African Food Processing Technology (Food Science/Technology)

Solar Panels in Rural Ethiopia: Water Quality and Health Impacts Assessment

Mekonnen Mengistu[1,2], **Yared Gebru**[3,4], **Getachew Debella**[5,6], **Tsegaye Asresayo**[3]

[1] Department of Sustainable Systems, Addis Ababa Science and Technology University (AASTU)

[2] Department of Civil Engineering, Hawassa University

[3] Hawassa University

[4] Department of Mechanical Engineering, Ethiopian Public Health Institute (EPHI)

[5] Ethiopian Public Health Institute (EPHI)

[6] Department of Mechanical Engineering, Addis Ababa Science and Technology University (AASTU)

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Correspondence: mmengistu@aol.com

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Author notes

Mekonnen Mengistu is affiliated with Department of Sustainable Systems, Addis Ababa Science and Technology University (AASTU) and focuses on Engineering research in Africa.

Yared Gebru is affiliated with Hawassa University and focuses on Engineering research in Africa.

Getachew Debella is affiliated with Ethiopian Public Health Institute (EPHI) and focuses on Engineering research in Africa.

Tsegaye Asresayo is affiliated with Hawassa University and focuses on Engineering research in Africa.

Abstract

Solar panels have been installed in rural areas of Ethiopia to provide off-grid water supply systems. This study aims to evaluate their impact on water quality and health outcomes. A comparative study design was employed to collect baseline data before installation and post-installation monitoring of water sources. Water samples were analysed for microbiological indicators using standard protocols, and health impact assessments were conducted through surveys among local communities. Microbial contamination levels showed a significant reduction ($p < 0.05$) in treated water samples compared to pre-installation data, indicating improved water quality from solar panel installations. The study demonstrates that the installation of solar panels can lead to substantial improvements in water quality and health outcomes in rural Ethiopian communities. Further research is recommended to explore long-term sustainability and cost-effectiveness of these systems. Implementation strategies should include community engagement and ongoing maintenance protocols. The maintenance outcome was modelled as $Y\{\} = beta\,0 + beta\,1\,X\{\} + ui + varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: *Sub-Saharan, Africa, Sustainable, Hydrology, Epidemiology, Qualitative, Comparative*

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