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

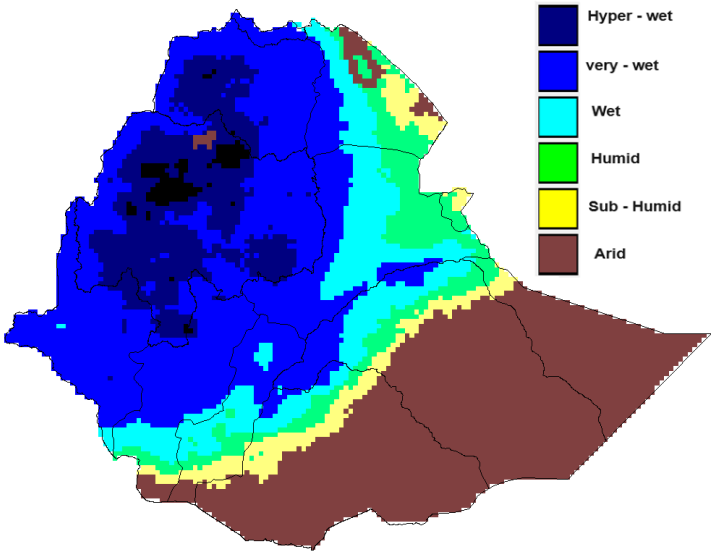
The information contained in this bulletin is believed to assist the water professionals for planning the capacity expansion of reservoirs, water supply, ecosystem restoration as well as rehabilitation of existing systems including dams, irrigation, canals, pumps, wetlands and the likes. In addition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

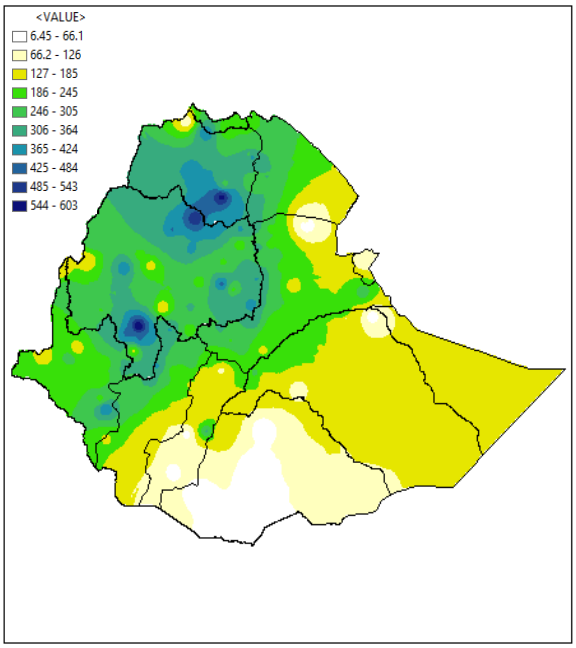
1.1.1 August Monthly Climatology of the Ethiopian River Basin



As can be seen in figure 1, most parts of Abay, Tekeze, Baro Akobo, Omo gibe, Rift Valley, Awash, Afar Danakil, upper Wabi shebele and Genale Dawa receive significant amount of moisture exceeding the potential evapotranspiration of the areas. In climatologically the western, south western, north, north western, north eastern and central basin experienced wet to very wet. And the rest south and south eastern climatological dry ,such as most of Ogaden, Genale Dawa, lower Omo gibe and rift valley.

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

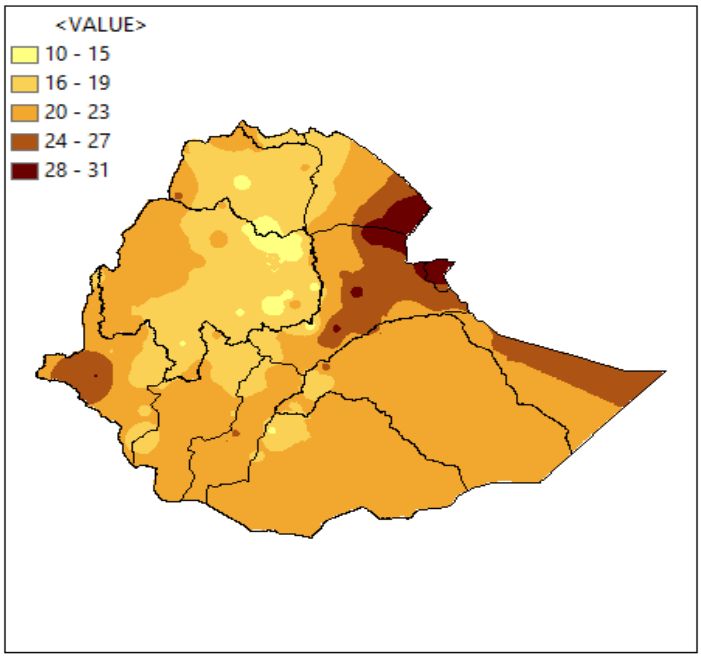
1.1.2 July 2025 Rainfall Assessment over the River Basins



