Monthly Hydro Meteorology Bulletin 2024

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 June 2024-month climate condition and its impacts over the river catchment across the country and highlights the July 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.

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 Climatology of the Ethiopian River Basin

As illustrated in figure 1, in normal condition the western half parts of the river basin experienced wet to very wet moisture on June. In line with this, most parts of Abay, Baro Akobo, Western Tekeze, Omogibe, Mereb Gashe, marginal part of upper Awash, Rift Valley, some parts of upper Ogaden, Genale Dawa and upper Wabisheble receive significant amount of rainfall exceeding the potential evapotranspiration of the areas. On the other hand, most of eastern half parts of the river basins remain in arid moisture condition during June.

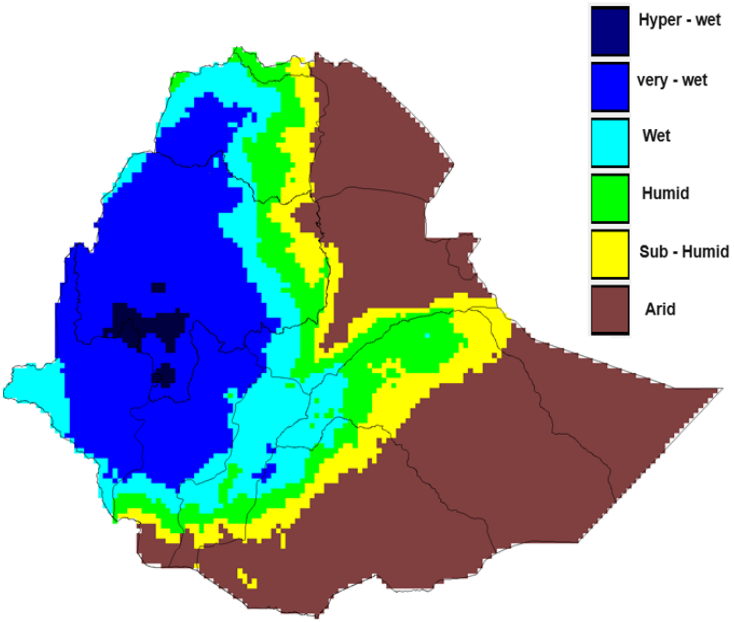


Figure 1 Monthly climatology of the Ethiopian river basin (JUNE).

1.1.2 June 2024 Rainfall Assessment over the River Basins

During June 2024, the observed rainfall over the basin illustrated in figure 2, a better monthly rainfall distribution is observed across the western half of the country's basins. The result shown over the most parts of Abay, Baro Akobo, Western Tekeze, Omogibe, and Mereb Gashe, along the margins of upper Awash and Rift Valley, and some parts of upper Genale Dawa and upper Wabisheble received above 150mm of rainfall. Secondly, most of Afar Denakel, Ogaden, the lower part of Wabisheble and Genale Dawa, lower Awash, and lower Rift Valley received below 100mm of rainfall.

