Determining the potential of the sand Ore with GIS and RS software at Mehriz, Yazd Iran

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Abstract

Sand is a material used in the field of civilization which it is available in the nature directly. Therefore, an exploration is needed to supply human requirement.
This study aims that use GIS science and sediment data and laboratory result and integrate them with geology, civilization, hydrology, and geomorphology data and finally provie an applied map from sand Ore to use in building and civilization. Hereby, all activations focused on Mehriz area.

Key words: *Ore, GIS, RS, Mehriz*

Introduction

This study aims to extend the sand ore and consider its reservoir potential in Mehriz Area. Hereby, sand ore in rivers of Mehriz limited to longitude of 54.13 to 55.29 and latitude of 31.3 to 31.58. Their geology structure related to quaternary period and they consist of the most important part of this study. These sediments limited to conglomerate of Paleocene period from east and cretaceous calcified mountains of Shirkooh from west. Tectonic activations are as rift valleys which it is demonstrated by rift valleys lines near gravel mountain. This study carried out with the aid of natural trenches at the length of river and pitting new trenches. In addition, all geologic hydrology reports and satellites images, and processing aerial pictures were considered. Regarding the above performances, first proper trenches were selected and then desert surveys and sampling based on available standard were monitored. In continue, the samples were analyzed and results considered using GIS software. The different data integrated and the best model obtained by software. The map of extending the sands at the area was provided regarding to proficiency. Finally, the proper area designated to extract sands for various structural industry. Recommendations to continue exploration studied.
The method of prepare extending map

First method

Using satellite images and uphill places, the DEM map and hypsometry were prepared. Figure 1 and waterways map obtained.
It is noted that just waterways can be used that located at a specific height. After preparing waterways layers, the area was considered and it was found that almost waterways located at height more than 1700 or 1800 m is not economical to extract. Therefore, waterways with proper height separated.
Then the map of proper waterways classified. We could disassociate the fine- and coarse-grain sediment area. (figure 3 the base of waterways classification).

Regarding to first method in map 1, more waterways calcifications resulted to more fine grain. Therefore regarding to produced map, we can prepare the fine grain and coarse-grain based on industrial requirement.

Second method

Regarding to samples prepared from studied area, it is decided to prepare the extending map. Finally, 2 extending maps were prepared in 2 different conditions.

In the first condition, values were prepared in GIS software of correlated granulation map. Then area of granulation value and extending map was prepared based on granulation.

In the second condition, a restery map was provided for any size of granulation. Standard range for the final layer was modified for any materials separately and area located into standard range isolated. For example, areas which are extractable for base industry provided into basic extending map (figure 4). Areas which are proper to extract and use in basic industry changed to green color and area out of standard is red.

Conclusion

Because of importance of precise processing information and digital result from natural data integratedly (geology, sedimentlogy, hydrogeology, and …), quality and quantity of sand were evaluated at Mehriz area. An informational package was provided in form of different extending map using sedimentology data, GIS, and RE. It can be helpful for experts of civil engineering, geology, semidentology, hydrogeology, and environment.

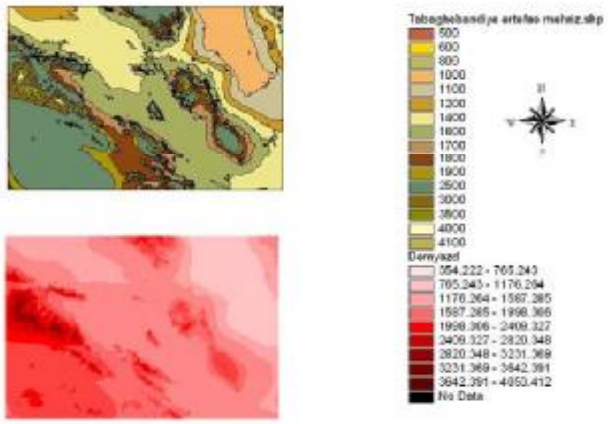

Figure 1: DEM map and height hypsometric

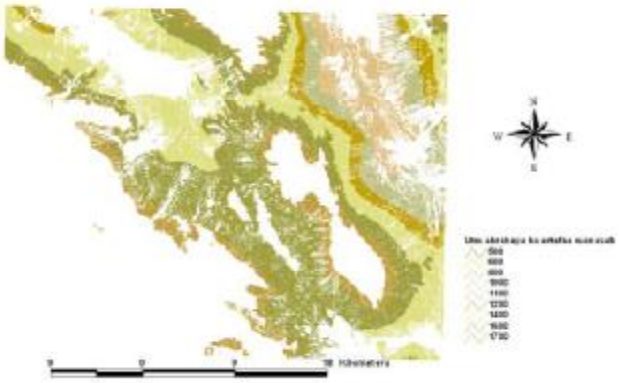

figure2:waterways map of altitude classification

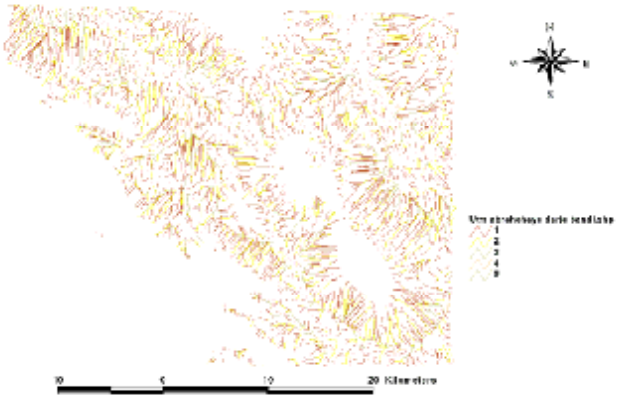

figure3: the base of waterways classification

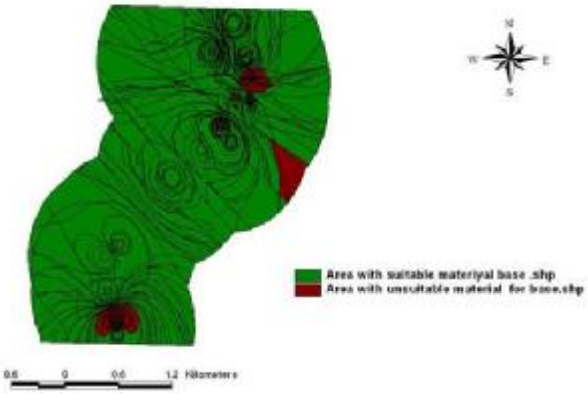

figure4: basic extend the sand ore map

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