



Monthly Hydro Meteorology Bulletin



Forward

This Monthly Hydro Meteorological Bulletin is prepared and disseminated by the Ethiopia Meteorological institute (EMI). The ultimate objective of producing and disseminating this bulletin is to inform all level decision makers with the updated and relevant hydro meteorological information. This monthly Bulletin reviews the August 2024-month climate condition and its impacts over the river catchment across the country and highlights the September 2024 climate outlook along with the likely impact over the water dams and the rivers basins.

The information contained in this bulletin is believed to assist the water professionals for planning the capacity expansion of reservoirs, water supply, ecosystem restoration as well as rehabilitation of existing systems including dams, irrigation, canals, pumps, wetlands and the likes. In addition to the aforementioned benefit the bulletin also reveals the aridity levels of each basin, extremes heavy rainfall events and areas where significant amount of moistures loss through evapotranspiration. In the impact outlook section of the bulletin it provides the likelihood of the climate in the coming month and its potential impact over various aspect of the river basins including the hydraulic structures such as culverts, bridges, reservoir spillways, road embankments and dikes. It also indicates the measures need to be taken as the early actions so as to reduce the possible negative impact of the upcoming month climate condition. Meanwhile, your comments and constructive suggestions are highly appreciated to make the objectives of this bulletin a success.





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1. Introduction

The provision of hydro meteorological services can contribute a significant role toward water resource management and socio-economic development. Both surface water and groundwater management are essentially linked to climate variability. Therefore, the provided climate information and knowledge in this monthly hydro meteorological bulletin have a critical importance for efficient, equitable and sustainable development and management of the national water resources and for coping with any climate related risks. The information illustrates the impact of previous month climate on each and every water basins and the associated climate risks observed during the month under review. In addition to the previous month impact assessment, the bulletin also provided the expected climate condition for the coming months and its impact on the water resource. The design of water-use and flood-control facilities, mainly dams and reservoirs, is frequently based on these analyses. Estimating the likelihood of precipitation, the distribution of precipitation and the rate of evaporation in location and time, the heavy rainfall and the subsequent runoff, extreme temperature and wind are among issues that hydro meteorologists are concerned with.

1.1 Monthly Hydro Meteorological Assessments

1.1.1 Monthly aridity Climatology over the Ethiopian River Basin

As illustrated in figure 1, in the normal condition the western, northern, central and southern parts of the river basin experience wet to hyper wet moisture condition. In line with this, most parts of Abay, Baro Akobo, Tekeze, Omogibe, Mereb Gashe, Afar Denakilel Awash, Rift Valley, some parts of upper Ogaden, Wabisheble and Genale Dawa receive significant amount of rainfall exceeding the potential evapotranspiration of the areas. On the other hand, most of southern and southeastern half parts of the river basins remain in arid moisture condition.

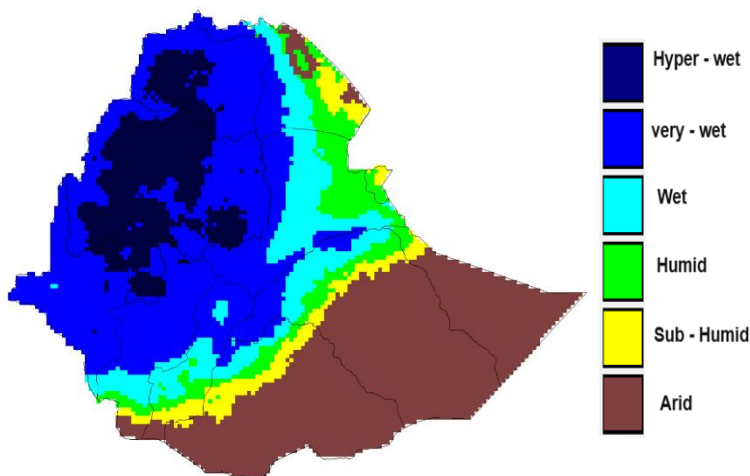


Figure 1. Monthly Moisture Climatology over the river basin during August



1.1.2 August 2024 Rainfall Assessment over the River Basins

A better monthly rainfall distribution is observed across the western half basins of the country. According to this, firstly, most parts of Abay, Baro Akobo, Tekeze, Omo Gibe Afar Denakile and Mereb Gashe, in the margin of upper Awash and Rift Valley, and some parts of upper Genale Dawa and upper Wabishebele got above 150mm of rainfall. Likewise, part of the Ogaden, lower part of Wabishebele and Genale Dawa, and lower Rift Valley received below 100 mm of rainfall as it is illustrated in Figure 2.

