ISSN 2348 – 8034
Impact Factor- 3.155

GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES

AREA CLASSIFICATION OF MORPH CLIMATE OF TEHRAN PROVINCE USING CLUSTER ANALYSIS METHOD

Dr. simin Armaghn[*1], Mahdi Ebadi[2], Elhan Rahnama[3] & Dr. Hossin Asghari[4]

[*1]Department of Geography,Collrge of Faculty of Science, Yadegar -e- Imam Khomeini (RAH) Branch, Islamic Azad University, Tehran, Iran.

[2]M. A., Department of rural geography and planning, Islamic Azad University, Yadegar-e-Imam Khomeini branch, Tehran, Iran

ABSTRACT

Categorizing the morph climate of geographic area has been studied by many ecologists and geo-morphologists since long time ago. The application of various ecology parameters accompanied with topography elements is very important in determining morph climate regions. Therefore in the recent years the scholars have attempted to provide a virtual view of ecology topographic areas using the major effective parameters on ecology and multi variables methods. The aim of this paper is area classification of Tehran province using cluster analysis method. In this method, most of ecology elements involved are accompanied with topography to specify the morph climate regions, to show the area classification of Tehran province from 8 aero logy sites, have been used prevailing ecology elements (rain, humidity, pressure, wind, temperature) and topography and height.

The result of cluster analyzing for area classification of Tehran morph logy areas demonstrate that Tehran province has been divided into three main categories which are: First Firooz-kooh, Second Amin –

Abad in Firoozkooh and Abe-Ali and the remaining are in third section that in this section the areas are in space distance considering the predominant ecology and topographic elements.

Keywords- *Climatology, Tehran, Cluster Analysis.*

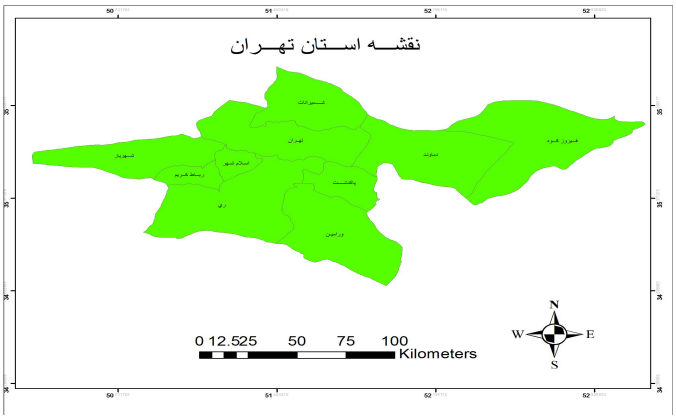
I. INTRODUCTION

Distinguishing the natural potentials as a ground for human activities forms the dominant base and the fundamentals of environmental planning and logistics of land. In this direction the ecological characters and its prevailing elements and topography agents which play a determinant role in dispersion and formation of life phenomena

(herb, animal, human) are assessed as one of the most important natural-environmental factors, if the ensuring of full success in developing agriculture planning, industry, housing, transportation, health and Medical care and etc. are all achieved that by knowledge of ecology and the application of variety of potentials included the traditional classifying methods are very diverse. Nevertheless, these methods being important from historical point of view and from comparative aspects, have the following weak points which decreases the comprehensive efficiency and better effective of these systems:

1-The selective criteria alternatives for climate elements such as the species of the vegetables' shelves, sort of land dust and the needed water by plants or it is on human's reaction. 2- The boundaries among climatic types, in most cases have been conventional or voluntarily and scientific based reasoning climatic conditions had a looser and the less role effect. 3- In determining the kind of climate in a region, the implement of all the climatic elements must be performed, not only a few of them, whereas in all traditional systems, a few climatic conditions era become the base for categorizing. 4- In using of all climatic elements , the similarity scale among them must be measured exactly in different areas, where in traditional categorizing the similarity is not paid much of concerns 5-The climatic condition of region, adding local conditions such as unevenness, angle of radiation, of external mass factors in air and atmospheric regular rotation are effected as well. In most cases the climatic affects, regional or external in general and the situation of Tehran province are viewed as descriptive and precise measurement has not been performed on them. To the reason mentioned above the obtained climatic condition is not so in conformity and coordinated with the reality and the domain of the expansion of ecology of a region does not show the required coordination by application of different methods in climatic differentiation (Kavianai-Alijani,2001). The main goal in statistics settings is to maximize the homogeneity and eternal group heterogeneity. It means that the climatic conditions have the most domestic homogeneity and at the same time, the most diversity to each other ,(Kaviani, Alijani 1898-,353)

ISSN 2348 – 8034
Impact Factor- 3.155



Map(1) Tehran

II. PROBE MATERIAL & TOOLS

The research due to application characteristic and the view of its descriptive method is analytic. The coordinates system UTM was

used as the system based on cartography. The cartography details in Atuo Cad digital software environment and then by the digital formats to shape files was transformed to software environment Arc GIS from topography measuring 150000 used for providing height digital model of Tehran province. Several statistics from aero logy cities which are located in inside and outside of regions were used for the investigation

of climatic elements of region to make climatic charts. Information regarding to topography, geology, and geomorphology of the region obtained from the existing library documents and report used to approach a result in analytic methods and then for more analysis of topography and for the complications the Google photos on region were used. After recognizing the parameters which have a role in photography and form- making of the area, the computing the test of coherence within parameters these variables weas performed.

