ASSESSMENT OF CLIMATE CHANGE IMPACTS ON LAL SOHANRA BIOSPHERE RESERVE, PAKISTAN, USING SATELLITE DATA

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Abstract

Countries and communities globally are hit hard by climate change but worse affected are those with higher vulnerability. The most serious climate change impacts include environmental, social and economic. Pakistan being an emerging economy is at high risk due to climate change and inadequacy of resources to mitigate and adapt. This research examines the impacts of climate change at Lal Sohanra biosphere reserve Pakistan by incorporating satellite data (1999 to 2017), rainfall and temperature data (1999 to 2015) Landsat 4-5 TM year 2000, and Landsat 8, 2017 imagery. The results indicate that the monthly average maximum rainfall for Bahawalpur city occurred in the months of July (80 mm) and August (45 mm) and the annual average rainfall exhibited decrease from 100mm to 50mm during the period of 1999 to 2015 with 2002 and 2014 being relatively dry. The monthly normal minimum and maximum temperature recorded for Bahawalpur City during 1999 to 2015, showed rise from April till September with June as the hottest month (35^{o}C) and December (15^{o}C) and January (14^{o}C) as coolest months. The average minimum and maximum temperature per year for Bahawalpur City manifested, the average maximum temperature during 2002 as 34.5^{o}C along with minimum of 18^{o}C in 2014. Results from the climograph of annual average conditions for Bahawalpur city showed that maximum rainfall was recorded in 2015, that resulted in a decrease in the temperature. The land cover changes in and around Lal Sohanra National Park exhibited decrease in total surface water and increase in forest/cultivated vegetation during 2017. Significant decrease of water was observed in Patisar Lake during 2017 resulting in a marked increase in vegetation cover. The research finds that these land cover changes were mainly due to the water scarcity, land degradation and not least by mismanagement of the resources.