Government of Nepal
Ministry of Forest and Environment
Department of Environment
Babarmahal, Kathmandu

Air quality status of Nepal 2016-2020

Volume XXIV

Janakpur air quality monitoring station

First online edition

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List of Figures

1. Janakpur Air Quality Monitoring Station

- Address : Simara, Bara (ward no.)
- Location: 26.739805 latitude, 85.92854 longitude
- Surrounding of the station
    - East: Green Field
    - West: Buildings of Provincial Office
    - North: greenery
    - South: Janakpur Ringroad
- Establish year: 2018 (2074)
- Brief introduction of the instruments installed in the station (should include- brief specification; number of instrument)
    1. PM instrument- GRIMM EDM 180
    2. Met sensor luffth WS 700
    3. Data logging and data transmission and power backup system

2. Air Quality Status of Janakpur station (2020)

2.1. Air quality status, 2020

2.1.1. Annual average of PM1, PM2.5, PM10 and TSP

The annual average of PM_1, $PM_{2.5}$, PM_{10} and TSP of the Janakpur, Dhanusha monitoring station for 2018 could not be calculated due to the availability of Data was calculated.

2.1.2. Temporal variation of PM1

Annual average of PM_1
Histogram of hourly average PM_1 is shown in the figure 2.

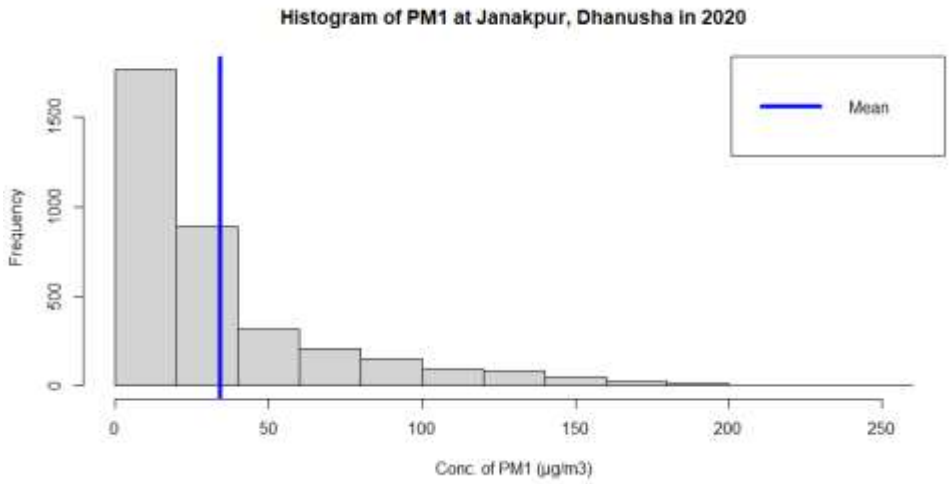

Figure 1: Histogram for the ambient concentration of PM_1

Daily average of PM_1

Plot for daily average concentration of $PM_{2.5}$ was not available due to the unavailability of data.

Monthly average of PM_1

The highest and the lowest concentration of PM_1 was found during November (62.95 µg/m^3) and August (7.6 µg/m^3) respectively from the available data.

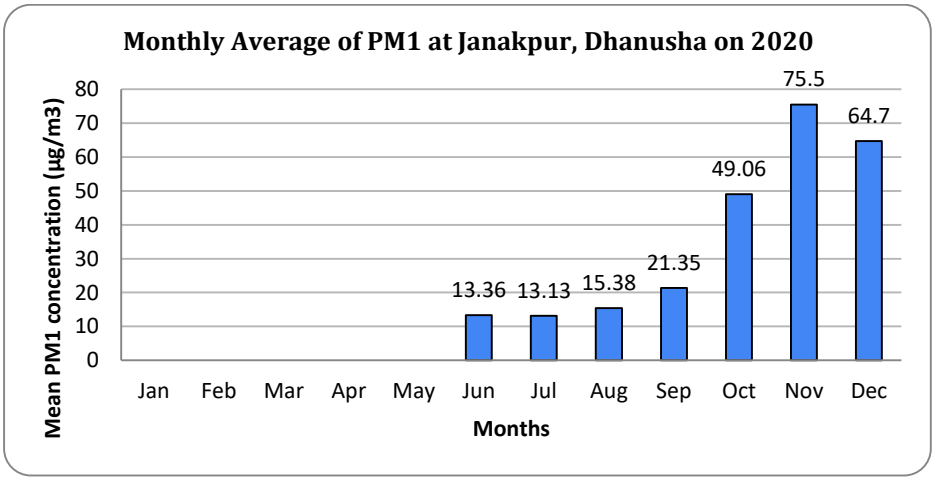

Figure 2: Monthly average of PM_1 in 2018

Variation in concentration of PM_1 was found more during December whereas low during June (**Error! Reference source not found.**).

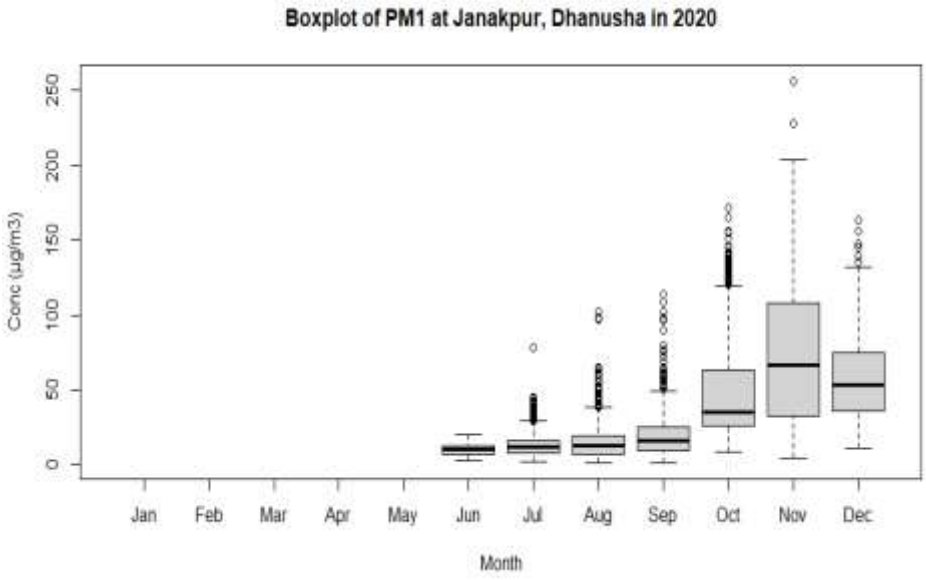

Figure 3: Monthly Variation of PM_1 in 2020

Seasonal variation of PM_1

Ambient concentration of average PM_1 only for monsoon (June –September) and post-monsoon (October-November) are available figure 5.