1-Climatic elements including (annual rain, the definite maximum temperature, annual relative average of humidity and the median annual temperature 2- topography outputs including: height, is limited digital model. The study domain (Tehran province).

Tehran province centralized in the Tehran city with the area of nearly 12,981,000(s) Km within 34 to 36.5 N degree and 50 to 53 E.

(Figure No. 1-3). Tehran province is located in the west of Dashte Kavir region and the southern Alborz mountain slope. This province

is limited to Mazandaran province in the North in South to Qom province, in South west to central province, in west to Alborz province, in East to Semnan province. Tehran city is also the capital city of Iran. (Complete tourism map, 1988, 20)

The domain unevenness of study is divided to three sections:

1- mountainous, 2 mountain –side ,3- plateau. Also the minimum height in study domain is 765.00m and the maximum height is 4346m (Rezaei,1989,20)

1-mountainous: This region is a part of central Alborz and in general it is located in the north part of Tehran province and its height is more than 1500.00m. The southern boundary of central Alborz is located completely in Tehran province but Damavand peak-which is a part of the middle central Alborz , is located in Mazandaran a mountainous region from residency point of view and population absorbing does not matter much but its existence from the view of supplying water and modifying, temperature for mountain-side region, and the plains in the province is of significance. The elevations and the high summits of this region in the form of permanent reservoir to the rivers which originate from this elevation. In this manner, the centers of population in mountain-side and in southern Alborz plains because of the existence of the above mountainous regions could have ensured the reservoir in hot and dry season of the year. In this mountains, the summits such as: Kehar,SiahSang,Tochal, Kloon basten, Poolan garden and Khar Sang Kooh are the reservoir of some parts of the rivers in the province.

ISSN 2348 – 8034
Impact Factor- 3.155

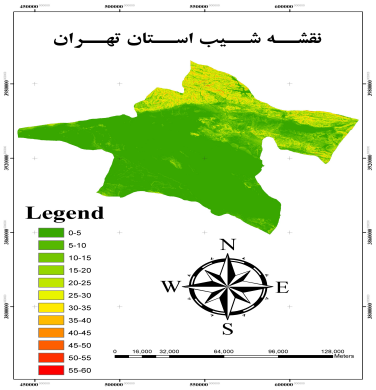
2- Mountain-side: Southern Alborz mountain–side in Tehran province because of the existence of numerous conics throw in them, has become the place of the creation of many cities and villages. The existence of sediments with big beads, small beads these cones throws

cause water permeation to underground and creating underground reservoirs and can provide the water needs for the people residing in this area and to this very some reason, these regions are a suitable place for urban and rural residence.

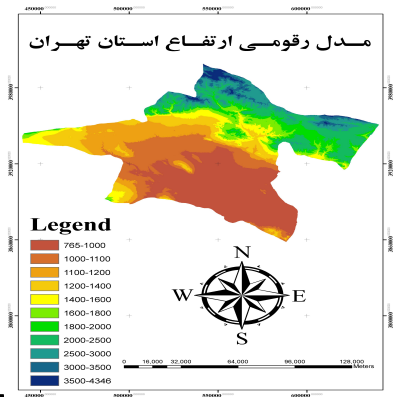
3- Fields: The \Tehran plains in Southern Alborz elvation are in (900 to 1500.00 m) in height(The complete tourism, 1994,65).Tehran province is relatively placed to the sea level. In a rather very high level, the height of the ground decreases from the north part toward the South. To this reason even in the area of Tehran city the difference in height is also in the north of the north of the city (Tajrish Square around 1300.00m and in the down town Rah Ahan

(Rail way) around 1100.00m can be distinguished. These two squares space in a distance of 15 Km and in such distance about 200 m has been decreased in height. (Mahmoodi-1986, 25)

After investigating the slop of map (figure 3), it became evident that the minimum slope measure is related to plain regions with the slope of 25-0 and the maximum slope measure belongs to mountain-side and mountainous area of the province.