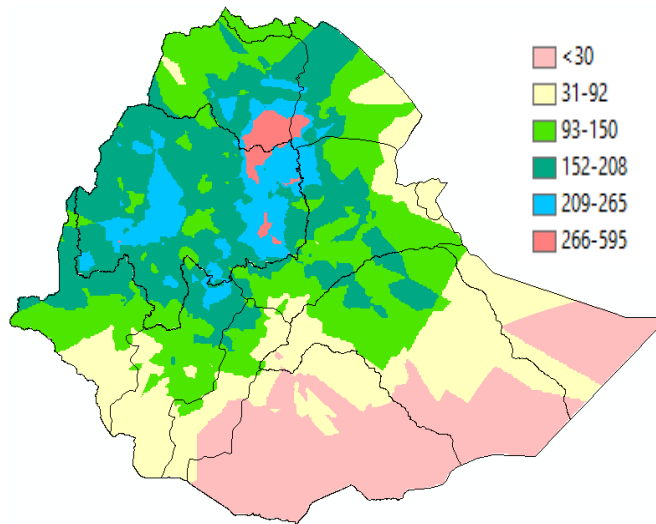


Figure 2 August monthly mean rainfall over Ethiopian River Basin

1.1.3 Monthly Mean Temperature over the River Basin

As we can see in Figure 2, the majority of the central catchments, Abay, Baro, Omo Gibe, Rift Valley upper Wabishebele, upper Awash and Genaledawa, experienced monthly average temperatures below 25°C. However, the monthly average temperatures that were reported in the remaining catchments of some part of BaroAkobo, Awash, and Afar Denakel, was received above 25 °C.

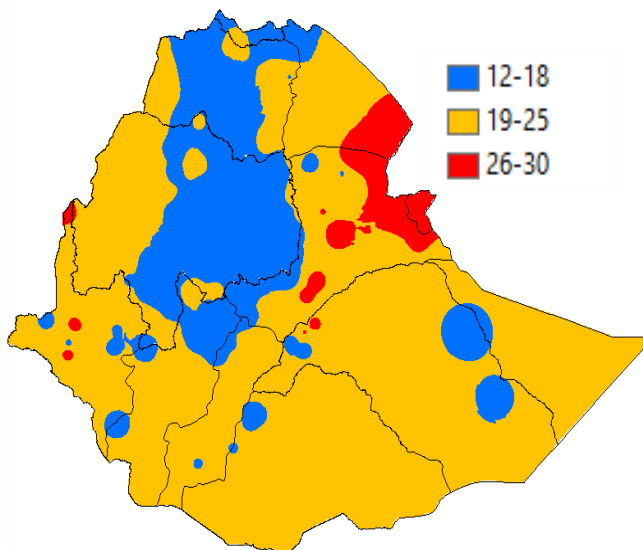


Figure 3 August monthly mean temperature over Ethiopian River Basin



1.1.4 Assessments of Aridity Index during the month of August

During this month, most parts of Abay, Baro Akobo, Tekeze, Mereb Gashe, Afar Denakile, Omogibe, Rift Valley, the upper Genale Dawa, Wabisheble and Ogaden have experienced wet to very wet moisture condition. Likewise, part of Afar Denakel, Ogaden, lower part of Wabishebele and Genale Dawa received sub-humid to Arid moisture during the month under review. Since the received moisture over most parts of Kiremt rain benefiting catchment are well exceeded from the potential evapotranspiration of the month, it favours the available of ample moisture on the surface and ground water. On the other hand, arid moisture condition was prevailed across most part of the eastern half river catchments.