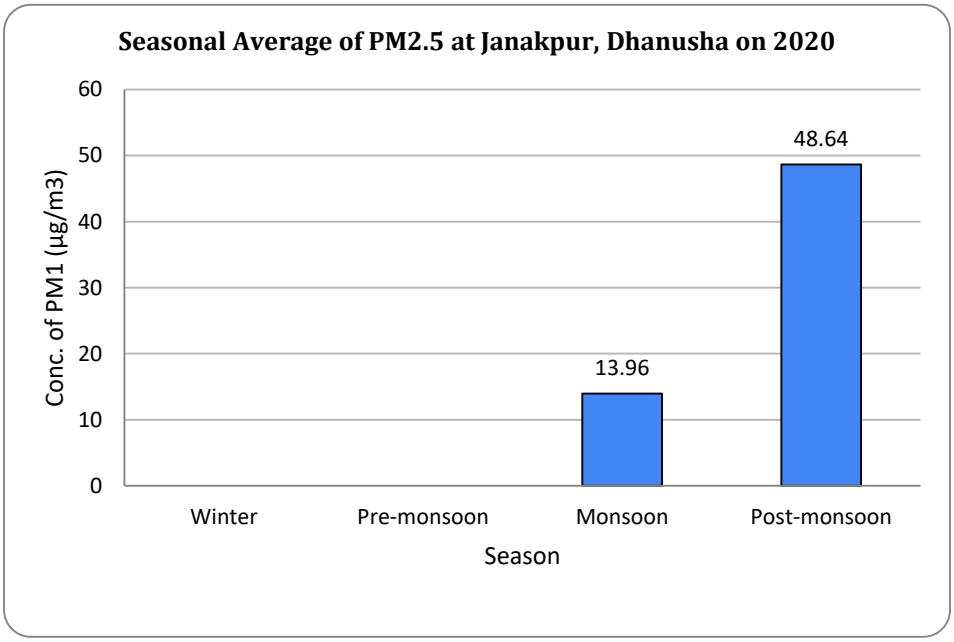

Figure 4: Seasonal variation of PM_1 in 2020

Diurnal variation of average concentration of PM1

The diurnal variation of average PM_1 concentration can be shown in the. The variation in PM_1 concentration was higher around 9 pm and lower around 11 am.

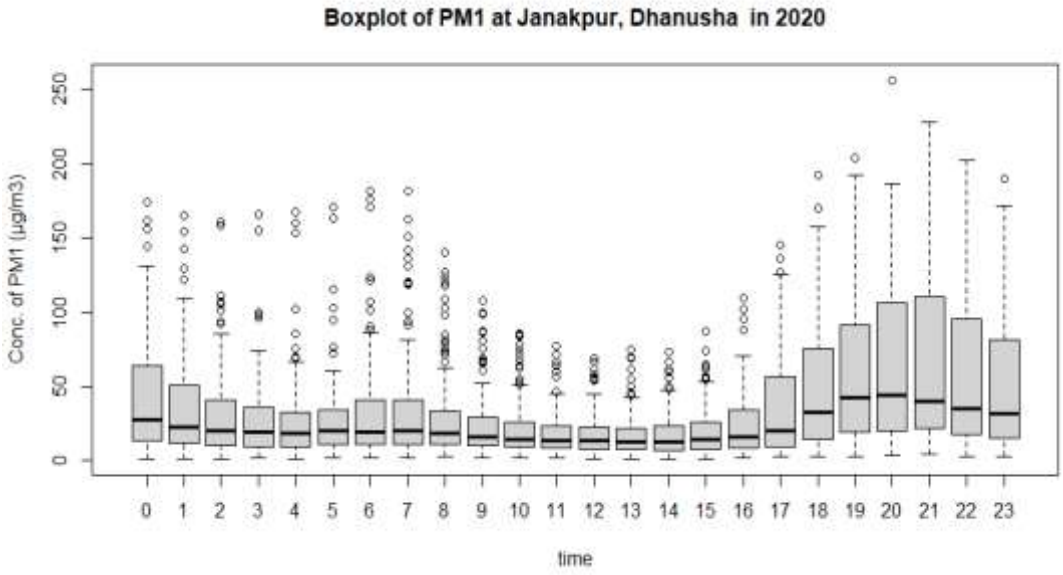

Figure 5: Diurnal variation of average PM_1 concentration

2.1.3. Temporal variation of PM2.5

Annual average of $PM_{2.5}$

Most of the data for PM2.5 was found to be less than the NAAQS (

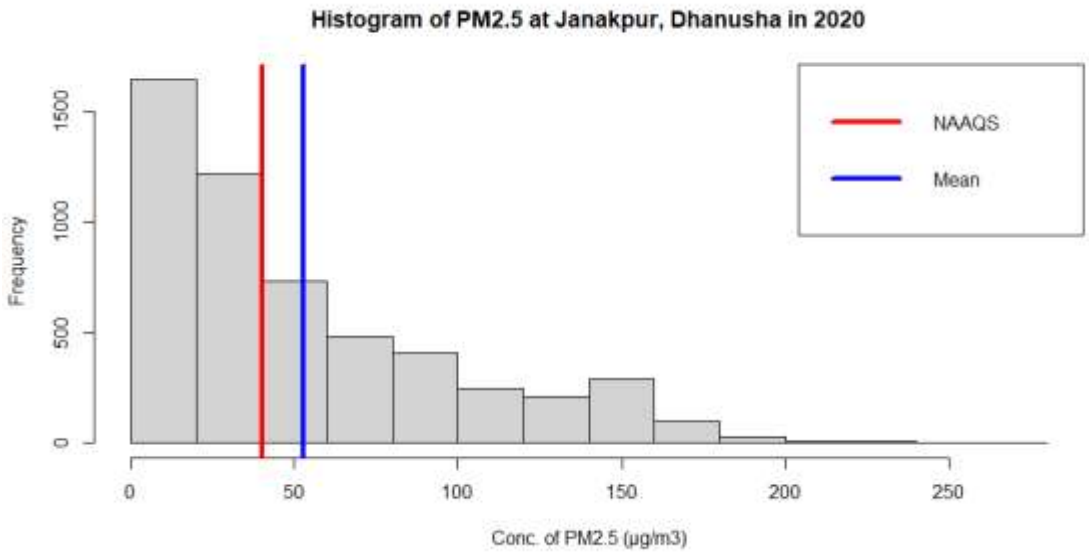

Figure 6: Histogram of PM2.5

8).