Map(2) of Tehran province slope



Map(3) of height of Tehran province

There are three geographic agents in Tehran province which have an effective role in the province' climate. These agents are as follows:

Alborz mountain range in North, in down part ,the western rainfall wind and Dashte-Kavir in south of province. The factor of height has a major role in Tehran province climate. To these reasons the temperature rises with slope decrease from North part to the south. But the amount of raining is lower. The median of rain in the mountains in North part of the province is over 500 mm but decreases toward the south area and in regional area of salt Lake of Qom. It reaches to 100 mm. The dominant wind in this province is the wind from west. These winds whenever exceeding, they expel out the air pollution from Tehran.

III. THE RELATION OF THE PLANT SHELVES WITH TOPOGRAPHY

A- Plain regions

Changing the slope lower than %2 and with the height of 900 and with the height of 900 and the maximum of 1800 m above the sea level which is mainly expanded in the central part and in the south of domain, currently the major part of this physiographic has been transformed to cities, rural land, factories and installations, the lands, being changed, martial focuses, and marginal lands. In general these regions are consisted in fertilized lands of the domain.

ISSN 2348 – 8034
Impact Factor- 3.155

A-middle-sized mountainous regions and mild-altitudes mountainous beginning and lowering the depth of soil, being rocky, steep slope, coolness, Atmospheric descending, lower congestion of coverage could be observed in these regions.

(Complete map of tourism of Tehran province.2003, 52).

The considerable compacted vegetables' shelves exist only in some parts, position ally and in small plane. The minimum of height in this part 1800 and its maximumis2800 m. mainly it is accounted as a summer residence and or used as recreational and protected areas.

J) High mountainous, steep slope, coolness, and atmospheric descending caused the plants shelves changes in this growing place with regard to the previous parts. The minimum height above the sea level is 2800 m in this area. Depending on conditions (Microclimate) the compaction and the variety of the plants' shelves are variables. (Complete map of Tehran province tourism. 1986, 52)

Due to the elevation and topography of Tehran province is very different in the manner that in southern parts of the province with latitude of 990 Imam Khomein (BBUH) airport is placed and in opposite side of Imam Abad of Firoozgah, with the altitude of 2985 m above the sea level is placed which demonstrate the difference in elevation among the Tehran province parts and lands is very high such that there is a difference of 2000 m in height between the lowest and the highest point.

Table No. 1- The situation of Tehran province cites

width	Length	Height from sea level(m)	
51.31	35.68	1190.80	Mehrabad
51.53	35.75	1549.10	Tehran N.
51.16	35.73	1305.20	Chitgar
51.53	35.75	2465.20	Abe Ali
51.38	35.73	1418.60	Geophysics
52.73	35.75	1975.00	Firrozkooh
52.56	35.71	2985.70	Firoozkooh - pol
51.33	35.70	1209.20	Doushan Tappeh
51.06	35.41	990.20	Imam

4- Investigating the ecology of Tehran province the ecology elements used in this research includes the average monthly rain, the median of temperature. The minimum and maximum of the absolute temperature, the median of the relative rate of annual humidity in percentage, the wind speed and air pressure givens are from the aero logy cite and used in median status of ecology conditions from 1951 to 2010. Before investigating the mentioned conditions, one by one it is necessary that the effective elements in Tehran ecology to brought under investigation and to be discussed as a whole. Tehran province due to its geographical position prospers various ecology and topography conditions. As it is connected to Alborz mountain range in one side and on the other side, to the desert lands and to the low height plain. This topographic condition has influenced ecology of this province much. Three factors have influenced the Tehran province climate:

1.Alborz mountain range in North of Tehran

2-The West rainfall wind blow

3- Dashe-Kavir in the south of the province

ISSN 2348 – 8034
Impact Factor- 3.155

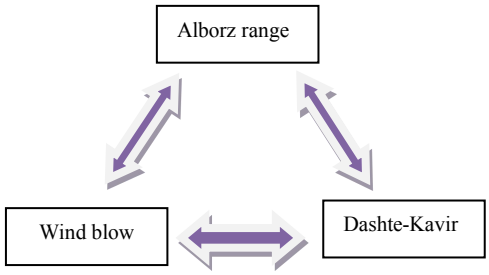


Figure No.1- The effective agents in the variety of Tehran province climate

Findings

Among ecology elements and different variables the followings were selected for analyzing. Considering the characteristics and the aim of this research. We investigate these variables one by one so that their result will aid in hypothesis:

1-Total of monthly rainfall in (mm)

2- Median of daily temperature (cm)

3-Minimum median of daily temperature (cm)

4-Maximum median of daily temperature (cm)

