

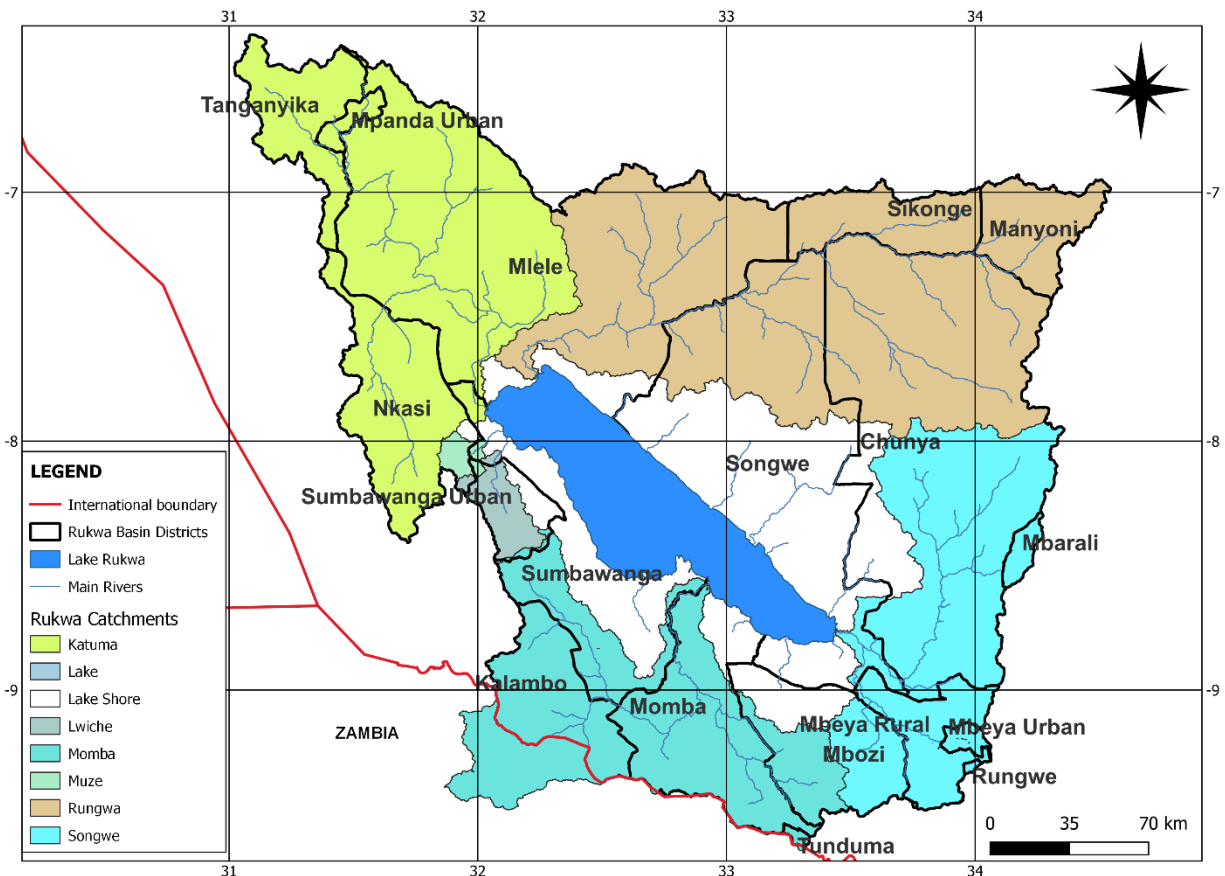


# Lake Rukwa Basin Water Board

## Water Status First Quarter 2023/2024

### 1. Introduction

Lake Rukwa Basin is an internal drainage basin located in the southwestern part of Tanzania. The basin lies within the Rift Valley with Lake Tanganyika on the northwest and Lake Nyasa on the southwest. It covers an area of about 88,000 km<sup>2</sup> extending the regions of Mbeya, Songwe, Rukwa, Katavi, and small parts of Tabora and Singida.