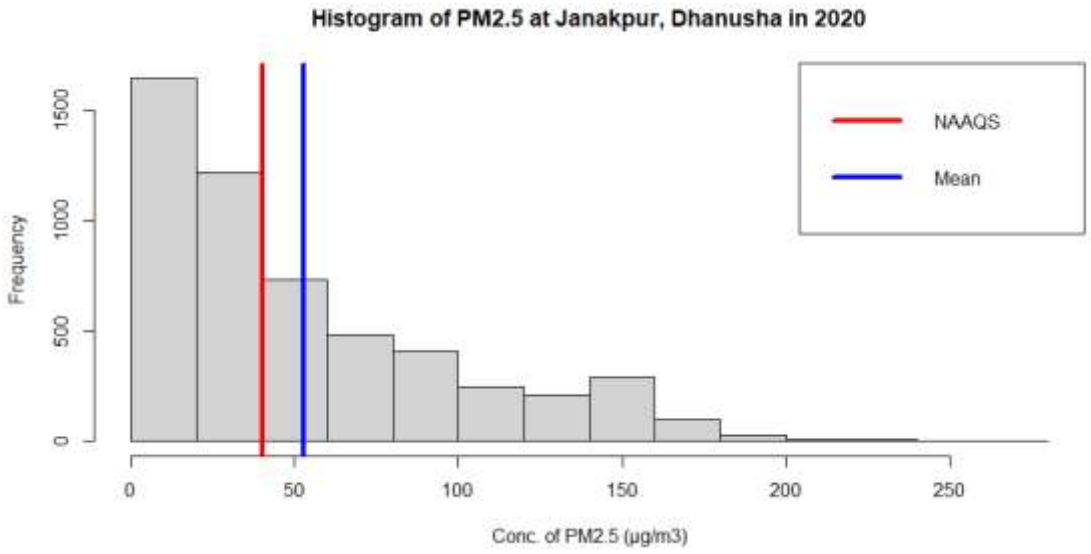

Figure 6: Histogram of $PM_{2.5}$

Daily average of $PM_{2.5}$:

Plot for daily average concentration of $PM_{2.5}$ was not available due to the unavailability of data.

Monthly average of $PM_{2.5}$

The highest and the lowest concentration of $PM_{2.5}$ was found during November and August respectively. The mean value for those months were found to be 67.79 and 9.31 µg/m^3 respectively (**Error! Reference source not found.**9).

Figure 7: Monthly Average of $PM_{2.5}$

Variation in concentration of $PM_{2.5}$ was found more during November whereas low during July based on the available data. The mean value of $PM_{2.5}$ was found the highest in during November and the lowest during July.

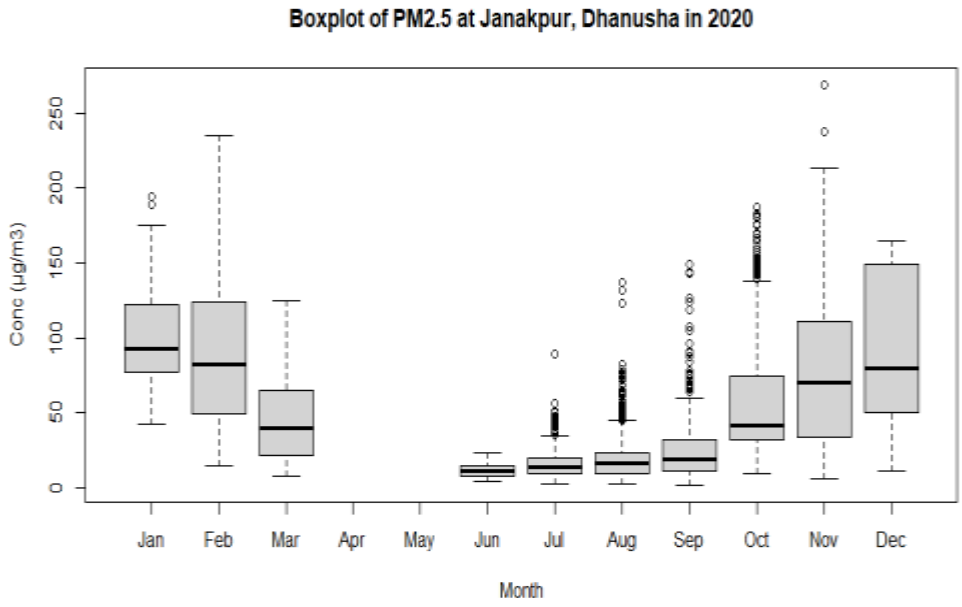

Figure 8: Monthly Variation of $PM_{2.5}$

Seasonal variation of average $PM_{2.5}$ concentration

Ambient concentration of average $PM_{2.5}$ only for monsoon (June –September) and post-monsoon (October-November) are available. The $PM_{2.5}$ concentration was higher in post monsoon (53.8µg/m^3) than in winter (17.27µg/m^3).

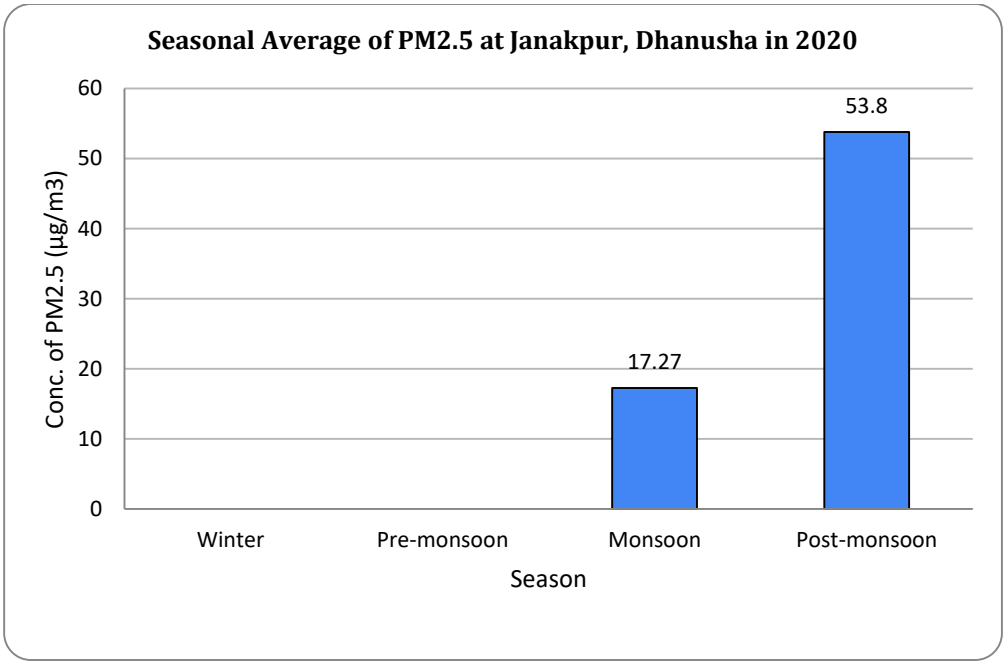

Figure 9: Seasonal variation of $PM_{2.5}$

Diurnal variation of average $PM_{2.5}$ concentration

The diurnal variation of average $PM_{2.5}$ concentrations can be shown in the **Error! Reference source not found.** below. The variation in $PM_{2.5}$ concentration was high at around 5 to 6 pm and low at 8 to 9 am. Additionally, mean concentration of $PM_{2.5}$ was high and low at 4 pm and 11 am respectively.

