**Clean Energy Access and Women’s Economic Empowerment: A Case Study of PAYGo Solar in Rural Kenya**

**Abstract**

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**Funding:** Supported by and Roehampton University/UK Research and Innovation (UKRI)

**Overview**

Background: Energy poverty is a critical barrier to gender equality and development in rural Sub-Saharan Africa, disproportionately affecting women. The exhaustive energy chores, such as gathering firewood and using inefficient cooking methods, expose women to health hazards and consume time that could be spent on education or economic ventures. This traditional energy dependence deepens gender disparities by limiting women's roles and opportunities.

PAYGo solar systems offer a transformative solution by breaking down these barriers, with their use becoming increasingly prevalent across Sub-Saharan Africa, particularly in Kenya. These innovative systems allow customers to acquire solar home setups through manageable, incremental payments, enabled by mobile money technology. This approach provides essential utilities like lighting and charging without the hefty upfront costs, and smart technology ensures users can access the service as they pay. Completing payments transfers ownership to the customer, making it a wise investment in their future.

By dramatically reducing the labor and time associated with traditional energy sourcing, PAYGo solar empowers women to engage more fully in economic and community life. Additionally, it serves as an entry point into the formal financial world, building credit histories and promoting financial inclusion. PAYGo solar stands as a beacon of progress, offering a pathway to gender equality and broader socio-economic advancement by delivering affordable, sustainable energy solutions to rural African communities.

Benefits in Terms of Income Generation and Financial Inclusion:

* Income Generation: PAYGo systems extend business hours, create new economic opportunities, and improve productivity, directly benefiting women's income.
* Financial Inclusion: Regular payments through PAYGo systems build credit history, facilitate access to formal financial services, and enhance financial literacy among women, promoting broader economic resilience.

Despite the potential benefits of PAYGo solar systems, research on their impact, particularly on women's economic empowerment in rural Sub-Saharan Africa, remains scarce.

Objective: This research explores the impact of PAYGo solar systems on the economic empowerment of women in rural Kenya, examining demographic, financial, and social dynamics, and the system's role in promoting economic independence and community development.

**Methods:** A 12-month analysis involving 201 PAYGo solar customers highlighted customer profiles, financial behaviors, and empowerment metrics. Data was collected through comprehensive telephone surveys, ensuring a detailed understanding of user experiences. The study utilized descriptive statistics and Probit regression to focus on gender-disaggregated impacts

**Results:**

Key Findings:

* Demographic Insights: Predominantly, PAYGo solar customers are women aged 25-44, showcasing significant female engagement.
* Financial Behaviors: Despite financial inclusion barriers, women more commonly resort to informal financial systems, underscoring the need for targeted financial literacy.
* Challenges and Empowerment: PAYGo solar systems enhance business activities and financial autonomy, though challenges in repayment and societal norms persist.

Policy Implications and Recommendations:

* Initiatives to expand financial inclusion and implement flexible PAYGo models.
* Financial literacy campaigns tailored to women's needs.
* Recognizing PAYGo credit history in formal financial systems.
* Diversifying PAYGo products to specifically cater to women.
* Addressing restrictive social norms to ensure comprehensive empowerment.

**Conclusion:** PAYGo solar systems serve as a crucial catalyst for social change and women's economic empowerment in rural Kenya, highlighting the intersection between clean energy access and sustainable development goals. The study emphasizes the need for informed policy-making and targeted interventions to maximize PAYGo solar benefits.

**Acknowledgements:** The authors express gratitude to Roehampton University/UKRI and Solar Panda for their collaboration, facilitating this impactful research.

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