Assessing the Impact of Flooding on Faecal Sludge Management and Diarrheal Disease Risk.

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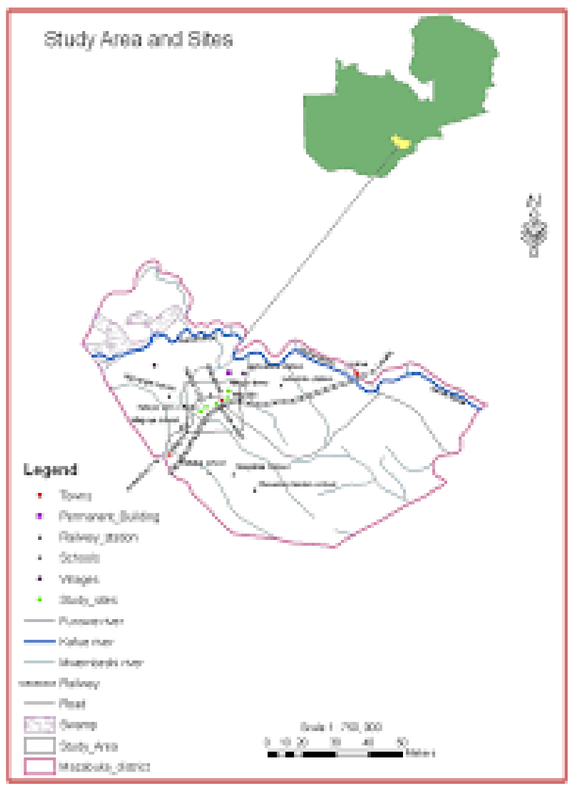
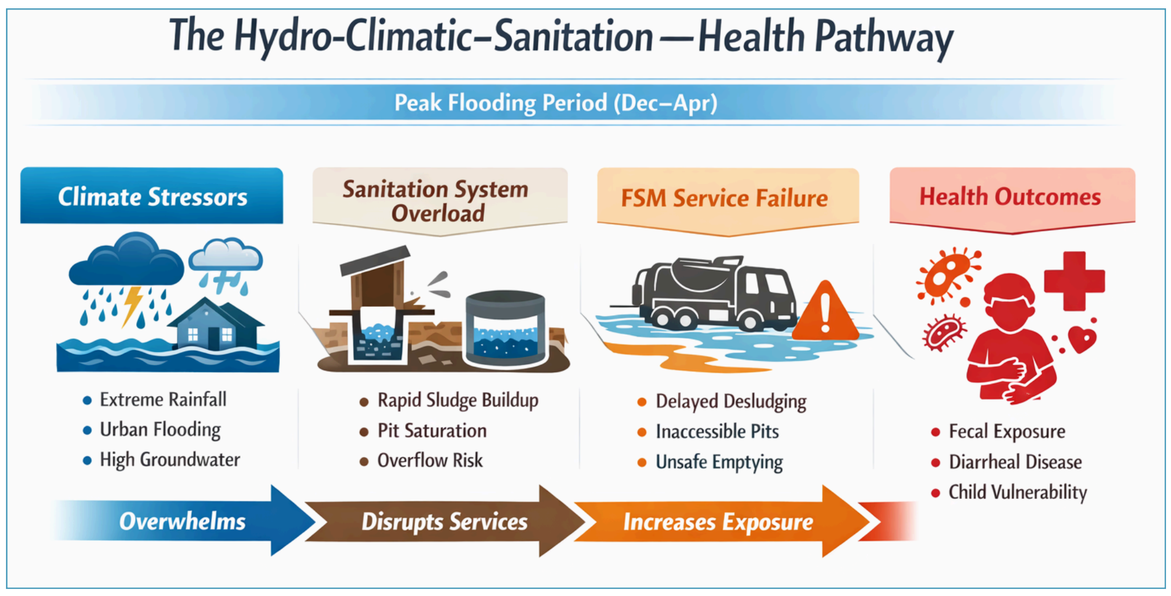
Introduction

Small towns depend primarily on on-site sanitation. Climate variability is increasing rainfall intensity and flooding. Flood-induced infiltration and pit overflow elevate faecal contamination. Mazabuka provides a relevant case to understand the hydro-climatic–sanitation nexus.