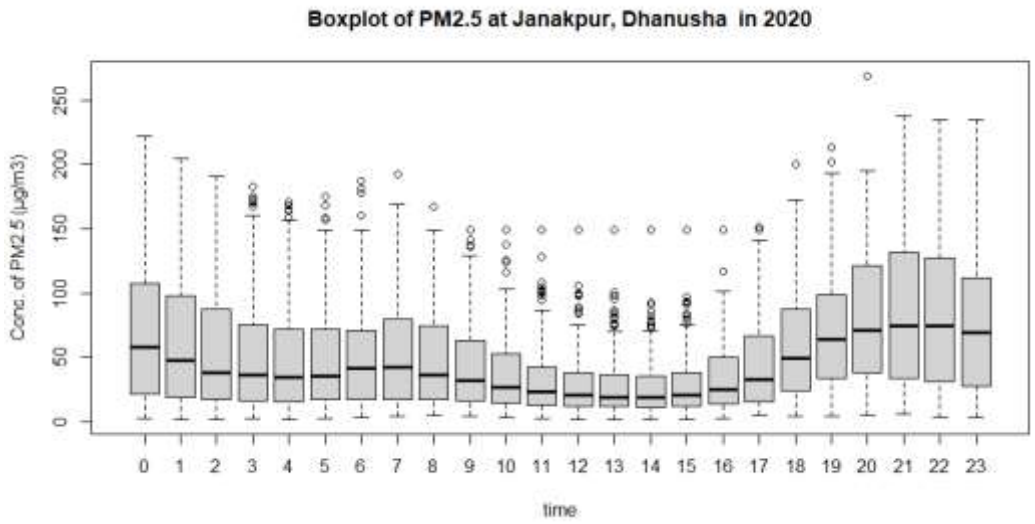

Figure 10: Diurnal variation of $PM_{2.5}$

Compliance status of $PM_{2.5}$

The total days of $PM_{2.5}$ monitored in the year 2020 counts 170, of which 74 days exceed the NAAQS guideline. October, November and December were the months having maximum number of days exceeding the NAAQS guideline. On July and August, none of the days exceeded NAAQS guideline value.

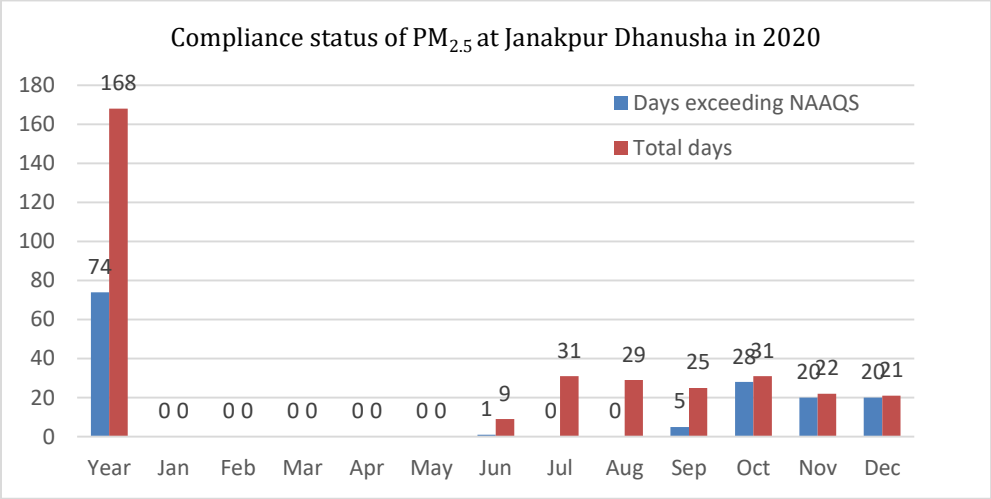

Figure 11: Compliance status of $PM_{2.5}$

2.1.4. Temporal variation of PM10

Annual average of PM_{10}

Most of the data for PM_{10} was found to be less than the NAAQS.

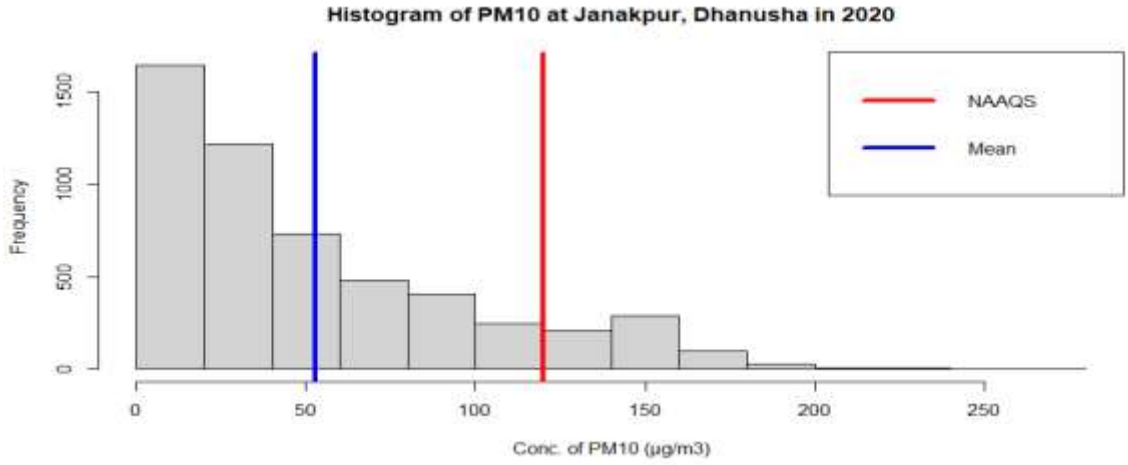

Figure 12: Histogram for the ambient concentration of PM_{10}

Daily average of PM_{10}:

Plot for daily average concentration of $PM_{2.5}$ was not available due to the unavailability of data.

