

Moisture Fluxes over Sudan during the Rainy Season

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The objective of this study was to evaluate the tropospheric moisture fluxes into and out of Sudan during the rainy season. The data was retrieved from the European Re-analysis (ERA-40) of the European Centre for Medium and long-range Weather Forecast (ECMWF) archive. Horizontal wind speed and specific humidity for levels of significance between the ground surface and the tropopause were used. Vertical integrals for moisture fluxes between the ground surface and the tropopause were calculated at spacing of 2.5° . The moisture fluxes were calculated around the box bound by 2.5°N , 20.0°N , 22.5°E and 37.5°E . Depending on the moisture flux three distinct layers were found within the troposphere. The bulk of moisture entered Sudan from south and west. In the dry year of 1984 the out flux of moisture exceeded the influx leaving the area in a situation of divergence which did not favor rain production. The drought of 1984 was attributed to the absence of rain-producing systems rather than to lack of atmospheric moisture. The study concluded that high moisture content was necessary but was not sufficient to produce rain in the absence of converging wind flows. To improve rain predictions and forecast, adequate monitoring of tropospheric moisture and winds are needed.

Key words: Moisture flux Monsoonal flow Rain-producing systems
