

SINDH

CHANGES IN TEMPERATURE & PRECIPITATION

OBSERVABLE IMPACTS OF GLOBAL WARMING



1. Introduction

Global warming is a climate change related phenomena which refers to warmed temperatures and associated changes on land surface. The global warming is causing prolonged summers, frequent occurrence of heatwaves, changes in sea-land temperature, hence uneven pattern of winds and weather systems. It may have been contributing in unprecedented and severe weathers around the globe.

Sindh province is also undergoing global warming and climate change and its impacts are observable in different forms. In view of occurrence of frequent abnormal weather events in Sindh province, this brief study has been conducted to determine changes in temperature and precipitation over the province. For this purpose, temperature and precipitation data have been acquired from international sources and processed to ascertain decadal changes in these weather parameters. The study is conducted on temperature and precipitation data starting from 1981 to 2022 which has been processed to acquire decadal averages.

Keeping in view the geographical distribution of province, the province has been divided into three regions i.e. Upper Sindh, Central Sindh and Lower Sindh. For Upper Sindh, station data of Kamber Shahdadkot, Ghotki, Larkana and Khairpur; for Central Sindh, Dadu, Hyderabad, Sehwan, Shaheed Benazirabad, Naushahro Feroze and Mirpurkhas, and for Lower Sindh, Karachi, Sujawal, Badin and Tharparkar has been used.

1.1 Temperature

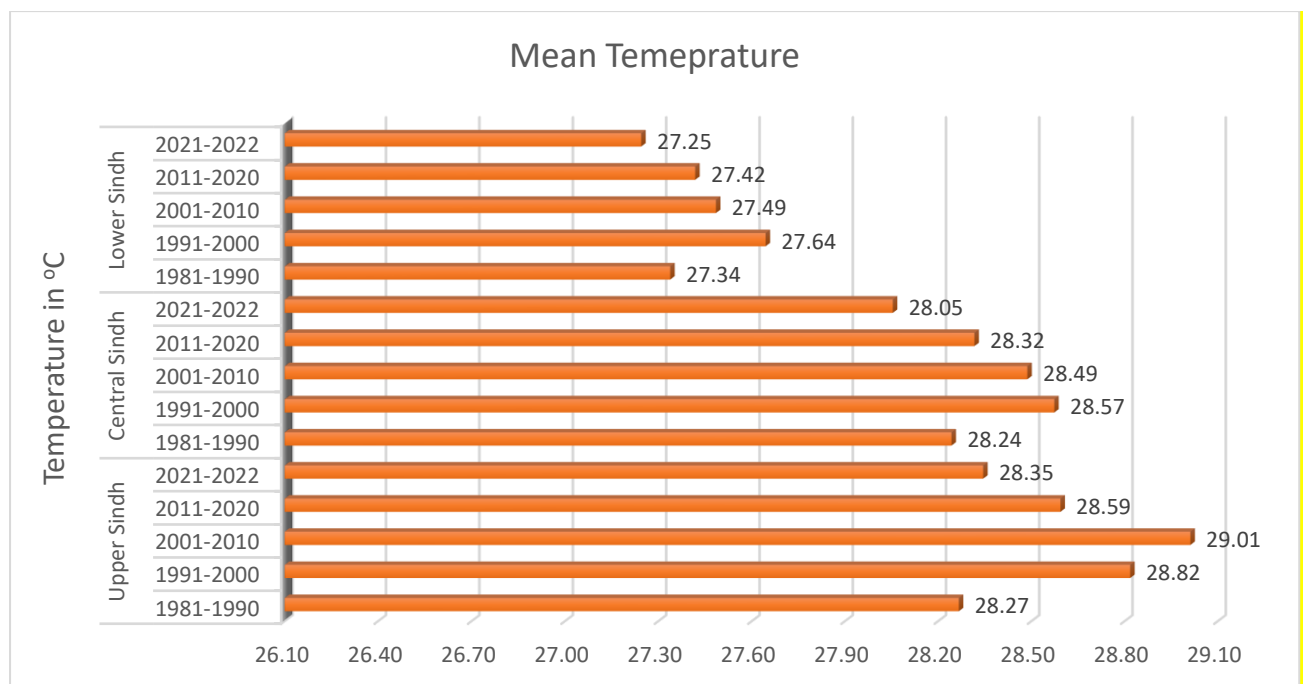


Figure 1.1.1: Decadal Mean Temperature in °C (Data Source: NASA)