Monthly average of PM_{10}

The highest and the lowest concentration of PM_{10} was found during December and July respectively. The mean value for those months were found to be 95.66 and 22.27 $\mu g/m^3$ respectively.

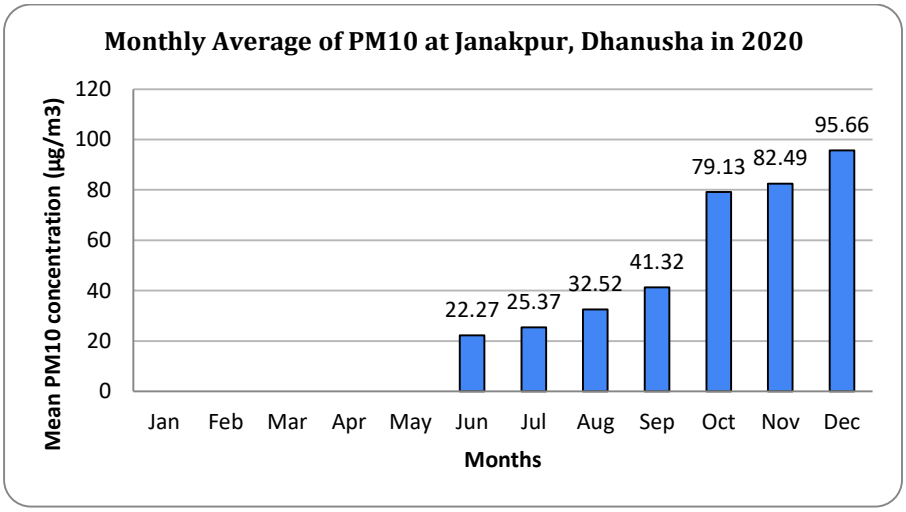

Figure 13: Monthly average of PM_{10}

Variation in concentration of PM_{10} was found more during November and low during June. The mean value of PM_{10} was found the highest in December and the lowest in in July.

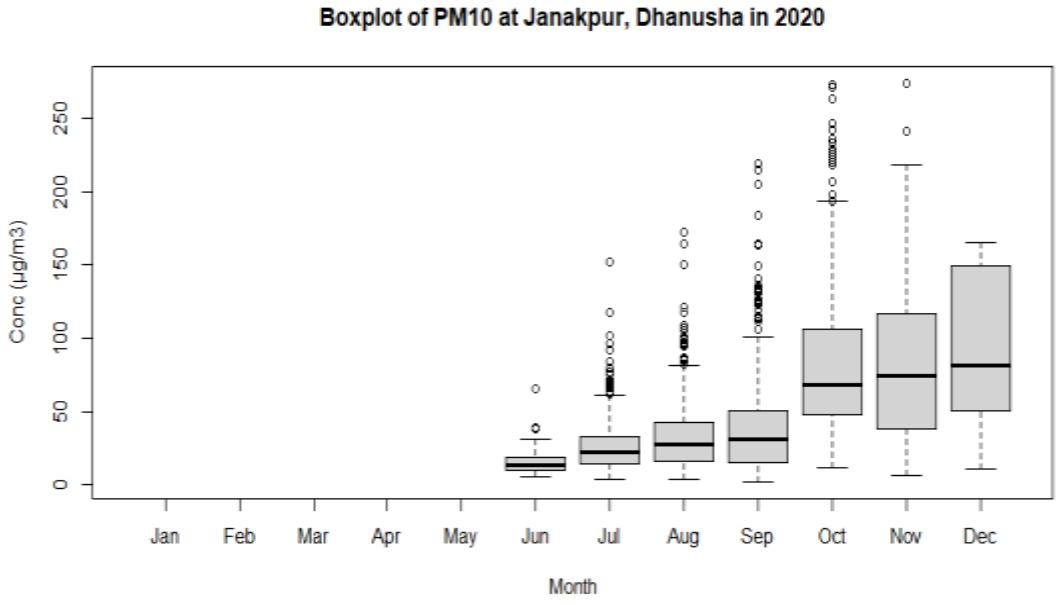

Figure 14: Monthly Variation of PM_{10}

Seasonal variation of average PM_{10} concentration:

Ambient concentration of average PM_{10} only for monsoon (June –September) and post-monsoon (October-November) are available. The PM_{10} concentration was higher in post monsoon (67.64µg/m^3) than in winter (26.72µg/m^3).

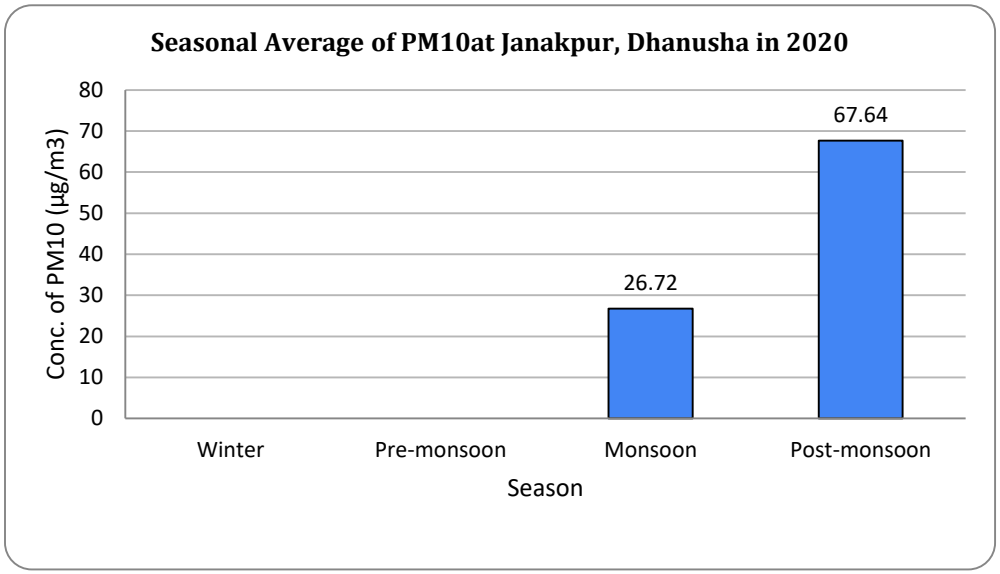

Figure 15: Seasonal variation of PM_{10}

Diurnal variation of average PM_{10} concentration

The diurnal variation of average PM_{10} concentrations can be shown in the **Error! Reference s ource not found.** below. The variation in PM_{10} concentration was high at around 8 and 9 pm and low at 5 am. Additionally, mean concentration of PM_{10} was high and low around 8 pm and 5 am respectively.

