

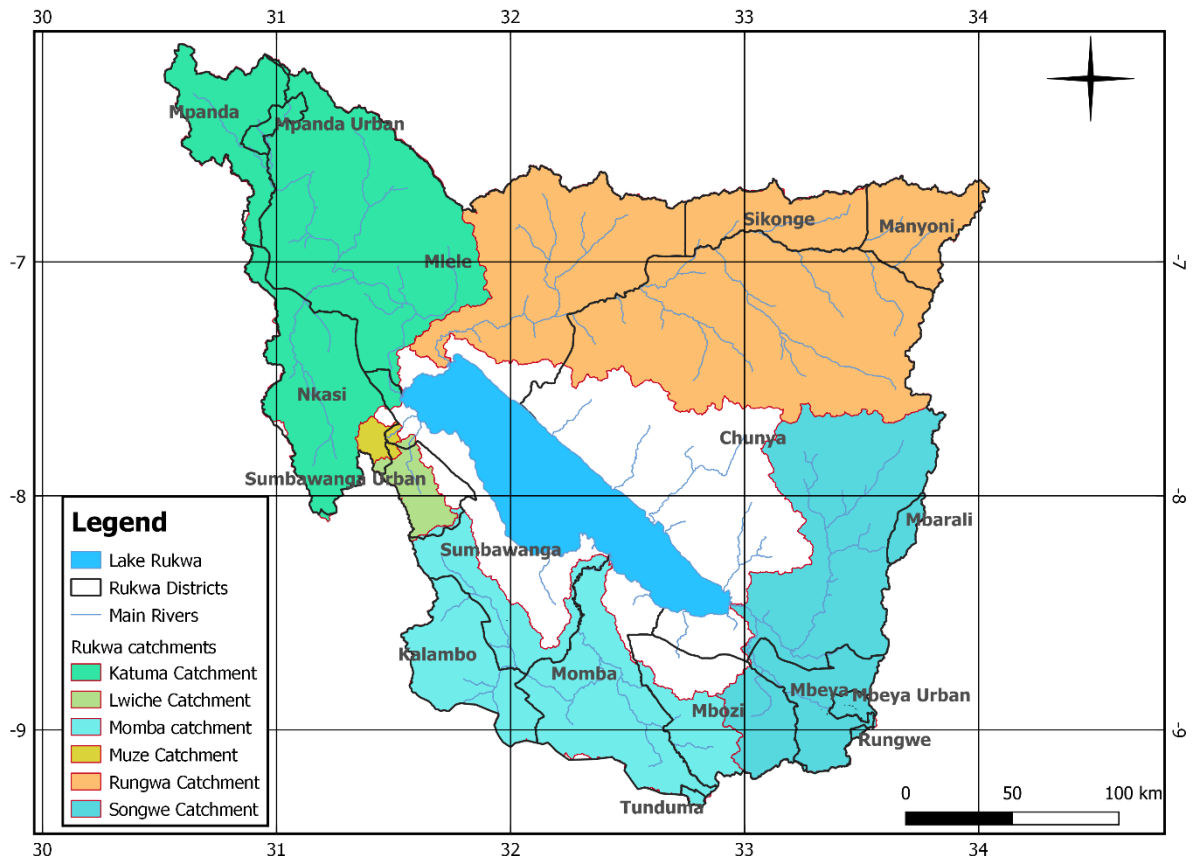


# Lake Rukwa Basin Water Board

## Water Status Second Quarter 2022/2023

### 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 2022 as compared to the long-term average of 2014-2020.

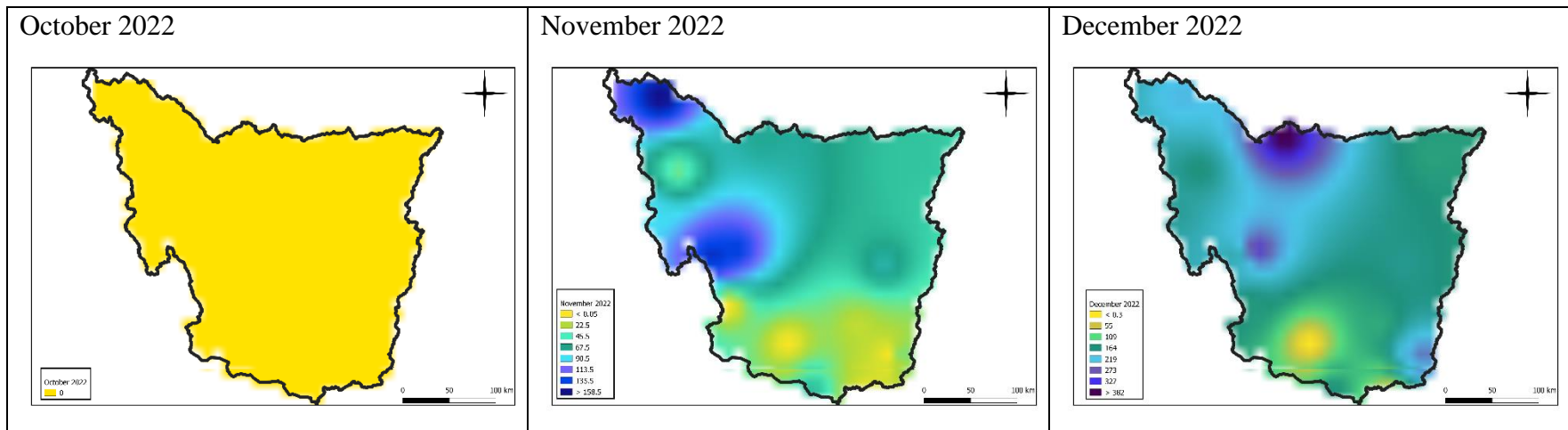
### 2. Climate

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 low 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 October 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 southeast part of the basin and