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Ethiopian Meteorology Institute

Monthly Hydro Meteorology Bulletin

2025

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 May 2025-month climate condition and its impacts over the river catchment across the country and highlights the June 2025 climate outlook along with the likely impact over the water dams and the rivers basins.

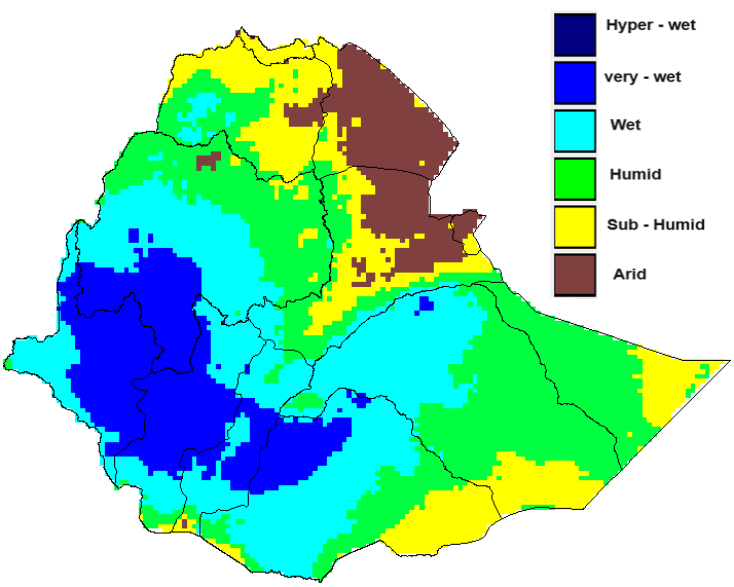
The information contained in this bulletin is believed to assist the water professionals for planning the capacity expansion of reservoirs, water supply, ecosystem restoration as well as rehabilitation of existing systems including dams, irrigation, canals, pumps, wetlands and the likes. In addition 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.

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

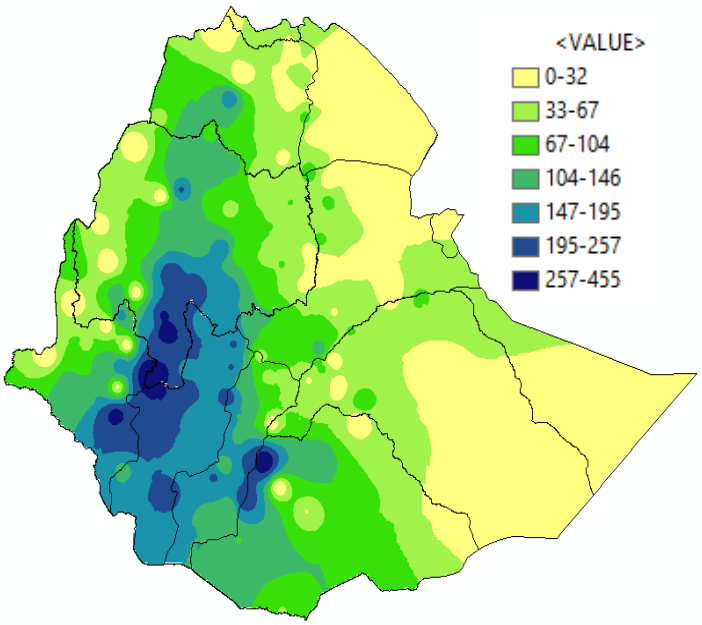
1.1.1 May Monthly Climatology of the Ethiopian River Basin



As can be seen in figure 1, most parts of Abay, Tekeze, Baro Akobo, Omo gibe, Rift Valley, Genale Dawa, Wabisheble and Ogaden some parts of middle and upper Awash, receive significant amount of moisture exceeding the potential evapotranspiration of the areas. In climatologically the western, central, southern and southwester, northern, and eastern parts of the river basin experienced wet to very wet moisture on this month.

Figure 1 Monthly climatology of the Ethiopian river basin (May).

