

# Climate and Water Analysis Report: Aitchison College, Lahore

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Project Raindrop

Date: April 2024  
Location: Lahore, Pakistan  
Version: 1.0

## Introduction

This report provides a detailed climate and water analysis at Aitchison College, Lahore, Pakistan. The analysis integrates findings from existing studies and reports to offer a comprehensive understanding of the climatic conditions and water resource management at the pilot location. This evaluation will support the implementation of the rainwater harvesting project aimed at addressing local water scarcity issues effectively.

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## Climate Overview

Lahore experiences a semi-arid climate with a monsoon season, which significantly influences its water dynamics. Key climatic characteristics include:

- **Temperature:** Lahore has a wide temperature range, with extreme heat in summer (up to 45°C) and mild winters (as low as 1°C). The average annual temperature is approximately 24°C.
  - **Precipitation:** The average annual rainfall is around 600 mm, predominantly during the monsoon months of July and August. The variability in rainfall is high, leading to frequent periods of both excess and deficient water availability.
  - **Humidity and Evaporation:** High humidity levels during the monsoon season contrast with dry conditions for the rest of the year. High evaporation rates during summer exacerbate water scarcity.
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## Water Resource Overview

The primary water sources for Lahore are groundwater and the Ravi River. However, both sources face significant challenges:

- **Groundwater:** Over-extraction has led to declining water tables and deteriorating water quality due to the infiltration of contaminants.
  - **Surface Water:** Pollution in the Ravi River due to industrial and agricultural runoff severely limits its use for potable supplies without extensive treatment.
  - **Urban Water Supply:** The Lahore Water and Sanitation Agency (WASA) provides urban water services, but coverage and reliability issues persist, particularly during peak summer months.
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## Water Analysis at Aitchison College

Aitchison College, spanning over a considerable acreage, maintains vast green spaces, which require significant water resources. The specific water needs and current practices at the College include:

- **Water Usage:** The primary uses of water at the college are for irrigation, sanitation, and drinking purposes. The college has a high demand for water, especially during the summer months for landscaping and sports fields.
  - **Existing Water Supply and Management:** The college primarily relies on groundwater, supplemented by municipal supplies. There is an existing need to optimize water use and explore sustainable alternatives due to the increasing water demand and decreasing groundwater levels.
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## Potential for Rainwater Harvesting

Given the climatic conditions and water usage patterns, rainwater harvesting presents a viable option to augment the college's water supply. The analysis suggests:

- **Catchment Potential:** The large roof areas of school buildings and wide expanses of impermeable surfaces offer substantial catchment potential.

- **Storage and Usage:** Properly designed storage facilities can help in capturing significant amounts of rainwater during monsoon months, which can be used for non-potable purposes such as irrigation and flushing toilets.
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## **Conclusions and Recommendations**

The climate and water analysis indicates that Aitchison College is suitably positioned to benefit from a rainwater harvesting system. Recommendations for further action include:

1. **Detailed Site-Specific Studies:** Conduct hydrological studies to determine optimal catchment areas and storage capacity needs.
  2. **Integration with Existing Infrastructure:** Design the system to integrate seamlessly with existing water supply and management infrastructure.
  3. **Monitoring and Maintenance:** Establish a system for regular monitoring and maintenance to ensure the sustainability of the rainwater harvesting system.
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## **Future Research**

Further research into the specific impacts of climate change on regional precipitation patterns and water availability in Lahore is recommended to continuously update and adapt water management strategies at Aitchison College.