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# Investigation of the role of geomorphology and its application in identification and sustainable development of desert areas (Case Study desert area of Hamedan, Iran)

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## ABSTRACT

*Now a days application of geomrphology in reginal reconstruction has attracted the attention of all planners. Role of geomorphology in recognition of desert regions the method of developing thesese regions by surveying type / unit and faciase can confirm them as being desert on not. InrestigationGhahavand region using by Topography maps 1:50,000 and 1:25000 scale is Located then are analized aerial photograph 1:20000 and photo sattlie and Arc Gis9 software Excel, filed observation in the bioclimatic. Ghahavand plain is a natural occurance with a slope of less them (%2 ) which is located betwean the full of slopes around the regions like Alvand / Shazand and vessal which is most probabably our subsidant region located in the east of Hamedan province . considering the geological / climatological / hydrological / soil and ... charactristics the present pedimont has been developed as expanded under hydro geomorphological / and morphodynamical conditions and unit / type and geomorphological faiase like those seen in central regions of graben like playas can be well seperated and recognized in it. the geomorphologic desert plain of Ghahavand has been devided to plain and playa. From rocognizable types of the plain unit we can refer to Fans and pedimont cone and from playa unit to Kavir and desert. The faciase of the Fans / ending Pediomont / aluvialtrases / mark hills / clay extentions ( like Degh ) saltishextentions are the geomorphological features of Ghahavand desert plain which is well distinguishable . Due to such features / Ghahavand region is one of the desert regions of the country / and by considering the geomoropological indicators we can easily seperate the dersert from nondesert .*

**Key words:** Geomorphology, Desert, Playa, Pedimont, Fan, Desertification.

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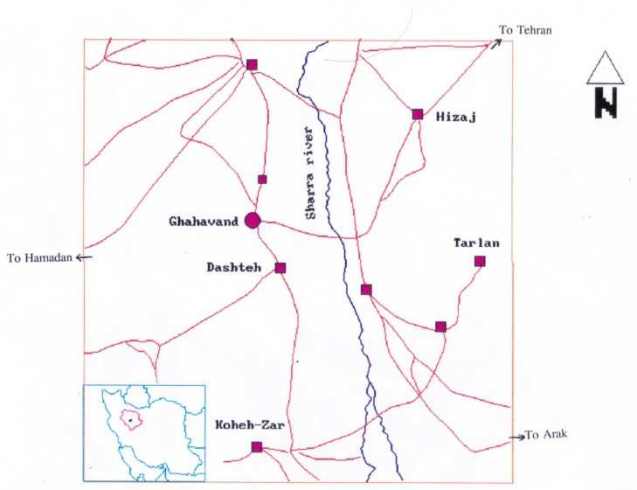
## INTRODUCTION

### The geographic location of the area

The study area, in the northeastern part of Hamedan plain Qhahvand, located near the geographical coordinates to the northern latitude and eastern longitude and to the northeastern

part of Sanandaj - Sirjan placed parallel to the Zagros region and strongly has been altered and magmatic activities have been occurred in it. Much of the study area has been formed from young Quaternary alluvial fan and floodplain.(fig,1)




**Fig(1). geography Location of the area**

## MATERIALS AND METHODS

InrestigationGhahavand region using by Topography maps 1:50,000 and 1:25000 scale is Located then are analized aerial photograph 1:20000 and photo sattlie and Arc Gis9 software Excel, filed observation in the bioclimatic.

In this study the continouvance of the concepts related to the past of land / the condition of present ballance / type and processess and that the rigion is in the threshhold of which changes has been observed and has been stated regarding to geomorphological time and location scales of the region . Moreover / whit collecting and snrveying present sources / by using aerial / and sattellite photographs and field works the geomorphologic desert plain of Ghahavand has been devided to plain and playa. Then. The Factors have of ghahvand. Hamedan, Iran.

Now a days application of geomrphology in regional reconstruction has attracted the attention of all planners. Role of geomorphology in recognition of desert regions the method of developing thesese regions by surveying type / unit and faciase can confirm them as being desert on not.

This becomes important when in sensetive regions wherers the recongnition of the border between deserts and other regions is impossible and some how difficult.

For this reason the desert plain of Ghahavand has been snrveyed from geomorphologic point of view to be able to determine the type of the recognition of desert regions by using geomorphological data.

According to Statistics and Meteorology Station Qhavnd, its annual rainfall is 250 mm and the amount of evaporation is 2/1351 mm per year and relative humidity is less than 50%.Water balance is negative and in the most of the year, dry and warm and cold semi-arid weather is dominated in the region.

