Zonnation of west Alborz zone based on geomorphic indices

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Extended abstract
1- Introduction
Every earth movement affects the earth surface suddenly and slowly. Geomorphic changes are in relationship with tectonic-geomorphology directly or indirectly (Sumerfield, 1991). Earth's crust movement is an effected factor for forming and evolution of landscapes. Geomorphic characteristic can be good indicators to predict regional active tectonic. West Alborz is located between 49 to 50°30 East between Khasar pediment in north and Qazvin pediment in south.

In this paper have been studied active tectonic with geomorphic indices, drainages pattern and alluvial sediments in 30 watershed basins. At the first have been determined the geomorphic indices and combined with another factors like drainage patterns and alluvial fan systems.

Then factors and indices have been compared in all of the basins. Ultimately, west Alborz regional segmented to three local like; active, semi active and inactive basins.

2- Methodology
At first step, have been used topographic map and Landsat images, the topographic scale map was 1:250000 and 1:50000 and the satellite image scale was 1:250000 and 1:100000. Then using Google Earth the border of watershed basins has been determined.

By assessments of geomorphic indices like Stream Length-gradient (SL), Mountain front sinuosity (Smf), ratio of valley-floor width to valley height (VF) and Hypsometric graphs in 30 watershed basins in west Alborz area, the active ratio estimated. With comparing data have been distinguish active tectonic and tectonic geomorphology of west Alborz.

3- Discussion
Studying all of the geomorphic indices in west Alborz area have been divided to 30 watershed basins and studying most...
important geomorphic indices determined the active ration like:

1- The mountain front sinuosity which mentioning and characterizing relationship between rivers power and mountain front dip and slop was calculated by

\[ Smf = \frac{Lmf}{Ls} \]

that in the formula Smf is mountain front sinuosity and Ls is direct mountain front (m or Km) and Lmf means the length of mountain front.

2- Stream length-gradient (SL) has been estimated by formula of

\[ SL = \frac{AH}{\Delta L \times L} \] (Keller, 1980)

SL: Stream length-gradient
L: The length of river
\( \Delta H / \Delta L \) is stream gradient in section that studying it.

3- Ratio of valley-floor width to valley height (Vf) was predicted by below formula

\[ Vf = \frac{2 \times Vfw}{[(Eld-Esc)+(Erd-Esc)]} \] (Boll, 1987)

Vf is ratio of valley-floor width to valley height
Vfw = Width river
Erd = the height of right wall of river
Eld = the height of left wall of river
Esc = the elevation of valley-floor

4- The drainage basin asymmetric (Af) that mentioning relation between active faulting and tilting the basin (Keller, 1980), was calculated by formula of

\[ AF = \frac{Ar}{At} \times 100 \]

that Af- is drainage basin asymmetric, Ar-means area of drainage pattern in left of essential river (Km2) At-is area of drainage pattern in right of essential river (Km2)

5- Hypsometric graphs introduced by Strahler (1952). This parameter mentioned topographic elevation in this region.

With modulation all of data and assessment geomorphic indices were distinguishing the activity of watershed basins.

4- Conclusion

A: Activity was distinguished for several ways like uplift zones for example alluvium fans and the new alluvium step rivers slop and the ground in lineament fault trace.

B: The new and uplifted alluvium fan distinguished in Qezel Owzan River which was constituted by active faults.

C: There are many rectangular and trills drainage patterns in the west Alborz that constitute with active faults and effectiveness from active tectonics.

D: Comparison of the activeness geomorphic indices in 30 watershed basins conducted to the below results:

1- The basins like Velankuh, Pakdeh, Dramkhani, Cheshmahrud, Siahkuheballaey, Takas, Khasrud, Chelegan, Zereshk, Zarigan and Zardgoli are active basins.

2- The basins like Haftchesmah, Rudbarepaen, Siahkuhepaeini, Parudbar, Changaldasht, Alinezam, Khorramabad, Shahmoallem, Surankhani, Faragabad, Kuhkan, Qeshlaq, Saravan, Golenkesh are semi active basins.

3- The basins like Foumansharqi, Rizagarab, Merzonsar are the inactive basins.

E: The basins in east area are more activity than west.
**Key word:** west alborz, geomorphic inden, drainage basin

**References**


