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Identification of Sand Sources of Nogh Erg by Using of Wind Analysis and Sand Grain Morphometry

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Extended abstract

1- Introduction

More than two thirds of Iran located at the arid and semi arid areas. Deficit of precipitation, reduced biodiversity and low density of vegetation. Poor vegetation allows to the wind to easily erode the soils and removes surface soil, from source areas and move to other places. In wind erosion we can recognize tree zones, Detachment zone (deflation and Afflation), transportation and accumulation. Preventing of movement of aeolian sediment from source region is a basic task and executive operations have to concentrate at the source region. In order to stabilization of source region of sands, identification of sources areas are necessary.

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Infact dominant of wind erosion, accumulation and mobilization of sand grains create heavy destruction in villages, cultivation areas, especially pistachio garden and finally infilling of irrigation channel.

2- Methodology

Nogh region in point of view of administration division located in the Rafsanjan County and is part of Daranjir basin. From North West, limited to Davaran mountainous area and alluvial fans and from south west limited to pediment of Badbakht Kouh Mountains. For identification of source sediments in the Nogh region we use step- by- step Method. This method done in two stages. At the first, direction of detachment area was found, and then placement finding for finding the detachment sectors in Nough area was done. In this stage firstly, data about dust storm of region with use of questionnaires (people of region) was collected. Then with comparing of satellite images and aerial photos of region for two different times and with field check, morphology map of sand dunes for Nough erg, was prepared.

Eventually with study of wind regime and preparation of wind rose, effective and erosional wind of region, that has important roll on establishment of sand dunes, identified. After finding of detachment sectors (south west and north east), the stage of place identification of detachment areas were started. In this stage with sampling from sediment, mineralogy and morphoscopy of sand dunes were done. And then we studied the genetic relation between them. Tools for doing this research are 1:25000 topographic maps, 1:250000 geological maps, 1:55000 and 1:40000 aerial photos, IRS satellite images and Arc GIS and win rose plot soft ware.

3- Discussion

The results with respect to sand dunes morphology, such as Seifs (in south east) arrow sands and barkhan in west part of region, show that intense and prevailind wind blow from south west. Also abundance of igneous minerals (heavy minerals) in the west part of regions samples and long diameter of samples (293 micron), and also relation between grain diameter and transportation distance (less than 20 km) and halo coefficient of samples, shown that they transport from a close region such as alluvial fans and pediment and abandoned arable land located on the east of region (source of sediment region). Bed of Shore River and surface of pediment in the south west and west are also the source of the sands.

4- Conclusion

With respect to results from identification of detachment sectors and placement finding of detachment area, can be told that the source of wind sediments in the region of Nogh area are close and from surface of alluvial fans, abandoned arable lands, bed of Shor river in the east and surface of pediment in the west of the region. Also with regarding to this fact that good sorting of samples grain has direct relation to movement of sand dunes, therefore sands transported to this area from close source. Result from sands morphoscopic of grain, shown that the sources of detachment areas are from short distance to the regions of accumulation areas. Mineralogy survey of sediment shown that the bed of Shor River in the Anar playa, southern ranges and western alluvial fans are the source region of sands in the study area.

Keywords: Sand dunes, Geomorphology, Wind erosion, Source identification, Nogh plain

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