Base on the results of the study and interpretation of aerial photographs and topography maps, plain Qhavnd has topography and a gentle slope of about 2% and maximum peak height about 1704 m and minimum 1607 m and has a minimum height difference is equal to 97 meters. General slope of approximately is north - south side, but the slope of the East and West sides of the river talvegis to the side of Qhara chai rivers (fig 2,3)

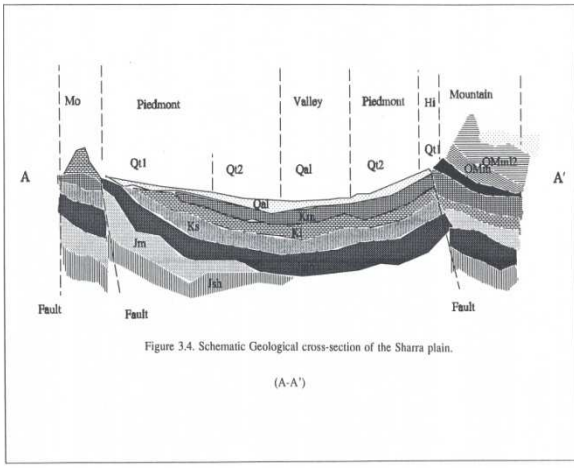
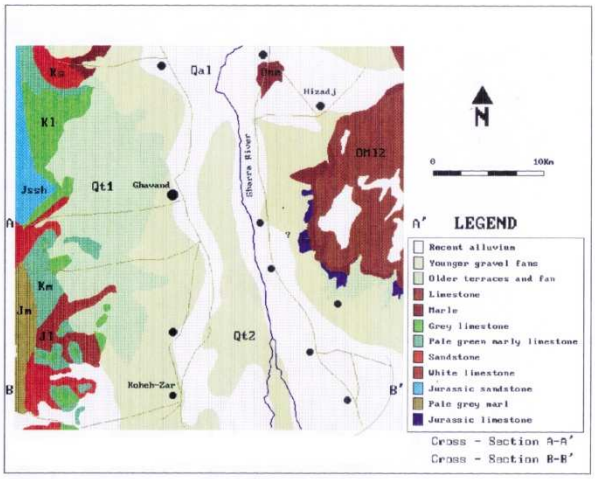



Figure 3.4. Schematic Geological cross-section of the Sharra plain.

(A-A')

**Fig(2)-Geological cross-section**

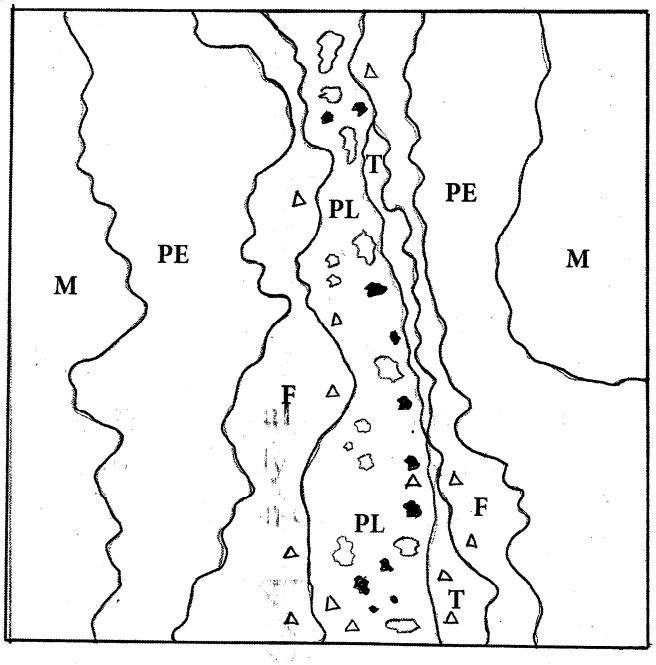


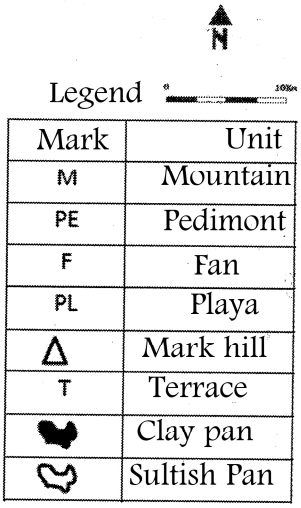

**Fig(3)-Geological maps of area**

## DISCUSSION

### The Geomorphological units of the area:

According to the study of the aerial and satellite photographs and objective observations, the region can be divided into geomorphic units and playa that
each one has types and faciase. (Table,1)




