



## The impact of changing climate on the safety of hydropower dams

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Global climate change is expected to lead to changes in precipitation patterns and increased frequency and intensity of extreme weather events which may produce conditions outside current design criteria for dams. This study investigated climate change effects on future safety of the Gilgel Gibe II hydro-power dam during extreme floods. The design inflow floods for present and future climate scenarios were calculated using two approaches. Flood frequency analysis was applied to the annual maximum series from the simulated daily flows for present and future periods. Analysis of extreme precipitation and floods was performed using a hydrological model to compute the corresponding extreme flood values for the present situation and future scenarios. The outflow flood with the associated water level was calculated using a reservoir routing model linking all the Gilgel Gibe II reservoirs. Results from this study show that there will be a change in seasonal shift in the peak inflow flood from summer to autumn for the future scenario; and from the range of results of climate models and emission scenarios, the design inflow flood in the autumn is projected to increase for future scenario.