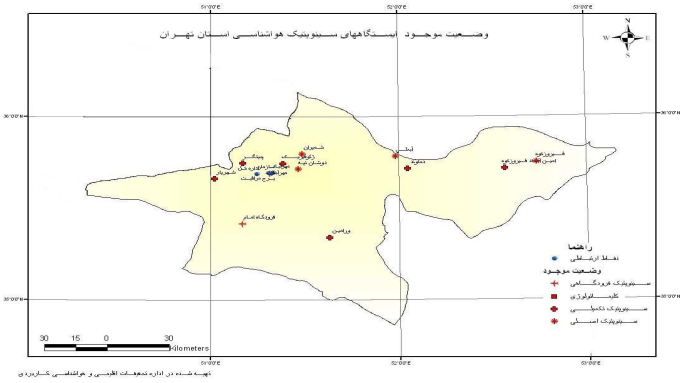
5-Median of relative humidity (percentage)

6-Medium pressure QFE, (HPA)

7-Median of wind speed (KNOTS)

8-Median of wind speed (KNOTS)

In the beginning, the situation of semiotic cites currently in Tehran province and their placement situation is shown as in the map below. It is necessary to mention that because of using the long term statistics and data, meaning from 1951-2010, some of the cites had no statistics and data, so to this reason, some of the cites have not been used in the investigation of this research,



Map No(4)- The situation of the dispersion of aero logy cites in Tehran province

1- Rain

It became clear through statistics and the maps obtained from the amount of rain in the cites that the amount of annual rainfall from the North of the province decreases to the south, (Figure No.6) that considering the topography of province where we reach to the North of southern side of Alborz and in the south of province to the mountain–side, it is quietly considerable .This process of rain amount is observed in all seasons in compare with annually and all the seasons, Abe Ali fortunate from topography conditions and high elevation, has allocated much of raining to

ISSN 2348 – 8034
Impact Factor- 3.155

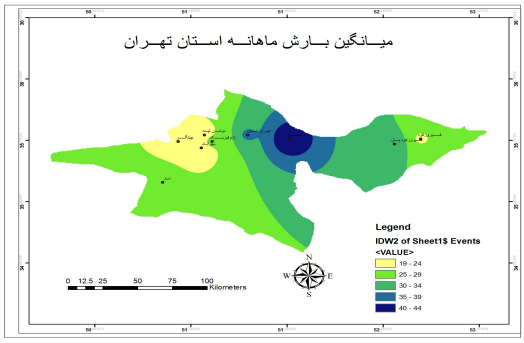
itself and the lowest scale of rain is allocated to Imam Khomeini (BBUH) airport that from the view of height is located in the lowest point .

Table No.2 –Total of monthly rainfall (mm) Tehran province

months	Mehrabad	Tehran North	Chitgar	Abe Ali	Geo-physics	Firooz kooh	Firooz Kooh pol	Doushan Tapeh	Imam (PBUH) airport
january	34/6	61/9	38/1	63/2	45/5	33/3	48/1	40	28.7
February	33/2	68/3	30/1	74/3	37/8	34/8	45/3	38/5	20.1
March	39/6	73/9	48/9	96/7	64/7	36/5	61/5	44/6	25.2
April	31/9	53/2	42/3	44/5	41/4	36/1	49/3	31/9	28.5
May	14/8	24	14/3	10/8	20/9	25/2	35	17/8	11.5
June	3	4	1	10/9	4/7	11/9	12/6	4	3.9
July	2/2	3/8	3/7	9/5	3/3	18/4	24/5	3/3	1.9
August	1/7	2/5	1	7/5	2	10/4	24/5	1/6	0.3
September	1/2	3/8	1/1	24/5	0/8	9/7	14/9	1/4	2.3
October	10/7	18/4	13/7	57/3	12/1	13/9	20/2	12/6	5.2
November	26/1	41/5	28/9	67	35/9	27/6	25/4	27/2	19.2
December	33/7	64/3	46/8	67	46/5	29/7	42/3	41/8	18.1
Per Year	232/7	420/5	269/6	532/5	315/7	287/5	391/6	264/7	16.5

Source: The State aero logy

As the diagramNo.4 shows-The highest rainfall in Tehran province from the location point of view Abe ali and from the period and time, in March and April occurs.



Map No(5): Area classified of the state of rain in Tehran province area.

2-Temperature

A-The median of daily temperature in Tehran (c)

On the bases of 60years statistics from Tehran synoptic cites, the medium median of daily temperature (c): is various in different sites.

ISSN 2348 – 8034
Impact Factor- 3.155

As its highest amount is related to Mehr abad Tehran with 17,4© and its lowest is related to Aminabad Firoozkooh cite with 5 © which shows from the view of Temperature also the elevation has much influenced .

