

LEVERAGING CLIMATE DATA ANALYTICS FOR SUSTAINABLE ENVIRONMENTAL SOLUTIONS IN KENYA AND BEYOND

Exploring Climate Variability and Environmental Trends and in Kenya and beyond Using an Interactive Data Dashboard

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Kenya's climate system is characterized by strong spatial and temporal variability driven by interactions between topography, regional circulation systems, and broader global climate processes. These variations significantly influence agriculture, water resources, ecosystem stability, and overall environmental sustainability. Understanding these patterns requires analytical tools that can process large climate datasets while presenting findings in an accessible and scientifically meaningful format. This project analyzes historical climate variability in Kenya through the development of an interactive, data-driven dashboard designed to transform raw climate data into clear visual and analytical insights. Open-access climate datasets were used to examine key environmental variables, particularly surface temperature and precipitation trends across different regions and time scales. Data processing and statistical exploration were conducted using Python, while visualization and user interaction were implemented through a Streamlit-based web application framework. The analysis indicates a consistent warming trend across multiple regions of Kenya, alongside increasing variability in precipitation patterns. Observed shifts in seasonal rainfall distribution suggest growing uncertainty in water availability and agricultural planning cycles. Regional contrasts in climate behavior further highlight the need for localized analysis when assessing environmental risk and adaptation strategies. By converting complex datasets into an interactive and user-friendly interface, the dashboard bridges the gap between climate data and practical environmental understanding. The platform supports research, education, and informed decision-making by improving transparency and accessibility of climate information. This work demonstrates how interactive data systems can strengthen climate and environmental research capacity in Africa and contribute to evidence-based discussions on climate change adaptation and environmental management.

The link to this captivating project is:<https://climate-dashboard-by-brown-awqze9mmv7pszcnavl3pdy.streamlit.app/>

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