This Water Status report aims at providing a shared understanding of patterns of some of the water cycle components in our changing environment based on ground data. Estimates of water cycle parameters provide insights into available opportunities for water use, and water conservation and thereby enhance water use efficiencies.



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This issue provides an analysis of Rainfall in the 5 catchments compared to the long-term average of 1985-2021, and an analysis of Water levels in Lake Rukwa during 2023 as compared to the long-term average of 2014-2020.

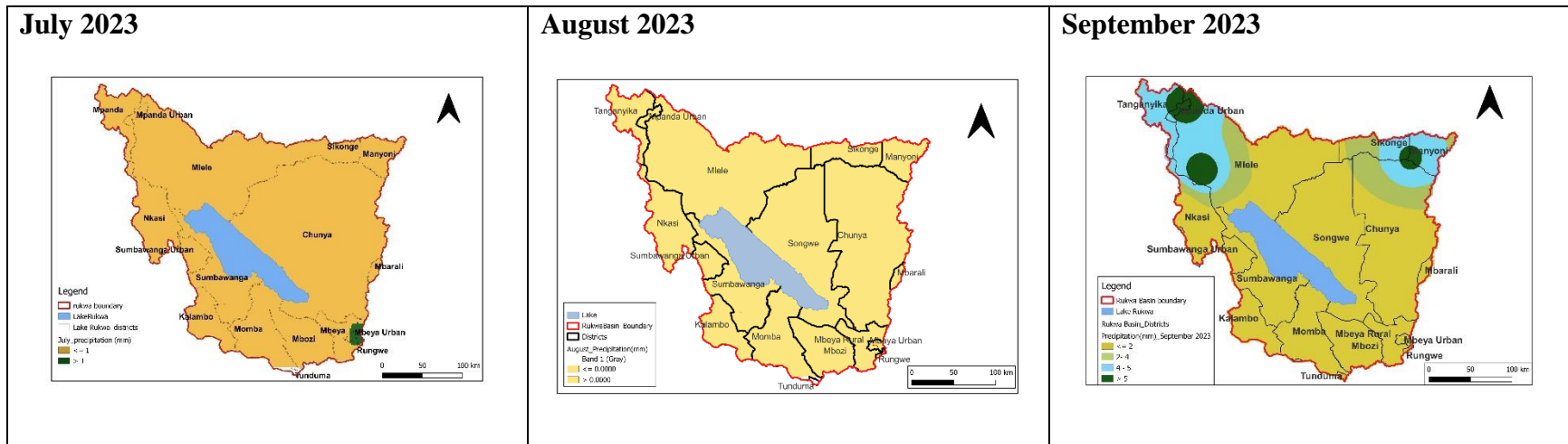
### 2. Climate

Generally, the climate of Lake Rukwa Basin is tropical and wet. There is one rainy season with most precipitation falling from February to April, although the Ufipa Highlands also experience rains in May and January (very rarely). Average annual rainfall ranges from about 650 mm in the south of the basin to about 900 mm in the north to about 2,500 mm in the Ufipa Highlands. The quarter under review has received less rainfall in most parts of the basin compared to the long-term average.

In the southern portion, the mean annual temperature is 21°C, with a mean maximum in the warmest month of about 28°C and a mean minimum in the coolest month of 12.7°C. Temperatures across the basin are moderately hot during the period from August to March and fairly cold in June and July with the rest of the year being fairly warm.

### 2.1 Variability of rainfall in Rukwa Basin

The monthly distribution of rainfall over the basin is characterized by unimodal rainfall patterns (End of January to Mid of May). Overall, monthly rainfall estimates within the year indicate wide spatial and temporal rainfall variability in the basin. Minimum rainfall is normally seen in the Northeast part of the basin and the maximum rainfall estimates are normally observed in the North and South part of the basin. In September 2023, the Rukwa Basin received rainfall in the North and East parts especially in the Katuma and Rungwa Catchment. In July 2023, Songwe catchments received more rainfall than other catchments. In August 2023, no rainfall was received in all catchments districts in the Basin. A full analysis of how much rainfall was detected in each catchment is given in this report. The map below indicates how rainfall was distributed over the reporting period for each month.