Figure No. 3- Medium median of Tehran daily temperature in degree© in different cites of the year (1951-2010)

	mehabad	tehran	chitghar	Abali	ghofizi k	Firozko h	Pol	Doshan tape	Emamrah
January	3.8	2.3	4.1	3.2	3.8	-4.6	-6.8	4.3	3.2
February	6	4.4	6.1	-2.9	5.7	-1.8	-6.1	6.5	6.9
March	10.7	9.2	10.3	1.8	9.5	3.7	-2.7	11.2	13.2
April	16.8	14.9	16.6	7.2	16	9.1	3.5	17.4	17.4
May	22.1	19.8	21.7	12.1	20.6	13.5	8.5	22.4	23.2
June	27.5	25.6	27.3	17.8	26.7	17.9	13.9	28.3	28.7
July	30.3	28.5	29.4	21.1	29.7	20.8	16.8	31	31
August	29.5	27.6	29.8	20.6	29.4	20.4	17	30	29.9
september	25.5	23.4	25.7	16.7	25.2	16.1	13.1	26.2	25.5
October	19	17.2	19.8	10.4	18.6	10.7	7.1	19.2	19.9
November	11.6	9.9	11	3.6	11.1	4	-0.2	12.2	11.5
December	5.9	4.8	6.5	-1.3	5.9	-1	-4	6.5	5.7
Yearly	17.4	15.6	17.4	8.9	16.9	9	5	18	18

Source: State aero logy organization

3- Median of relative humidity

The measure of humidity is also one of the very important ecology elements in the region which is affected under the different conditions and agents that the most important agent could be to the existence of the elevation, the coverage of land. In Tehran province the measure of the relative humidity, considering the topographic condition and land unevenness is variable. The lowest measure of relative humidity, from the location point of view is in

Chitgar cite and from time point of view is in June, and the highest measure of relative humidity is also in Firooz-Kooh cite in January and February. The more we move to the south the measure of humidity decreases. It is given in the table and diagram in below.

Figure No.6- Median of relative humidity in Tehran province

(In percentage). 1951-2010

4-Median of relative humidity

The measure of humidity is also one of the very important ecology elements in the region which is affected under the different conditions and agents that the most important agent could be regarded to the existence of the elevation, the coverage of lands. In Tehran province the measure of the relative humidity, considering the topographic conditions and land unevenness is variable. The lowest measure of relative humidity from the location point of view is in Chitgar city and from time point of view is in June, and the highest measure of relative humidity is also in Firrozkooh site in January and February. The more we move to the south the measure of humidity decreases. It is given in the table and diagram in below.

Figure No. 6-Median of relative humidity inTehran province (in percentage)-1951 to 2006

ISSN 2348 – 8034
Impact Factor- 3.155

	Mehr abad	Tehran North	Chitgar	Abe Ali	Geo physics	Firooz kooh	Firoozkooh pol	Doushan tapeh	Imam
January	64	67	60	66	58	67	64	61	66
February	56	59	48	66	49	63	64	54	58
March	47	51	40	62	44	54	64	46	44
April	40	44	37	52	36	48	57	39	44
May	33	39	28	44	31	44	47	34	34
June	25	30	23	33	23	42	38	27	26
July	26	31	25	32	25	43	40	29	27
August	26	31	24	31	23	41	36	29	25
September	27	33	24	32	24	43	37	30	29
October	36	44	30	44	32	49	47	38	37
November	49	57	47	58	47	58	60	49	52
December	62	66	62	66	58	65	63	60	62
Yearly	40	46	37	48	37	51	51	41	42

Source: State aero logy Organization

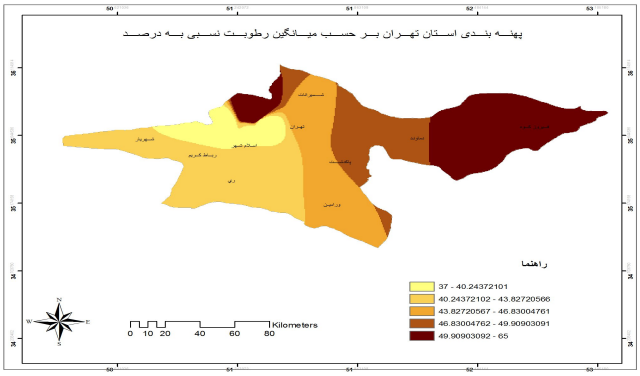


Figure (6)- Area classified Tehran province according to the median relative humidity (percentage)

5- **The median pressure QFE (HPA)**

The measure of air pressure in the site area is also one of the important ecology elements in the region which effected by different agents in Tehran province, the relative humidity measure considering the topographic conditions and unevenness of the land, is variable. The lowest measure of pressure in Aminabad Firoozkooh area is in January and the most measure of median of air pressure is in Imam airport sites in January and December. The more we move to North part the air pressure decreases. It is brought in the following table and diagram in more full details.

