

Analysis of Rock deterioration in Naqsh-e Rostam relief by Geospatial Technology



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Introduction

Naqsh-e Rostam is known as an ancient periphery which is located in northwest of Perspolice in Fars Province, Iran.(Fig. 1). The oldest relief at “Naqsh-e Rostam” is severely damaged and dates to 1200 BC. There is a Rock relief thought to be Elimate, originally. Four tombs (Fig. 2) belonging to Achaemeind kings are carved out of the rock face and seven oversized rock reliefs at Naqsh-e Rostam depict the monarchs of the Sassanid period.(Fig.3) In Sasanian epoch, Naqsh-e Rostam site was very important because of its religious and national role. This historical site which is one of the most unique evidences in Iran, is suffering from some problems like erosion and deep cracks. These works are locate d in orographic mountains which expose overall to interaction with their surrounded environment. Therefore existing deterioration as well as erosion process is mainly observed due to climatically conditions and geo-environmental factors that have influence of causes such challenges.



Figure.2: Tomb of Darius I, Showing King, God, and Fire Altar in the Top Register (height of tomb: 22 meter)



Figure.1: Panorama of Naqsh-e Rostam. Achaemenid tombs above, Sassanian reliefs below. The tombs, from left to right, probably belong to: Darius II, Artaxerxes I, Darius I, Xerxes I. Height of rock: 60 meter



Figure.3: The triumph of Shapur I over the Roman emperors Valerian and Philip the Arab (6.65x2.40 meter)

Methodology

Overlaying and combining information in Geographic Information Systems (GIS) with considerable analysis and visualization methods can provide an important contribution for the sustainable development of the historic areas. Thereby the survey and analysis of cultural data are playing a special role in the management of Naqsh-e Rostam site.(Fig.4) As a result of the combination Remote Sensing data (Aerial photos & Satellite Images) valuable hints arise from the procedures in site and can be used for future planning.

