

# **Kulfo River, Southern Ethiopia**

## **Regulator of Lake Level Changes in the Lake Abaya –Chamo Basin**

- Poster -

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The Lake Abaya-Chamo Basin, a temporary endorheic system, is located in the Southern Ethiopian Rift Valley. The Northern Lake Abaya is separated from the Southern Lake Chamo by a barrier with a vertical offset of 65 m. The Kulfo River drains the Western graben shoulder, depositing a large alluvial fan at the inflexion point between graben flank and graben floor, as well as in the drainage zone from Lake Abaya to Lake Chamo. The alluvial fan shows a relict braided drainage pattern that is indicating alternating drainage of the Kulfo River into Lake Abaya or Lake Chamo. At present, the Kulfo River drains into Lake Chamo. The exception occurs during high water discharge, when the river drains into both lakes. Surface drainage from Lake Abaya into Lake Chamo only takes place during high water levels of Lake Abaya. In this case, water is drained through the Kulfo River.

Average annual precipitation patterns over the thirty year period (1970-2000) are highly variable without showing a significant trend. The lake levels of the two lakes closely correlate with the prevailing precipitation pattern. Lake levels have been subject to large fluctuations, however, over the last decade, the lake level of Lake Abaya has been constantly rising. Although over the last three years, data show an adverse trend, mainly due to low precipitation.

Based on a time series of aerial photographs (1965, 1975, 1984), a changing drainage pattern of the major channel of the Kulfo River, i.e. a downstream shift of meanders, can be observed. Several minor channels, characterised by bifurcations and a general flow direction towards Lake Abaya, can be identified, while runoff only occurs during flood events. At that time, runoff in all channels carries high concentrations of suspended load. High rates of soil erosion in the catchment are considered the main cause of the high sediment load.

Deposition of the sediment generally takes place in the floodplain between Kulfo River and Lake Abaya, due to the low sediment carrying capacity. Additionally, a levee developed which obstructs direct surface flow from Lake Abaya into the Kulfo River and Lake Chamo.