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Rainfall-runoff modelling in Northern Afghanistan

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Irrigation and hydropower projects require detailed knowledge on water resources of the project area. In developing countries unfortunately observations are sparse and relevant time series are often interrupted. The purpose of this contribution is to develop a monthly water balance model using global observations on different temporal and spatial scales. The suggested model uses scaled global gridded precipitation and temperature data. The subscale topography is taken into account as subscale distribution affecting snow and evapotranspiration processes. The model is applied to the area of the Lower Kokcha Irrigation and Hydropower Project located in Northern Afghanistan in Kunduz and Takhar Provinces, near the border to Tadjikistan. It is a multipupurse project including irrigation as well as energy production. With a command area of more than 160,000 ha to be irrigated, it presently is the largest hydraulic engineering project of the country. Because of war and civil unrest during the last 25 years no hydrological or meteorological data was recorded in the whole country. For Lower Kokcha merely monthly discharges are available from 1964-1978 from a level recorder at Khojaghar. The model developed during the study made possible a plausible and statistically sound extension of the available discharge series. Using the whole series of temperature and precipitation, a reasonable extension to the 60 years long period of 1950-1999 could be achieved.