During August 2025, the observed rainfall over the basin illustrated in figure 2, a better monthly rainfall distribution is observed across the north, North West, Northeastern western and central. The result shown over the most parts of Abay, Tekeze, Baro Akobo, Omo Gibe, Awash, Mereb Gash, Afar Danakil upper and upper Rift Valley, and Wabisheble, received 186-543 mm of rainfall and in addition few place of upper and middle Abay and upper Tekeze have received 544-603 mm. The other, most of Genale Dawa, wabi shebele, Ogaden, Aysha lower Awash and few place of Afar Danakil basins have received below 127 mm rainfall.

Figure 2 August monthly mean rainfall over Ethiopian River Basin

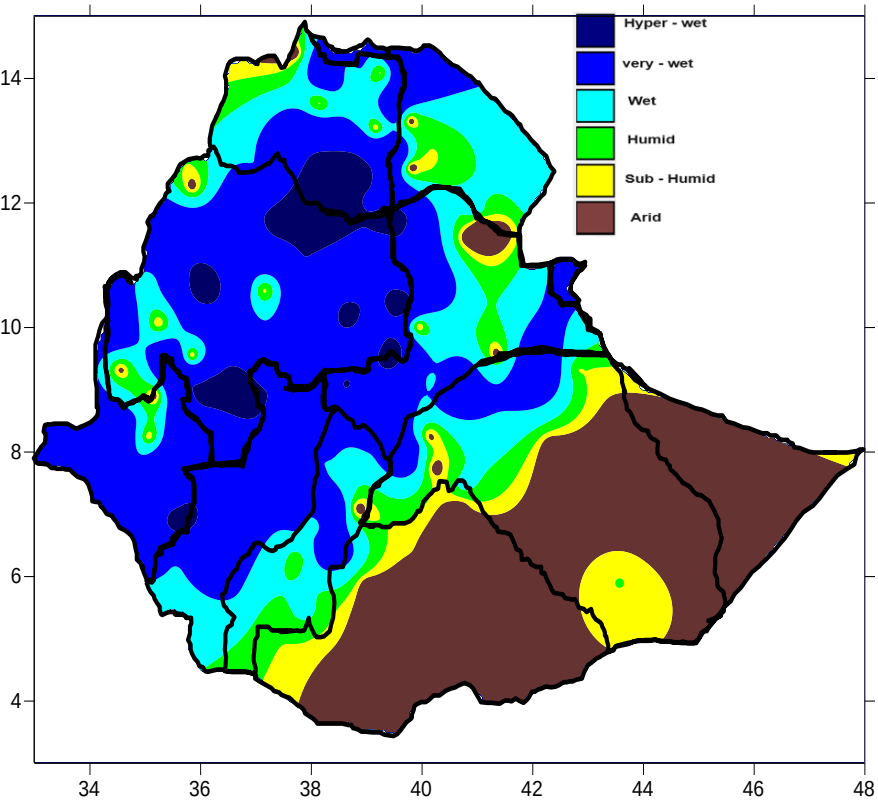
1.1.3 Monthly Mean Temperature over the River Basin



During August, 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 most of Abby, Omo-Gibe, Rift Valley, Wabisheble, Genale-Dawa upper and middle Awash, basins have lower evapo-transpiration. However, the monthly average temperatures reported in the Ogaden, Afar-Danakil, Lower Awash, Baro Akobo, catchments were above 25°C.