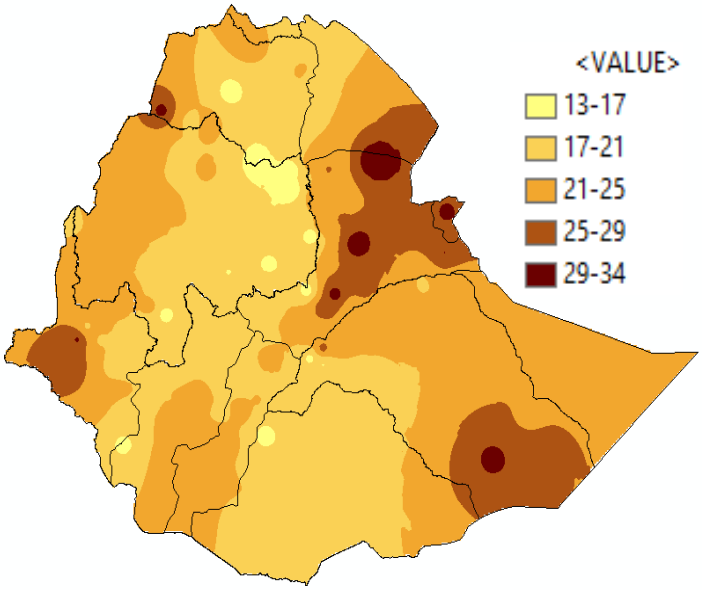
1.1.2 May 2025 Rainfall Assessment over the River Basins



During May 2025, the observed rainfall over the basin illustrated in figure 2, a better monthly rainfall distribution is observed across the western. Southwest and southern half of the country's basins. The result shown over the most parts of Abay, Tekeze, Baro Akobo, Omo Gibe, Rift Valley, Genale Dawa, Wabisheble and Ogaden some parts of middle and upper Awash, received above 104mm of rainfall. Secondly, most of Afar Danakil, Ogaden, the lower part of Wabisheble and lower Awash received below 100mm of rainfall.

Figure 2 May monthly mean rainfall over Ethiopian River Basin

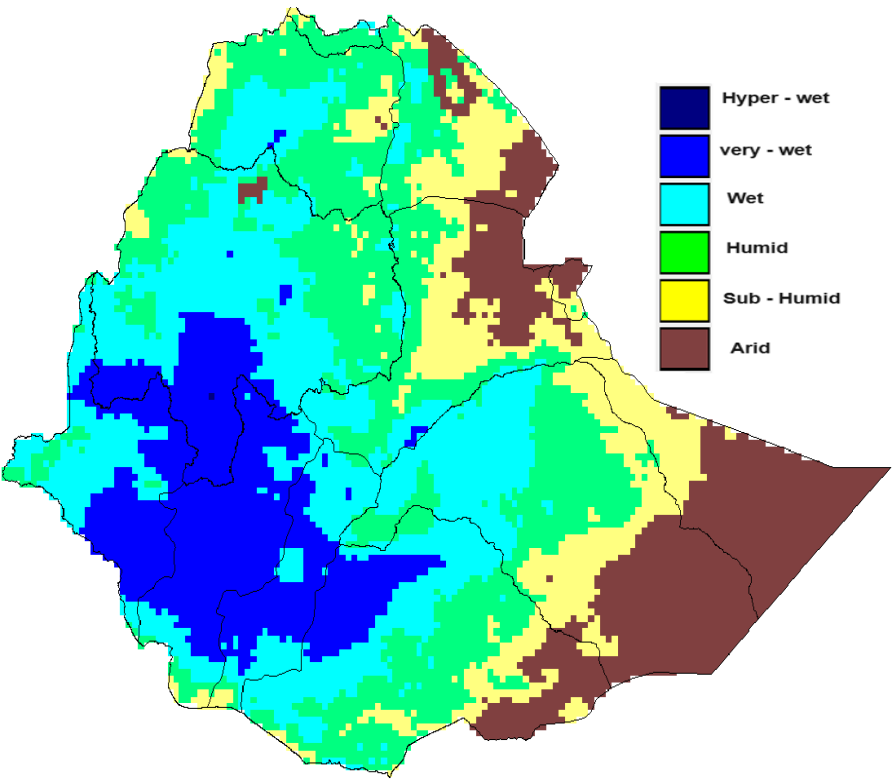
1.1.3 Monthly Mean Temperature over the River Basin



During May 2025, the observed mean temperature, as shown in Figure 3, was below 25°C in the majority of the central catchments, including in some part of upper Abby, Baro, Omo Gibe, Rift Valley, Wabisheble, Awash, and Genale Dawa basins have lower evapotranspiration. However, the monthly average temperatures reported in the Ogaden, Lower Wabisheble, Baro Akobo, Awash, Omo Gibe, Rift Valley and Afar Danakil catchments were above 25°C.