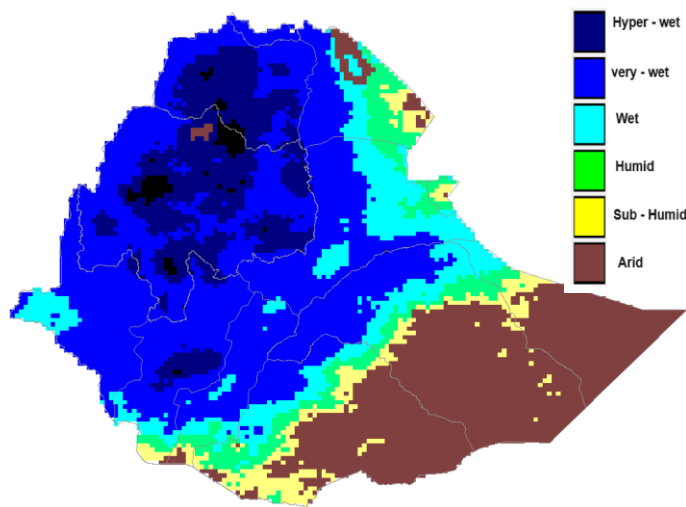


Figure 4. August monthly Aridity Index condition over the river basins

1.1.5 Distribution of Heavy fall (>30mm a day)

As can be seen in the above figure 4, most of Abay, Baro Akobo, Tekeze, Mereb Gashe, Afar Denakile, Omogibe, Rift Valley, the upper Genale Dawa, Wabisheble and Ogaden have received from one to three frequency of heavy fall in this month. This frequency of rainfall will be increasing water holding capacities for dams and basins.