**Fig(3)-Geomorphology units maps of area**

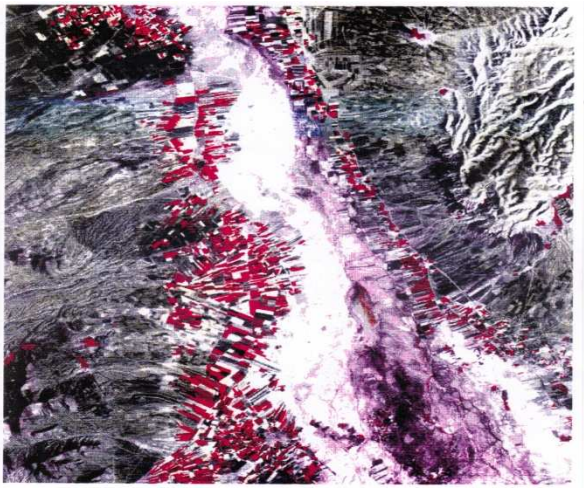
**Table(1)-units and geomorphological facieses**

| Type Erosion | Geology strucure | Faciases | Type | Geomorphology unit |
|---|---|---|---|---|
| -rill<br>-Lattreal Erosion<br>-Gully | -Alluvial Fans<br>-Sediment Rivers | -gravel fan<br>-Debris flow | Fan | plan |
| -Hydro Eolin<br>-wind Erosion | -Reg<br>-Nacl<br>-Gyps<br>-Limeston | -platu<br>-medium Grain plain<br>-Epandage<br>-Desert paivment | Pedimont | |
| -aggradation<br>-surface Erosion<br>-Gully<br>-piping | Nacl<br>Gth<br>cstz | -clay pan<br>-subsidance Or Big crack<br>-aggradation Humid zone<br>-saty pan<br>-Lick Degh | Kavir And desert | playa |

From recognizable types of the plain unit we can refer to Fans and pedimont cone and from playa unit to Kavir and desert. The faciase of the Fans / ending Pediomont / aluvialtrases / Shaded hills / clay extentions ( like Degh) saltishextentions are the geomorphological features of Ghahavand desert plain which is well distinguishable . Due to such features / Ghahavand region is one of the desert regions of the country / and by considering the geomoropological indicators we can easily separate the dersert from nondesert .(Fig,3)

considering the geological / climatological / hydrological / soil and ... charactristics the present pedimont has been developed as expanded under hydro geomorphological / and morphodynamical conditions and unit / type and geomorphological faiase like those seen in central regions of graben like playas can be well seperated and recognized in it.

**Fig(4)playa unit ,clay,clay and salt pan**



**Fig(5) –salinity area in ghahavand of Hamedan Iran**

## Desertification due to Qhavand

Based on the results, three factors in desertification of Qhavand have been taken into account. 1) Create a regional plainQhavnd 2) the multiple input streams to the fields and changing the direction of the main river. 3) Existing geological formation and geomorphological processes producing fine grain sediments in the central plain.

The results of the topography of the area shows that this plain stone formation before the erosion caused by two factors, age and folds on the one hand and shearing and subsequent faulting on the other hand has been achieved. Aggregation state and thickness of sediments in different parts and also the existing of the hills in the plain approved this issue. There are deposits of granulated clay - rich in silt and coarse calcareous cement reason there soft and less resistant limestone formation Qom organizations in the region (especially the western plains) is found to have erosion easily. And clay and high carbonate production and have put in a deep plain. There are so loose rock formation of limestone and clay which was formed one of the main factors causing this situation is plain. Posts appearing in topography and smooth plains achievements in addition to the primary sedimentary structures have also been effective. (Fig 4,5).

## CONCLUSION

According to the desert areas of knowledge from the viewpoint of geomorphology can be concluded that by studying the indicators and measures of biological, geological and soil climate and geological studies, the existence of desert area of Hamedan Province has been approved. So by studying and identifying Geomorphology Land forms by emphasizing to the investigation of the structure of the deployment of materials according to climatic characteristics can offer not only criteria for identifying areas of the desert but also prevent the costs of the parallel studies. Considering that Land forms and geomorphological characteristics are the result of process performance and internal and external forces, so by identifying these forms, the whole effective factors in forming them can be studied well and even can be classified according to priority. The achieving results and evaluating the Qhavnd plain from the of geomorphology view point, indicate the existence of plain and playa type units with geomorphology and alluvial fan pedimont and Faciases and show that the region has desert condition and because alluvial fan Faciase, the alluvial terraces, saltish pan, clay pan or Degh mark hill, which clarifies the area with desert conditions and boundaries can be classified and non-desert, desert region to expand the range units, Faciase type and geomorphology as well as specific and desertification range, and can even work in the areas of sustainable development and to identify and prioritize critical areas, especially from the viewpoint of regional development processes affecting desertification desert or be scheduled in the same direction according to the characteristics of such programs can geomorphology in the region such proposed briefly.Feeding particular area of flooding on the alluvial fan in, for supplying groundwater and preparing water in order to develop the region and paying more attention to playa part in order to prevent the advance of desertification or desert region. Accurate identification of regional water resources perspective and the proper use of rain water and use of saline water area, removing constraints and bottlenecks, such as human resources and investment in the region

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