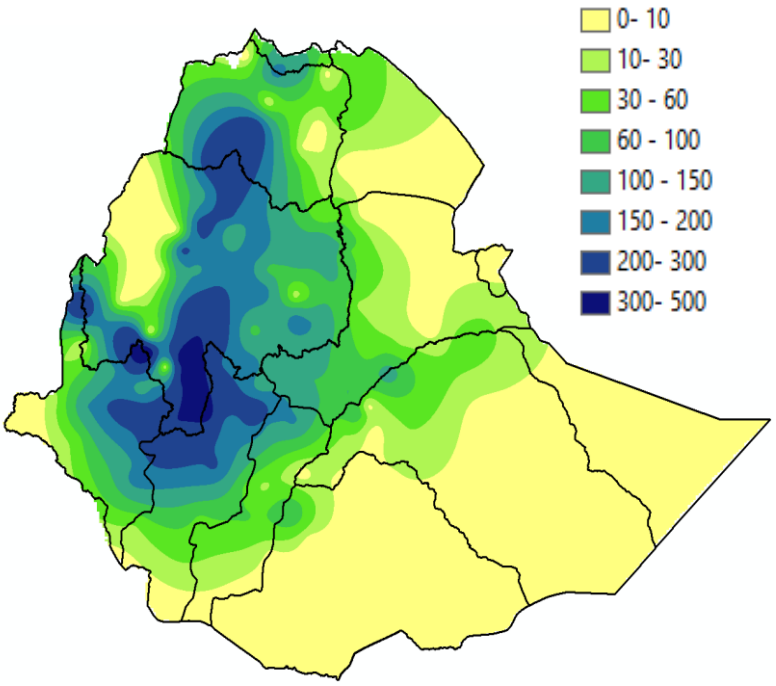
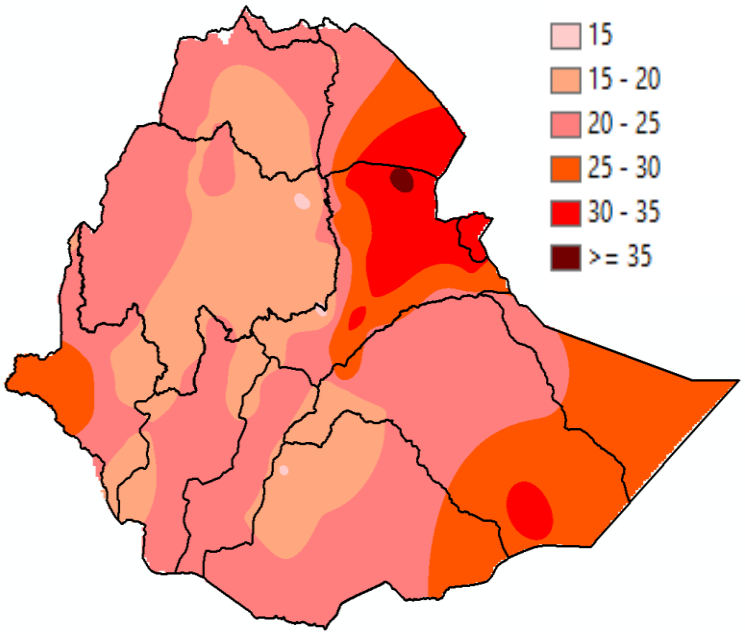


Figure 2 June monthly mean rainfall over Ethiopian River Basin

1.1.3 Monthly Mean Temperature over the River Basin



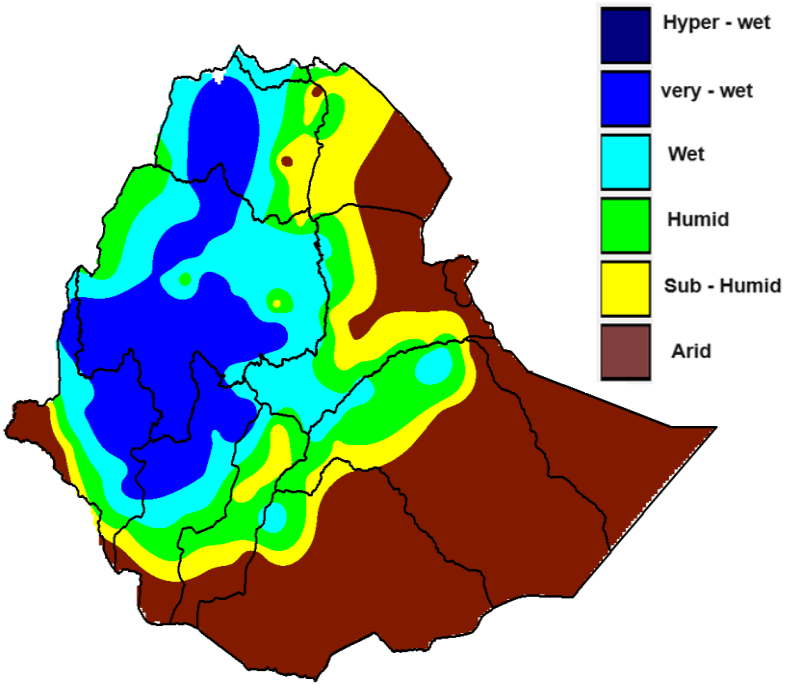
During June 2024, the observed mean temperature, as shown in Figure 3, was below 25°C in the majority of the central catchments, including the Abby, Baro, OmoGibe, Rift Valley, Upper Wabisheble, Upper Awash, and Genaledawa basins. However, the monthly average temperatures reported in the Ogaden, Lower Wabisheble, Baroakobo, Awash, and Afar Denakil catchments were above 25°C.

