Investigation of trend eight-year vegetation changes in Eskandari watershed using images of landsat satellites (Case study: Isfahan)

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Abstract: Monitoring of dry areas vegetation is one of the important items to assess its evolution over time. One of the newest sciences has been entered in the study of vegetation is remote sensing science. Nowadays, remote sensing science can show a lot of vegetation changes over time that for humans is not clear. In this study to assess changes in vegetation over 8 years (2000-2008) with the imaging of landsat TM sensor the vegetation destroy maps was prepared for the watershed Eskandari that was located in the West of Isfahan Province. This catchment having an area of over 1649 square kilometers and a weighted average height of 2626 meters above sea level in the catchment area of the Zayandehrood dam is Located.

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1. Introduction

Some of the ground phenomena and effects, such as vegetation, for various reasons with natural factors or human causes has changed over time and conditions that affect ecosystem function.

In addition to gaining knowledge about the vegetation and their health in managing soils plays an important role nowdays, the production of an exact vegetation map consider one of the important tools in planning and development (shojaei et all, 2014).

In order to monitor and assess global and regional scale of vegetation access to the timely field data is usually difficult and limited. Because such data in traditional small places and at different intervals are collected Which are different in kind and degree of credit (Rajesh and Yuji2006).

Smoonakyz et al (2001) in study to investigate the relationship between land use and vegetation changes with rill erosion and surface runoff, conducted in the Mediterranean area, used the compounds data and maps available. Scarf 2000 described land use and vegetation changes from 1957 to 1990 in the Nigerian Chad Basin using the GIS. He divided basin into two kinds of sedimentary sand (40%) and 60% sedimentary clay and sedimentary and land use changes using NDVI in 24 years covering three time periods 70; general weakness coverage, 80s, low rainfall, high-coverage, 90s, Because of the presence of wet year and increased deposition.

results show that in 1957, 70% of the land were unchanged; by 1990 this rate was reduced to 31% and, unlike the residential areas increased more than 5 times, agricultural development was not significant (1985, Inman).

Remote sensing data to predict crop yield can also be used in two ways. In the first method, which focuses on crop growth models is that these models require agronomical and meteorological data Usually are not easily accessible and in desired location scales. Therefore, for the reasons mentioned NDVI satellite data to some extent possible to overcome the above problems. In the second method to estimate the yield based on vegetation indices such as NDVI is provided. Many researches show evidence of high correlation between NDVI index and yield of corn and soy products during grain filling stage. The results also show that with NDVI can estimate yield (2004, Adamchuk) that.

2. Materials and Methods

2.1 The geographical location of the study area

Eskandari watershed is located in the West of Esfahan province in Iran and having an area of over 1649 square kilometers and a weighted average height of 2626 meters above sea level and coordinates 02 ° 50 to 30 ° 50 'east longitude and 42 ° 32' to 11 ° 33 north latitude and Located in the catchment of the is Zayandehrood dam. Plasjan River that emanates from the highlands of Fereydunshahr city in Isfahan province and current in the Eskandari watershed.

Three branches of the river, Dehaq, damaneh and stream Khalaj riders join together in a nearby savaran village. Eskandari runoff measure in the Hydrometry station with longitude 25 ° 50 ° East and latitude 49 °

32 ° N and measured height of 2130 meters above sea level.

The average annual discharge is 131 million cubic meters and annual precipitation of watershed Eskandari is 339 mm. Plasjan River after Zayandehrood is the most important branches of zayanderood catchment and is near the village of Aliabad in the end part of the West of Dam Zayandehrood Lake joins to Zayandehrood. Figure 1 position of the Eskandari basin in the and Isfahan in Iran is shown.

NDVI Index

To study the vegetation of the area was carried Land sat TM sensor images. This research is part of the following steps. Pre-processing and increased image resolution: In this stage first, geo-referenced satellite image and atmospheric and geometric corrections were done on the raw images to increase resolution. Land use mapping using satellite imagery: preparing and using supervised classification of NDVI maps at this stage vegetation index were prepared. Evaluation of classified images: To assess the accuracy of maps with ground truth from random points during harvest in the region that have been used by terrestrial positioning device. Compare the different decades vegetation and analyzing them to determine the level changes during two different decades periods of GIS and ARCVIEW software was used(shojaei et all, 2014). The index was used to determine changes in vegetation. So that NDVI index Obtained for the images of 2008 and 2000 years, and then Statistics calculation for this two images after calculation of NDVI indices were calculated using the ENVI software finally, a classification map of vegetation changes was prepared (Figure 1).

