

## 1. Introduction

Hydrology and Water Resources Services Division (HWRSD) is one of the four Divisions of the Center, responsible for generating and disseminating information and services related to hydrology and water resources.

The Division collects and archives daily data from the river gauging station located across the country, to keep updated on the status of the flow, the Division is coming up with Monthly Flow Monitoring Report in selected hydrological stations located in different river basins. Currently, following stations (figure 1) are selected for monthly monitoring of the flow;

1. Lungtenphu station in Wangchhu,
2. Kerabaristaion in Punatsangchhu basin and
3. Bjizam station in Mangdechhu basin.

The main objective of the report is to understand and keep updated flow status of the river and further provide information on the abnormal data observation while comparing with the historical flow data.

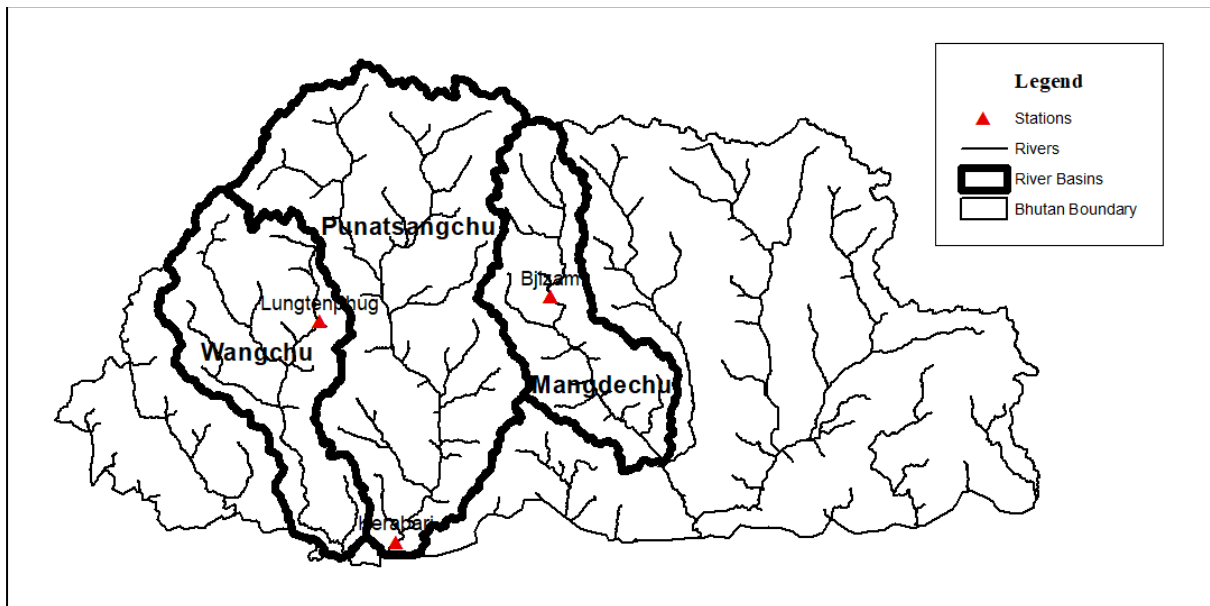


Figure 1 Map showing the selected stations for Flow monitoring

## 2. Methodology

The flow of January 2020 is compared to the flow of historical January months. The historical flow data is available from 2008 to 2018. The measures of dispersion such as mean, maximum and minimum flows are computed to make comparison. The rainfall data is also plotted with flow data to visualize how the river flow response to the precipitation.

### 3. Observation

The time series plot (figure 2) shows mostly lean season flow for the month of January 2020. The minimum flow recorded for the month of January 2020 was 100.58 m<sup>3</sup>/s. It is the highest minimum flow compared to the past historical record (2008-2018) of minimum flow 99.57 m<sup>3</sup>/s. Overall, the average flow has been lower than the normal, which attributes to lesser precipitation over the Punatsangchhu basin.

