

The geomorphologic evaluation of Semnan & Garmsar Road

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Abstract

The article discusses The geomorphologic evaluation for designing Garmsar -Semnan railway & road in the Semnan water shed using to map. Linear structures (such as high ways, railway, ...) have main and common effects on geomorphologic and rivers hydrologic system and on houses and structures establishment in geomorphology unit in the region which were studied (Hableh-rood and Semnan river basin). Garmsar - Semnan road and railway is a part of Tehran-Mashhad way also a part of the Hableh-Rood and Semnan rivers basin. The area of study is located : E 52° 45' to E 53° 30' and N 35° 21' 30" to 35° 45' 30" (Iran). The arid and semi-arid regions influence to this area . The important characteristics for semnan water shed are Low and high fluctuation of precipitation and in some years it may exceed annual average. Since there is no control over climate element it is very important to know those change to assess and study method of safety railway. This region has relative morphologic stability . Without studying and planning & this leads to unpleasant results and in turn these results change natural units equation and have effects on people in many ways. On the other hand it has main effects on region economic balance in future and it causes that environmental and safety index will be decreased. So in this paper & according to the reaction of Hableh-rood, Semnan and its sub rivers and the effects on environmental elements & it is necessary to study the following activities: at first organizing a systematic and exact study to change the effect of different selective plans on structures and the way of using them on environment and finally & the selection of structural projects measurements and linear structures so that they have minimum effects on environment. For these purposes & continuous researches necessities for improvement of the rivers and city zones linking with rivers also application of their results in urban and regional levels & it is necessary to systematic studies with comprehensive geographic views which based on different subjective sciences such as geomorphology & climatology & hydrology and so on . To distinguish of geomorphologic features and units & at first aerial photographs and different geomorphologic units have been showed on topographic maps. These units have been reviewed in field study and finally comprised features and units has been reviewed in field study.

Key-Words: Semnan Road - Environmental consideration - Garmsar - Geomorphologic map
Hableh-rood Basin

1. Introduction

ACCORDING to importance of transportation its socio -economic effects and its role micro and macro long lines of transportation have received much attention in scientific communities.

Natural Factors (water, climate and geology) and artificial factors (all human's activities) are the date of this system (construction projects and linear structures have been considered in this research) and the products of it are vital requirements of human (security and safety).

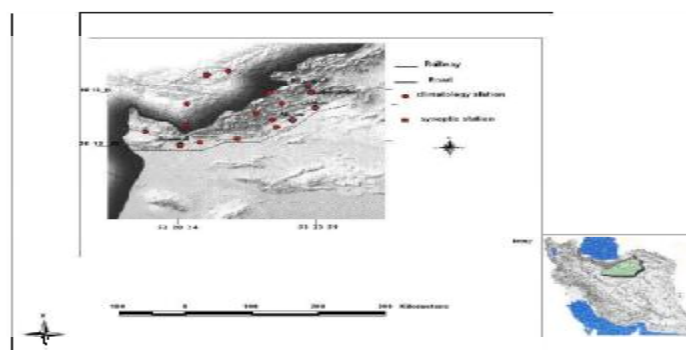
Buildings and structures in geomorphologic units, which don't have relative morph dynamic stability, may result in disasters if no studying and programming is being done on them. It almost changes influences on life style as well. Economic balance of such regions would also face major problems in the future.

The existing cities should gradually change to stable places for human's life. It means that civil management should pay more attention to a balanced and suitable relation between cities and the environment around them. Civil crisis can be stopped or at least minimized by observing these kinds of environmental issues.

It is obvious that the environmental conditions of cities could not be ameliorated all at once. This process requires many actions and provisions that forecasting ecological cures, based on the existing potentials, is one of the main components of it. These kinds of studies are essential for identifying the existing characteristics of evaluating construction impact and the way they are being used in environment and also for choosing the size of constructions projects and line structures so that the harmful effects on the area come to the minimum level. In order to achieve the extensive goals and requirements related to the rivers and urban areas around them and to use the results in civil and local levels, some systematic studies are necessary and such studies should benefit various geographic views like geomorphology, climatologic, hydrology etc.

2. General situation of the area

Second Road Transportation section of Semnan is a part of Greatway road Tehran (Iran's Capital) and a part of catchment's-basin of Semnan and hableh rood as well. This basin has been located in 52° 29' 51" - 53° 30' 10" of eastern geographic zone and in 35° 57' 30" - 34° 26' 54" of northern latitude.



Map.1 General Situation of the area

3. Methodology

order to define the optimal method for confronting the Semnan region, characteristics of the transportation were defined by using GIS.

table(1) characteristics of the data

| scale | date | No data | Kind of data | No |
|-----------|---------------------------|------------------------------|-------------------|----|
| meter 30 | Aug-9-2002 (1380-11-8) | ETM+ (164-35) | Land sat image | 1 |
| 1:25000 | 2003 | 39-3NI31-3 NI | Topography map | 2 |
| 1:1000000 | - | geology map region | Geology map | 3 |
| 1:40000 | 2006 | transportation map of Semnan | map | 4 |

