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 December 2024-month climate condition and its impacts over the river catchment across the country and highlights the January 2025 climate outlook along with the likely impact over the water dams and the rivers basins.

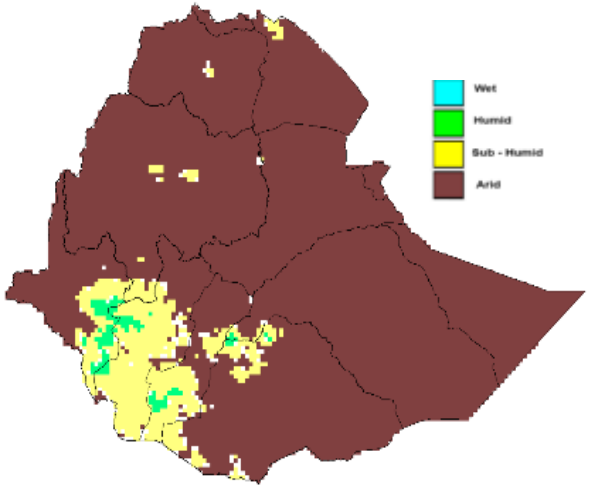
The information contained in this bulletin is believed to assist the water professionals for planning the capacity expansion of reservoirs, water supply, ecosystem restoration as well as rehabilitation of existing systems including dams, irrigation, canals, pumps, wetlands and the likes. In addition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

1.1Monthly Hydro Meteorological Assessments

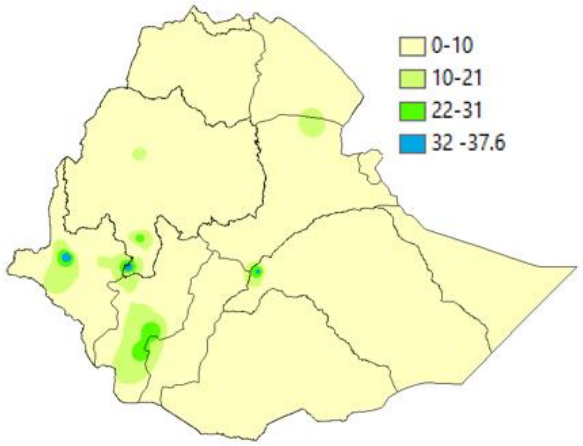
1.1.1 Monthly aridity Climatology over the Ethiopian River Basin



In the normal climate moisture condition of December in the south western,and south parts of the river basin have experienced sub-**humid to humid condition**. In line with this, upper parts of Baro Akobo, Genale Dawa, middle and lower Omo and lower Rift Valley, few place of upper Genale Dawa, and Wabi shebele receive sub humid to humid moisture that exceeding from the potential evapotranspiration of the areas.

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

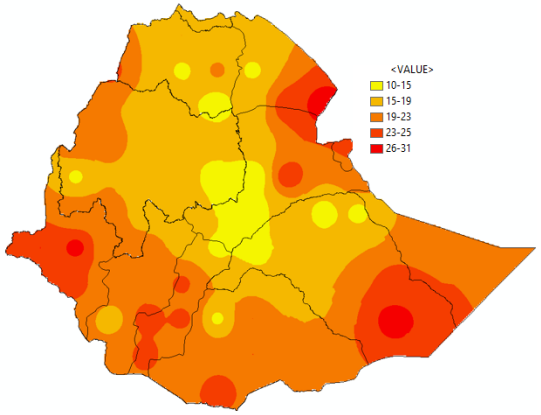
1.1.2 December 2024 Rainfall Assessment over the River Basins



As can be seen in figure 2, better monthly rainfall distribution is observed across the south and south west basins of the country. According to this, Few upper and middle parts of Baro Akobo and ,lower Omo Gibe, and few place of upper Wabi shebele, 30 -150 mm of rainfall. In addition to this upper Baro Akobo, few place of middle Abay, Lower Omo Gibe, and Central Rift valley have experienced above 150 mm.