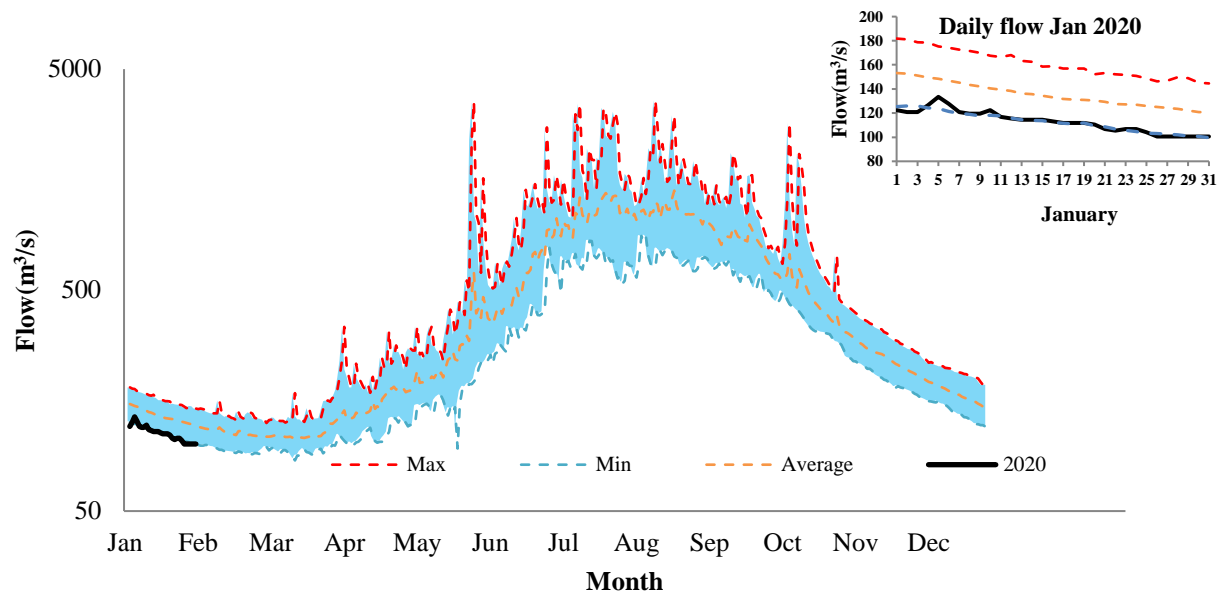


Figure 2 Daily flow status of January 2020 as compared to historical daily flow data of January months

Table 1 Table of flow statistics comparison between January of 2020 and historical (2008-2018).

Statistics	Jan 2020 (m <sup>3</sup> /s)	Historical Jan(2008-2018)m <sup>3</sup> /s
Mean flow	112.98	134.69
Max flow	133.44	181.79
Min flow	100.58	99.57

The rainfall data from Dagana Meteorological Station is used in this analysis to compare the response of the river flow with the precipitation. The river discharge highly varies with the precipitation in the catchment, the Kerabari station observation shows good response to the precipitation (figure 3). However, there are some days where the river flow shows increasing trend but no precipitation recorded in the station, this happens when there is precipitation in the upper catchment and dry weather over the rain gauge station.

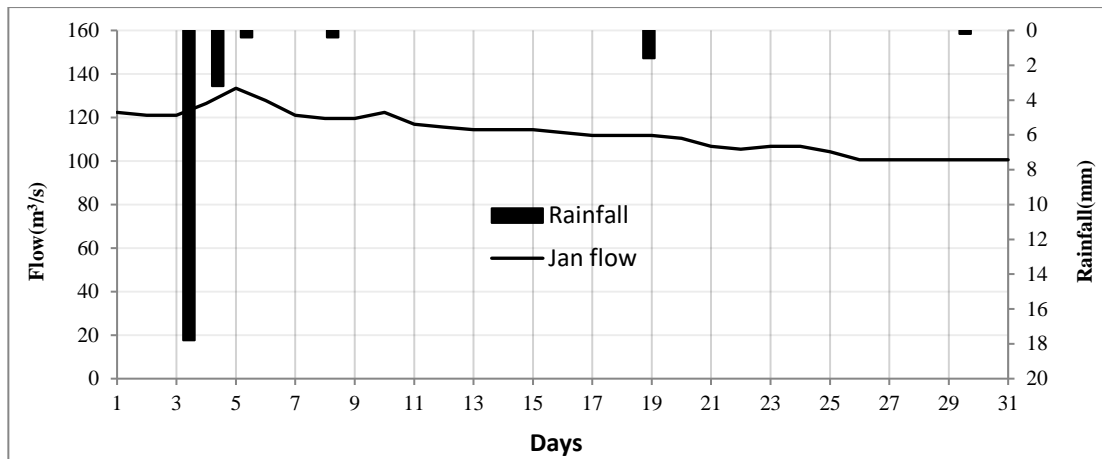


Figure 3 Comparison of Rainfall with flow data for January

#### 4. Summary

1. The mean flow of Jan 2020 is observed to be 21.71 m<sup>3</sup>/s lesser compared to the mean of Normal flow (Historical Jan).
2. The minimum flow of Jan 2020 is observed from 26<sup>th</sup> January to 31<sup>st</sup> January.