The study will be conducted by a visiting scientist (Fahad Saeed) from the Global Change Impact Studies Centre in Islamabad, Pakistan. The main target of the study is the investigation of climate change impact on glaciers and glacial runoff over the South Asia region including Pakistan. Especially the glacial runoff plays a key role in the hydrological cycle over the Pakistan land area. For this study, the regional climate model REMO will be setup and applied over the South Asia region forced by ERA40 reanalysis data for the period 1958-2001. Here, the a version of the REMO model will be used that includes a dynamical glacier scheme which that is currently developed by Sven Kotlarski within a Ph.D. study at MPI-M. This Ph.D. study will be finished in 4.4.2007. The REMO model resolution will be 0.5 degree. The Hydrological Discharge (HD) model will be force with REMO output to calculate river runoff. The simulated meteorological REMO data, the simulated glacial areas and the simulated discharge will be validated with observations.

A climate change simulation with REMO and the HD model over the South Asia region forced by the global MPI-M IPCC simulations will be conducted. This includes a simulation for the control period 1950-2000 and an A1B scenario simulation for 2001-2100. The results of the climate change simulations will be analysed focusing on the hydrological cycle and the glacial runoff. As it is very likely that a finer spatial resolution will improve the results of the dynamical glacier scheme, a regional domain at 1/6 degree focussing on Pakistan and the Indus catchment will be nested into the 0.5 degree domain. A REMO simulation for the ERA40 period will be conducted and validated. Then it is planned to conduct two 20 years time slices for the control and the A2 scenario period.