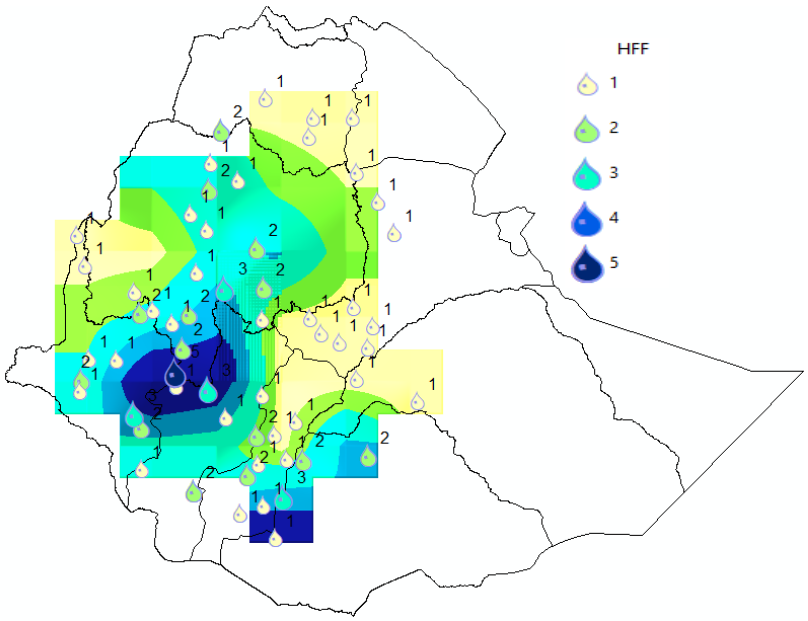
Figure 3 May monthly mean temperature over Ethiopian River Basin

1.1.4 Assessments of Aridity Index during the month of May



During May 2025, the observed Aridity Index is shown in Figure 4. The results indicate that the western, northern southern, south western eastern and north eastern part of the basins have good monthly moisture distribution. This is evidenced by the above-wet to hyper-wet Aridity Index observed in the majority of the Abay, Baro Akobo, Tekeze, Mereb Gash, Omo Gibe, Rift Valley and Genale Dawa, the upper Ogaden and Wabisheble border as well as in certain areas of the upper and middle Omo Gibe and upper Wabisheble and humid to sub-humid Aridity Index was observed in most Afar Danakil, Ogaden, lower Awash, lower Rift Valley, and the lower parts of Wabi shebele and Genale Dawa.

1.1.5 Distribution of Heavy fall



As can be seen in the above figure 4, most of Abay, BaroAkobo, Omo Gibe, Rift Valley, and upper Genale Dawa and Wabisheble have received from one to five frequency of heavy fall in this month. This frequency of rainfall will be increasing water holding capacities for dams and basin.

Figure 4(a, b) May monthly Aridity index and Heavy Fall Frequency over Ethiopian River Basis