Table No.7-The median of Pressure QFE according to (HPA) Tehran Provine in percentage(1951-20100

ISSN 2348 – 8034
Impact Factor- 3.155

	Mehr abad	Tehran North	Chitgar	Abe Ali	Geo physics	Firooz kooh	Firoozkooh -pol	Doush tapeh	Imam PBUH
January	883/7	793/2	871	754/8	759/7	802/4	706/6	881/6	7/905
February	882/5	793	869/6	754	858/2	801/1	706/1	880	5/903
March	880/6	792/9	869/2	754/7	857/8	801/1	707/2	878/7	6/901
April	880/1	794/1	868/7	757	857/8	802/1	710/4	878/2	1/901
May	879/9	795/2	867/9	758/4	757/7	803/4	712/8	877/9	900
June	877	793/1	865/7	758/4	855/4	802/4	713/6	875/1	9/896
July	875/6	791/9	865/1	758/5	854/5	802/1	714/1	873/9	1/895
August	877/6	793/4	866/7	759/8	856/4	802/4	715/6	875/8	4/897
September	881	796	869/6	761	859	801/9	715/6	879/1	8/900
October	884/7	798/3	872/9	761/9	862	803/6	712/2	882/9	4/905
November	885/7	797/4	873/7	759/6	862/1	805/6	712/2	883/4	2/906
December	885/6	795/4	873/6	757	861/8	804/3	709/8	882/9	6/906
Yearly	881/1	794/5	869/4	757/9	858/8	803/4	711/6	879/1	7/901

Source: State aerology organization

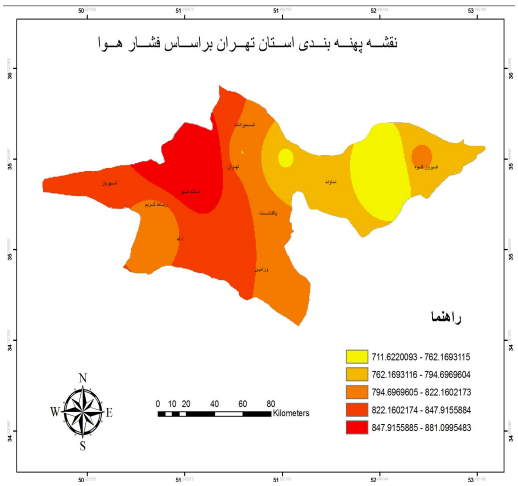


Figure No(7)-Area classified of Tehran province according to the median pressure in the site area

6-Median of wind speed in (KNOTS)

The measure of registered wind speed in Tehran sites show that considering the topographic conditions and the unevenness of the lands, is variables. The lowest measure of the wind speed is in (KNOTD) in the area of Tehran North site in January and the highest median of wind speed in Imam Airport sites in June.

ISSN 2348 – 8034
Impact Factor- 3.155

Table No. 8- The median of wind speed according to KNOTS in Tehran province.1951-2010

	Mehr Abad	Tehran North	Chitgar	Abe Ali	Geo physics	Firooz Kooh	Firooz Kooh-pol	Doushan tapeh	Imam
January	1/5	1	1/9	2/6	3/5	2/4	8/8	1/9	8/4
February	2/5	1/7	3/6	3/4	5	3/8	10/9	3	9/7
March	3/8	2/1	4	4/7	5/6	5/1	11/1	3/9	10/6
April	3/9	2/6	5	5/5	6/3	6/3	11	4/8	10/4
May	3/4	2/6	5/2	5/8	5/6	6/4	9/8	5	11/7
June	2/4	2/2	3/2	5/3	5/4	7/6	7/6	4	12
July	2/5	1/7	2/8	5/2	5/4	7/1	6/6	3/2	12/6
August	2/2	1/8	2/6	5/1	5/1	6/1	7/2	3	10/4
September	2	1/9	2/9	4/6	5/4	5/5	9	2/9	9/6
October	2/1	1/2	3/3	4/1	5/1	4/4	10/3	2/8	8/9
November	1/7	1/1	2/2	2/9	4/1	3/3	8/8	2/3	9/1
December	1/5	0/9	1/5	2/4	3/2	2/3	10/2	1/8	7/9
سالانه	2/5	1/8	3/2	4/3	5/2	5	9/3	3/2	10/1

Source: State aero logy organization

From the speed view upon (KNOTS)in Tehran province sties, there is a clear difference in regard to a manner that in geophysical sites Imam(PBUH) speed in comparison with other sites is very higher.

