

Water Balance of the Lakes Abaya & Chamo Under Limited Data Situation and Impact Scenario Modelling

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Little information is available regarding the water resources systems of the Lakes Abaya and Chamo, which are located in the Southern Ethiopian Rift Valley. In this paper, parameters for the water balance of the two lakes are derived from primary and secondary data, as well as modelling and regionalization and used in the water balance model LAKEBAL. In order to develop a water balance model, maps of the lake watersheds are generated in GIS and the watershed characteristics are derived. The morphometry of the lakes is evaluated by undertaking a bathymetry survey. Furthermore, the hydro-meteorological components of the system have been evaluated by developing a database and information system, establishing regional relationships, as well as creating a rainfall-runoff model. These information systems have been integrated into a water balance model of the Lake Abaya Chamo Basin, which simulates the water level. The impacts of current water uses for various purposes, such as irrigation, on the lake water volume have been investigated, based on various scenarios of development targets. Using the lake water balance model, an impact assessment has shown that the impact of erosion in the catchment and sedimentation in the lakes has a serious detrimental impact on the two lakes, while water use for irrigation does not affect the Lakes Abaya and Chamo that heavily.