Figure 2 November monthly mean rainfall over Ethiopian River Basin

1.1.3 Monthly Mean Temperature over the River Basin



As we can see in Figure 3,

In December month daily average 10-15 ºC experienced few area of upper Tekeze and few area upper eastern Abay , middle Awash, and also most of upper and middle Abay, upper Baro Akobo, the margin and upper Omo Gibe, some pocket area of upper Rift Valley, upper Wabi shebele, Awash and Genale Dawa, performed monthly average temperatures **below 23ºC**. However, the monthly average temperatures that were reported in the remaining catchments of some part of middle and lower BaroAkobo, Rift Valley, Afar Danakil, Awash, Abay, Wabi shebele, Genale Dawa and Ogaden were received above 25ºC.

Figure 3 November monthly mean temperature over Ethiopian River Basin

1.1.4 Assessments of Aridity Index during the month of December

During this month, most parts of Baro Akobo, Abay, Omo Gibe, Rift Valley, Genale Dawa Wabi shebele, Awash, and Tekeze, Ogaden, Aysha, have had arid moisture condition. Perhaps some few place of the river basins was received sub humid moisture condition, such as few place of upper and middle Baro Akobo, the lower Divide place of Omo gibe and Central Rift valley.

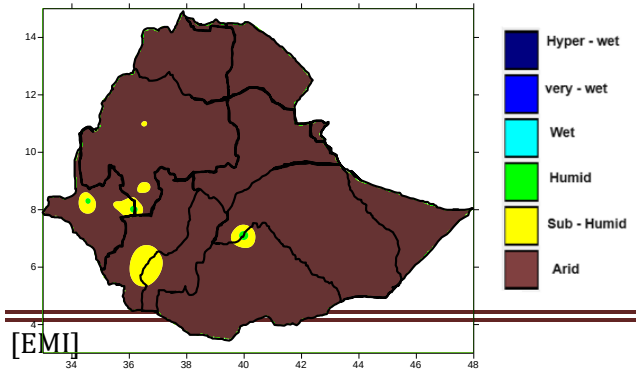
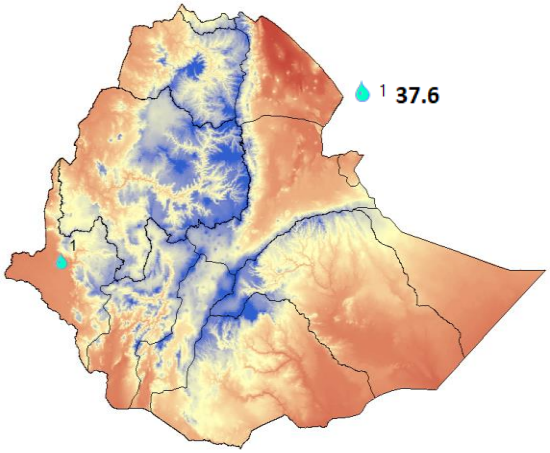


