# Survey of green area`s effect on hemisphere and its biological effects on metro polis of Tehran

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**Abstract:** Tehran is considered as one of the most populated, political. economical, commercial and industrial areas of country and occurring any biological undulation will result in irrecoverable damages such as lack of water sources , wild floods , soil`s scuff , etc . this issue will lead to environmental problems . as a result, studying area`s hemisphere has an important role in facing such hemispheric problems and reducing damages and performing environmental schematization.There fore, major issues of city and its solutions should be characterized by correct biological and environmental researches. among environ me elements and controlling human`s life, green area and her baceou overlay are priotorized. Procedure of population increase in this metropolis is not same as growth of green areas , and it`s less than international area`s capitation ( Makhdom , 1386 . p.p 67 ) human beings cause change in important factors like surfaces , amount of vaporization , temperature , etc by changing earth`s overlay. Increasing of Tehran`s population has a direct effect on biological elements which had led to temperature increase, humidity decease and raining. Also, lack of green area and her baceou overlay in this metropolis, has empowered the situation. In this article, we are goring to study green area and its effects on hemisphere and environment of metropolis of Tehran.

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## Introduction

Nowadays, cities caused negative effects on environment by irregular spread. Misuse of natural sources inattention to environmental issues, ignoring avarice limitations and human`s willingness , during second half of last century and current century , made a situation hat nowadays, environmental problems are being discussed in all places.

Convert of agricultural lands to industrial places in suburbs has an effective role in decrease of green area. Positive effects of urban green area on cleaning pollutions will be obvious when there is enough green area. In order to prevent from harmful effects of pollutant materials, they must be surrounded by green area. Nowadays, herbaceous overlay`s effect on pollution`s purge has been proved by many researchers. totally, herbaceous effects will change according to the following situations:

1- voluminous kind of pollutant materials
2-green area`s structure
3-resistance degree of various kind of trees
4-area`s climate

Recent surveys have presented that green area with $500^{m}$ width can reduce 70 % of so2 and 67 % of Nitrogen oxide in the air which has been passed through it . also, in a laboratory survey, it`s been cleared that plants have an effective role in cleaning air`s ozone. as an example while a mass of polluted air, containing 150 $^{PPB}$ of ozone, is passing over a jungle which includes live – meter – height trees, as a result of purging, the amount of ozone in jungle will be reduced to 6090 $^{PPB}$. In this mass of air stays over the same jungle for 8 hours 30 $^{PPB}$ of ozone will remain in jungle.

other effects of trees specially sycamore, is being effective in absorbing this toxic substance through leaf and bough and has an important role in cleaning air.( Imani , 1373 , p.p 25 )

**Effects of green area on reducing globular and dust particles**

Herbaceous overlay is considered as an important factor in reducing globular and dust particles. globular and dust particles, carried by wind sediment because of reducing in wind`s speed and carrying force due to contacting green areas, especially trees.

different assessments have shown that per hectare of jungle will sediment about 68 $^{ton}$ of globular and dust. In urban environments, effect of green area on reducing globular and dust particles, is different compared to plants density For example , recent measurements in central part of Frankfort have shown that the air in this part includes 18000 particles each volume unit of air while it includes 1000-3000 particles in a hectare park in the same city.

In other surveys, It`s been modified that by equality of other conditions in tree – planted streets, globular and dust density is 3000 and in other streets is 10.000-12.000 particles each liter.( Tabatabai , 1371 , p.p 25)

Table (1) shows beneficial effects of planting in cities in order to over come pollution caused by globular and dust particles.