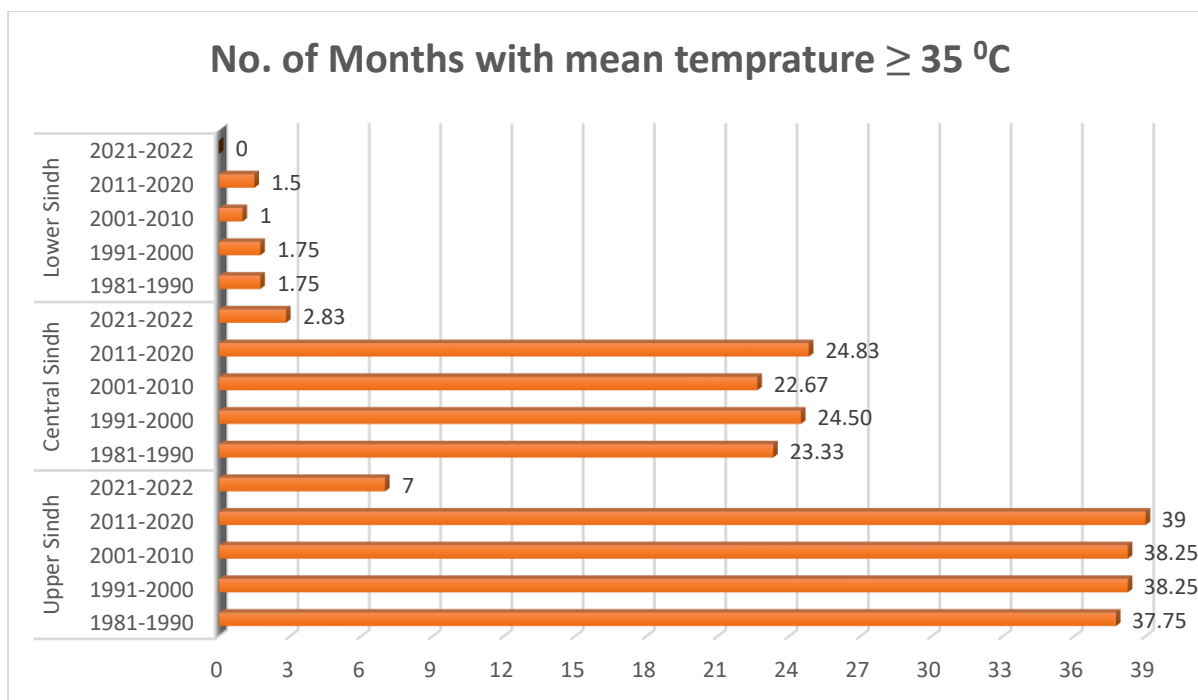


Figure 1.1.2: No. of months in each decade with mean temperature $\geq 35^{\circ}\text{C}$ (Data Source: NASA)

1.1.1 Descriptive Analysis of Data:

- The decadal mean temperature in Upper Sindh during 2011 – 2020 remained 28.59°C which is increased by 0.32°C in comparison to baseline decadal temperature i.e. 1981 – 1990 (28.27°C).
- In Central Sindh an increase of 0.08°C is observed in 2011-2020 decade (28.32°C) in comparison to baseline temperature i.e. 28.24°C .
- The mean temperature of Lower Sindh is raised by 0.08°C .
- The figure 1.1.2 refers the number of months in which temperature remained more than 35°C . Maximum months i.e. 39 months with more than 35°C are observed in Upper Sindh, followed by Central Sindh. The temperatures in Lower Sindh remained lower.

Conclusion:

The decadal average of temperature shows increase in annual temperatures of the province. Significant increase is observed after 1990 and onwards. The significant changes in temperature rise are observed in Central and Upper Sindh.