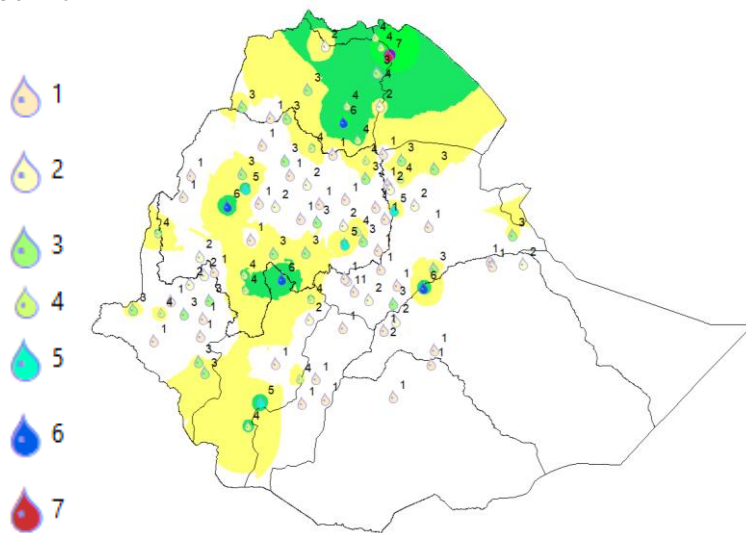


Figure 5 Heavy fall Frequency during the August month over Ethiopian River Basin



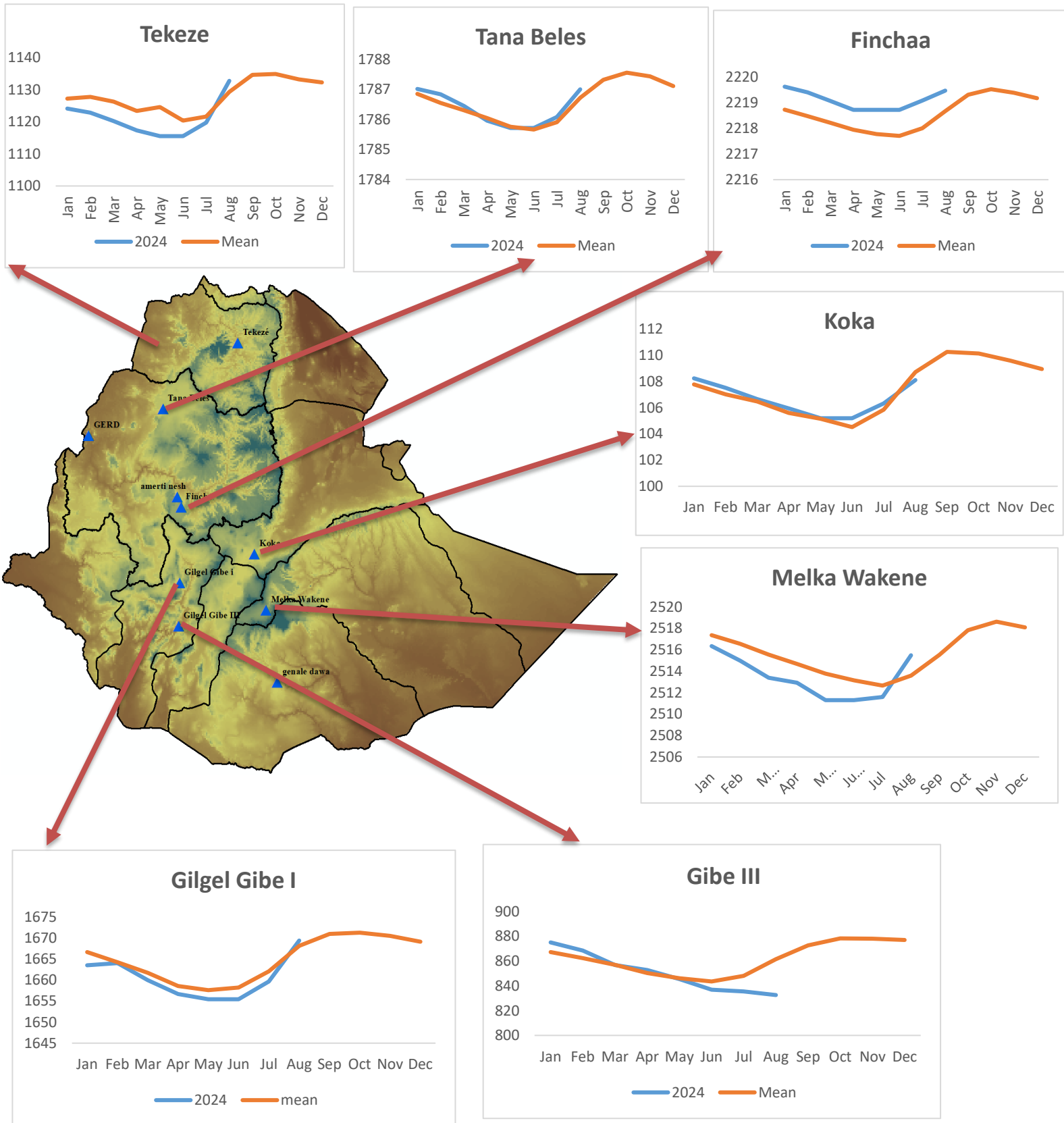


Figure 6 August monthly mean DAM status over Ethiopian River Basin



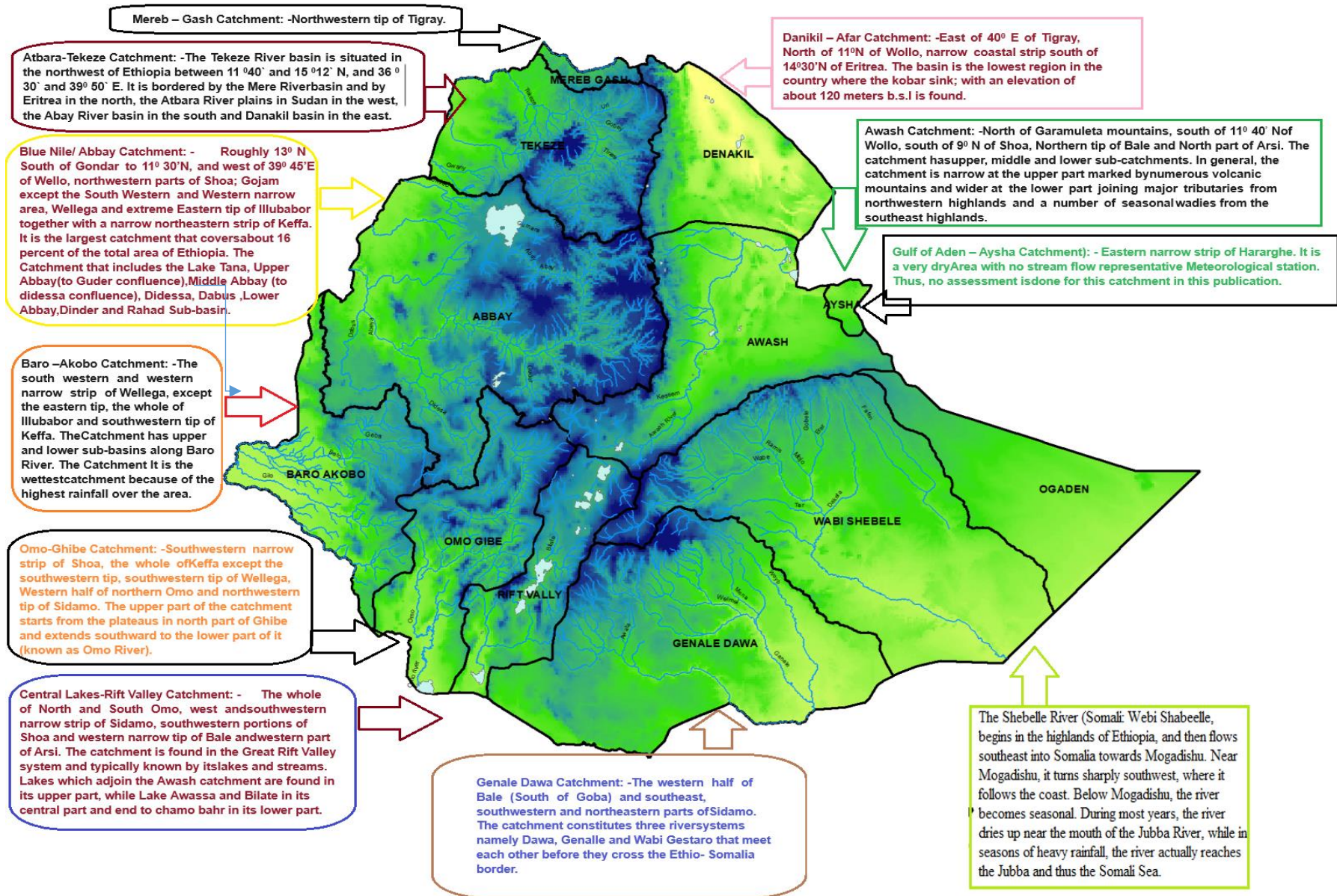
As can be seen in figure 6 most of Kiremt benefiting DAMs have good water holding capacity. Specially Tana Beles, Tekeza, Koka and Melka Wakene shows start rising to above mean, ' Gilgel Gibe I have good water holding capacity, Finchaa rally have good water and it needs watch and also those the reaming dams have the same good water holding capacity and this is used for different applications that used for power generation, irrigation and different agricultural purposes.