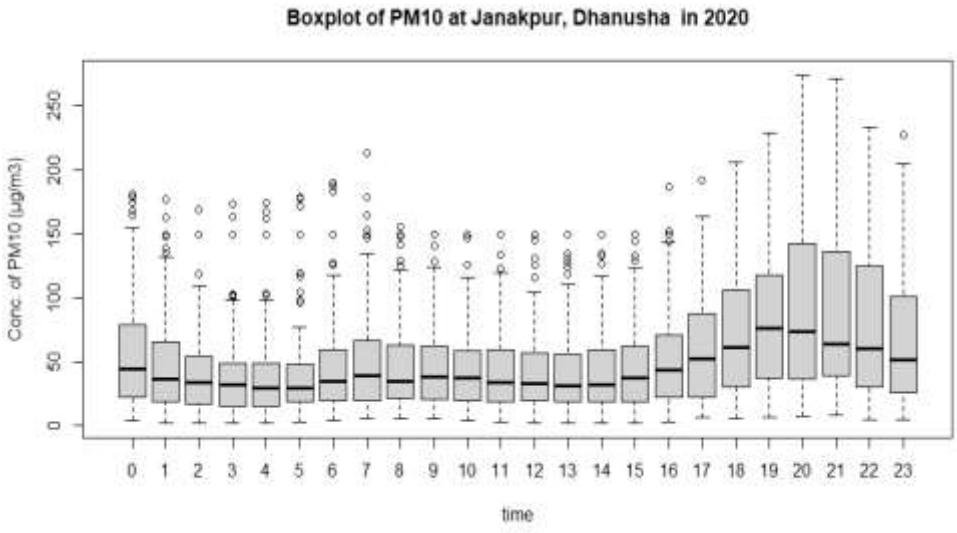

Figure 16: Diurnal variation of PM_{10} concentration

Compliance status of PM_{10}

The total days of PM_{10} monitored in the year 2020 counts 169 of which 13 days exceed the NAAQS guideline. December has maximum number of days exceeding the NAAQS guideline. From June to October, none of the days exceeded NAAQS guideline value as shown in **Error! Not a valid bookmark self-reference.**

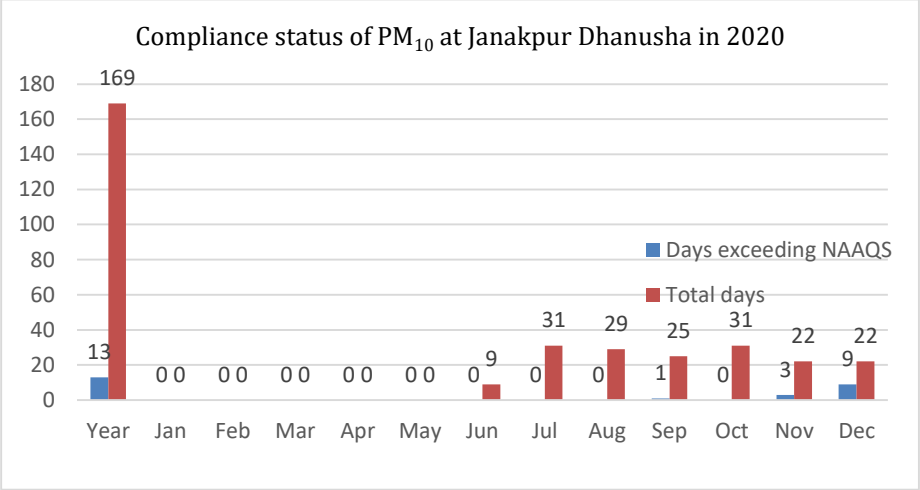

Figure 17: Compliance status of PM_{10}

2.1.5. Temporal variation of TSP

Annual average of TSP

Most of the data for TSP was found to be less than the NAAQS (

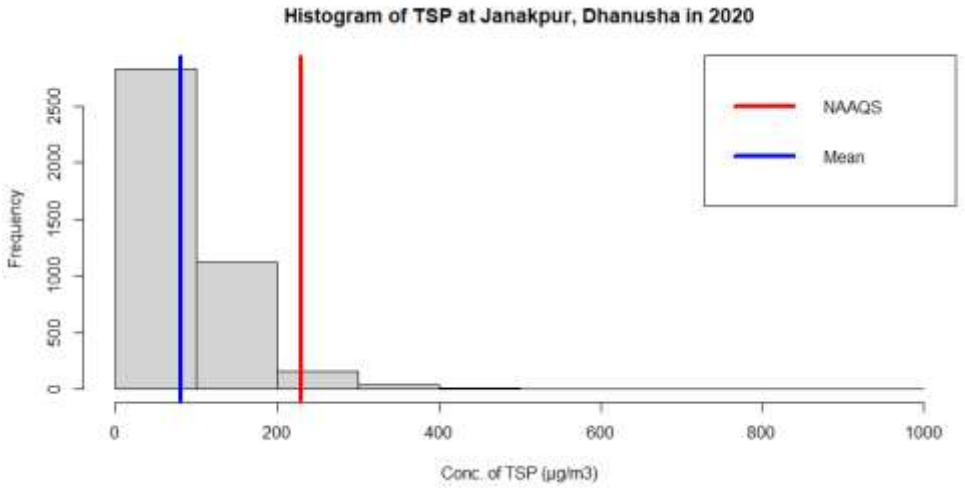

Figure *18*: Histogram for the ambient concentration of TSP

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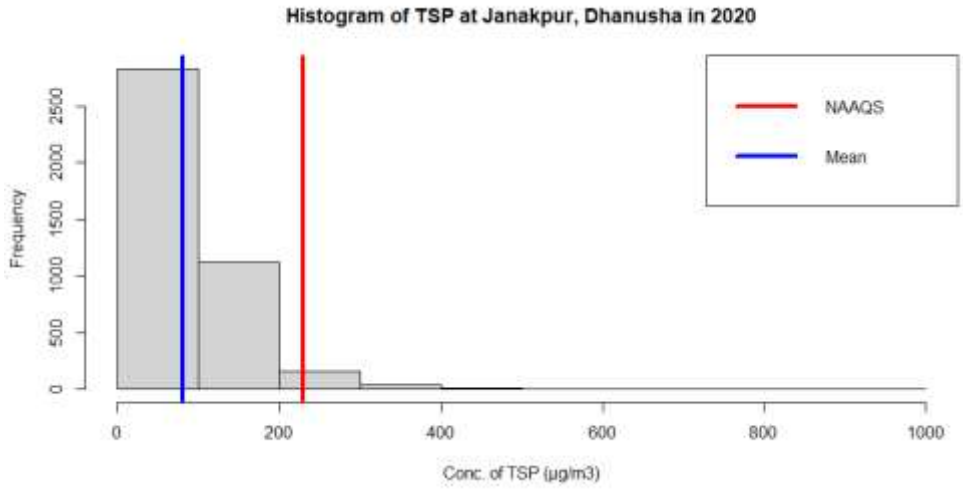

Figure 18: Histogram for the ambient concentration of TSP

Daily average of TSP:

Plot for daily average concentration of $PM_{2.5}$ was not available due to the unavailability of data.