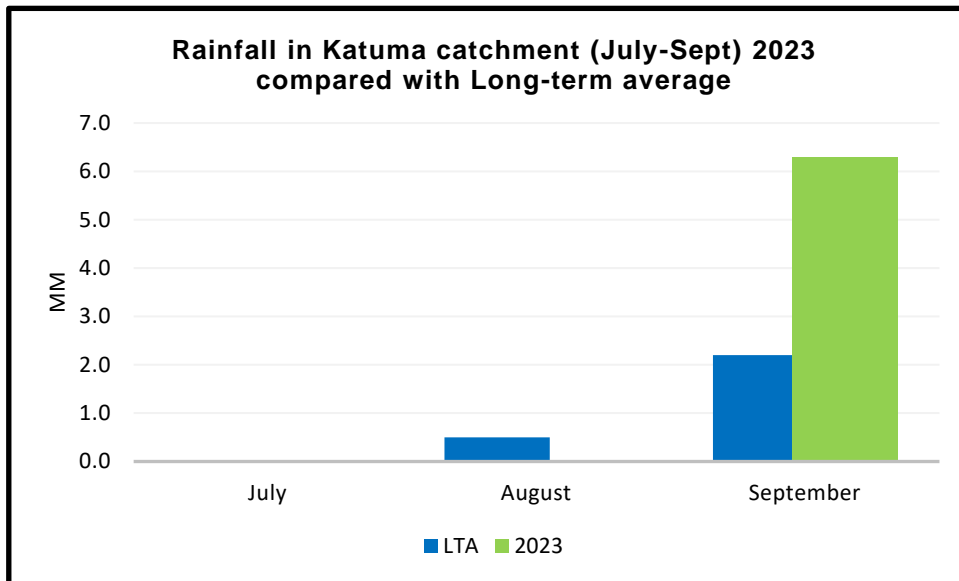


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### Rainfall over Katuma catchment

Katuma catchment normally experiences a unimodal rainfall pattern that is registered at mid of September. In July and August, there was a decrease in rainfall by 100%. In September, the rainfall recorded was above the average by 186.3% as compared to the long-term average of 1985-2021.



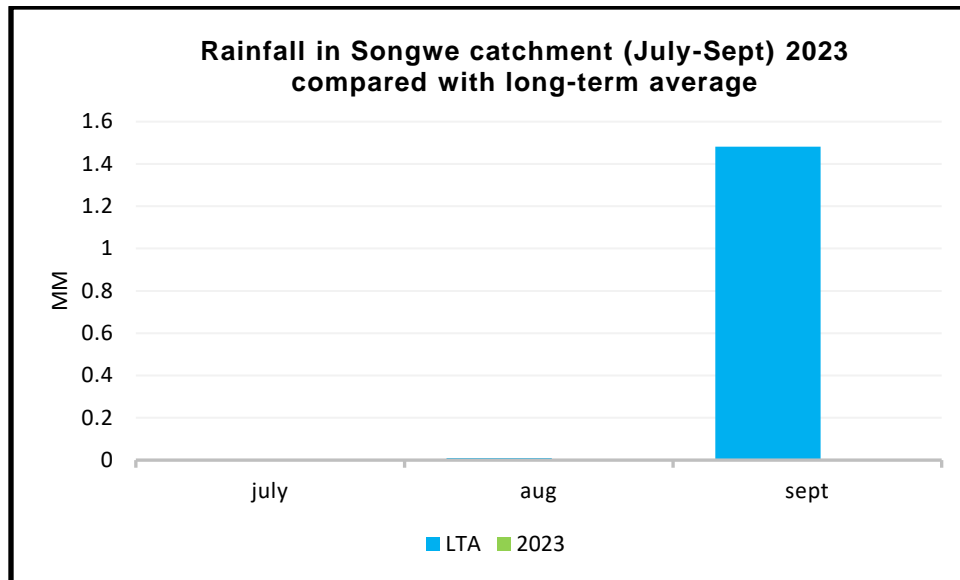


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### Rainfall over Songwe Catchment

In July, August and September, there was a decrease in rainfall by 100% compared to the long-term average of 1985-2021.



