Highlights

July to September are the months which fall in the dry season.

The river flows fluctuations in all catchments are low compared to previous years.

Height variation charts show a sharp rise in water levels in Lake Rukwa.

MONITORING LAKE RUKWA BASIN USING GROUND DATA OBSERVATIONS (JULY – SEPTEMBER 2022)

1.0 General 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^2 extending the regions of Mbeya, Songwe, Rukwa, Katavi, and small parts of Tabora and Singida.

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

This issue provides an analysis of Rainfall in the 5 catchments compared to the long-term average of 1980-2020, fluctuation of flows in rivers, and an analysis of Water levels in Lake Rukwa during 2022 as compared to the long-term average of 1992-2020.
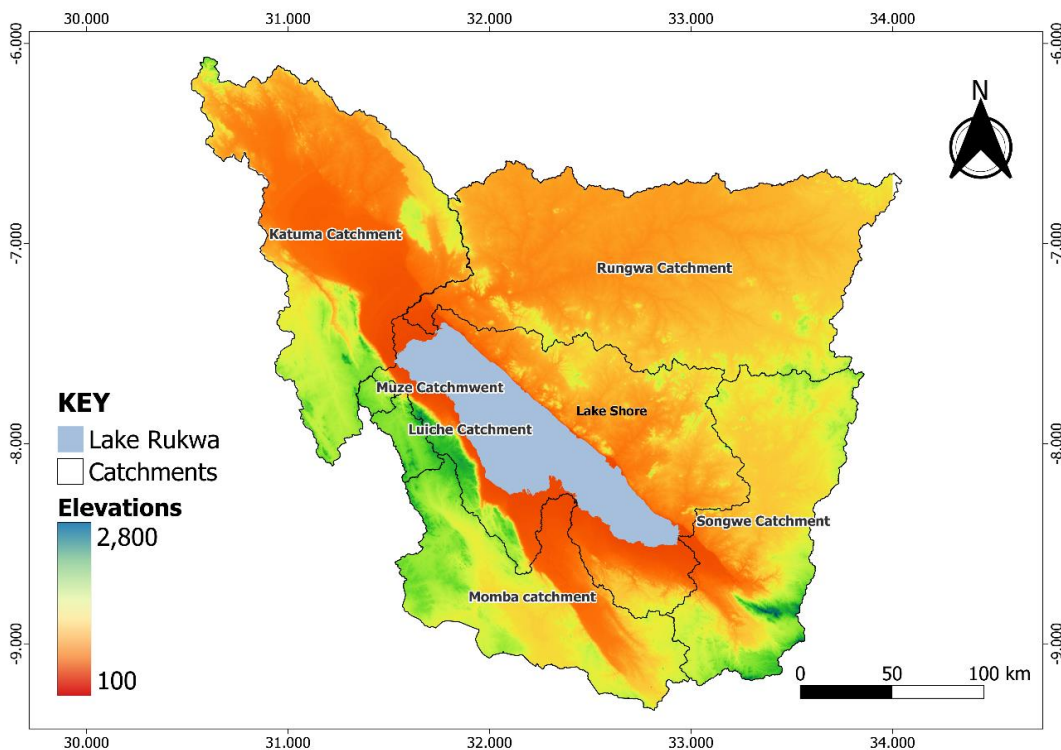

