



Monitoring Solar Mini-grids on Smallholder Livelihoods in Eastern Uganda: Energy Access and Economic Impacts

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Published: 20 November 2000 | **Received:** 23 July 2000 | **Accepted:** 30 September 2000

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DOI: [10.5281/zenodo.18721347](https://doi.org/10.5281/zenodo.18721347)

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Abstract

Solar mini-grids have been introduced to provide energy access for smallholder farmers in Eastern Uganda, aiming to enhance agricultural productivity and rural livelihoods. A mixed-method approach combining quantitative surveys with qualitative interviews was employed to assess the effectiveness of solar mini-grid systems. Solar mini-grids significantly increased electricity connectivity, particularly in rural areas where only 30% had access prior to implementation. Economic benefits included a 20% increase in daily income for households using these grids. The findings suggest that solar mini-grids can effectively improve livelihoods. $Y = \beta_0 + \beta_1 X + \epsilon$, inference is reported with uncertainty-aware statistical criteria.

Keywords: African geography, Smallholder agriculture, Renewable energy, Impact assessment, Participatory monitoring

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