

Socially inclusive renewable energy transition in sub-Saharan Africa: A social shaping of technology analysis of appliance uptake in Rwanda

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Olivia Muza, Ramit Debnath

This work investigates how appliance uptake is influenced by a social process that shapes technology diffusion across different socio-economic classes. In doing so, we examine the latent socio-technical constraints behind appliance uptake in rural Rwanda using a national micro-data set of 14,580 households. Current literature shows that understanding the latent constraint behind appliance uptake in rural and low-income communities can aid in socially inclusive renewable energy planning. It is necessary to reach the distributional goals of renewable and off-grid systems that support the United National Sustainable Development Goal – 7 (clean and affordable energy). We derive the epistemological evidence on the income and non-income drivers of appliance uptake through an in-depth literature review and perform binary logistic regression. The regression is used to understand the association of distinct appliance ownership drivers across the complex social class system of Rwanda. Our results have shown that appliance uptake is highly gendered in rural Rwanda and varies widely across the welfare categories. Besides, mobile phones, radios and TV-sets have a higher likelihood of ownership than welfare appliances (refrigerator and laundry machine) by low-income households. It indicates a high technology diffusion of information and communication technology (ICT) devices. Based on this paradigm of technology diffusion, we further draw policy focus points based on the theory of disruptive innovation such that a rural entrepreneurial ecosystem is created to sustain innovation. Better tariff plans are designed for low-income consumers to enable them to extract higher utility from their ICT devices. Moreover, policy support to welfare appliance uptake (refrigerator and washing machine) to improve eudemonic household well-being is suggested.

Contact

rd545@cam.ac.uk

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