

Lensa Etefa Jotte



Department of Civil and Environmental Engineering

Spring 2018

Water resource management for integrated use of rivers and reservoirs in rural areas of developing countries: Gundar River Basin

Supervisor: Oddbjørn Bruland

Co-supervisor:

Tor Haakon Bakken



## Background

Ethiopia, with its aim of becoming the «water tower» of Africa through hydropower production, needs to fully take advantage of the country's 10% of untapped small scale hydro power potential. What is often overlooked in the prefeasibility study of not only small, but indeed, large scale hydro-power plants is the upstream competition for the use of freshwater for irrigation, water supply purposes and impact of land use on the amount of water available for energy production downstream. The consequence of such oversights is more severe on small scale hydro plants than the large scale ones.

The objective of the thesis is to examine if the Bello catchment located in the Guder River Basin (GRB) in Ethiopia, has the capacity to produce the same amount of power by mid and end of the century as it does now. The scenario analysis on the catchment is conducted by first studying the trend of temperature, precipitation, and runoff of the GRB and then level of impact on runoff due to upstream activities and evaporation was forecasted by using Water Evaluation and Planning Tool (WEAP).

Currently a similar project is in the process of development for the Central Rift Valley Lakes (CRVL) located in Ethiopia by NTNU partnering with the Stockholm Environment Institute (SEI) (creators of the WEAP tool).