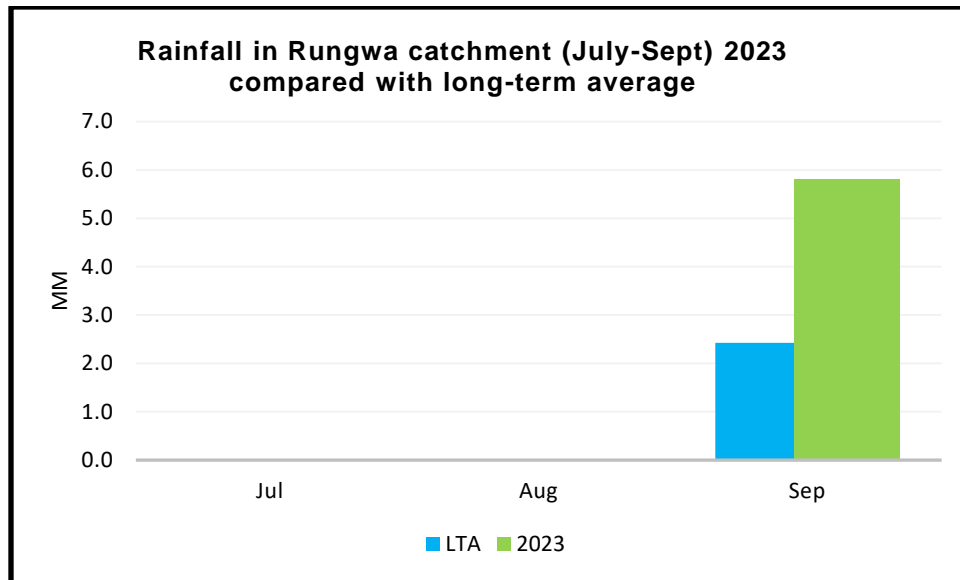


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### Rainfall over Rungwa Catchment

The Rungwa catchment experiences a normal climate in the Basin with little rainfall amounts recorded mainly in September compared to other catchments. In September the rainfall recorded was above the long-term average by an increase of 141.6%. In July and August, there was a decrease in rainfall by 100% compared to the long-term average of 1985-2021.



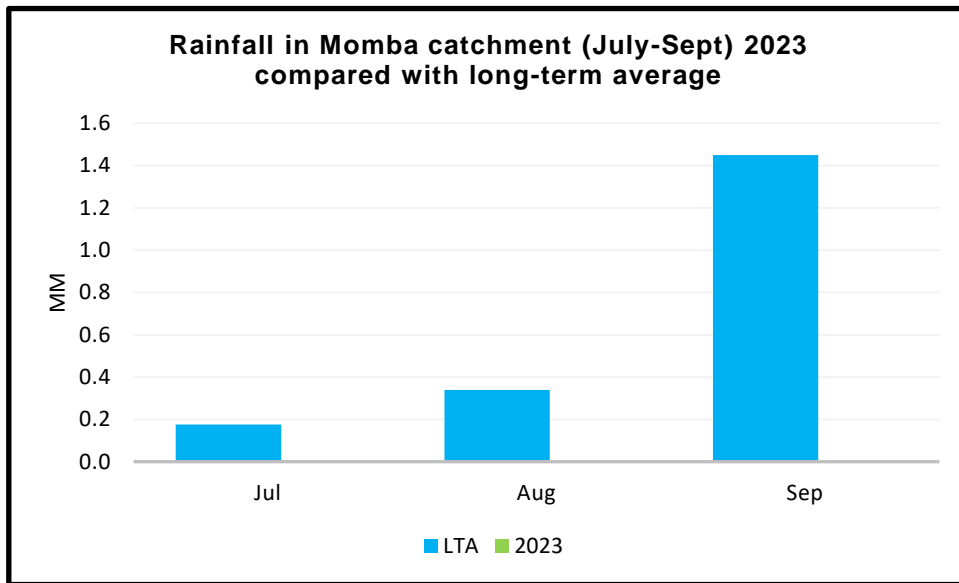


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### Rainfall over Momba Catchment

The Momba catchment no rainfall experienced in all reported periods. In the reported periods, there was a decrease in rainfall by 100% compared to the long-term average of 1985-2021.