the maximum rainfall estimates are normally observed in the North-west part of the basin. From October to December 2022, the Rukwa Basin received rainfall in the North-west and Northern parts especially in the Katuma, Lwiche and Rungwa catchment in November and December. No rainfall was recorded in October. 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.



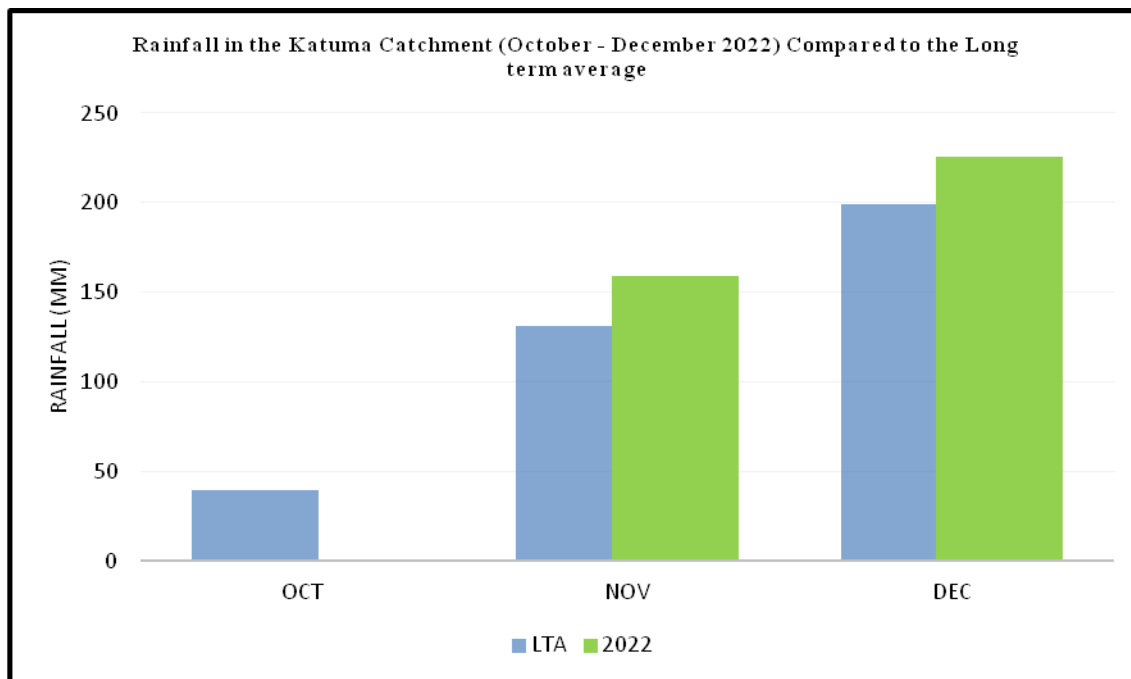


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### Rainfall over Katuma catchment

