

Forest cover change assessments in the Tribal area of North Western Pakistan: A study of Kurram Agency

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Abstract

Deforestation is one of the major problem in the north and western mountainous belt of Pakistan. A number of factors are responsible for this process including demographic development, ownership change, law and order situation and accessibility. The impact of these determinant factors vary considerably both spatially and temporally across the region. Deforestation has usually coupling effect and changes the entire ecosystem including hydrological cycle soil cover and sedimentation in reservoirs and canals constructed downstream. The mountain inhabitants heavily depend on these forest for a number of ecosystem services. Detail up to date knowledge is the need of the time to plan properly to save the entire ecosystem. The present research is focused on Kurram Agency that was one of the thickly forested area of the federally administered tribal area (FATA). Like other parts of the northern mountainous belt here the forest cover is rapidly decreasing. This research is mainly focused to find out the forest cover change in the last about four decades. Geographical Information System and Remotely Sensed data has been used for this purpose. Landsat multi spectral 30 meter spatial resolution satellite data has been downloaded freely from United State Geological Survey (USGS) for the required periods. The images were preprocessed and the area of Kurram Agency were extracted in ArcGIS 10.2.2 and supervised mechanism of image classification was adopted using ERDAS Imagine 2014. The total of six land use classes were digitally developed including forest cover, irrigated agriculture land, un-irrigated agriculture land, rangeland, bare soil and rocks outcrops, water bodies and snow cover. To substantiate and verify the study results, secondary data were also collected from different departments and organizations.

The mountains of Kurram Agency are covered with natural forest of deodar, blue pine, juniper trees etc. at high altitudes and oak are found in low altitudes. The total forest cover in 1970 was 28% which declined to 16.7% in 2014, and the deforested area was 40.5% of the total forest cover. An abrupt decrease was recorded in earlier years of the study period but in later years the decrease was slowed down. The abrupt decrease was because of Afghan refugees, who in a huge number immigrated into Kurram Agency and were settled in the camps in 1980s. Although in later years the rate of deforestation decreased due to regrowth and artificial plantations and also due to the release of the pressure of Afghan refugees but still deforestation is practicing and the forest cover have been degrading.