Figure 1: Catchments of the Rukwa Basin
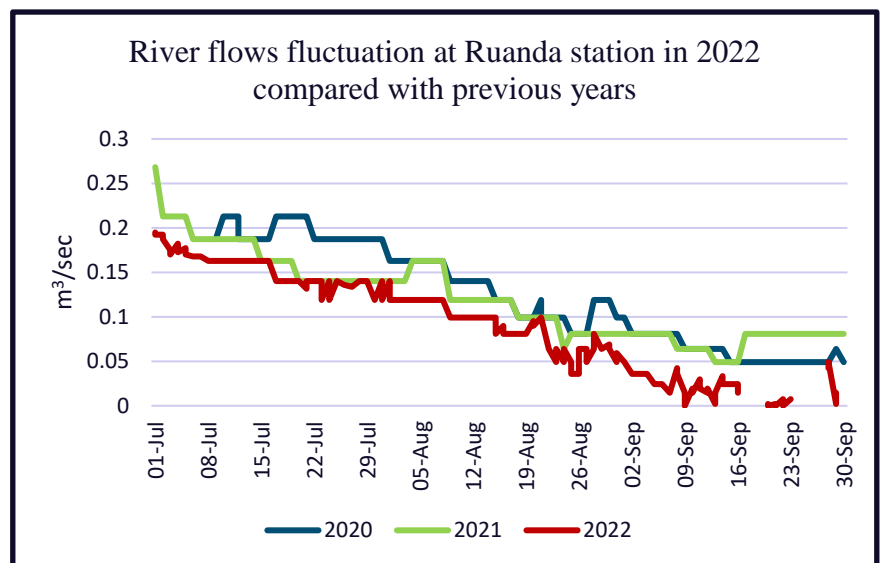
2.0 Water Status

2.1 Variability of rainfall in the Basin

Rainfall in the catchments of Rukwa Basin has been estimated using the ground observations data through weather and rainfall stations located in the 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 July to September 2022, the Rukwa Basin received **NO** rainfall in all catchments because is the dry season. Therefore, the amount of rainfall recorded during the three months decreased by 100% compared to the long-term average.
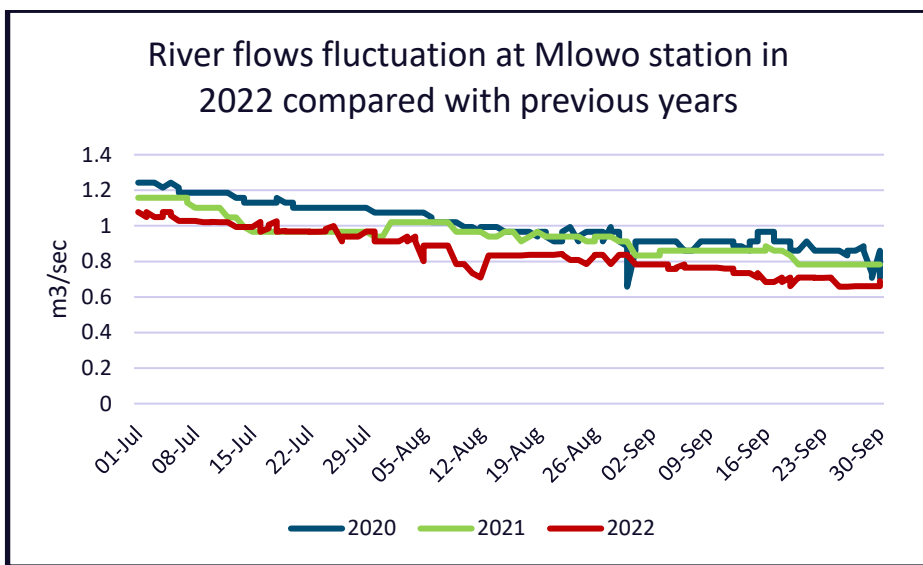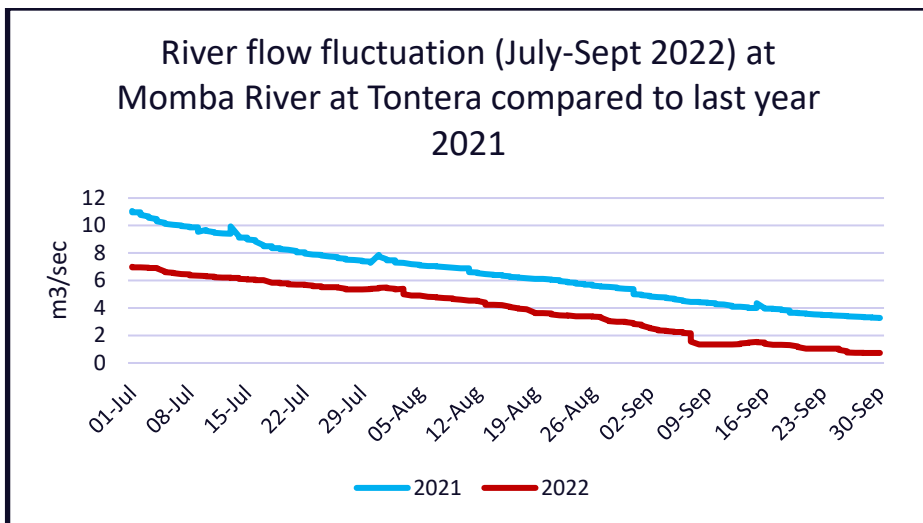
2.2 River flows fluctuations

