

## Analysis of Drainage Network Geomorphometry on Bidkhan Volcano. Case study: in Kerman Province

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### Abstract

Bidkhan Mountain is located in the southeastern part of the central Iranian volcanic belt. Profound valleys and irregular drainage pattern on volcano side show a long time erosion and development of drainage network on it. This study aimed to identify geomorphometric characteristics of drainage basins, drainage pattern, as well as study longitude river profile and morphologic evidence in order to analyze tectonic behavior on them. To obtain necessary data for the present research, topographic maps of 1:25000, Aerial photos: 1:55000 and 1:20000, geologic maps 1:100000 of Chaharghonbad and Bardsir and computer software were used as research equipment. To carry out the goal, drainage basin was designed in GIS and WMS software and then morphometric statistics done in Excel. Based on the results of morphometric factors and comparing drainage pattern, in inner basin of caldera, a dendroid pattern has been developed and longitude profile shows equilibrium. In lateral basins, parallel pattern has been developed. Southern basins show high elevation (3195.4Meter) and longitude profiles are convex that shows youthfulness on valleys. It seems that this side of volcano is affected by fault line showed on geologic map as an inferred fault. Fracture on longitude profiles, deep excavation and, in some occasions, barred valleys and pressure ridge are evidence of such claims.

**Keywords:** Drainage Pattern, Geomorphometry, Bidkhan Volcano

### Introduction

Volcanic cones are among the simplest volcanic landforms. They are built by ejecta from a volcanic vent, piling up around the vent in the shape of a cone with a central crater. Volcanic cones are in different types, depending upon the nature and size of the fragments ejected during the eruption.

Bidkhan Mountain is a stratovolcano that located in the southeastern part of the central Iranian volcanic belt in Kerman province. Profound valleys and irregular drainage pattern on volcano side shows a long time erosion and development of drainage network on it.

The purpose of this research is to use geomorphometric characteristics like drainage pattern, and longitude river profile to identify differences in basin erosion, and find their relationship with neotectonic in this region.

### Materials and Methods

Research methodology is descriptive and analytical. Data have been collected in two ways: from library to study the theoretical basis and research background, and in field to control basic information, and to identify landforms.

In order to analyze tectonic behavior on drainage pattern and longitude profiles necessary data are topographic maps of 1:25000, aerial photos: 1:55000 and 1:20000, geologic maps 1:100000 of Chaharghonbad and Bardsir. To carry out the goal, drainage basin was designed in GIS and WMS software and then morphometric statistics done in Excel.

### **Results and discussion**

Morphometric factors and drainage patterns show differences in inner and surrounding basins of Bidkhan volcano. The comparison between morphometric factors and drainage pattern shows differences in basins. Lateral basins in southern side with high elevation and convex profiles shows that this side of volcano has been affected by rejuvenation.

### **Conclusion**

The results of morphometric factors and comparing drainage pattern depict that dendroid pattern has been developed in inner basin (caldera) and its longitude profile shows equilibrium. In lateral basins, parallel pattern has been developed. Southern basins shows high elevation (3195.4Meter) and longitude profiles are convex that shows youthfulness on valleys. It seems that this side of volcano affected by fault line showed on geologic map as an inferred fault. Fracture on longitude profiles, deep excavation and in some occasion barred valleys and pressure ridge are evidence of these claims.

Moreover, the results of the present investigation suggest that the tectonic is active in southern basin of Bidkhan.