

GLOBE OMAN



RYSUT School



The impact of Rysut Industrial Area on Temperature and Air Quality

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Abstract

temperature data from several accredited sources, such as NASA POWER and aqicn.org for air quality measurement, were compared between two geographically close areas (Salalah and Raysut). The research study revealed several conclusions, including:
Thermally: There is a high degree of similarity in the average temperatures between Raysut and Salalah. However, the average temperature in Raysut shows a higher increase compared to Salalah.
Environmentally: The levels of air pollutants PM2.5 and PM10 in Raysut may be higher than those in Salalah.
Recommendations: The environmental impacts of industrial areas largely depend on the effective implementation of environmental regulations. Therefore, it is recommended to increase green spaces within industrial zones.
Key Terms: Air pollutants (PM2.5, PM10) – Industrial Heat Island – Global Warming – Acid Rain.

Research Questions

Are there differences in monthly and annual temperature patterns between Salalah and Raysut over the past ten years? Do air quality characteristics differ in terms of pollutant concentrations, particularly PM2.5 and PM10, between Raysut and Salalah? Can these differences be linked to local environmental factors, such as the presence of industrial areas, and what is their impact on environmental life?

Introduction

This research study aims to investigate the impact of the industrial area in Raysut on both temperature patterns and air quality levels. If a significant gap in temperature values and air quality indices is identified, this would serve as a warning sign highlighting the need for more effective implementation of environmental monitoring and control regulations. Conversely, if temperatures and air quality levels are found to be largely similar, this would provide reassurance to those concerned about the negative impacts of industrial areas. It would also represent a message of appreciation to those responsible for environmental monitoring, reflecting their commitment to protecting the health and safety of the people of this valued nation.



Research Methods

1 The scientific method based on problem-solving and hypothesis formulation was used.

First Axis of the Research Study: (Impact of the Industrial Area on Temperature)	second Axis of the Research Study (Impact of the Industrial Area on Air Quality)
Monthly and annual temperature data for both Salalah and Raysut were collected from reliable and accredited sources such as NASA POWER.	Air quality data were collected from reliable and accredited sources such as aqicn.org and other trusted platforms
The data were organized into tables using formats such as CSV and Excel.	The data were organized into tables using formats such as CSV and Excel
Monthly and annual average temperatures were calculated over the past ten years (2015–2024).	Air quality indicators and pollutant concentrations for both Salalah and Raysut were compared over the past year.
The magnitude of temperature increase or decrease over the same ten-year period (2015–2024) was calculated.	.Graphical charts were created to compare air pollutant levels between Salalah and Raysut throughout the most recent year (2024–2025)
Done by: 2. Fael Aadel + Supervisor	Done by: 1. Mohammed Ali + Supervisor

3-the results were interpreted graphically to verify the hypotheses and to determine the extent to which the results matched the expectations, as well as the degree of variation between them.

Research Study Tools

Data obtained from accredited GLOBE platforms, such as NASA POWER and aqicn.org.
QR code () (Line charts – Bar charts and others)

Badges

- I Am a Data Scientist
- I Am a Collaborator
- I Am a Problem Solver

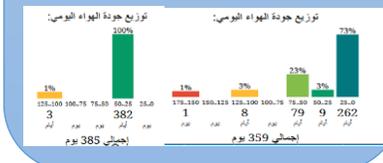
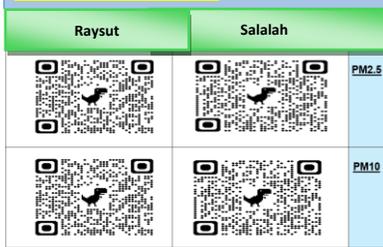


Results

Axis 1. Temperature compare



Axis 2. Air Pollution Levels



Discussion of Results

First Axis (Temperature Impact)

1-Both Raysut and Salalah recorded an increase in temperatures over the past ten years, consistent with the global trend of gradual temperature rise (global warming).
2-The average temperatures of Raysut and Salalah are largely similar. However, Raysut's average temperature increase (+0.73) is higher than Salalah's (+0.59). Raysut also records slightly higher temperatures in some months, especially during the summer season.

Second Axis (Air Quality Impact)

Regarding PM2.5 concentrations: Salalah recorded a "Good" daily air quality index at 99.2%, while Raysut recorded 95.4%.

Conclusions

First Axis (Temperature Impact)

The industrial area in Raysut may contribute to a local urban heat island effect due to industrial activities and the density of infrastructure. However, the temperature difference over the ten-year period (2015–2024) did not exceed 0.14°C, which indicates strict adherence to environmental regulations by factories and companies.

The difference in vegetation cover is also significant, as Salalah enjoys better vegetation during the autumn season, which helps reduce temperatures. This highlights the importance of improving vegetation cover in Raysut.

All of the above provides reassurance to those concerned about the negative impacts of industrial areas. It also expresses appreciation to those responsible for monitoring industrial facilities.

Second Axis (Air Quality Impact)

PM2.5 and PM10 levels in Raysut may reach higher concentrations more frequently throughout the year compared to Salalah. The similarity in the air quality index for PM2.5 between Salalah and Raysut does not exceed 4%, which is also a positive indicator.

References

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