**Table (1) :** Amount of globular and dust according to number of particle in each liter of air. (weather report organization of country)

| Type | Morning | Noon | Evening |
|---|---|---|---|
| Downtown | 15120 | 13220 | 18370 |
| Not planted street | 13880 | 10.80 | 11490 |
| Planted streets | 3870 | 3040 | 3830 |
| City park | 3280 | 1180 | 3140 |

generally, in the shown table, it`s been perceived that in parks and planted areas, amount of globular and dust is much less than other areas. this amount is usually more in the morning and evening than at noon. considering that wind`s vector is toward east. desert`s wind contains dust that is blowing from south to north , setting wind breakers , especially against these atmospheric flows has a major effect on preventing from movement of pendant particles to central parts.

a point that must be considered in planting trees and shrubs is that such blocks should not be so massive in order to sediment globular and dust. because in a condition like this, a huge amount of globular and dust winds will pass over green area and arrive to central part of city.( The Environment Organization , 1372 , p.58 )

**Herbaceous overlay`s survey in the city of Tehran**

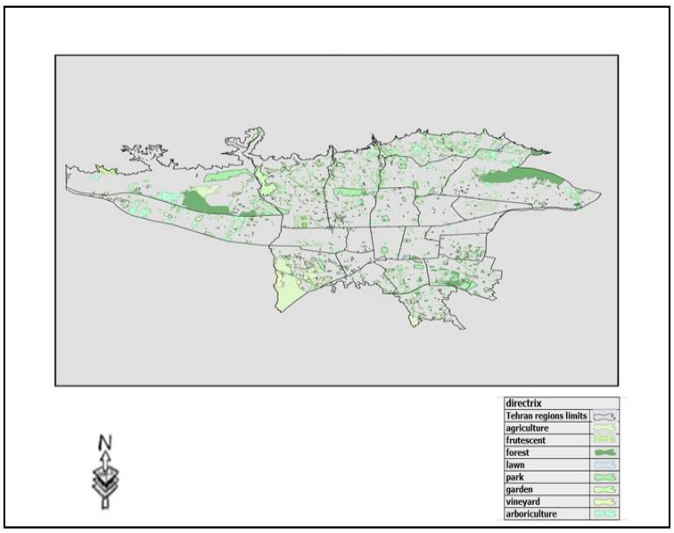
Tehran is in a dry and semi-dry region in compared to world`s big cities like new York, Tokyo, los angeles, London, and warning in this area, helps in crease air pollution effectively. according to natural barriers that prevent from cold weather to Tehran form Alborz mountain chains also. western, eastern and southern Tehran`s mountains have caused a bad atmospheric situation occurring over Tehran`s sky that is called smog, and it has bad effects on leaf of tree, especially vine`s leaf. Increase of so2 and co2 in Tehran`s atmosphere lead to increase in temperature and when sun`s beams expose the earth, some of them are absorbed by co2, some are reflected and some are converted to infrared radiation that produces much heat. the temperature behind greenhouse`s window, which means Smog, has become green houses window and so many plants will burn in summer. now, by increasing in planting environmental plants like chestnut and other trees that have property of purifying air. we can prevent from increasing air pollution and help change air`s temperature in Tehran effectively and reducing dangerous types of gas like co2, etc.

table (2) shows natural forest`s condition and Tehran`s implanted areas and map (1) shows herbaceous overlay in the city of Tehran.

**table (2):** Summary of natural Forrest condition and implanted areas ( The area of Tehran , 1386 )

| State | Forest | | | Considerations |
|---|---|---|---|---|
| | Natural | Implanted | total | |
| Islam shard | 0 | 0 | 0 | |
| Pakdasht | 0 | 0 | 0 | |
| Tehran | 11437 | 1079 | 12516 | |
| Damavand | 6450 | 20 | 6480 | |
| Robat karim | 0 | 0 | 0 | |
| Rey | 0 | 85 | 85 | |
| Sa`avog Balag | 500 | 0 | 500 | |
| Shemiranaat | 3300 | 2990 | 6290 | |
| Shahryar | 0 | 0 | 0 | |
| Firouzkuh | 11600 | 150 | 11750 | |
| Karaj | 533 | 169.8 | 702.8 | |
| Nazar Abad | 0 | 0 | 0 | |
| Varamin | 0 | 0 | 0 | |
| Total | 0 | 4503.8 | 38323.8 | |