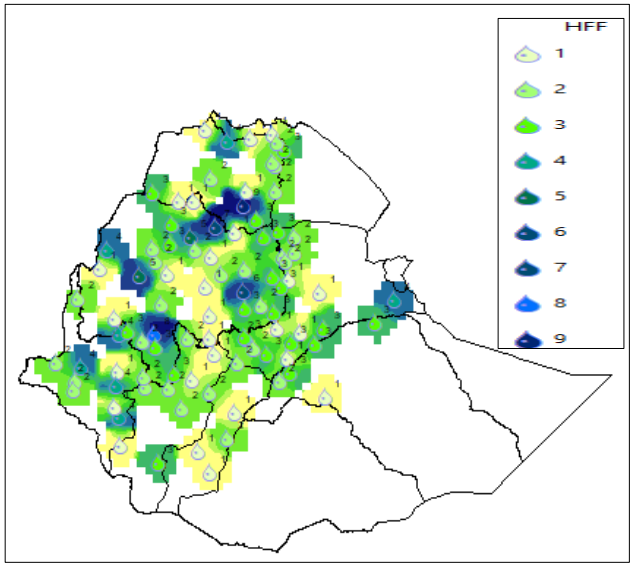
Figure 3 August, monthly mean temperature over Ethiopian River Basin

1.1.4 Assessments of Aridity Index during the month of August



During August 2025, the observed Aridity Index is shown in Figure 4. The results indicate that the Northern, western, north western and Eastern, northeastern part of the basins were have significant distribution of surface water. 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 upper Genale Dawa, and Wabisheble. On the other hand most of Genale Dawa, Ogaden, and middle and lower wabi shebele were have been experienced arid condition.

1.1.5 Distribution of Heavy fall distribution of August 2025



As can be seen in the above figure 4, most of kiremt moisture benefiting Basin such as Abay, Baro Akobo, Omo Gibe, Rift Valley, Tekeze, Awash, have received from one to nine days 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) August monthly Aridity index and Heavy Fall Frequency over Ethiopian River Basis