Katuma catchment normally experiences a unimodal rainfall pattern that is registered between the End of October to mid-May. In October the rainfall recorded was below average by 100% below the long-term average. In November and December, there was an increase in rainfall by 21.7% and 13.4% respectively as compared to the long-term average of 1985-2021.



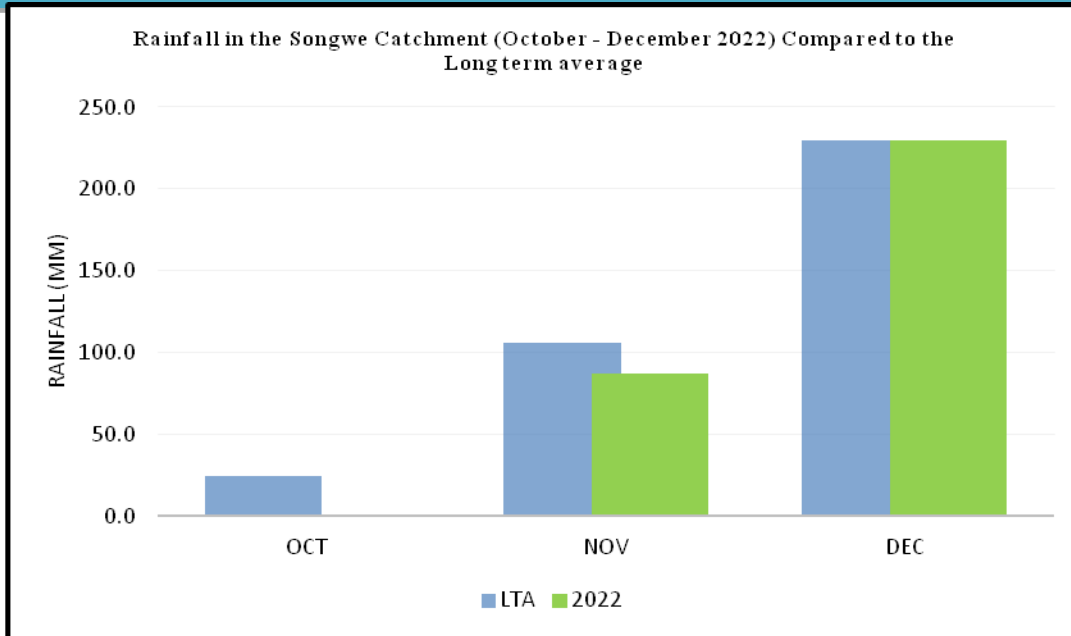
### Rainfall over Songwe Catchment

The Songwe catchment recorded less rainfall in the entire Basin. In October and November, there was a decrease in rainfall by 100% and 18.3% respectively compared to the long-term average., Almost similar rainfall was recorded in December compared to the long-term average to the long-term average of 1985-2021.