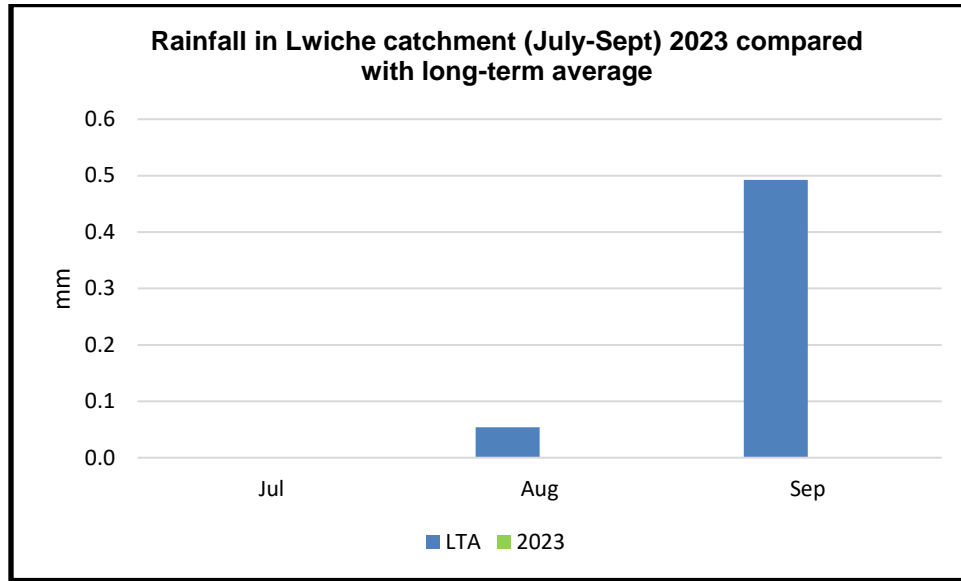


# Lake Rukwa Basin Water Board

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### Rainfall over Lwiche Catchment

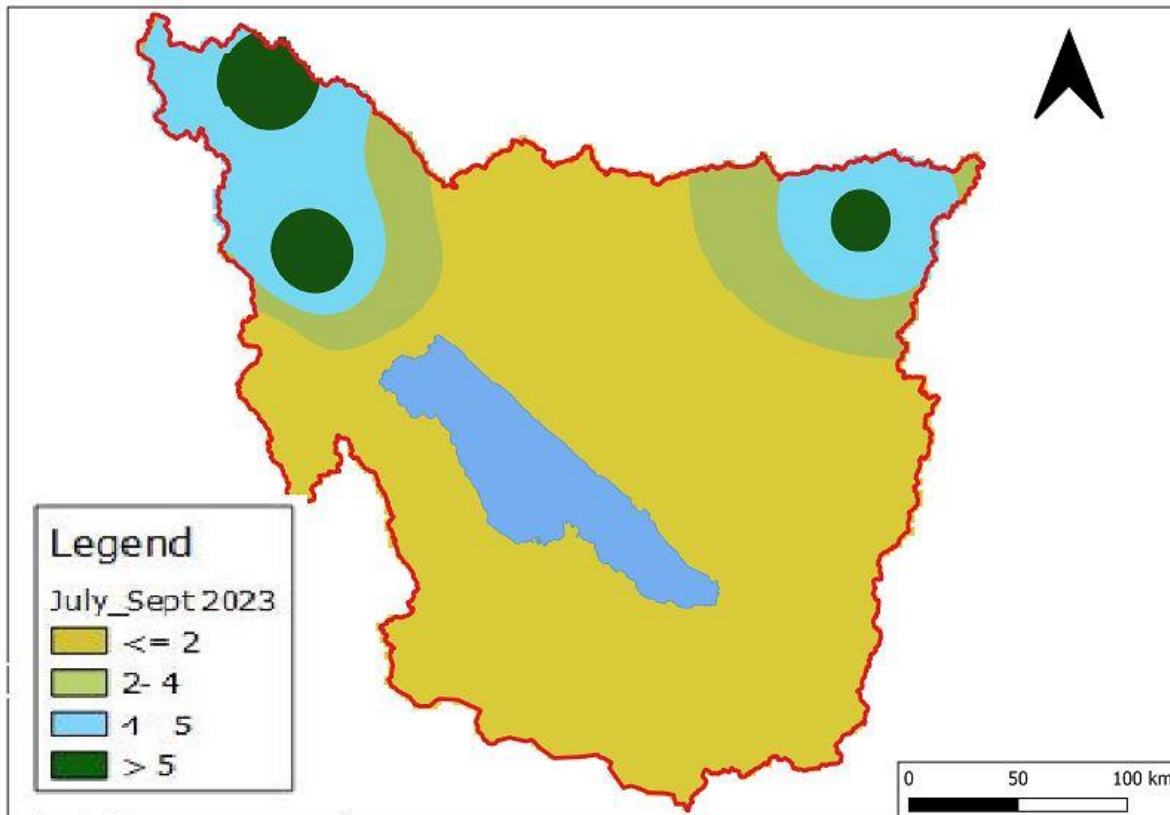
The Lwiche catchment no rainfall experienced in all reported periods. In July, August and September, there was a decrease in rainfall by 100% compared to the long-term average of 1985-2021.