**The map covering herbaceous Tehran′s city**




**Efficiency of green area in ventilation of city`s air**

however , green area has made air`s sphere more desirable by creating green plant`s barriers and lively and absorbing carbon Oxide and releasing Oxygen, fresh puff of air , is depended on whirl of air which is a result of temperature difference between bare green areas and tree-covered areas ( PETER & MICHAEL , 2005 ) . ventilation of air in a city like Tehran is not possible by technical equipment. but an area with all its effects can have this role and is capable of preparing city`s environment for a healthy life widely. Considering extreme lack of entertainment and sport facilities and green area, which go tally decrease level of availability of common wealth facilities, presence of Alborz mountains, which Tehran is located in its southern hillside , can compensate depletion of out door areas of city up to some points. ( Toroko , 2007 , p.p 50

vaporization and distillate, of plants are a sign of water sweat from leaves` vents, plant`s outlet. and colitol and water vaporization in near area`s soil around plant`s root. Real vaporization an distillate is decrease of water in plant`s root that is begun by atmospheric factors and controlled by soil`s and plant`s properties. ( Leghai , 1368 p.p 49) Potential vaporization and distillate shows plant`s water requirement, where soil`s humidity reservoir is always enough 80 that necessities of plant`s distillate are provided. This issue can only continue by watering, there fore, the amount of water is controlled by atmospheric factors, size of vents, kind of plant and other varieties.( Mohammadi , 1382 p.p 285 ) the mast major reason concerning stability of pollutions in proximity of earth , are inexistence of air floods most of the times. So there will be capability of using ventilation role of green area on correct way. Therefore, an important amount of problems concerning inversion and stability of air pollution in proximity of earth will be solved in Tehran and its suburb. temperature has a considerable relation with constructed urban surfaces covered by asphalt, concrete, etc. as a result, if green areas don't contain enough expanses, it will be able to establish a blast and therefore will lead to valuable ventilation in polluted urban areas and spots.

**In table (3):** percentage of sun`s energy reflection by different surfaces: ( Iran Meteorology Organization )

| Refle Reflection degree | Type of surface receiving sun`s energy |
|---|---|
| 18-20 | Phyllde trees |
| 12-18 | Ouergreen trees |
| 8-10 | Concrete surfaces |
| 4-5 | Asphalt surfaces |
| 0-3 | Black surfaces |

**Importance and role of green areas in aspect of urbanismity and technical**

quantity of urban environment has a direct relation with facilities and installation of green areas. nowadays, green area and basically architecture and design of green area is discussed as a part of modern urbanismity. That`s why such areas have found their place in designing high – ways and their usage and other city designs.( Tim Hall , 2006 )

a city is a live system that parks are a small part of it and because of their effective impression in reducing urban aggregation, creating leading , complete ways and improvement of performance, instructive institutes and earth`s storage are valuable for nature city`s expedition and spread . Ecological importance of green area is because of that oxygen required for a person can be gained in a 30-40- square – meter green area. Spending leisure time is other important work of green area. Creation, variety and harmonic reduction of artificial bulks, providing an environment with beautiful scenery are important usage of plant to reduce noticed factors. so far, necessity of existence of criteria's for planning parks and green areas are appreciable as well. ( Ramanthan & Harrison , 1969 )

**Location criteria′s of urban green areas**

an important point in finding and location green areas, public locations, is social necessities in providing parks. that's why , Jane Jacobs, Contemporary urbanismity critic , believes that park should be located where life exists there, a place where work , culture , commercial and residetional activities are there, Some urban districts include such valuable spots of life that look suitable for providing local parks with public grounds.

The worst parks are located in places that people don't cross them. an urban park including suitable lands like a great shopping center encountered such problem and has a bad economical situation. as a summary, if a public park can not be supported by its surrounding natural potentials on varieties.( The scientific quarterly journal of Greenland , 1372 Winter, 1373 Spring )

it will change to a private park. variety on usage will lead to variety of users that is seen minimized in parks. According to condition, locating criteria′s of public green are following:

public green area`s usage should be located in urban centers like local`s centers, district`s centers, and urban areas at least.