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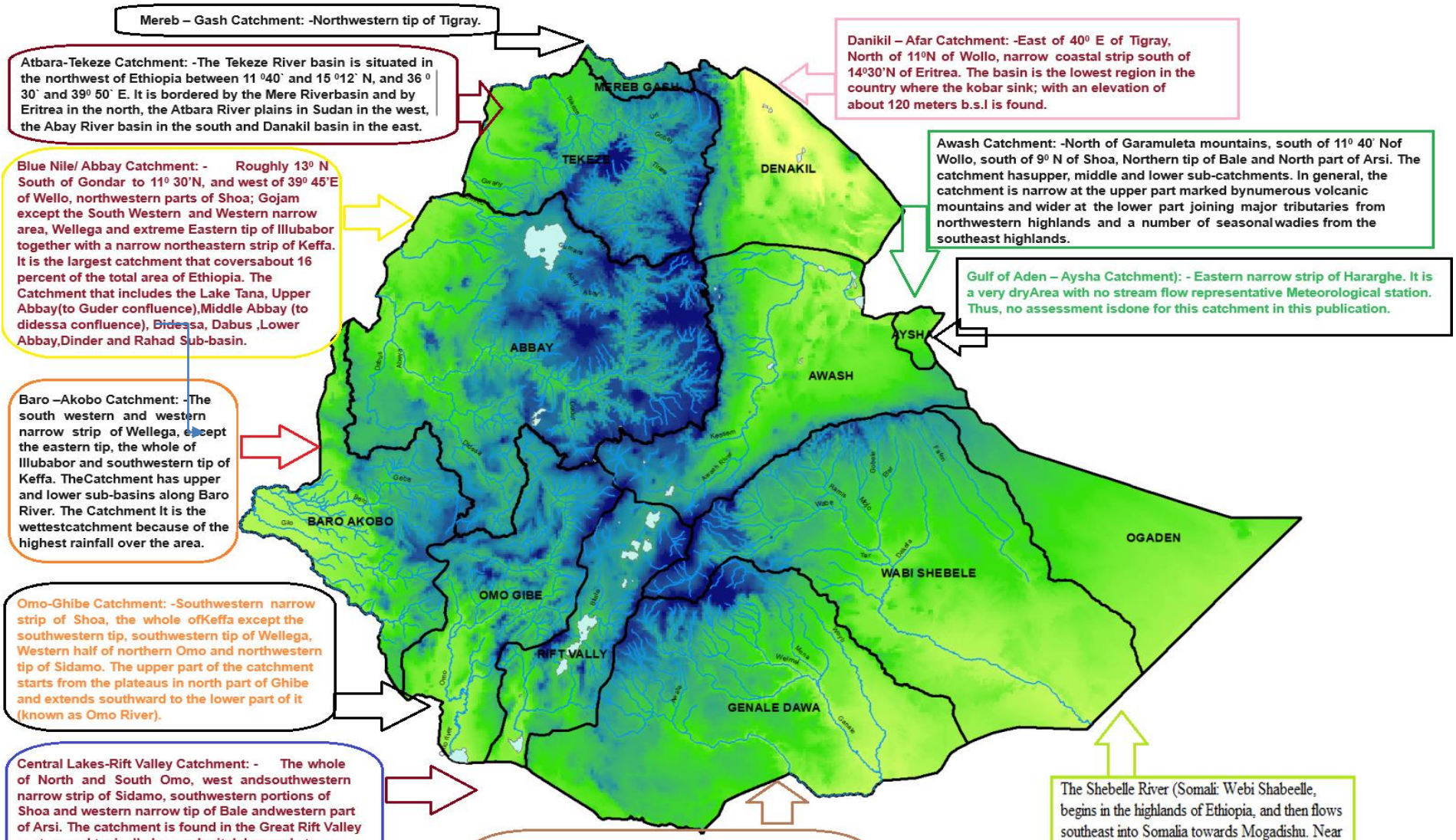