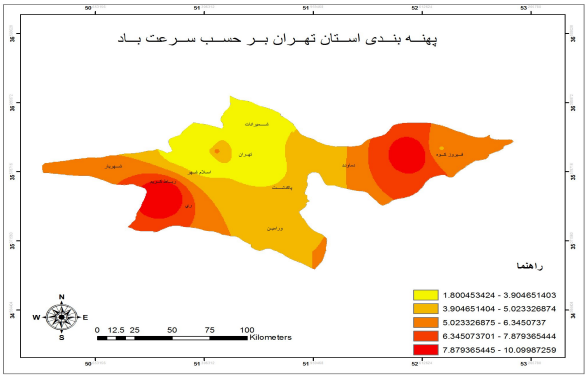


Figure No(8)- Area classified of Tehran province according to wind speed (KNOTS)

The ranged cluster analysis (cluster analysis)

IV. CLUSTER ANALYSIS (SPACE METHOD)

The space method is often used for grouping two or several criteria. In this method to determine the distance of the components from each other, the Euclid geometry is used. The Euclid space between place and time points. The space matrix is used that on the basis of the distances, the place and time groups are specified (Alijani 1999,173)

ISSN 2348 – 8034
Impact Factor- 3.155

The table in next page, which is in fact the first output of the ranged cluster analysis, is the criteria that clustering is based on is space. The points closer to each other, combined matrix nearly between the respondents (or variable).

In this research the method of square root of Euclid space is used. Which is an indicator to measure the length of the distance between the points' binds. In this method, the more the length of the distance it indicates that the difference between the areas is more and conversely, the low amounts also indicates that the similarity between the areas is high. As it is observed in the table, Mehrabad with Chitgar (with the amount of 0.544) has the shortest distance3 and with Aminabad Firoozkooh (with amount of 38 /650 the longest distance. In regard to other areas we can also reach the result in second order likewise since this table has a matrix shape, therefore each point with itself is equal to zero.

The coefficients shows the length of distance between two points combined it each other and the measure of coefficients that we observe here is based on the indicator of estimation and binding methods which we use in our analysis.

points in this diagram, the amount of variables in each group has the most similarity with each other and the lowest similarity with the other points. Indication is from observing the combination and the amount of the coefficients of cluster in each cluster.

V. CONCLUSION

Tehran province is located in a very special natural condition position. From topography view and ecological elements it fortunate from many varieties, somehow that from the unevenness view it is divided into three main category which comprises Alborz mountain range in North of Tehran province the central parts and Alborz southern mountain-side and the plain in Tehran province with mild slope which are drawn from the north west to the south east. These plains because of evenness, have provided a suitable condition for the collection of human activities. Suitable with this unevenness it has various ecology, In general Tehran can be divided into three main parts: A-t

The North elevations on souther side, central Alborz height of the mountainous, in a height of 300m and a humid and smi humid climate and cold region with very cold and relatively long winter. Abeali, Firoozkooh Township ,Damavand Township, Lavasanat (including Lavasan city-Lavasan rural district- Small Lavasan rural district- Varchin protected regions, Lar plain and Latian dam), also Amir Kabir dam and Taleghan valley are located in this ecology) dry and half dry. With short winter and hot summer, in an elevation slower than 2000 m is located. The more the height decreases, the drought of the environment increases. Varamin, Shahryar are located in this ecology. It can be stated that three main agents have influenced

Tehran ecology condition as follows:

Alborz mountain range is in north of Tehran, the blow of rainfall winds of the west and Dashte Kavir (Kavir desert) in south of province. Therefore determination and ecological classifying and Tehran province morph climate, for the reason of suitable and essential exploitation of the environment seems important and essential in practical application. In the same direction for the area classifying of morph climatic there are different methods that one of these methods, is using the cluster analysis (arrange cluster). Considering cluster analysis can distinguish the distance between plants from the view of ecology and indicators and morph climate therefore it can help in providing morph climate map in a very high precision.

Considering the findings of cluster analysis from ecology elements and morph climate of Tehran it can be state that the cluster analysis separates the points which from the view of ecological indicator, are closer to each other, fully , separates and segregates each other stage by stage, as according to finds of the present research, in the current cluster analysis , three main and general categorizing have been accomplished if we start from zero to analysis, Mehrabad , Chitgar, and Doushan tapeh sites, considering this, from the view of ecological and elements (temperature, rain, humidity, height, speed of wind and air pressure) were very close to each other have comprised a set among the measure between 0 to5. In next procedure they are combined to the net sites. In general classification, they are between the scale 20 to 25.

Firoozkooh sites in one set, Aminabad and Abe Ali in one set and the rest of 5 sites in the third category. So that the tree shape and range of morph climate cluster analysis of Tehran province forms more clearly and evidently. So considering the result of the present research, it could be stated that the range cluster analysis can help in determining the morph logical of the regions.