Conformity sequence in functional structure of public green area with geographical structure of public green area should be located to its functional condition per unit of neighborhood, district and area suitably.

Introduction of parks in a scale of parish in neighborhoods should be refused as much as possible.

green areas are efficient in reducing temperature in city and also in thermal is land having a impressive effect.( KHALEDI , 1377 , p.p 78 )

each of urban parks should be convenient to transportation system from four sides. In this way, possibility of attracting crowds is provided and social supervision and park`s safety will increase. also, possibility of taking advantage of park`s beautiful sceneries should be provided for pedestrians from four sides.

**Surrounding green belts**

green belts are created to specify city`s restriction, controlling spread of city, preventing over – population and inequality in city`s morphologic structure. Green belts may lose their main role in process of coverage. but their potential role as a green area remains equilibrative, urban promenade, and a lively indicator for specifying procedure of city.

**Green arcs**

they are wide green belts that are used to control city`s over –population and leading them towards desirable ways and also establish connection between city`s main core and separating main city`s area from suburb.

**Green pivots**

Inland green pivots an outside green pivots are called those green areas along roads that are acceded to the inside of city directly or by a belt.

**Green area`s effect on beautifying city`s environment**

green area always has a symbolic aspect for human and its creation in different part of city with different sizes and shapes, has led to a change in environment`s mood and variety and emit it from uniformity. variety of plant`s color is effective on creation of elegance and environmental attraction that is filled by artificial objects.

also, green color inside city has made the environment more pleasant and has a positive mental effect on people.

**Conclusion and suggestions**

one of the most important issues that are nowadays discussed in metropolises is urban hemisphere, human beings influence on their environment directly or indirectly and the environment is controlled by hemispheric process and weather.

green area is not based on specific standard in the city of Tehran. In surveys related to urban land`s usage, every herbaceous phenomenon existing over city is considered as green area ignoring any quality or quantity standards yearly amount of Tehran`s seasonal green area is exaggerated or understated. most of yearly amount of green area can develop Tehran`s hemispheric condition scientifically and criticized. Tehran`s green belt`s spread can also be an important factor in specifying city`s spread. On of the most fundamental solutions for limiting Tehran`s outspread is modifying areas with the usage of green area as green belt around the city. Surrounding green belt can prevent from procedure of population increase and living in outskirt areas. Sanctum of Tehran has caused damages to environment, changes in usage and types of irregular constructing by not controlling in recent years. Protection of Tehran`s sanctum is effective in order to control city`s shell and protecting identity and modifying metropolis of Tehran, organizing increasing settlement of

population and protection of environment surrounding city.

organizing area has a direct connection with size of city. efficiency, stability of organizing area in a metropolis like Tehran requires structural change in skeletal patterns of area. this evolution can be effective on Tehran`s hemisphere and can prevent from over- population in some special districts with multi-central pattern is city`s structure.

there are some actions that can be done about this issue:

**1**) providing Tehran`s green belt in order to restrict Tehran`s spread and restriction of its spread, specifying some backwoods with the aim of green area as green belt around city, which prevents from city`s physical spread.

**2**) close connection between green area and city`s environmental requirements and social function of urban society in order to approximate human and nature.

**3**) protecting formed areas filled by water and tree in the city of Tehran: considering topographical structure of Tehran with a slope from north to south, the most important urban areas existing with factors (water and tree), are streets which adopted themselves to water`s orient ion and have been formed gradually.

for example, Vali Asr street, as the most important street of Tehran, has a valuable urban area in aspect of area`s structure and leading with two combination of flowing water and that have positive effect on Tehran`s hemisphere.

**4**) planting trees instead of parks that have an effective role on environment`s cleaning and humidity.

**5**) Providing and organizing services, Commercial centers and green areas in Doshan and empowering connection between Doshan with Damavand and Pirouzi ways in aspect of services.

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