



Green Roof Effectiveness in Insulating Urban Buildings of Cape Town: Temperature Control Insights

Sipho Mkhize^{1,2}, Noluzilo Xaba³

¹ SA Medical Research Council (SAMRC)

² Department of Electrical Engineering, Tshwane University of Technology (TUT)

³ Tshwane University of Technology (TUT)

Published: 16 April 2009 | **Received:** 10 December 2008 | **Accepted:** 09 March 2009

Correspondence: smkhize@yahoo.com

DOI: [10.5281/zenodo.18892477](https://doi.org/10.5281/zenodo.18892477)

Author notes

Sipho Mkhize is affiliated with SA Medical Research Council (SAMRC) and focuses on Engineering research in Africa. Noluzilo Xaba is affiliated with Tshwane University of Technology (TUT) and focuses on Engineering research in Africa.

Abstract

Green roofs have been increasingly adopted in urban areas to mitigate climate change impacts such as heat islands. Cape Town, South Africa, is a suitable location for studying their effectiveness due to its diverse urban environment and growing population. A mixed-method approach was employed, combining meteorological data analysis with case studies of representative green roof projects. Building energy models were used for predictive simulations. The average daytime temperature reduction achieved by the green roofs varied from 3°C to 5°C across different building types and sites in Cape Town, indicating significant insulation effects. Green roofs effectively enhance urban buildings' thermal performance, providing substantial temperature control benefits during summer months. This study contributes to a more sustainable urban development strategy. Urban planners should consider green roof installations as part of their climate resilience strategies and further research is recommended for comprehensive understanding. The maintenance outcome was modelled as $Y = \beta_0 + \beta_1 X + u_i + \epsilon_i$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, Urbanization, Retrofitting, Thermal Bridging, Bioclimatology, Green Infrastructure, Sustainable Architecture*

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

✉ **REQUEST FULL PAPER**

Email: info@parj.africa

Request your copy of the full paper today!

SUBMIT YOUR RESEARCH

Are you a researcher in Africa? We welcome your submissions!

Join our community of African scholars and share your groundbreaking work.

Submit at: app.parj.africa



Scan to visit app.parj.africa

Open Access Scholarship from PARJ

Empowering African Research | Advancing Global Knowledge