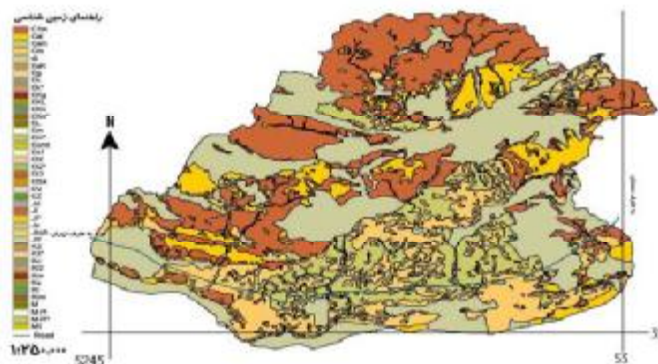
4. Geology of the area

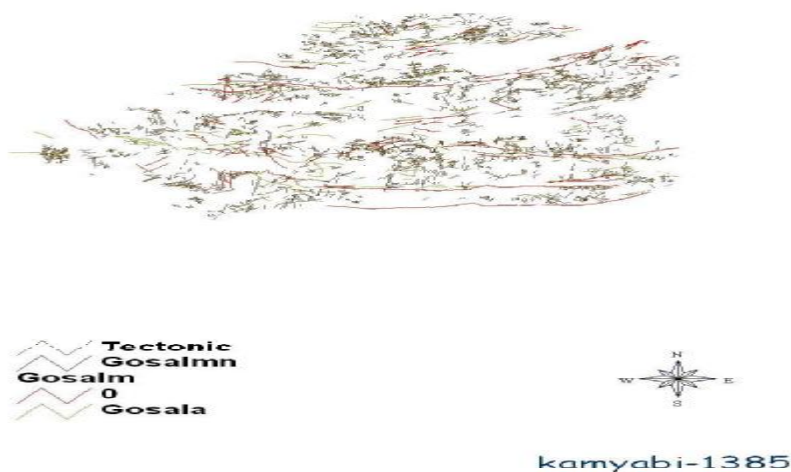
These catchments-basins have been placed in central Alborz zone and fifth structural section of Alborz, which consists of very thick Eocene volcanic deposits.

According to the geologic map and on 1:100000 scales, the structure of the studied northern areas is generally from karaj formation and the first Cenozoic era. The area is shown in lower shale and middle tufa parts in light blue and green colors (respectively) with E1 tsv and E2 t signs (map 2).

This basin consists of two Semnan and Hableh rood Rivers near to each other, but the structure of the northern areas are not the same. The western part of Semnan Rivers is E1 tsv, which has green tufas in from of mass shale with dacite and basalt andesite lavas (Najafiha, Babak, 2001).

The main structural factors of the area are faults, cracks and folds (respectively) that have the most effective role in speciation of the land and erosion of the stones, whereas in eastern valley of Semnan, specially in northern part, the land generally consists of crystallite tufa and green tufa ash and limestone layers in some parts. The southern parts of Semnan and Hableh rood valley, which have been divided by Truast & Fualt of Great Semnan from north side, generally are quaternary (map 2).

**Map2 . Geologic map of the area (scale: 1:250 000)**



Map 3. Tectonic & fault map of area



Map3 . geomorphologic map of the area (scale: 1:250 000)

5. Regular Slope

It has uniformed and heterogeneous steepness and the changes in profile become high and low suddenly and there are some reasons for these changes:

Changes in the material of characteristic of stones. Mass movements or displacement of the slope because of some mass movements. Displacement because of tectonic seismic activities such as big faults and cracks. The result of erosion in making centralized floodways. Differential erosion because of mineralogy nature and stratigraphy of the layers (Agriculture Ministry of Iran, 2002)

According to geologic studies, the major geomorphologic changes of the basin can be classified in two categories:

1-Major and great changes which have occurred because of folding phases and tectonic events.

2-Limited and small scale changes which have occurred because of movements in faults and fracture systems of erosion and climatic processes.

General and great changes result from Alpine orogeny and from orogeny phase of Pleistocene(Pasadenian)in special. The most important small-scale changes in the basin are as follows:

Destruction and erosion of litho facies and sedimentary facies of altitudes and folded structures. Some geomorphologic forms like gills, snowshide passage... and other factors like differential erosion of stone units in different scales of stability and hardness. Some different liquidated forms and snowshide conics in quaternary and ice ages, the effects of sedimentary of glaciers carried by alluviums in exit path of the basin on coarse grain alluviums.

6. Conclusion

Buildings and linear structures (Road ,rail , highways, streets...) have crucial effects on geomorphologic and hydraulic system of the rivers. These buildings and structures of the studied geomorphologic unit (Hableh rood and Semnan basin), which has not a relative morphologic stability, would have negative effects if done without studying and planning. It would cause disorders in the balance of natural units, affect the lifestyle and economic balance of the region and the security coefficient of the environment will be decreased as well.

Nowadays, systematic approaches for estimation and environmental studies are necessary to achieve remedies for optimal use of land and urban development. The basins of Semnan and Hableh rood rivers and their components (soil, river, road...) located on geologic bed (morphologic structure and the materials forming the land) are considered as a system. Inputs of this system consist of two natural (water and climatologic geology) and artificial factors like all the human's activities (building projects and linear structures in this research).

The outputs of this system are from vital human's requirements (security and safety).

All the components of this system are in mutual reaction with the inputs, outputs, landslides, Fluids and other damaging phenomenon. Other negative natural and artificial have impact on the components of this system, which has similar effect on artificial activities (communication paths).

The objective of this discussion is to consider the alluvial, hydraulic, geomorphologic and environmental issues and to understand the concepts of encroachments on the lands around Semnan and Hableh rood rivers like building residential constructions and using the river that does not disturb local streams, but it may become necessary to encounter floods. Most of the dangers, which threat such regions, are geomorphologic.

This region has not morphologic stability and Semnan's northern fault is also adjacent to the northern heights of the basins.

On the other hand, Semnan has been highly developed in recent years and construction projects and urban structures have continued to the northern heights and even many tall buildings have been made in harsh slopes. These buildings cause statistic pressures on the land under their bases and because of discharging sewages using absorbing wells and alluviums on the base- stones, the probability of discontinuity between soil and rocks has caused some landslides which may result in irreparable damages in the region. In case of any earthquake, there would be an unexpected disaster.

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