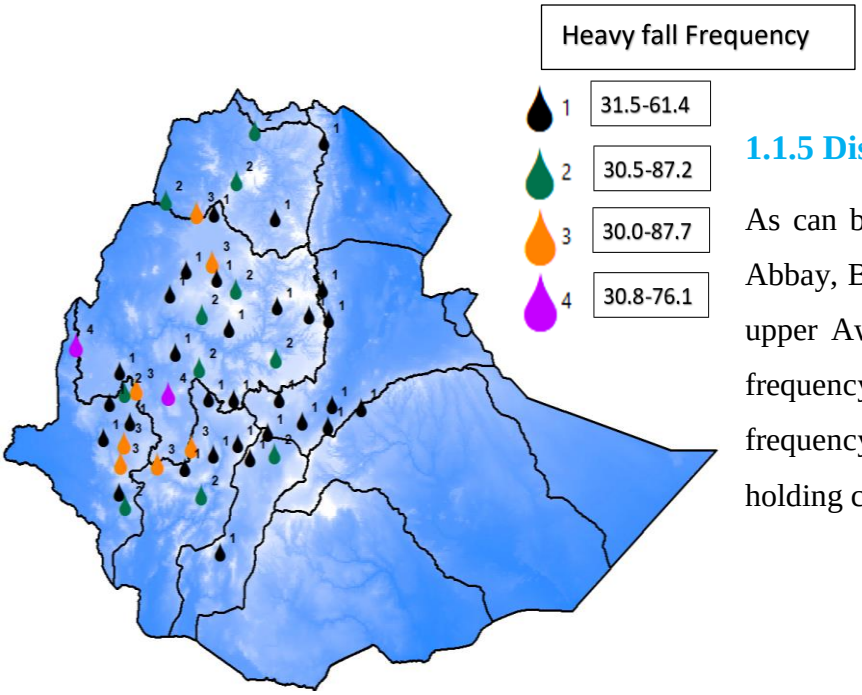
Figure 3 June monthly mean temperature over Ethiopian River Basin

1.1.4 Assessments of Aridity Index during the month of June

During June 2024, the observed Aridity Index is shown in Figure 4. The results indicate that the western half of the basins have better monthly moisture distribution. This is evidenced by the above-wet to hyper-wet Aridity Index observed in the majority of the Abay, Baro Akobo, Western Tekeze, Mereb Gashe, and the upper Genale Dawa and Rift Valley border, as well as in certain areas of the upper and middle Omogibe and upper Wabisheble. A humid to sub-humid Aridity Index was observed in most of

Afar Denakil, Ogaden, lower Awash, lower Rift Valley, and the lower parts of Wabishebele and Genale Dawa.