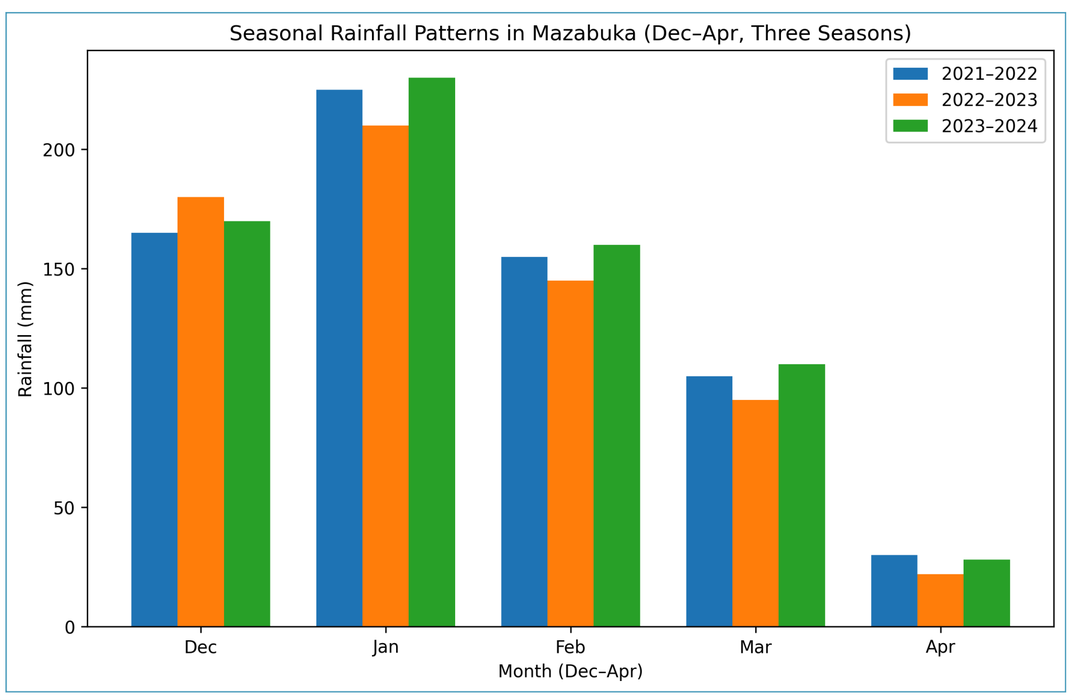
Methods

The study employed a mixed-methods design to examine the hydro-climatic–sanitation–health nexus in Mazabuka, Zambia. The approach integrates quantitative and qualitative methods to assess how urban flooding influences FSM performance and diarrheal disease risk, aligning with SDG 6 (safe and resilient sanitation systems), SDG 3 (reduction of preventable disease), and SDG 13 (climate adaptation and resilience).

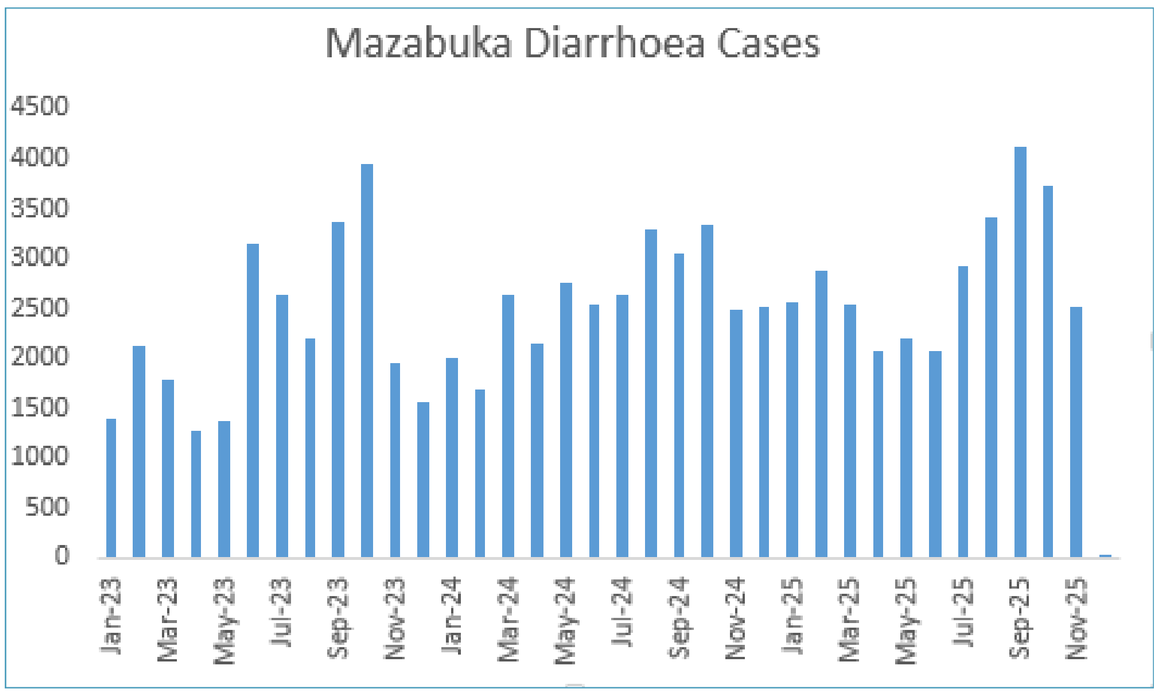


Results

The chart illustrates consistent concentration of rainfall in Jan–Feb across seasons, corresponding to periods of heightened flood risk and sanitation system stress in Mazabuka.



Results



Urban flooding is seasonal and recurrent, coinciding with peak rainfall months. Intense rainfall, poor drainage, and rapid urban growth cause floodwaters to persist in densely populated settlements, increasing human contact with contaminated water.

Flooding disrupts the entire FSM chain, leading to pit overflows, restricted desludging access, and delayed sludge transport and disposal. These failures coincide with periods of increased diarrhoeal cases, indicating flooding-driven sanitation breakdown as a key public health risk.

Sanitation in flood-prone areas is dominated by vulnerable onsite systems, located in low-lying, high-groundwater zones. Poor construction, shallow pits, and lack of raised platforms increase flood exposure and facilitate faecal leakage.

Conclusion

Urban flooding amplifies FSM failure and diarrhoeal disease risk in Mazabuka, revealing a clear rainfall–flooding–sanitation–health pathway that demands integrated, climate-resilient sanitation responses.

Recommendations

- Integrate climate risk into FSM planning
- Upgrade sanitation containment in high-risk zones
- Strengthen FSM service continuity during floods
- Link sanitation and public health surveillance
- Enhance institutional coordination and enforcement

Data Sources:

- Climate Data, Mazabuka Climate: Weather Mazabuka & Temperature by month
- Mazabuka District Health Office
- Mazabuka Population 233,084-Zambia Statistics Agency

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