1.2 Precipitation:

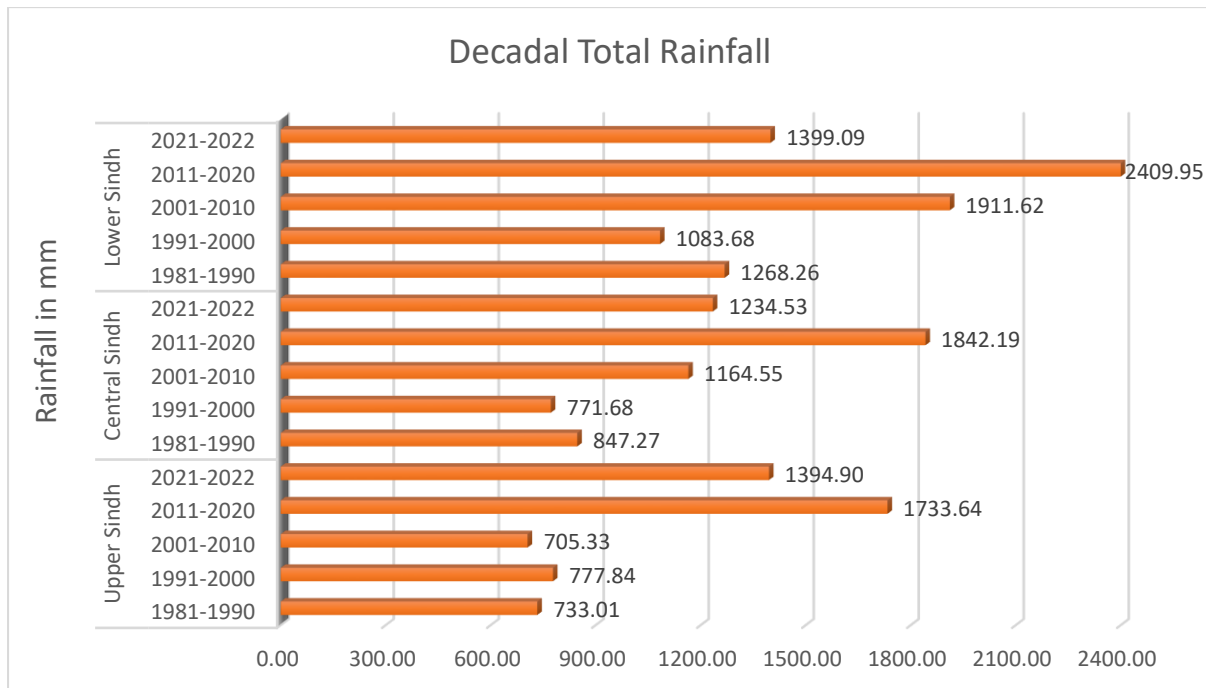


Figure 1.2.1: Decadal total rainfall in mm (Data Source: NASA)

1.2.1 Descriptive Analysis of Data:

- Decadal precipitation in Upper Sindh is 1000.63 mm higher in 2011 – 2020 (1733.64 mm) in comparison to 1981 – 1990 (733.01 mm) decade.
- In Central Sindh an increase of 994.92 mm is observed in 2011 – 2020 (1842.19 mm) in comparison to baseline decadal precipitation 1981 – 1990 (847.27 mm).
- The total decadal precipitation of Lower Sindh is increased by 1141.69 mm.

Conclusion:

Significant change in total provincial precipitation is observed over the period starting from 1981.



Contributors

Muhammad Umar, GIS Developer, PDMA Sindh
Fatima Khalid, Data Analyst, PDMA Sindh
Muhammad Kashan, GIS Developer, PDMA Sindh

Reviewed by

Dr. Sanaullah Shah
Disaster Management Specialist, PDMA Sindh

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Disclaimer

The data used in this brief study was obtained through online source with the courtesy of National Aeronautical Space Administration (NASA). PDMA Sindh does not claim or is responsible for any inconsistency and errors in the data.