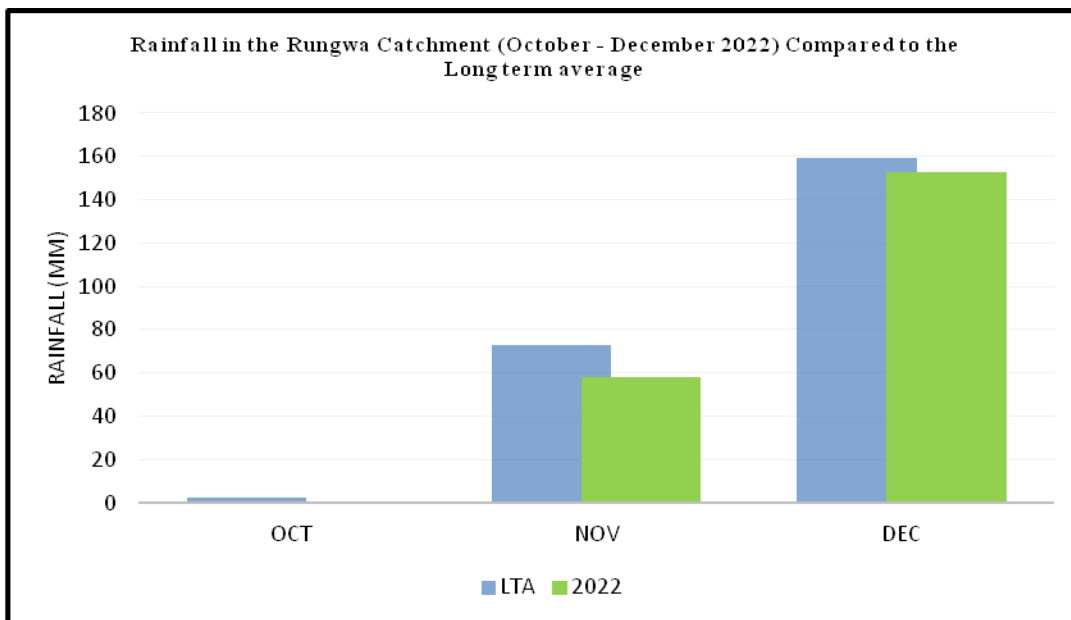
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### Rainfall over Rungwa Catchment

The Rungwa catchment experiences a normal climate in the Basin with little rainfall amounts recorded mainly in November, and December compared to other catchments. In October the rainfall recorded was below the long-term average by a decrease of 100%. In November and December, there was a decrease in rainfall by 20.3% and 4.2% respectively compared to the long-term average of 1985-2021.



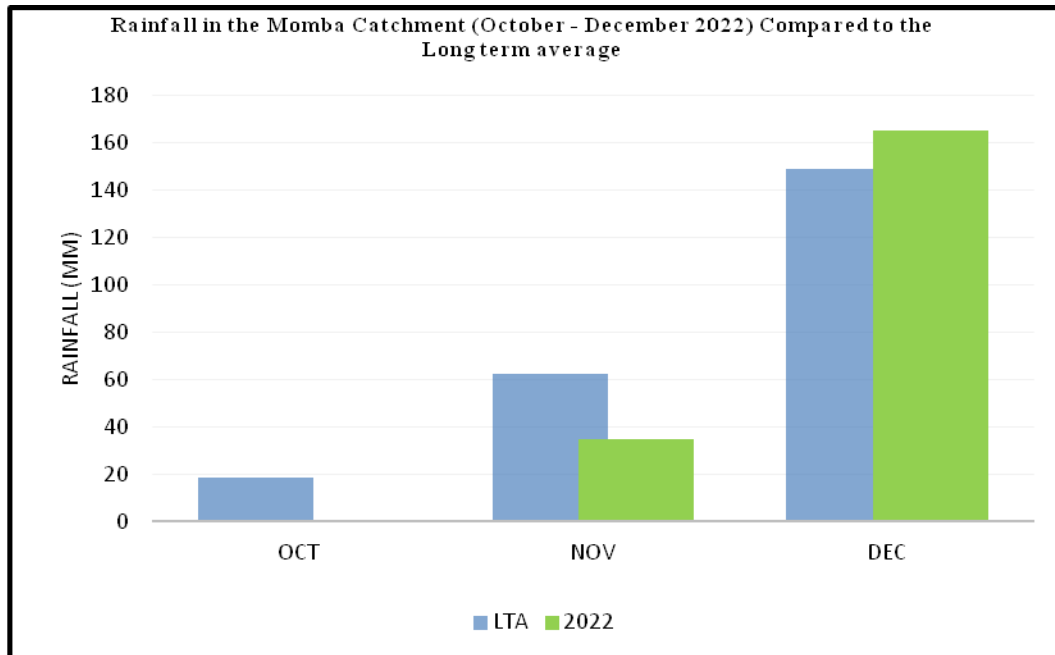


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### Rainfall over Momba Catchment

The Momba catchment experiences low rainfall over the entire Basin with little rainfall amounts recorded mainly in October and November compared to other catchments. In October and November, there was a decrease in rainfall by 100% and 44.2% respectively while in December there was an increase in rainfall by 11.1% compared to the long-term average of 1985-2021.