### 2.2 Seasonal Rainfall

The Rukwa Basin normally experiences unimodal rainfall patterns. This analysis indicates that catchments in the Northern part experienced little rainfall during the reporting period. However, there was a slight Rainfall increasing in some catchments and a decrease in others as compared to the long-term average as shown in the previous section.





### 3.0 Hydrology

#### 3.1 River flows

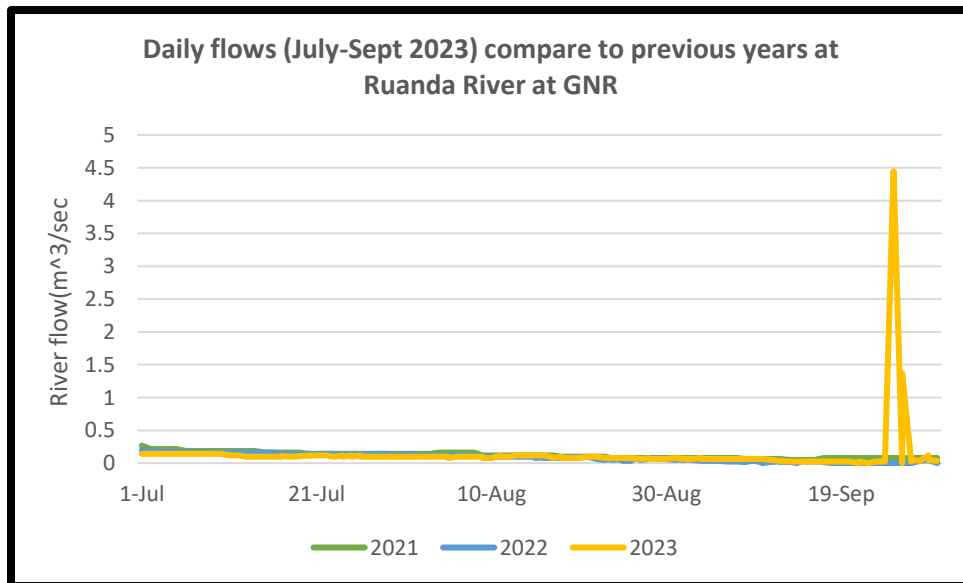
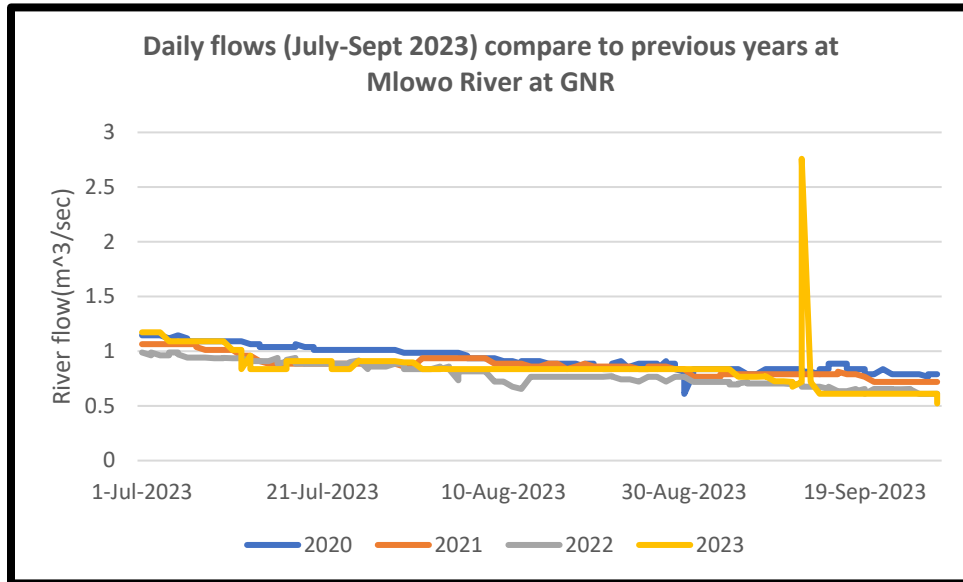
The basin is characterized by seasonal rivers, perennial rivers, and one Lake. The basin has a little drainage area of 88,000 km<sup>2</sup> which is, the Rungwa River with catchments of 20,000 km<sup>2</sup>, mainly in Chunya district is the largest covering about 25% of the total basin area. Other river systems in the basin are the Songwe from the Poroto mountains, Momba, Mtembwa, and other small numerous rivers both in the east and west of the lake. Others are Muze, Katuma, and Lwiche originating from the Ufipa plateau. Most or almost all the rivers have variable flows that rise and fall with the rains between February and May.