Monthly average of TSP

Based on the available data, the highest and the lowest concentration of TSP was found during November and July respectively. The mean value for those months were found to be

123.97 and 30.38 µg/m^3 respectively (

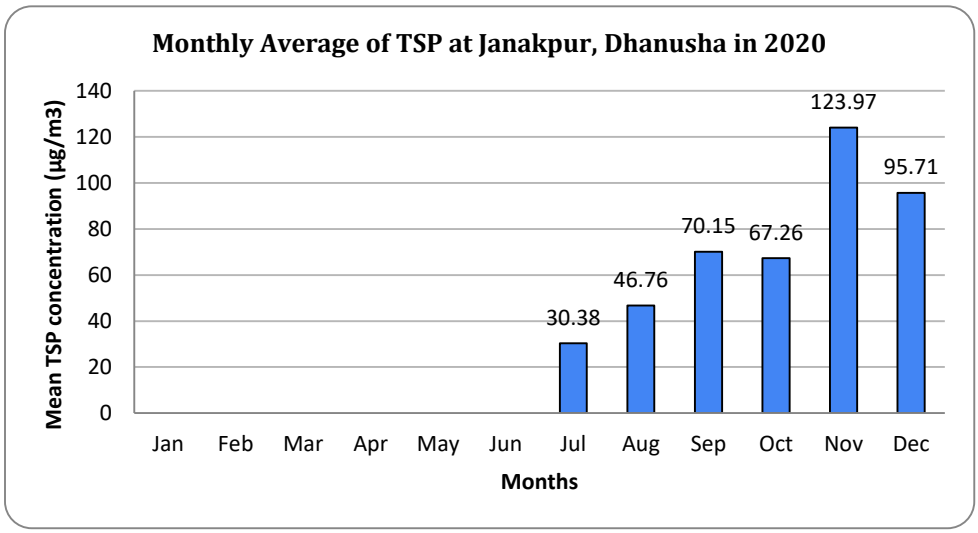

Figure *19*: Monthly Average of TSP

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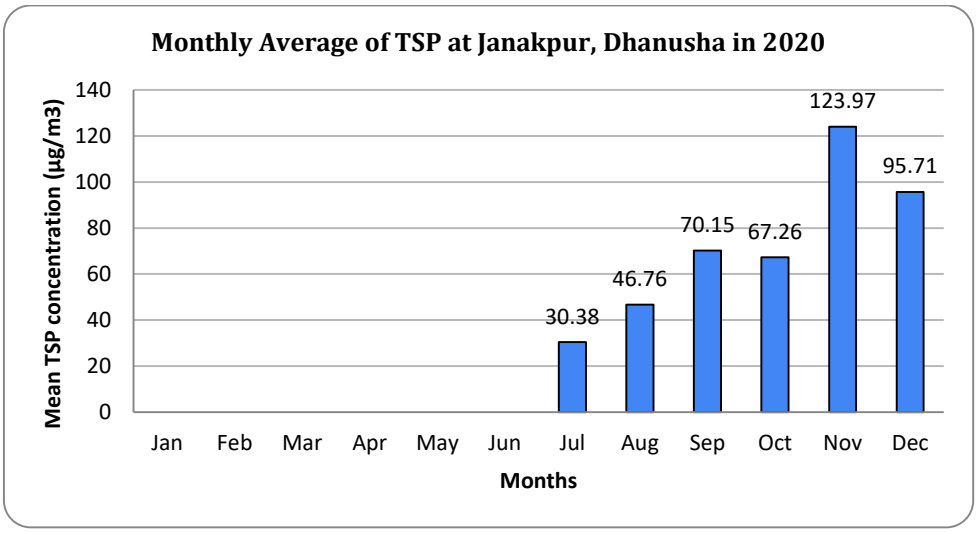

Figure 19: Monthly Average of TSP

Variation in concentration of TSP was found more during October and low during June. The mean value of TSP was found the highest in December and the lowest in June.

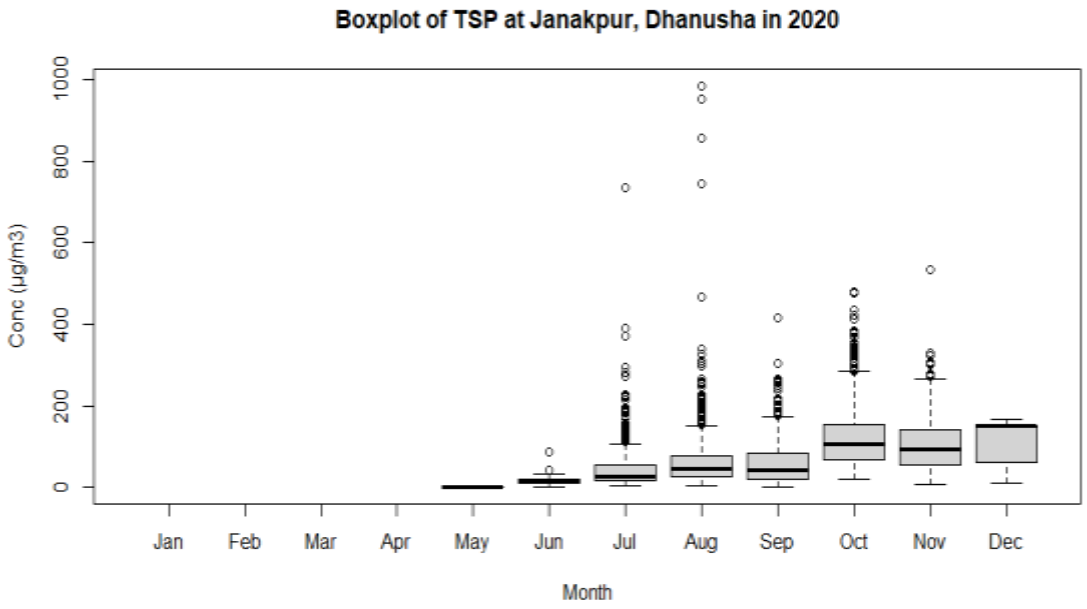

Figure 20: Monthly variation of TSP.