Figure 4. December monthly Aridity Index condition over the river basins

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

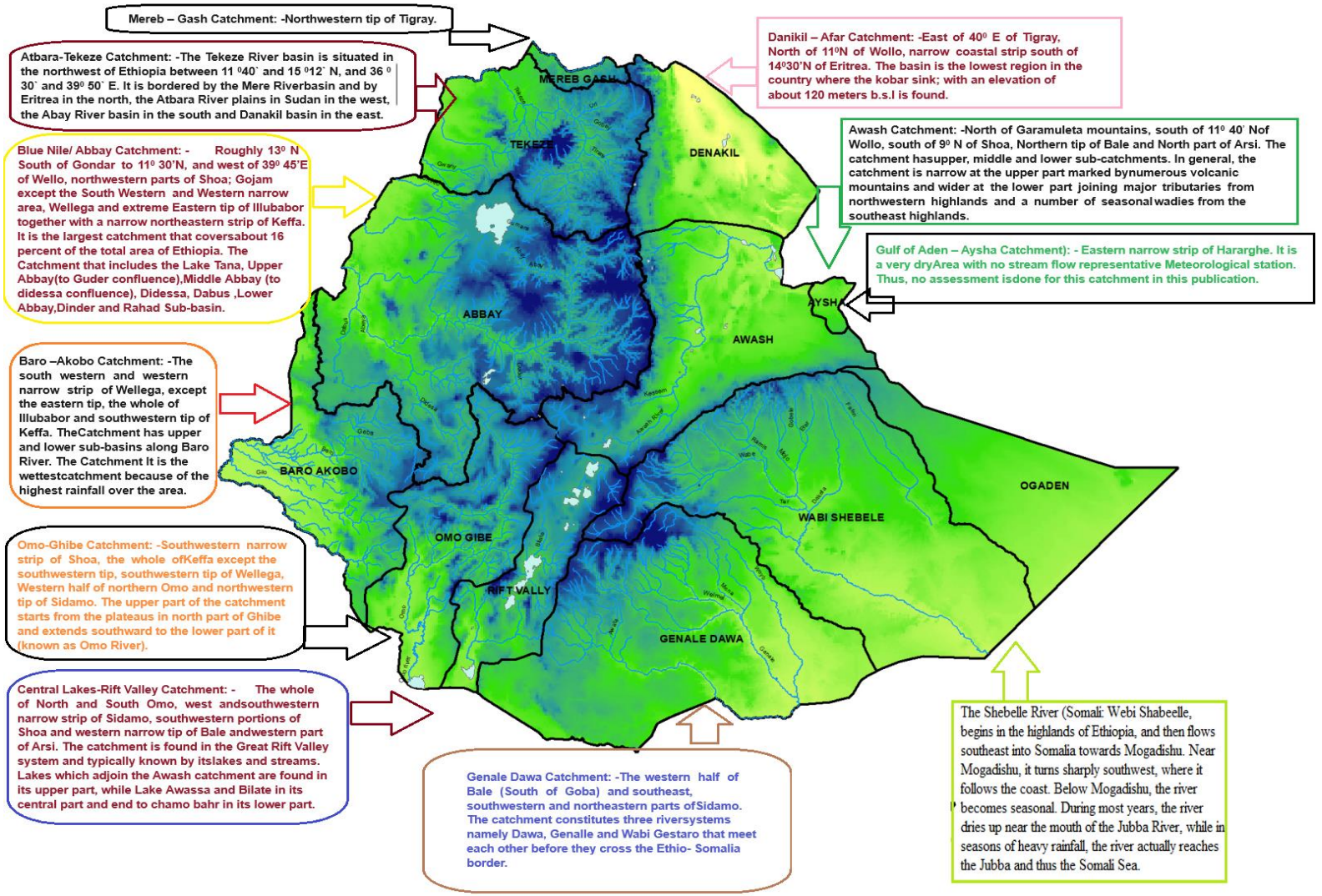


As can be seen in the below figure 5, most of the river basin was under dry weather condition therefore there was no heavy fall over most of basins, but middle BaroAkobo at Gambela stations recorded 37.6 mm one day at first dekade.