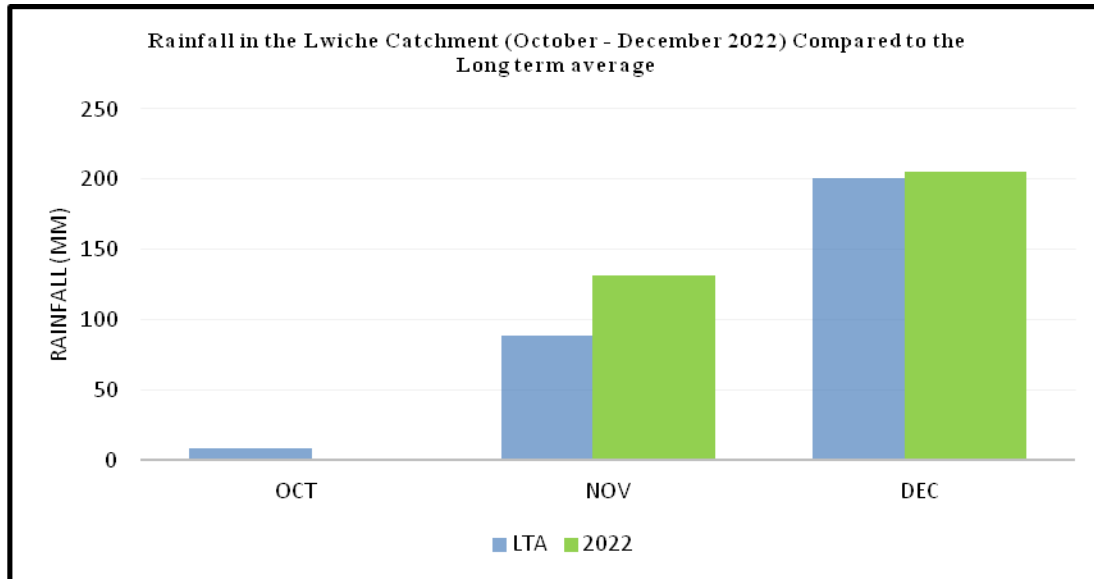
### Rainfall over Lwiche Catchment

The Lwiche catchment experiences a wet climate over the Basin with high rainfall amounts recorded mainly in November and December. In November and December, there was an increase in rainfall by 47.9% and 2.2% respectively while in October there was a decrease in rainfall by 100% compared to the long-term average of 1985-2021.



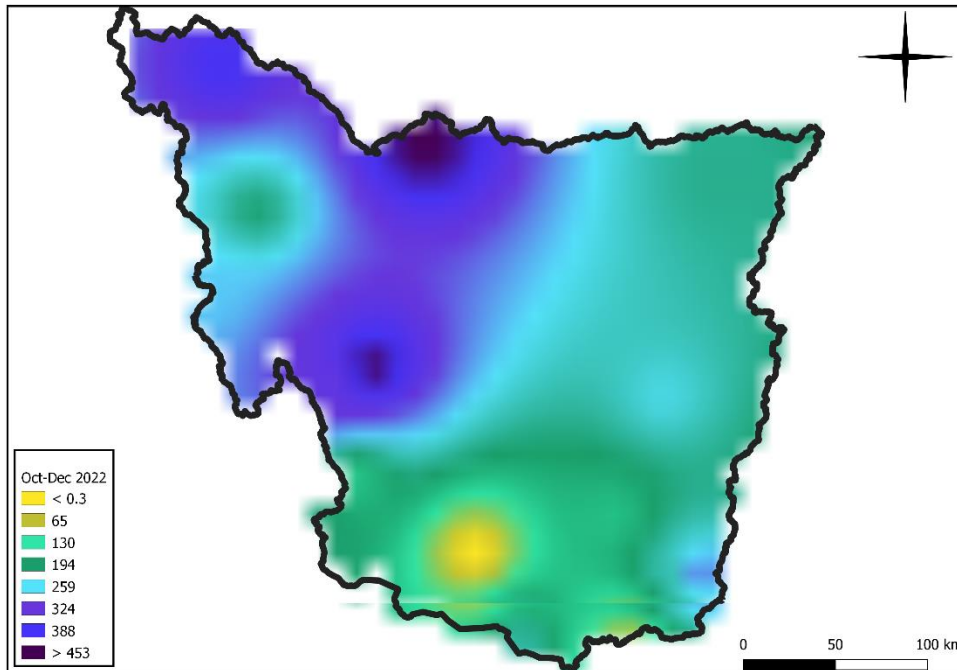
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### 2.2 Seasonal Rainfall