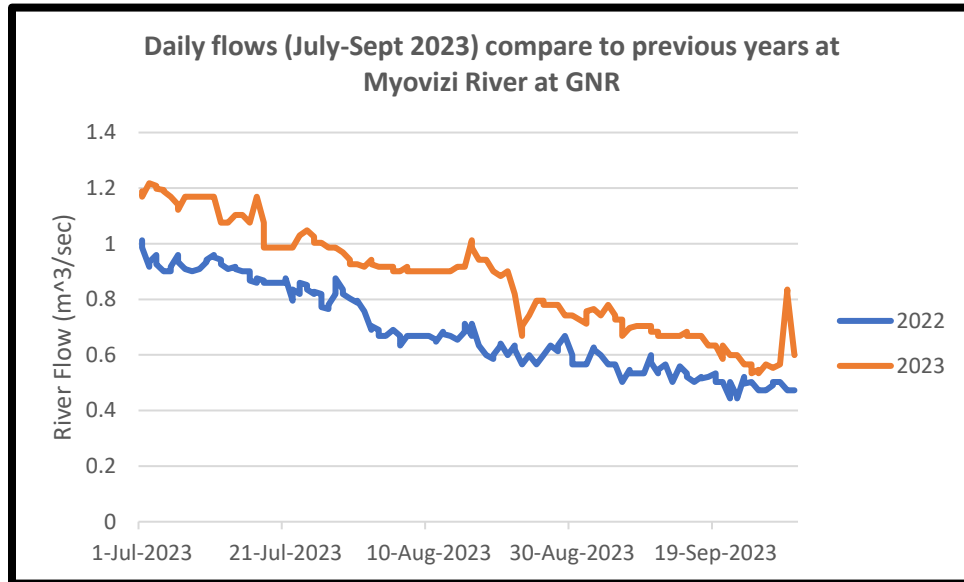


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During the reporting period, a large part of the entire basin no rainfall experienced especially in July and August as explained above. Therefore, in September, the river flows in a large part of the basin were reported to be higher than the previous years and in July and August the river flows were reported to be normal compared to the previous years as indicated in the figures below.