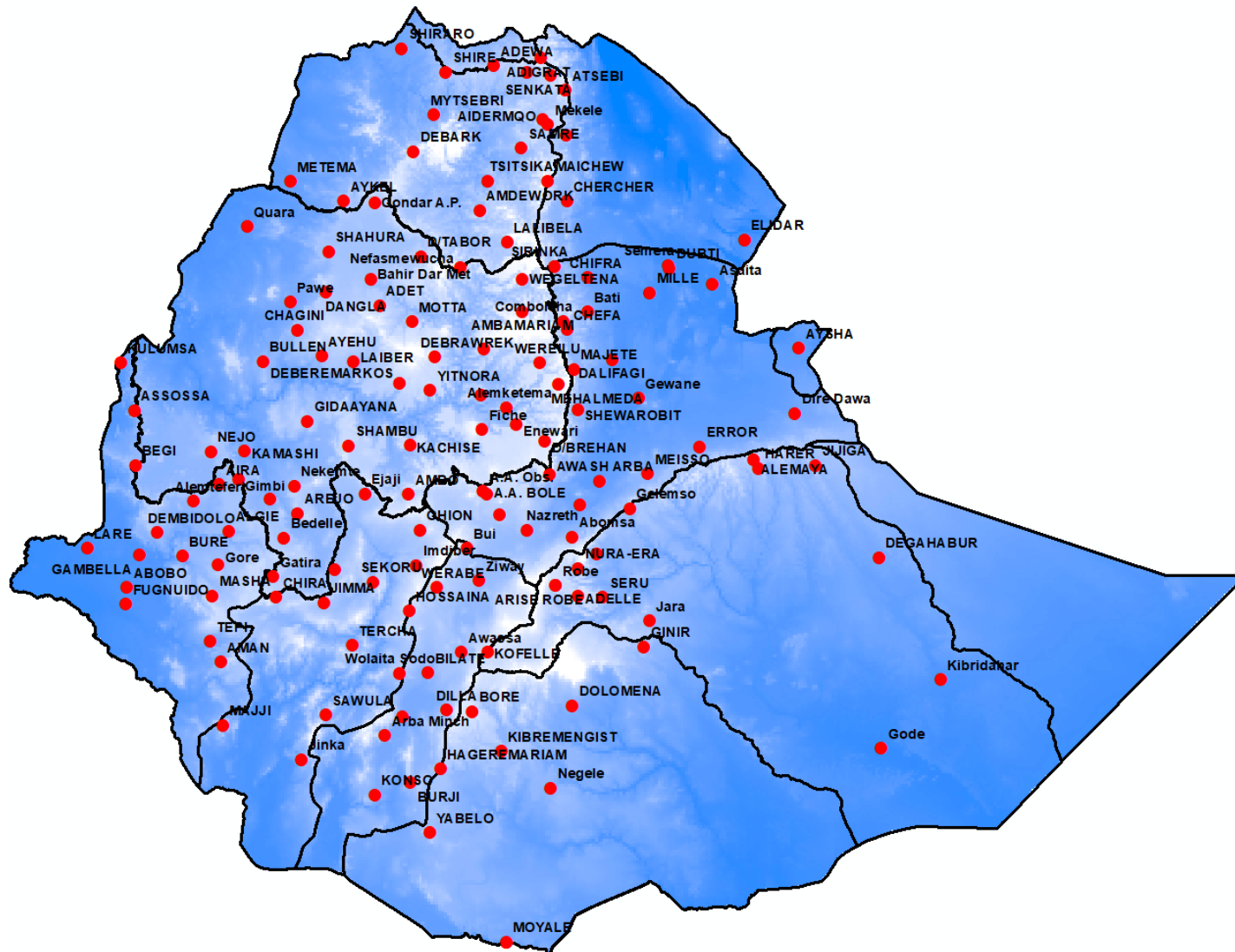
2. Hydro Meteorological Impact Outlook for July 2024

2.1. Expected weather impact on water resource during the coming September 2024

In September, there will be high humidity in the Abbey, Baro Akobo, Tekeza Upper and Middle Rift Valley, Awash, Genale Dawa, and Upper Wabe Shebele basins; the Afar Danakal and Lower Awash basins will also have moderate humidity. In addition to improving water resource availability, the moisture will also be beneficial for dams that need to hold water for the rest of the day. On the other hand, dams with high water levels at present, coupled with the additional moisture they will receive in the future, may put pressure on the dam and downstream. In order to reduce this impact, it is necessary to closely monitor the Tandaho, Kesem, Ribb, and Tekeza dams.







Number of weather stations used for Hydro Meteorological Analysis