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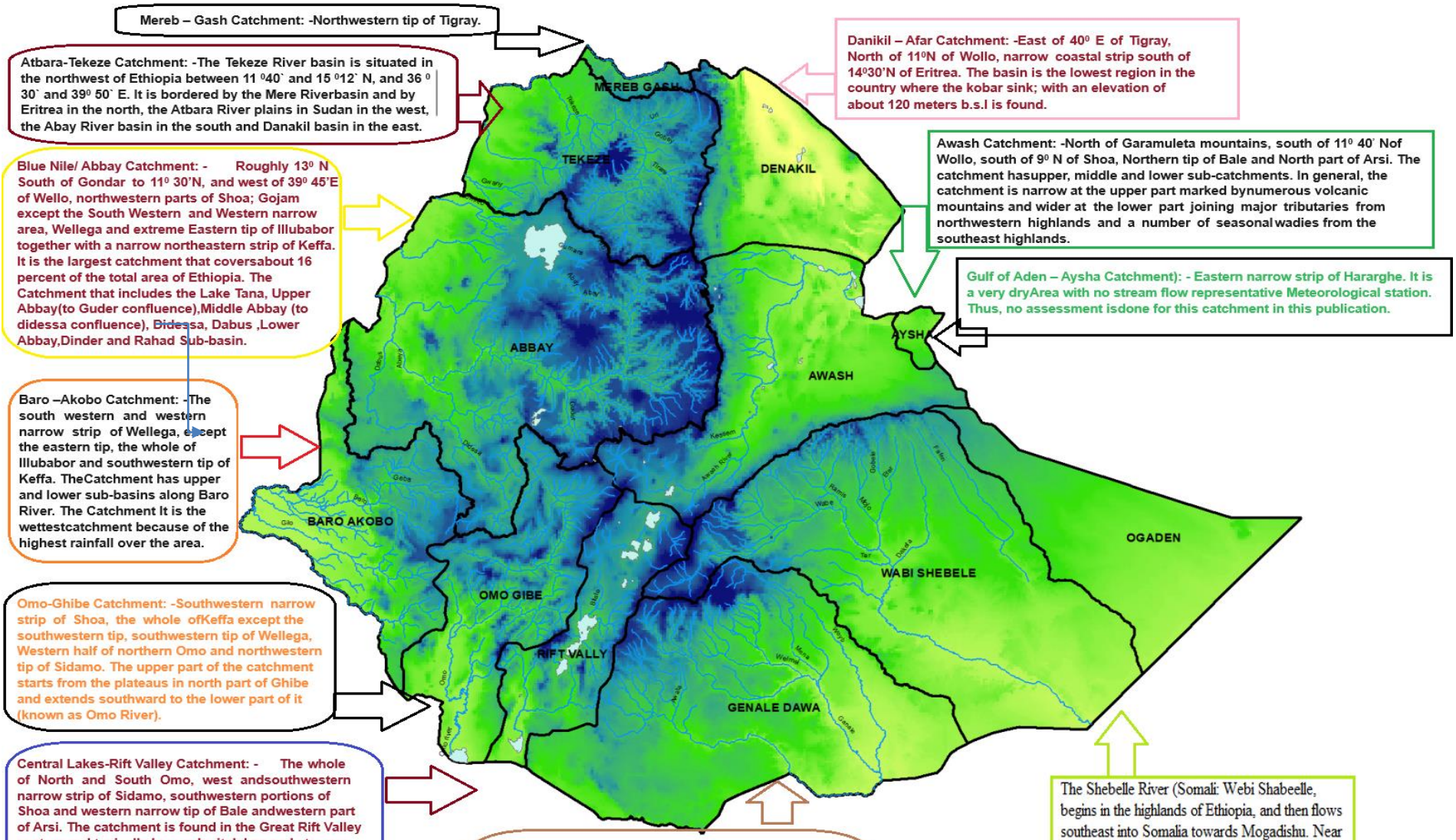
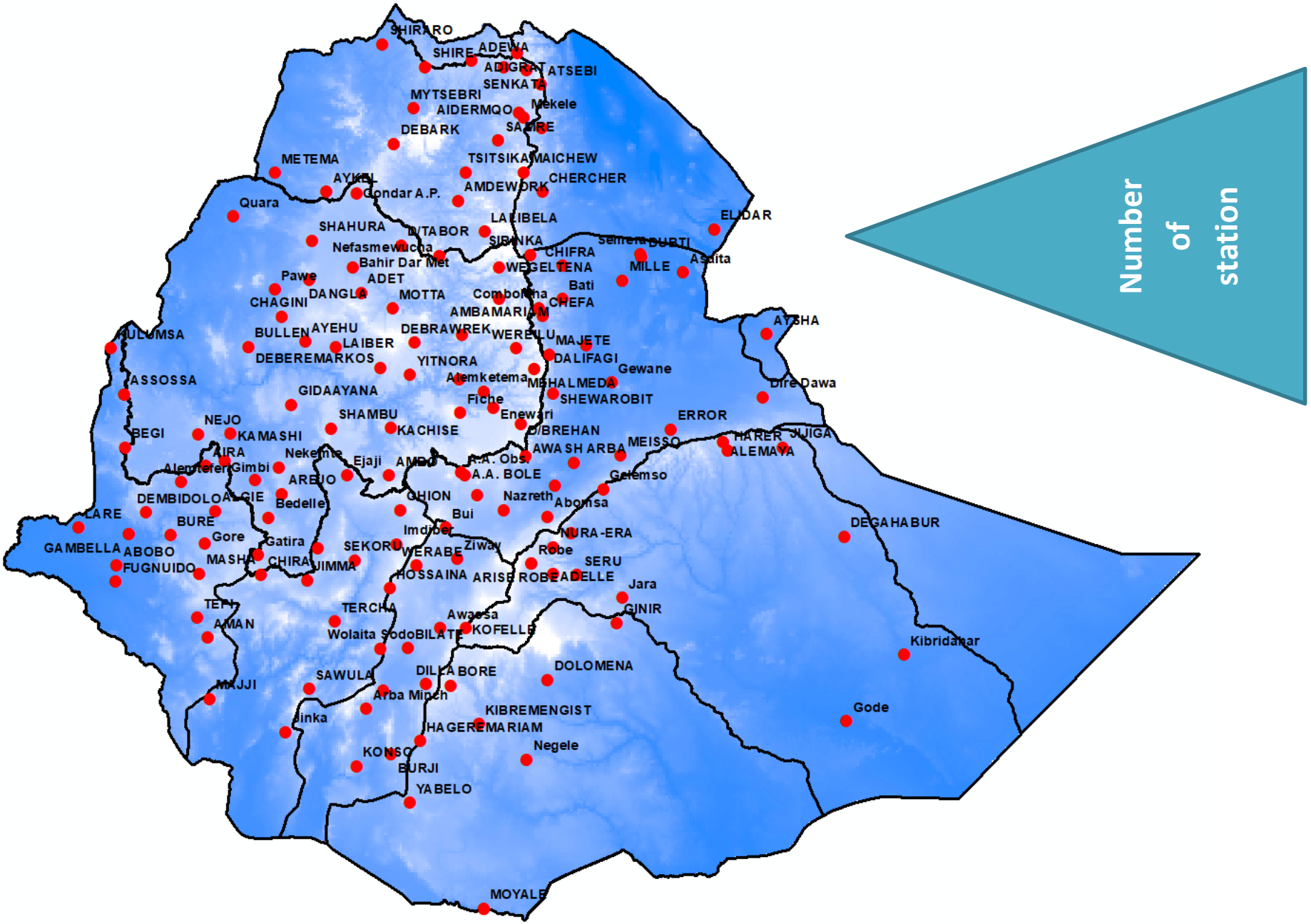
2. Hydro Meteorological Impact Outlook for September, 2025