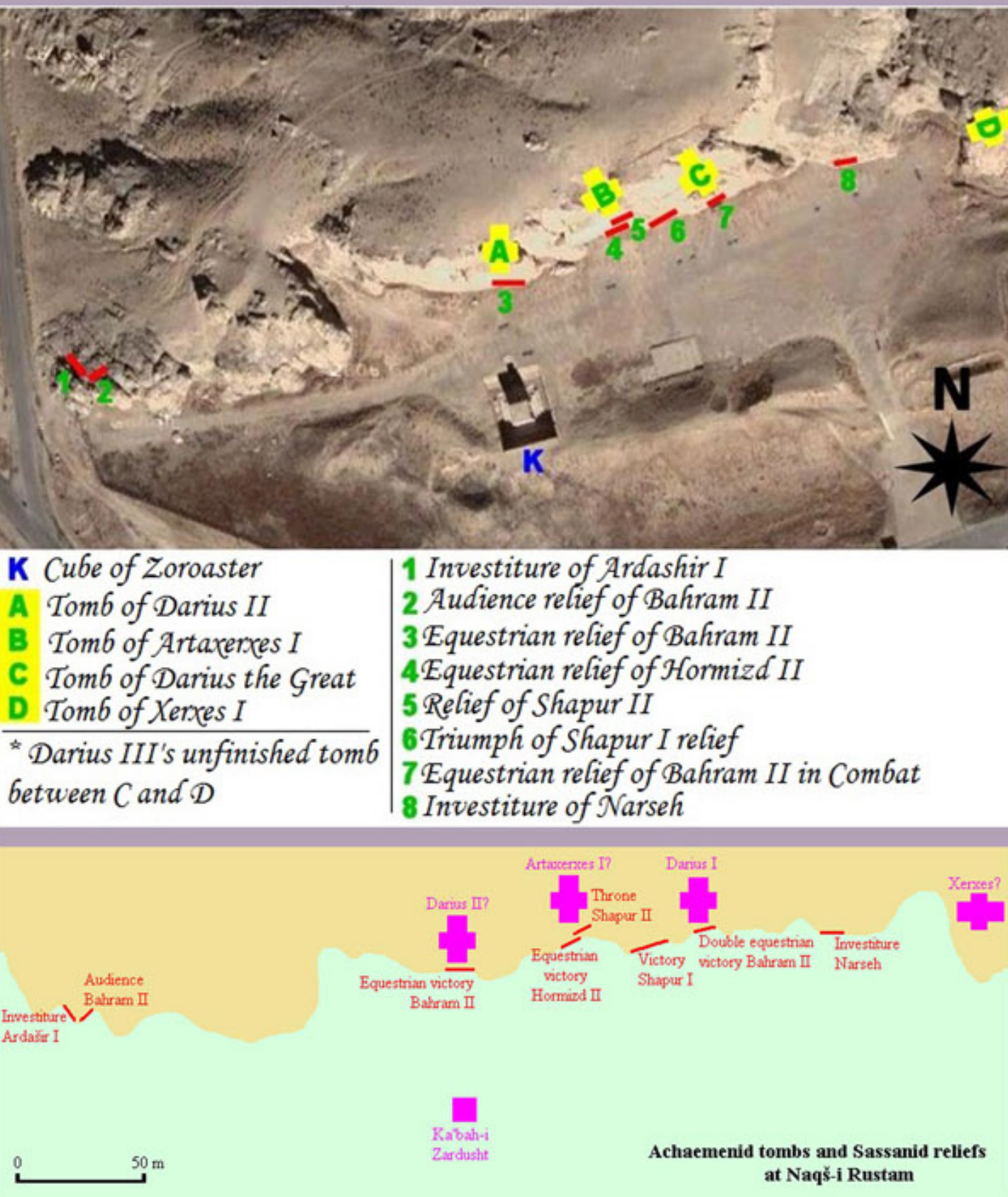


Figure.4: Map of the archaeological site of Naqsh-e Rostam



Figure.5: Satellite Images of Naqsh-e Rostam, Coordinates: 29°59'20"N 52°52'29"E

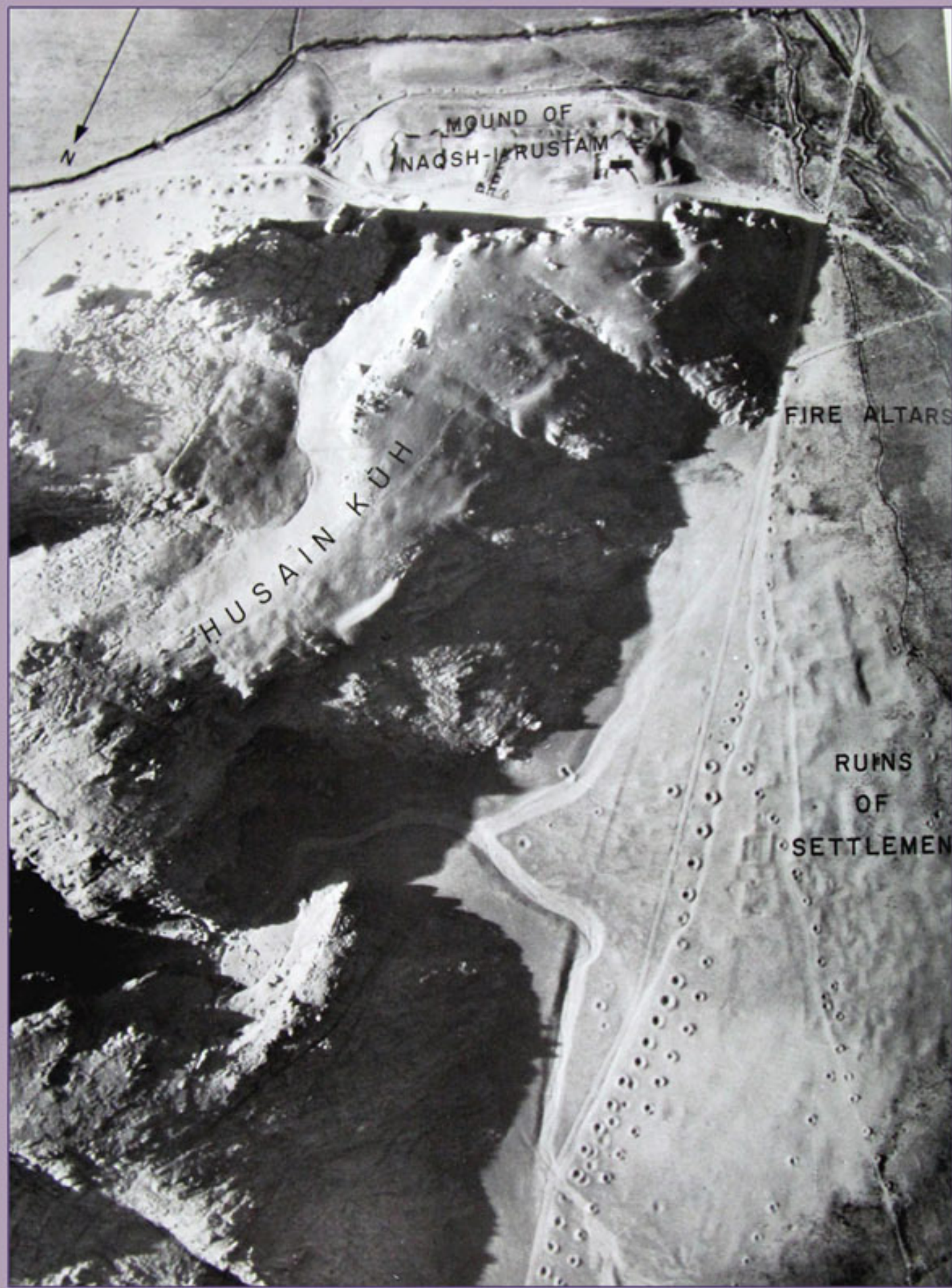


Figure.6: Vertical Air View of site of Naqsh-e Rostam And Environs



Figure.7: Air map of site of Naqsh-e Rostam



Figure.8: The main gullie in the back of the rocks of Naqsh-e Rostam site

Conclusion

In the recent years, the usage of Geographic Information Systems has been rapidly increasing and it became the main tool for analyzing spatial data in unprecedented number of fields of activities. The integration of GIS, Remote Sensing and modeling technologies applied to the field of Cultural Heritage Conservation can be an important tool for management and decision making. This article will present a study regarding the applicability of GIS in cultural heritage conservation, documentation and promotion in Naqsh-e Rostam site. Existing natural factors like fault and earthquake in this area or any other faulted or seismic areas, also human factors and vibration resulted in intensive quakes, are not necessarily creation factors of cracks and just gullies is the main factor for creation of main cracks in Naqsh-e Rostam site. The effects of gullies are serious and this site is endangers of more deterioration.

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