Climatic Consequences of Deforstation in Sudan

Abstract:

In this study we are examining the climatic consequences over Sudan resulting from the deforestation and replacement of vegetation cover that takes place in southern part of the country. Especial interest was laid on the precipitation and surface temperature.

Analysis of observed annual rainfall data showed significant reduction during the last 45 years between 1961 and 2005. The agriculture is the backbone of the Sudan local economy and it depends mostly on the rainy season as a rain-fed system of irrigation. So, reduction of annual precipitation will result in destructive impacts on the local economy. The third version of the regional climate model (RegCM3) of the Abdus Aslam International Center for Theoretical Physics (ICTP) has been used for purpose of examining the sensitivity of the regional climate to the change in vegetation cover.

Two experiments were made, control run and another run with perturbation in the vegetation cover southern of latitude 8°N. The model control run was verified over the domain against actual observation (CRU) data. The model has yield acceptable performance in simulation of precipitation and surface temperature.

The change in vegetation cover results in noticeable reduction in the monthly mean precipitation was found directly northern to the perturbed region between 9 N and 13N, with less response in the central and northern part of the country. The surface temperature, evapotranspiration and top layer soil moisture are significantly changed by the change in land use over perturbed region. The study demonstrates that the vegetation cover has local and non local impacts on the climate system.