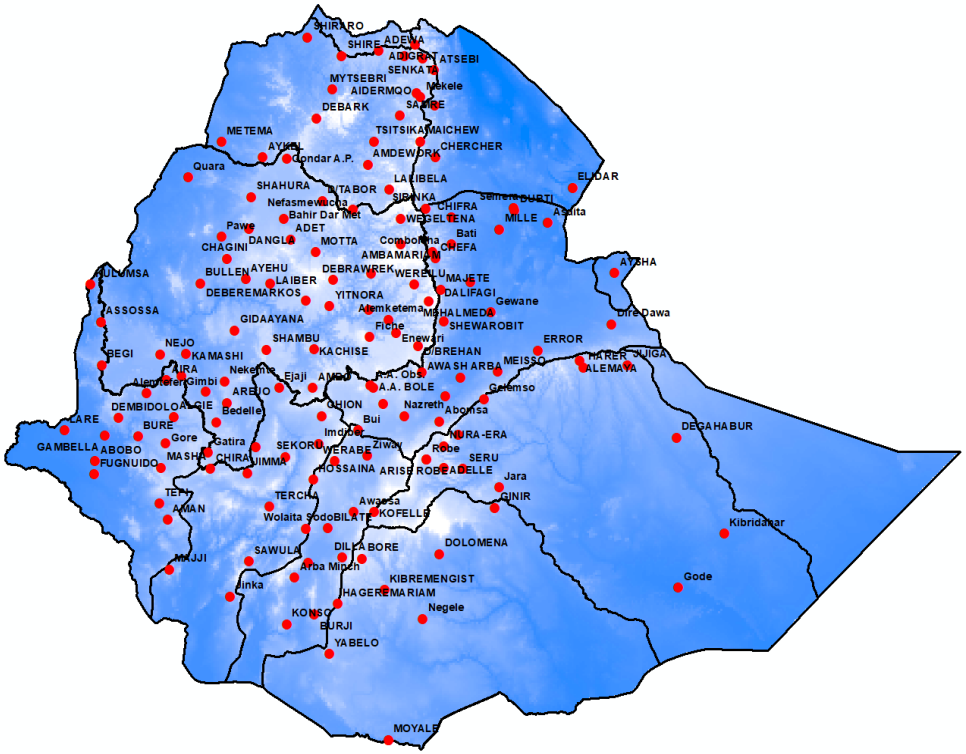
Figure 5 Heavy fall Frequency during the December month over Ethiopian River Basin

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

The next January month impact of weather condition on water resource will be arid condition most of the river basin, such Baro Akobo, Abay, Omo Gibe, Central Rift valley, Ogaden, Aysha, Mereb Gash, Genale Dawa. This situation gradually will leads to water insufficient. Therefore recommended to use water in proper without wastage.



Number of weather stations used for Hydro Meteorological Analysis


SHIRARO
SHIRE
ADEWA
ADIGRAT
ATSBI
SENKATA
MYTSEBRI
AIDERMQO
Mekele
DEBARK
SAMRE
METEMA
TSITSIKAMAICHEW
AYKEL
Gondar A.P.
AMDEWORK
CHERCHER
Quara
ELIDAR
SHAHURA
BITABOR
LALIBELA
SIRINKA
Semera
DUBTI
Nefasmewucha
Bahir Dar Met
WEGELTENA
CHIFRA
MILLE
Asaita
Pawe
ADET
CHAGINI
DANGLA
MOTTA
Combolcha
Bati
CHEFA
AMBAMARIAM
AYSHA
HULUMSA
BULLEN
AYEHU
LAIBER
DEBRAWREK
WEREILU
MAJETE
DEBEREMARKOS
YITNORA
DALIFAGI
Gewane
Asmketema
ASSOSSA
MSHALMEDA
Dire Dawa
GIDAAYANA
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SHEWAROBIT
SHAMBU
Enewari
ERROR
NEJO
KACHISE
GIBREHAN
HARER
JUIGA
BEGI
KAMASHI
AWASH ARBA
MEISSO
ALEMAYA
Nekemte
Ejaji
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GAMBELLA
ABOBO
Gatira
SEKORU
WERABE
Ziway
Robe
FUGNUIDO
MASHA
CHIRA KUMMA
SERU
HOSSAINA
ARISE ROBE
ADELLE
Jara
TEPI
TERCHA
Awaesa
GINIR
AMAN
Wolaita Sodo
BILATE
KOFELLE
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MOYALE