The Rukwa Basin normally experiences unimodal rainfall patterns. This analysis indicates that catchments in the Northern part experienced heavy rainfall during the reporting period. However, there was a slight increase in some catchments and a slight 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 Luiche 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.

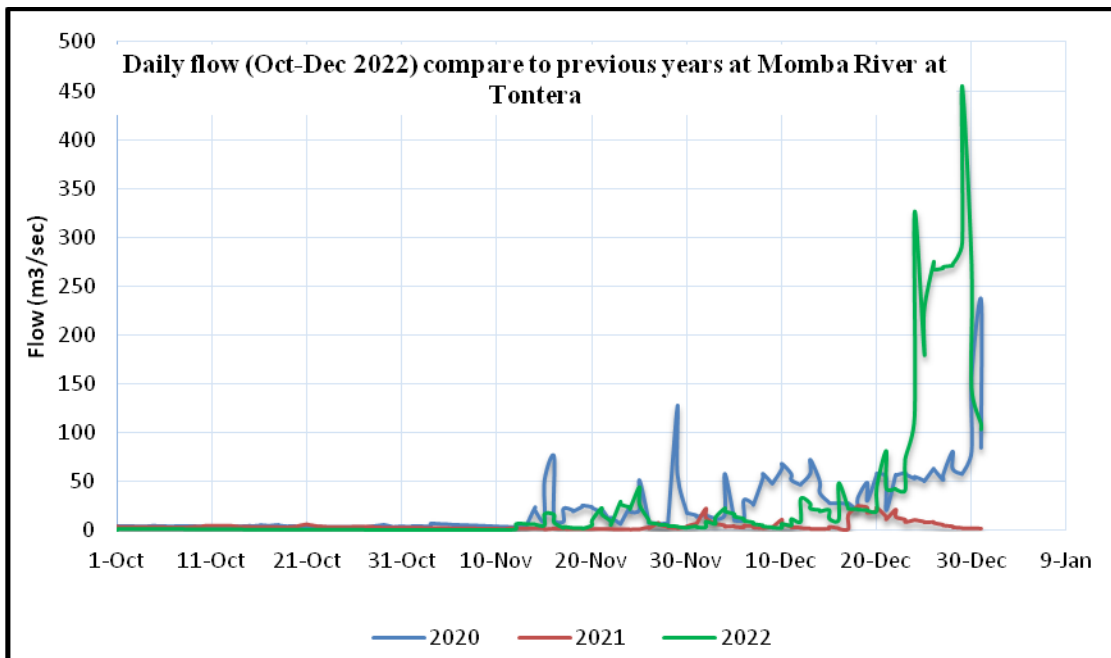
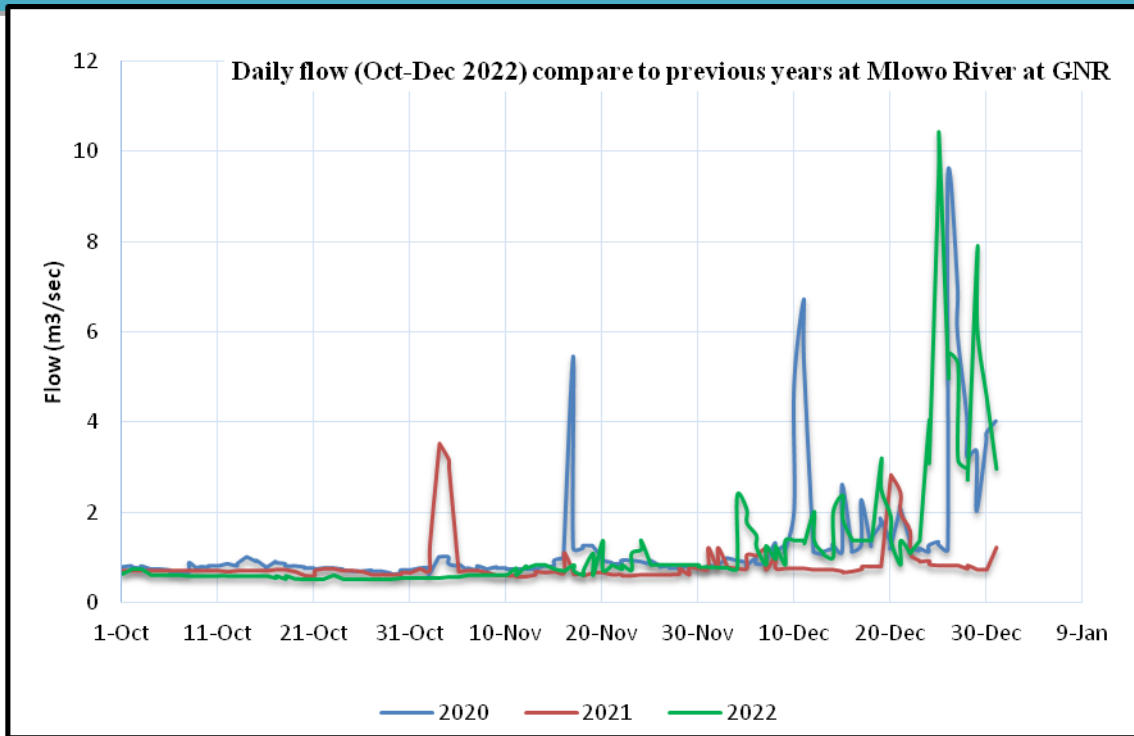
During the reporting period, a large part of the entire basin experienced more rainfall especially in December as explained above. Therefore, reported river flows of reported stations as indicated in the figures below are high compared to the previous years.