1.1.5 Distribution of Heavy fall

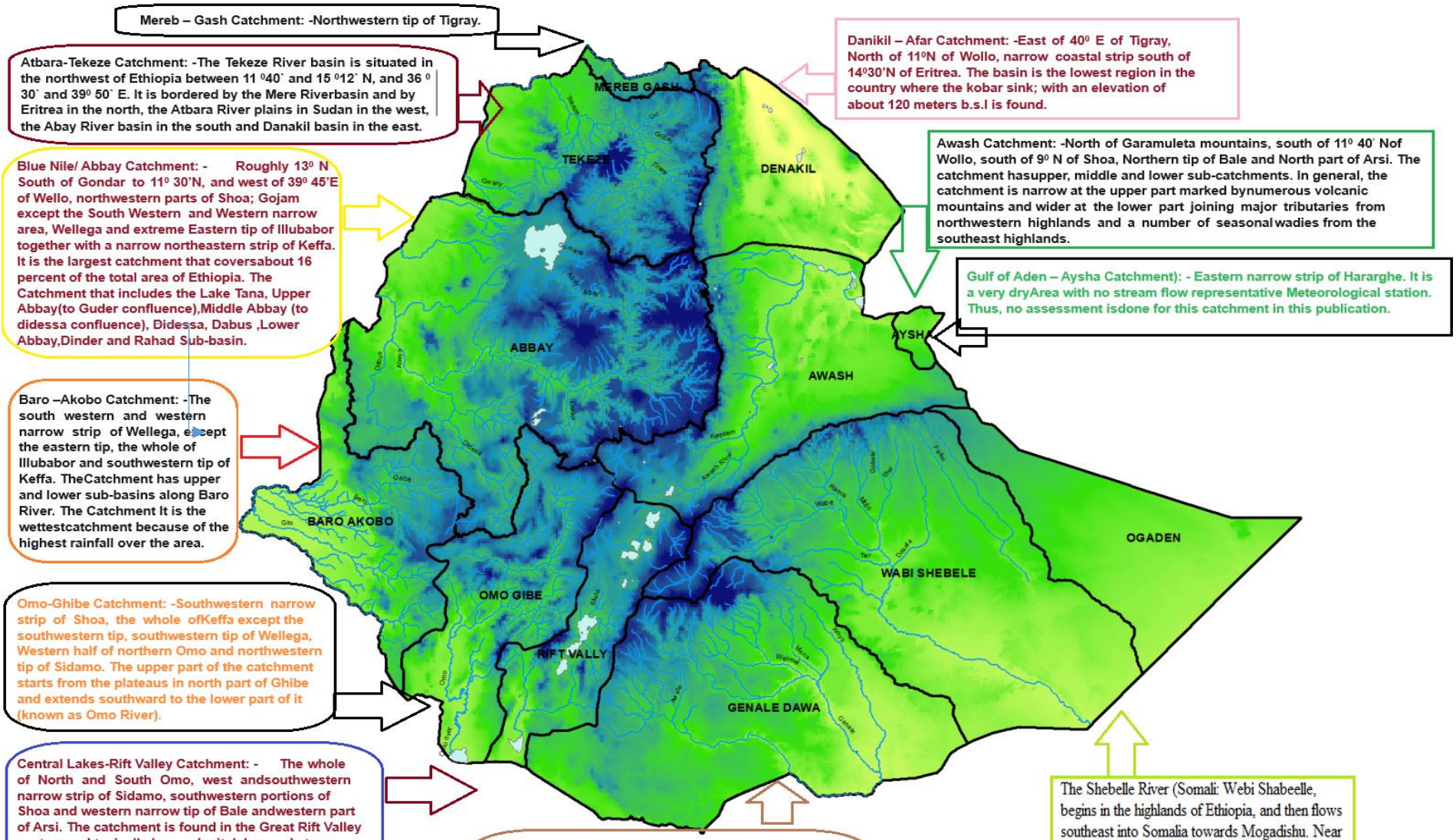
As can be seen in the above figure 4, most of Abbay, BaroAkobo, OmoGibe, Rift Valley, and upper Awash have received from one to three frequency of heavy fall in this month. This frequency of rainfall will be increasing water holding capacities for dams and basins.

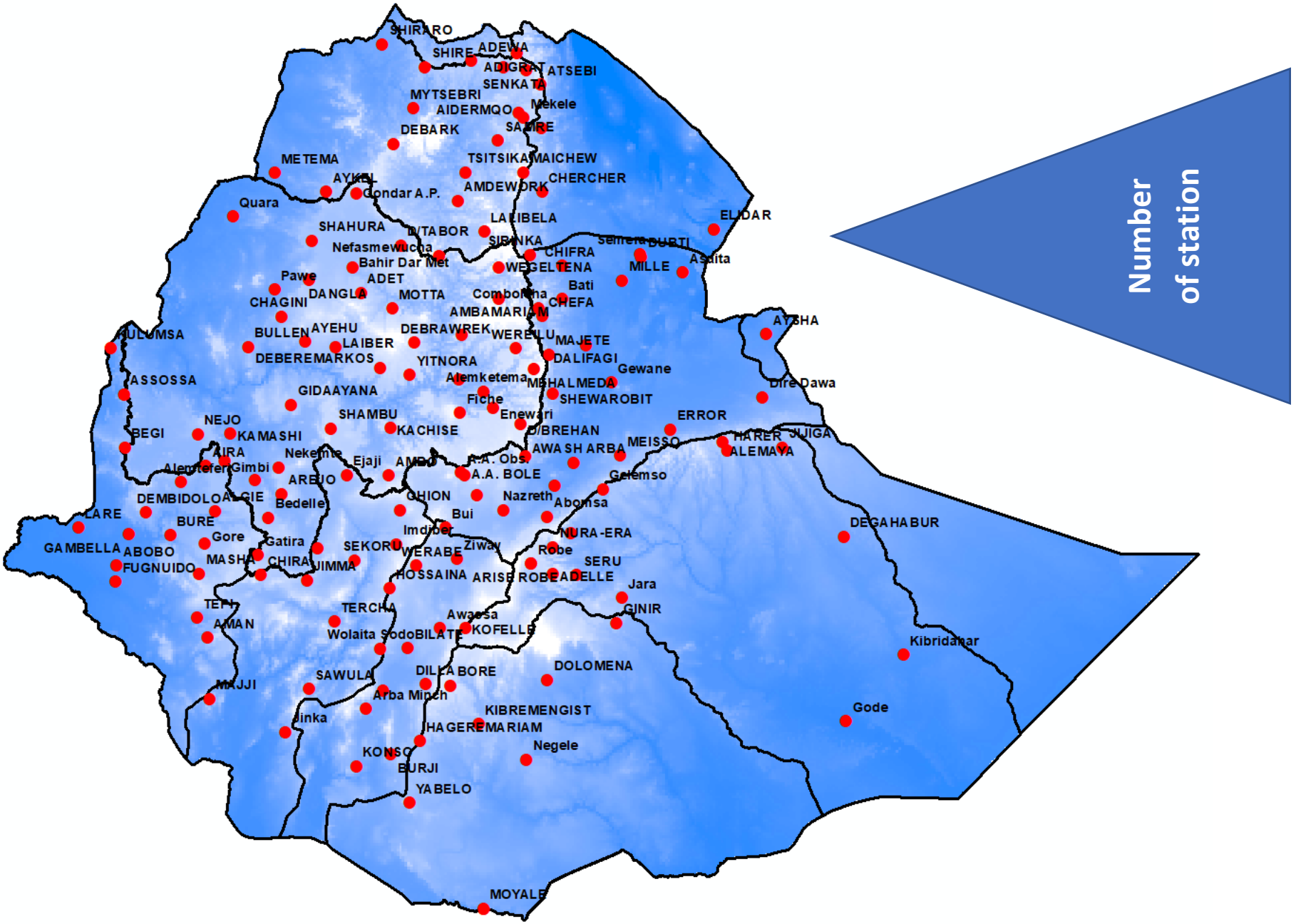
Figure 4(a, b) June monthly AI and Heavy Fall Frequency over Ethiopian River Basin