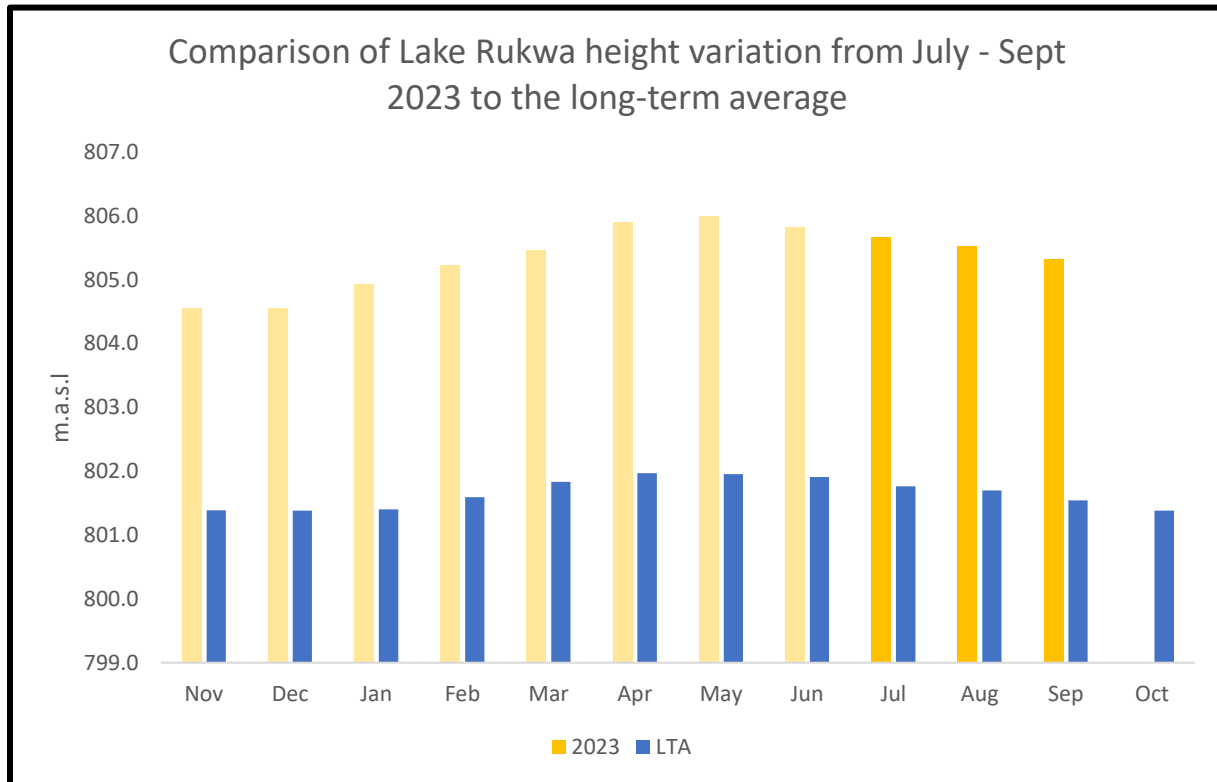




### 3.2 Lake levels

Lake Rukwa is the main hydrological feature of the basin. The lake, which is an inland drainage lake with no outlet, is quite shallow with a mean depth of about 4 m and a highly changing shoreline. The lake experiences very high evaporation rates on the order of 2,000 mm per annum compared to the average annual rainfall of about 900 mm. The lake stretches lengthwise for about 165 km, with widths of 37 km in the north basin and a maximum width of 48 km near the middle.

The rivers within the Rukwa basin are sensitive to changes in rainfall with variations impacting Lake Rukwa levels and river discharges. From July to September, the lake levels are seen to fluctuate with a high fall in all reported periods. The lake height is seen to be higher by about 4.0 meters as compared to the long-term average of 2014-2020.



#### 4.0 Implication for Water Resources Management

Ground data observations detected a decrease in rainfall of 100% for catchments in the Eastern part, South-East and some part of South-West in the reporting period, especially in Lwiche, Momba, and Songwe compared to the long-term average and this indicates a decrease in total amounts of water available downstream of the basin. Due to the decrease in water amount we continue to advice all stakeholders to use water more efficiently so as to avoid shortage of water during the dry season.