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

Moderate to high surface water cover and flow are expected in most of the country's basins, which benefit from kiremt moisture, in September. This is expected to increase surface and groundwater flow, increasing the amount of water entering both artificial and natural water reservoirs and reservoirs, and will have a positive role in improving water resources. On the other hand, the high surface water flow into dams during the past winter months, coupled with the high water flow expected in the future, may pose a threat to flash floods and river overflows, especially in low-lying and shallow basins and sub-basins that are prone to flooding, especially in the Tekeze, Abay (Fincha and Tana Beles dams), Omo Gibe and upper Baro Akobo basins. Therefore, it is recommended that relevant stakeholders implement the proposed basin-based hydro meteorological recommendations to minimize potential risks and maximize opportunities.


Mereb – Gash Catchment: -Northwestern tip of Tigray.
Atbara-Tekeze Catchment: -The Tekeze River basin is situated in the northwest of Ethiopia between 11 0̊40` and 15 0̊12` N, and 36 0̊ 30` and 39⁰ 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 13⁰ N South of Gondar to 11⁰ 30'N, and west of 39⁰ 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 40⁰ E of Tigray, North of 11⁰N of Wollo, narrow coastal strip south of 14⁰30'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 11⁰ 40` Nof Wollo, south of 9⁰ 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
AYSHA
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
BULUMSA
AYEHU
DEBRAWREK
WERELU
MAJETE
BULLEN
LAIBER
DALIFAGI
DEBEREMARKOS
YITNORA
Gewane
Alemketema
MISHALMEDA
ASSOSSA
Dire Dawa
GIDAAYANA
SHEWAROBIT
Fiche
Enewari
SHAMBU
ERROR
NEJO
KACHISE
D/BREHAN
BEGI
KAMASHI
MEISSO
HARER
JIJIGA
AWASH ARBA
AIRA
Nekemte
Ejaji
AMBO
A.A. Obs.
ALEMAYA
Alemtefera
Gimbi
A.A. BOLE
Gelemso
AREJO
DEMBIDOLO
GIE
QHION
Nazreth
Abomsa
Bedelle
LARE
BURE
Bui
DEGAHABUR
Imdibir
NURA-ERA
Gore
Gatira
GAMBELLA
SEKORU
Ziway
ABOBO
WERABE
Robe
MASHA
CHIRA
JIMMA
SERU
FUGNUIDO
HOSSAINA
ARISE ROBE
ADELLE
Jara
TEPI
TERCHA
GINIR
AMAN
Awaasa
Wolaita Sodo
BILATE
KOFELLE
Kibridahar
DOLOMENA
SAWULA
DILLA BORE
MAJJI
Arba Minch
Gode
KIBREMENGIST
Jinka
HAGEREMARIAM
Negele
KONSO
BURJI
YABELO
MOYALE
Number of station