Flows fluctuations in most of the rivers in the basin are eventually low as is the period of the dry season. Moreover, the river flows fluctuations from July to September 2022 are also low compared to the last year due to the low amount of rainfall received from November 2021 to May 2022. The graphs below show river flow fluctuation in some of the gauging stations in the Basin.

River flows fluctuation at Ruanda station in 2022 compared with previous years

River flow fluctuation (July-Sept 2022) at Momba River at Tontera compared to last year 2021

River flows fluctuation at Mlowo station in 2022 compared with previous years

2.3 Lake Rukwa water 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. From July to September,

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 2.5 meters as compared to the long-term average of 2014-2020. Despite decreases in rainfall since May, average lake levels at Lake Rukwa (Mbangala) remained above the long-term average for September, this is due to more rainfall received in 2019/2020.

Comparison of Lake Rukwa height variation from July - Sept 2022 to the long-term average
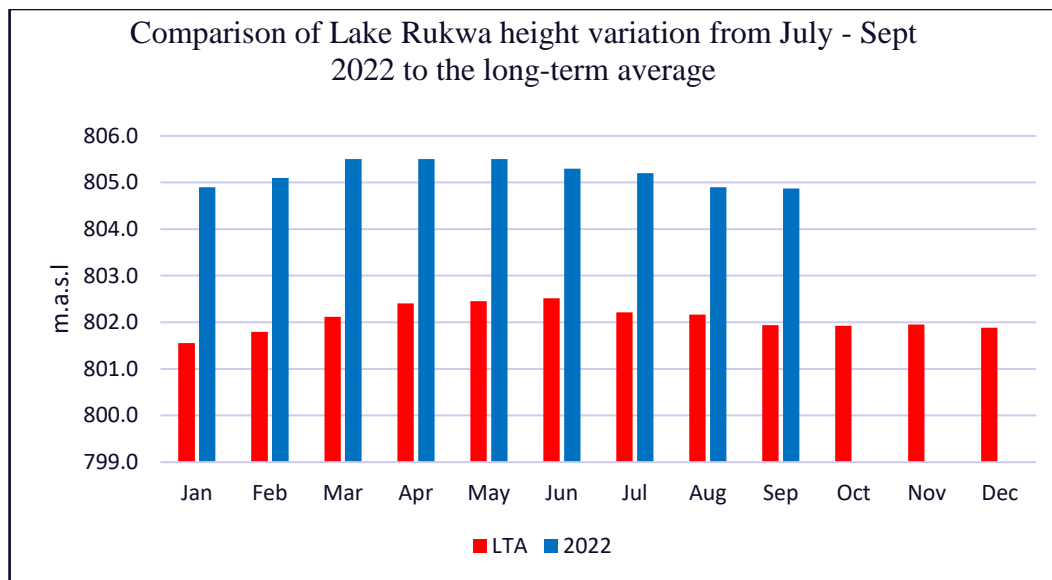
3.0 Conclusion

3.1 Implication for Water Resources Management

July to September fall under the dry season, and this indicates a decrease in the total amounts of water available in the basin. It is alert to the community that July to September is the dry period whereby they can apply irrigation activities/or plant crops that are drought resistant.

For the case of supplying water to the community, the Water Supply Authorities that are available in the basin should have a plan for storing water to have enough water for the whole period during the dry season.