REFERENCE

1. Jasbersing S.S. Dallon,Translated by Siavash Dehghani and others (1980), Ferdousi Agriculture University Meshad.
2. Heidary, Hassan and Alijani, Behlool ,(1977),The Climatic Classification of Iran using multi variable statistical techniques,Geograpic research,No.37. p 54-57
3. Khosroshahi Mohamad (1977). The realm of the deert regions of Tehran province from the view of plants' coverage, the scientifice and research season letter
4. Jackson, I.J., Weaned, H (1995), "Classification of Tropical rainfall Stations: a comparison of Clustering techniques", Int. J. climatic. 15, pp. 985-994
5. Klingseisen, B; 2004. GIS based generation of topographic attributes for landform Classification, PhD Thesis, university of Applied Sciences, School of Geohnformation, Kärnten. Germany. pp. 76-91.
6. MacMillan, R. A , Pettapiece, W. W;1997. Landform segmentation procedures manual: Step by step instructions for processing DEM data to define landform segments, Research Branch, Agriculture and Agri-Food Canada, Lethbridge, AB. 65 pp.
7. Dikau, R., 1989. The application of a digital relief model to landform analysis in geomorphology. In: Raper, J. (Ed.), Three Dimensional Applications in Geographic Information Systems. Taylor and Francis, London, pp. 51-77.
8. Dome roes, M., Kaviani, M., and Schaefer, D. (1998), "An analysis of regional andintra- annual precipitation Variability over Iran using multivariate statistical methods", Theor. Appl Climatic.61 (3- 4), pp. 151-159
9. Evans, I. S., (1972) General geomorphology, derivatives of altitude and d. Dscriptive statistics in R. J. Chorley (Ed.), spatial analysis in geomorphology, pp: 17-90, London: Methuen and Co. Ltd.
10. Fels, J. E , K. C. Matson, A;1996. cognitively based approach for hydro-geomorphic land classification using digital terrain models, In: 3rd International Conference/Workshop on Integrating GIS and Environmental
11. Modeling, Santa Fe, New Mexico, Jan 21-25, 1996, National Centre for Geographic Information and Analysis, Santa Barbara, CA, USA. CD-ROM (1996).
12. Franklin, S. E;1987. Geomorphic processing of digital elevation models, Computers and Geosciences 13, pp. 603-609.
13. Gerstenhaber F.W., P.C Werner, and K.Fraedrich (1999), "Applying Non Hierarchical Cluster Analysis Algorithms of Climate classification some problems and their solution", Theor. Appl. Climatic. 64, pp. 143-150.
14. Goudie, A. (2004), "Encyclopedia of Geomorphology".Vol 1. Routledge. London pp 162.
15. Graff, L. H , Usery, E. L.;1993. Automated classification of generic terrain features in digital elevation models, Photogrammetric Engineering and Remote Sensing 59 pp. 1407-1409.
16. Irwin, B. J; Ventura, S. J and Slater, B. K., 1997. Fuzzy and isodata classification of landform elements from digital terrain data in Pleasant Valley, Wisconsin, Geoderma 77, pp. 137-154.
17. MacMillan, R. A , Pettapiece, W. W;1997. Soil landscape models: Automated landform characterization and generation of soil-landscape models, Technical Bulletin No. 1997-1E. Research Branch, Agriculture and Agri-Food Canada, Lethbridge, AB. 75 pp.
18. Pennock, D. J; Anderson, D.W, E. DeJong.,1994. Landscape changes in indicators of soil quality due to cultivation in Saskatchewan, Canada, Geoderma 64, pp. 1-19
19. Pennock, D. J; Zebarth, B.J , DeJong, E.,1987. Landform classification and soil distribution in hummocky terrain, Saskatchewan, Canada., Geoderma 40, pp 297-315.
20. ROMERO, R, RAMIS, C, GUIJARRO, J.A, SUMNER, G., 1999. DAILY RAINFALL AFFINITY AREAS IN MEDITERRANEAN SPAIN, INTERNATIONAL JOURNAL OF CLIMATOLOGY, Int. J. Climatol. 19: 557–578
21. Sinha Ray, K. C. & Srivastava, A. K. (1999) Is there any change in extreme events like droughts and heavy rainfall? In: INTROPMET-97 (IIT New Delhi, 2–5 December 1997).
22. Skidmore, A. K., 1990. Terrain position as mapped from gridded digital elevation data, Int. J. Geographical Information Systems 4.pp. 33-49.
23. Skidmore, A. K., Watford, F, Luckananurug, P, P. J. Ryan.,1996. An operational GIS expert system for mapping forest soils, Photogrammetric Engineering and Remote Sensing62. pp. 501-511.
24. Tagil, Sermin and Jennies., Jeff; 2008. GIS- Based Automated Landform Classification and Topographic, Land Cover and Geologic Attributes of Landforms around the Yazren Polje, Turkey. Journal of Applied Sciences 8(6) pp. 910- 921.