2. Hydro Meteorological Impact Outlook for July 2024

2.1 Expected weather impact on water resource during the coming JULY, 2024

During the coming month of July, most of Tekeze, Abay, Mereb Gashe, Awash, Baroakobo, Omogibe, Afar Denacle, Upper and Middle Rift Valley, Upper Wabe Shebele, and Genale Dawa basins are likely to have wet to very wet moisture condition. The anticipated moisture during July is expected to favour to the availability of water in the natural and artificial reservoirs which in turn enhance the dam inflow and of energy production in one hand and sufficient moisture for both large and small scale irrigation applications on the other hand. To the contrary, the expected heavy rainfall may trigger flash as well as riverine flood over urban and rural flood prone areas which may cause considerable damage on human life, property and infrastructure. Therefore, the concerned water professionals and the wider community are advised to make the necessary preparation to reduce the likely potential risk of flood, including cleaning drainage structures. In General, all Residents at flood prone areas are advised to be on the lookout for potential floods, flash floods and poor visibility. Since the water levels in rivers, lakes and dams are expected to be high the community are advised to avoid driving through, or walking in moving water to minimize the risk of damage on life and property. In addition, people in landslide prone areas, especially over hilly areas, are strongly advised to be watchful.


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 ofSidamo. 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
Gondar A.P.
AMDEWORK
CHERCHER
Quara
LALIBELA
ELIDAR
SHAHURA
DITABOR
SIRINKA
Semera
BURTI
Nefasmewucha
CHIFRA
Asdita
Bahir Dar Met
WEGELTENA
MILLE
Pawe
ADET
DANGLA
MOTTA
Combolcha
Bati
CHAGINI
CHEFA
AMBAMARIAM
AYSHA
JULUMSA
BULLEN
AYEHU
DEBRAWREK
WERELU
MAJETE
LAIBER
DALIFAGI
DEBEREMARKOS
YITNORA
Gewane
Atemketema
MISHALMEDA
ASSOSSA
Dire Dawa
GIDAAYANA
Fiche
SHEWAROBIT
Enewari
NEJO
SHAMBU
ERROR
BEGI
KAMASHI
KACHISE
DIBREHAN
HARER
JIJIGA
AWASH ARBA
MEISSO
ALEMAYA
AIRA
Nekemte
Ejaji
AMBO
A.A. Obs
Alemtefera
Gimbi
A.A. BOLE
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