Seasonal variation of average TSP concentration

Ambient concentration of average TSP only for monsoon (June –September) and post-monsoon (October-November) are available figure 26. The $PM_{2.5}$ concentration was higher in post monsoon (87.12µg/m^3) than in winter (25.71µg/m^3) .

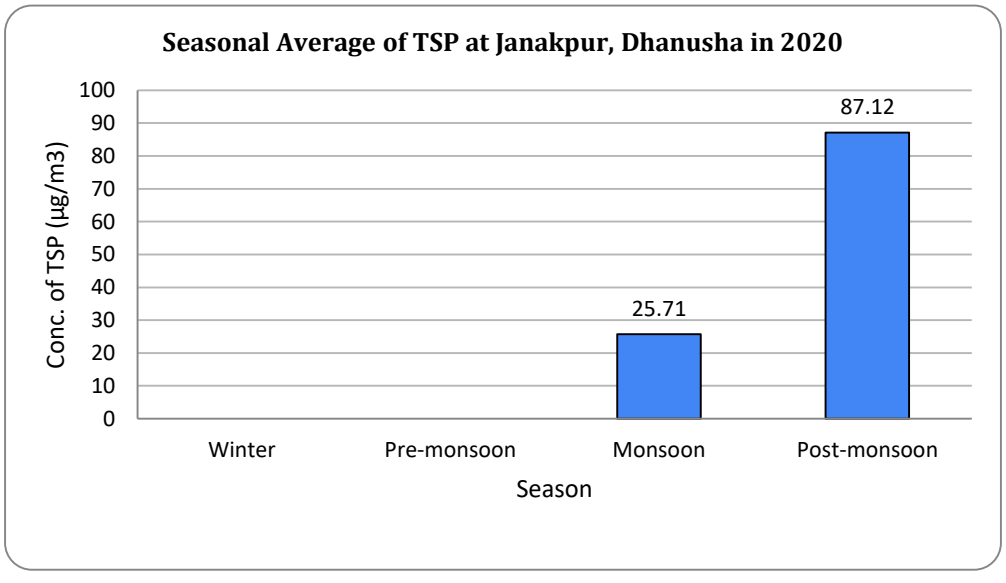

Figure 21: Seasonal variation of TSP

Diurnal variation of average TSP concentration

The diurnal variation of average TSP concentrations can be shown in the Figure 22 below. The variation in TSP concentration was high at around 1 pm and low at 12 am. Additionally, mean concentration of TSP was high and low at 2 pm and 2 am respectively.

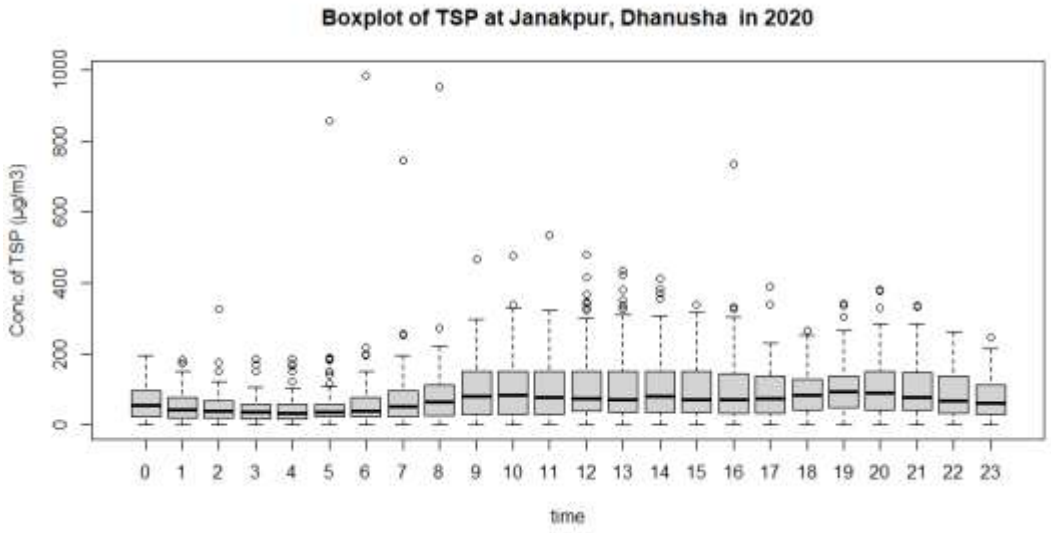

Figure 22: Diurnal Variation of TSP

Compliance status of TSP

The total days of TSP monitored in the year 2020 counts 156 of which one day in September exceeded the standard exceed the NAAQS guideline.

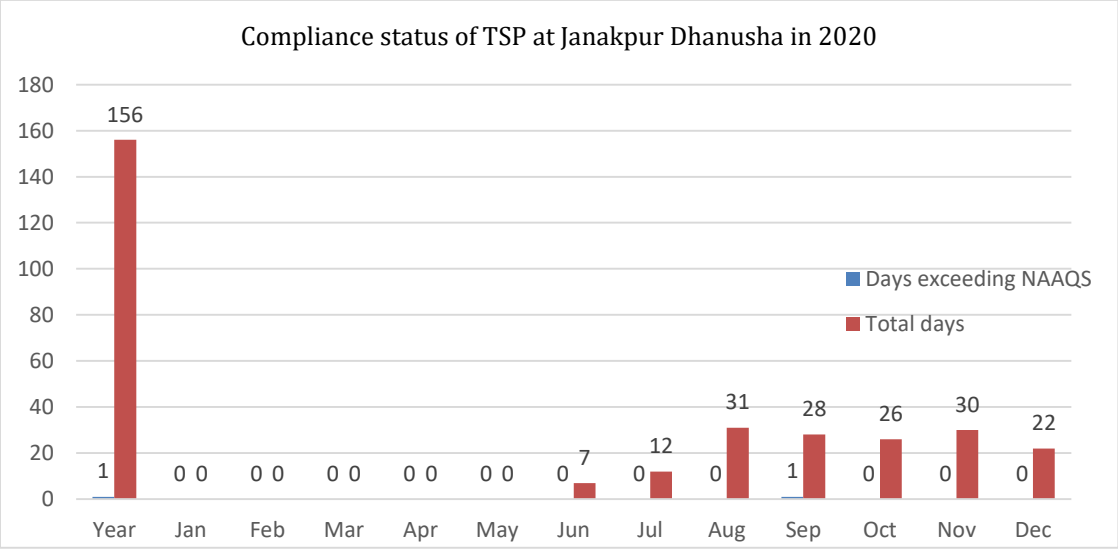

Figure 23: Compliance status of TSP

Annex