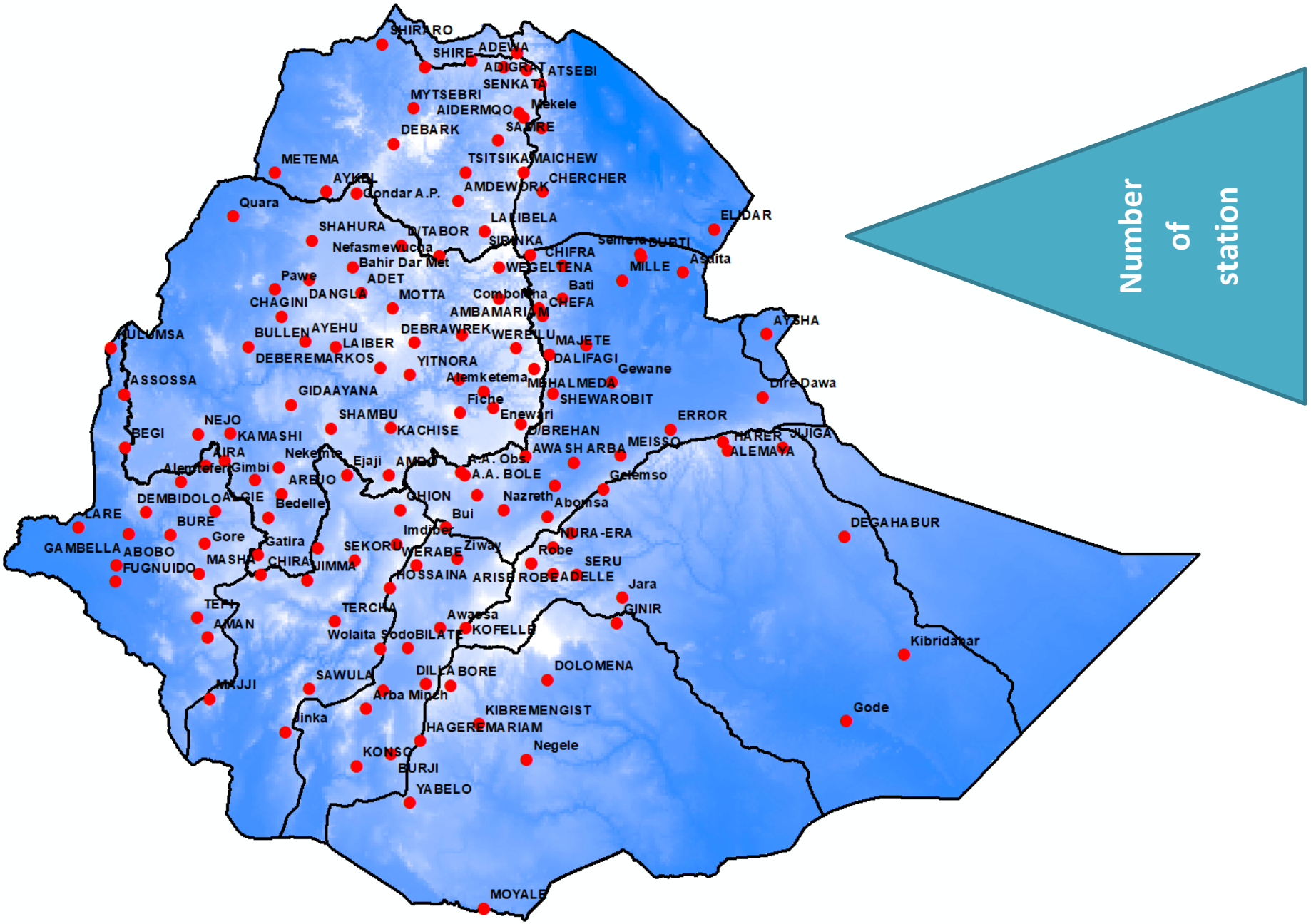
2. Hydro Meteorological Impact Outlook for June 2025