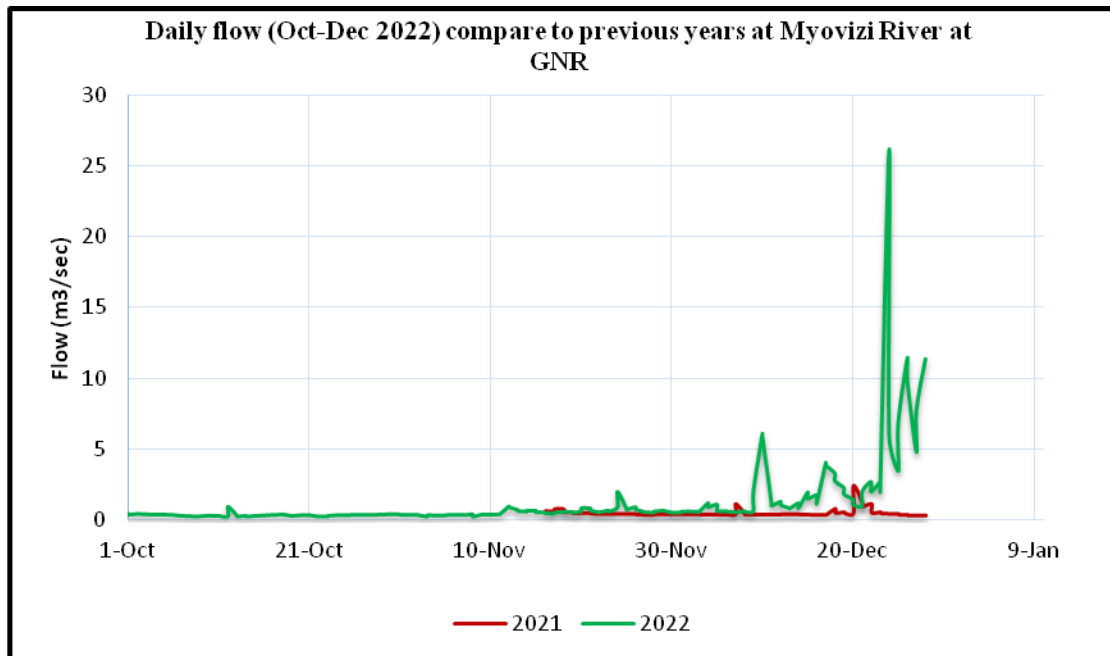




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### 3.2 Lake levels

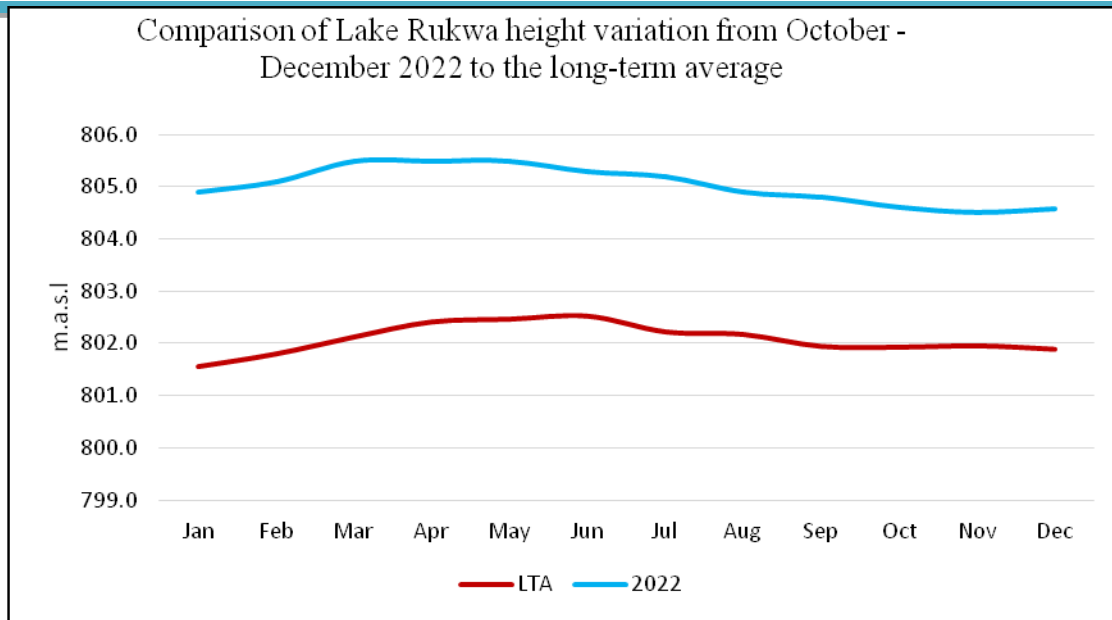
Lake Rukwa is the main hydrological feature of the basin. The lake, which is an inland drainage lake with no outlet, is quite shallow with a mean depth of about 4 m and a highly changing shoreline. The lake experiences very high evaporation rates on the order of 2,000 mm per annum compared to the average 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 October to December, the lake levels are seen to fluctuate with a high rise in all reported periods. The lake height is seen to be higher by about 2.7 meters as compared to the long-term average of 2014-2020.



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### 4.0 Implication for Water Resources Management

Ground data observations detected an increase in rainfall for catchments in the Northern part and North-West in the reporting period, especially in Rungwa, Katuma, and Lwiche compared to the long-term average and this indicates an increase in total amounts of water available upstream of the basin. This presents a good opportunity for higher crop yields in the agriculture sector, especially in the Katuma catchment.

Other catchments like Songwe and Momba received less rainfall compared to the long-term average and this indicates a decrease in water availability for these catchments. This presents a negative impact on the water supply for Vwawa- Mlowo, Mbeya Water Supply Authority and other users.