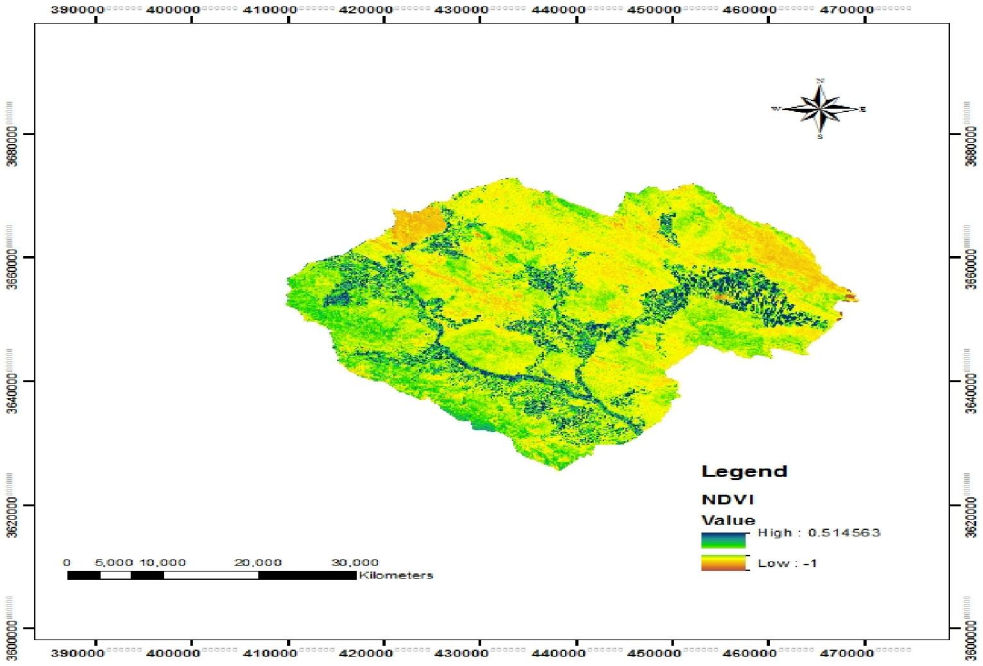

Figure 1. Map of classification of vegetation changes in the Eskandari watershed

Based on this research during the past eight years to 2008 because the area is close to the height of the mountain, vegetation destruction less is seen. Vegetation that during the many years is under the influence of climatic factors, soil, organisms have evolved. One of the main problems in the study of vegetation changes there is a lack of precise location information from the past.

Satellite images and remote sensing technology makes it possible. Relying on information generated from it to achieve better program for environmental management (Malmir, 2004).

Barkhordari, et al. (2005) study which was on the Ilam route to the Azadi tunnel with satellite images did stated that the region's forest severity has decreased. He were discussed, road construction is the main cause of deforestation. Interpretations of Detailed classificaed map can be concluded that the destruction of the coast is seen as more severe. Marzak et al (1998) using and aerial photos of 1996 and Landsat 1967 and SPOT satellite images in 1990 concluded That land use changes resulting from the utilization of forests and shrublands increased 30% agricultural land in 1976 (Shojaei et all, 2014).

To study the changes of vegetation NDVI index During 22 years in the Persian Gulf to the conclusion that Of the total area, 8% of the study area is the areas with severe damage And the area of the regions with severe destruction is 20% and regions area with average destruction is 60% of the study area

References

1. Barkhordari, jalal, Zare mehrjardi, m, Khosroshahi, m 2005. Evaluating the trend of land cover change in Minab dam catchment using GIS. RS, the scientific promote conservation of soil and water journal. Volume 1, Issue 2, summer 1.
2. shojaei, SA. Arrest, or. Khosravi, h. (2014). The Lancet study vegetation changes using satellite images (Case study: Sistan and Baluchistan) "in the fourth international conference on environmental challenges and dendrochronology, Sari University of Agricultural Sciences and Natural Resources, may,2014.
3. Malmir, H., Handbook of thematic maps from satellite imagery. 2004, Tehran.
4. Pettorelli. N, Vik. J. O, Mysterud. A, Gaillard. J. M,. Tucker. C. J and Stenseth. N. C(2005). Using the satellite –derived NDVI to assess ecological responses to environmental change. J. Trends in ecology and evolution. Vol.20 No.9.
5. Rajesh Bahadur THAPA and Yuji Murayama. 2006. Land use change analysis using remote sensing and GIS: A case study of Kathmandu metropolitan, Nepal. pp22.
6. Inman, D. L. and Jenkins, S. A., (1985): The Nile littoral cell and man, s impact on the coastal Zone of the southeastern Mediterranean, Am. Soc. Civ. Eng., New York, United States, P. 1600 – 1617.
7. Adamchuk. V, Perk. R and Schepers. J.(2004). Application of remote sensing in sitespecific management. Institute of agriculture and natural resources. University of Nebraska Cooperative Extension Precision Agriculture EC 04-702.

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