2.1 Expected weather impact on water resource during the coming June, 2025

During the upcoming month of June, most of the **Tekeze, Abay, Mereb-Gashe, Awash, Baro-Akobo, Omo-Gibe, Upper and Middle Rift Valley, Upper Wabe Shebele, and Genale Dawa** basins are expected to experience **wet to very wet moisture conditions**. The anticipated moisture during this period is likely to contribute positively to the availability of water in both natural and artificial reservoirs, thereby enhancing **dam inflow and energy production**. Additionally, it will provide **adequate moisture for both large- and small-scale irrigation activities**.

However, the expected **heavy rainfall may lead to flash floods and riverine flooding** in both urban and rural flood-prone areas, potentially causing significant damage to human life, property, and infrastructure. As a result, **concerned water professionals and the broader community are strongly advised to take precautionary measures**, such as cleaning drainage systems, to reduce the potential risk. **In general, residents in flood-prone areas are urged to remain alert** for possible floods, flash floods, and poor visibility. Given the anticipated high water levels in rivers, lakes, and dams, communities are advised **not to drive through or walk in moving water** to avoid risks to life and property. Furthermore, individuals living in **landslide-prone areas**, especially in hilly regions, are **strongly encouraged to remain vigilant** during this period.


Mereb – Gash Catchment: -Northwestern tip of Tigray.
Atbara-Tekeze Catchment: -The Tekeze River basin is situated in the northwest of Ethiopia between 11 °40` and 15 °12` N, and 36 ° 30` and 39° 50` E. It is bordered by the Mere Riverbasin and by Eritrea in the north, the Atbara River plains in Sudan in the west, the Abay River basin in the south and Danakil basin in the east.
Blue Nile/ Abbay Catchment: - Roughly 13° N South of Gondar to 11° 30'N, and west of 39° 45'E of Wello, northwestern parts of Shoa; Gojam except the South Western and Western narrow area, Wellega and extreme Eastern tip of Illubabor together with a narrow northeastern strip of Keffa. It is the largest catchment that coversabout 16 percent of the total area of Ethiopia. The Catchment that includes the Lake Tana, Upper Abbay(to Guder confluence),Middle Abbay (to didessa confluence), Didessa, Dabus ,Lower Abbay,Dinder and Rahad Sub-basin.
Baro –Akobo Catchment: -The south western and western narrow strip of Wellega, except the eastern tip, the whole of Illubabor and southwestern tip of Keffa. TheCatchment has upper and lower sub-basins along Baro River. The Catchment It is the wettestcatchment because of the highest rainfall over the area.
Omo-Ghibe Catchment: -Southwestern narrow strip of Shoa, the whole ofKeffa except the southwestern tip, southwestern tip of Wellega, Western half of northern Omo and northwestern tip of Sidamo. The upper part of the catchment starts from the plateaus in north part of Ghibe and extends southward to the lower part of it (known as Omo River).
Central Lakes-Rift Valley Catchment: - The whole of North and South Omo, west andsouthwestern narrow strip of Sidamo, southwestern portions of Shoa and western narrow tip of Bale andwestern part of Arsi. The catchment is found in the Great Rift Valley system and typically known by itslakes and streams. Lakes which adjoin the Awash catchment are found in its upper part, while Lake Awassa and Bilate in its central part and end to chamo bahr in its lower part.
Danikil – Afar Catchment: -East of 40° E of Tigray, North of 11°N of Wollo, narrow coastal strip south of 14°30'N of Eritrea. The basin is the lowest region in the country where the kobar sink; with an elevation of about 120 meters b.s.l is found.
Awash Catchment: -North of Garamuleta mountains, south of 11° 40` Nof Wollo, south of 9° N of Shoa, Northern tip of Bale and North part of Arsi. The catchment hasupper, middle and lower sub-catchments. In general, the catchment is narrow at the upper part marked bynumerous volcanic mountains and wider at the lower part joining major tributaries from northwestern highlands and a number of seasonal wadies from the southeast highlands.
Gulf of Aden – Aysha Catchment): - Eastern narrow strip of Hararghe. It is a very dryArea with no stream flow representative Meteorological station. Thus, no assessment isdone for this catchment in this publication.
Genale Dawa Catchment: -The western half of Bale (South of Goba) and southeast, southwestern and northeastern parts of Sidamo. The catchment constitutes three riversystems namely Dawa, Genalle and Wabi Gestaro that meet each other before they cross the Ethio- Somalia border.
The Shebelle River (Somali: Webi Shabeelle, begins in the highlands of Ethiopia, and then flows southeast into Somalia towards Mogadishu. Near Mogadishu, it turns sharply southwest, where it follows the coast. Below Mogadishu, the river becomes seasonal. During most years, the river dries up near the mouth of the Jubba River, while in seasons of heavy rainfall, the river actually reaches the Jubba and thus the Somali Sea.
MEREB GASH
TEKEZE
DENAKIL
ABBAY
AWASH
AYSH
BARO AKOBO
OMO GIBE
RIFT VALLY
GENALE DAWA
WABI SHEBELE
OGADEN


SHIRARO
SHIRE
ADEWA
ADIGRAT
ATSEBI
SENKATA
MYTSEBRI
AIDERMQO
Mekele
DEBARK
SAMRE
METEMA
TSITSIKAMAICHEW
AYKEL
CHERCHER
Gondar A.P.
AMDEWORK
Quara
LALIBELA
ELIDAR
SHAHURA
D/TABOR
SIRINKA
Semera
DUBTI
Nefasmewucha
CHIFRA
Assita
Bahir Dar Met
WEGELTENA
MILLE
Pawe
ADET
Bati
DANGLA
MOTTA
Combolcha
CHEFA
CHAGINI
AMBAMARIAM
AYSHA
GULUMSA
BULLEN
AYEHU
DEBRAWREK
WEREILU
MAJETE
LAIBER
DALIFAGI
DEBEREMARKOS
YITNORA
Gewane
Alemketema
MISHALMEDA
ASSOSSA
Dire Dawa
GIDAAYANA
Fiche
SHEWAROBIT
Enewari
NEJO
SHAMBU
ERROR
BEGI
KAMASHI
KACHISE
D/BREHAN
HARER
JIJIGA
MEISSO
AWASH ARBA
ALEMAYA
AIRA
Nekemte
Ejaji
AMBO
R.A. Obs.
A.A. BOLE
Alemtefera
Gimbi
AREJO
Gelemso
DEMBIDOLO
GIE
Bedelle
QHION
Nazreth
Abomsa
LARE
BURE
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DEGAHABUR
Gore
Imdibir
NURA-ERA
GAMBELLA
Gatira
SEKORU
Ziway
Robe
ABOBO
MASHA
WERABE
SERU
FUGNUIDO
CHIRA
JIMMA
HOSSAINA
ARISI
ROBE
ADELLE
Jara
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TERCHA
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Wolaita Sodo
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Jinka
HAGEREMARIAM
Negele
KONSO
BURJI
YABELO
MOYALE
Number of station