Dominoes in Geomorphology: A Case of Ghezel Owzan Basin

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Extended abstract

1-Introduction

The components of nature interact with each other in the form of an interconnected chain in such a way that the effect of each component cannot be ignored. On the other hand, these components and loops have a kind of autonomy and internal congruence, so that in another perspective, independence and independent identity can be considered for each of these loops. The efforts of researchers in scientific epistemology to regulate events were because of reducing human beings' tendency to predict events and behaviors. Although these efforts have been successful in many cases, the occurrence of all events and behaviors is not the subject of scientific discipline. Domino is a kind of game made by small rectangular pieces. It is a row of aligned tiles that once the first tile is hit, what happens to the first tile is happened to the last tile. If energy enters dominoes, this energy enters from a pixel to the next pixel and flows to the last pixel so that the energy eventually ends up. But domino's energy in geomorphology is just as defined, but energy vectors and directions need to be taken into account. When energy enters a domino, some of this energy sometimes transmitted to the next pixel in harmony with changes in the environment and two other energies are emitted. The emitted energy sometimes transmitted to other pixels in the direction perpendicular to the pixel and at other times parallel to the pixel.

2-Methodology

The most important thing in the examining of the domino process of Ghezel Owzan basin is a systematic look at the landforms that was obtained in frequent field observations. In order to obtain the domino process in the Ghezel Owzan basin, 30*30 DEM extracted from the USGS site and topographic 1:50000 map, geology 1:100000 and 1:250000 maps were used. Then ArcGIS and Arc map software were used to digitize layers such as drains, lithology and faults. By using the Global Mapper software and DEM of the study area, several profiles were mapped around the geonorons to estimate the difference between the height and the downslope of the areas. The remaining terraces are obtained by evacuating these geonorons. In order to measure the volume of evacuated material from geonorons, the DEM of geonorons was cut into segments, and the Below option in the metric unit was obtained from Functional Surface and Surface Volume extensions in order to obtain the volume of geonorons.

3-Results

The domino effect in the economy means more probability of tomorrow's occurrence compared to today and this energy is maintained for different types of events (Markwat, 2008). This sentence is used in economics, whose objectivity can be seen in geomorphology. The domino effect in geomorphology, i.e. the transformation in the roughness of a site located along the basin as a result of a change, will be greater than the development of a river or basin mirage. The interpretation of this sentence in geomorphology is that the amount of the transformation of roughness increases toward the coastal area. Of course, if the energy obstacle and transforming material are balanced in the basin and the dispersion of the transforming cells in the basin has a certain order, the amount of material and hence the amount of energy is decreasing

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or increasing in the hierarchical order from mirage toward coastal area. If a particular order cannot be made for the changes in material and energy, then the process of transformation also crashes. Rivers have wide beds in loose areas, i.e. energy and material evacuation is linearly in the surface. But strict lithology with the notion of tight valleys states that energy and material evacuation occurred linearly and led to tight formation over time. Based on the field documentation and the use of topographic and geological maps, evidence of past topo-geonorons can be traced. Among the evidences that can be mentioned are: 1) existence of a lake terrace at a height of 1561 meters in Bijar geoneron; 2) downslope in the base of the old alluvial fan in Zanjan and Miyaneh geonoron, and as a result, marl outcrop at a certain level; and 3) Lake terraces at a height of 898 meters in Abbar and the interstices of alluvial fans in Tarom, which are caused mainly by the changes in the base level of the basin of Ghezel Owzan River.

4-Discussion & Conclusions

The domino of Ghezel Owzan emphasizes the changes in the base level. The domino of base level changes has occurred in two types of inside the basins and outside the basins. The energy released by base level changes is transmitted from the highest rank of the watersheds of a basin, such as dynasties and domino vertices, to the first-order streams and drains. An example of such a reaction is the domination of the decline of erosion in the basin. The bondage and divergence of Anguran Chai, Hassanabad Yasukand, Yol Kashti, and Sojas Roud are related to changes in the base level of Bijar geoneron, and in Mehrabad and Qaleh Chai is related to the domino's effect of Zanjan geoneron. The energy transfer condition depends on parameters such as lithology, tectonics, duration and intensity. The study of geonerons of Bijar, Zanjan and Tarom well illustrate that Ghezel Owzan has not allowed the equilibrium of forms by varying the local base level. The spread and frequency of landforms are inversely related to the intensity of base level change. As the number of changes in the area is greater, the more landforms are remained but in a smaller size; larger landforms belong to the places where the number of changes is less. Although less landforms are created in such areas, they will remain larger and wider.

Key Words: Bijar, Domino, Zanjan, Geoneron, Tarom, Line erosion