Solar energy for homes ethiopia

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Solar home systems are brightening homes and futures in many remote locations across Sub-Saharan Africa beyond the reach of the electrical grid. In Ethiopia, where more than 60 million people live without access to electricity, the National Electrification Program aims to scale up energy access by 35% through off-grid solutions such as solar home systems. Since many rural households are far from the grid and use electricity primarily for lighting, phone charging, and powering radios, off-grid options offer a viable solution to meet their electricity needs.

But many low-income households across Sub-Saharan Africa are still hesitant to adopt solar power despite technology and cost improvements. To understand why, the World Bank"s Carbon Initiative for Development (Ci-Dev) and its Mind, Behavior, and Development Unit (eMBeD) teamed up to explore how societal factors, individual biases, and mindsets influence adoption of solar home systems.

We conducted behavioral diagnostics in Ethiopia, Senegal, and Uganda to better understand how people perceive solar power. We identified the roadblocks and developed ways to overcome them, as illustrated in the infographic below.Extensive interviews revealed that many barriers center around perceptions of the utility of solar home systems, including their financial value. Some important insights and potential solutions include the following.

In the next phase of our work, we will pilot selected behavior change interventions in refugee settlements in Uganda. This includes demonstrating ways solar home systems can help families engage in income-generating activities, such as using the light at night to cook more for the marketplace or charging cell phones for a fee. Women-run households, in particular, stand to benefit from increased economic activity, comfort, and security provided by solar energy. We look forward to seeing how behavioral science can increase uptake of solar home systems for sustained scalable use.

Globally, the number of people living without electricity access dropped from almost one billion in 2017 to 860 million in the latest estimate of 2018. Close to 600 million people, which represents more than two-thirds of the global total, are from Sub-Saharan Africa [1]. According to the 2018 data of IEA, about half of the Sub-Saharan Africa population living without electricity access is from five countries; namely Nigeria, the Democratic Republic of Congo, Ethiopia, and Uganda.

In developing countries, solar photovoltaic (PV) has got the potential to be an alternative source of clean energy at the household level [2]. Similar to developed countries, many developing countries in Asia, Africa,

and South America are emphasizing the inclusion of solar power in their energy mix to lessen the burden on non-renewable and expensive sources of energy [3]. In Africa, rapid progress has been seen in the propensity of using SHS. For instance, Ethiopia, Kenya, and Tanzania accounted a significant number of people gaining access to new SHS in 2018 [1].

Renewable energy and energy efficiency are key to sustainable development, enabling energy access, spurring economic growth, creating employment, and improving health [4,5]. To address the energy crisis of poor households in developing countries, off-grid solutions including solar home systems, solar lighting, and increasingly mini-grids are decisive [6].

Even though Solar Home System (SHS) has a high upfront cost, it has been considered as an attractive alternative energy source for households located in off-grid areas of many developing countries due to its cleanness, and simplicity to use [7]. Green innovations such as solar have the potential to lower fossil fuel dependency and minimize carbon emissions. But introducing such kinds of energy technology in developing countries requires financial and educational support [8].

However, there are limited studies in most of the developing countries regarding what factors determining the attitude of households whether to adopt or reject SHS, particularly in Ethiopia. For instance, in Africa, many scholars such as Adepoju [17] [Nigeria], Gitone [18], Keririr [19], and Naomi [20] [Kenya] are only concerned with determinants that hinder the adoption of solar energy in a general manner. Likewise in Ethiopia, Mekuria [21], Guta [22], Anteneh [23], and Zeru and Guta [24] studied determinants of solar energy adoption.

Although there is a growing interest in investigating the determinants of solar energy technology adoption, in a general manner, there are limited studies on the factors influencing household attitudes towards solar home systems. Since solar is infant technology in rural Ethiopia, it is imperative to study households" attitudes towards using SHS and factors dictating it to give informed policy recommendations. Focusing on these factors policymakers promote acceptance of the technology within the rural community.

Therefore, the main purpose of this study was to investigate factors affecting the attitude of households towards SHS using ordered logistic regression. The result of the study will have a vital role in developing programs and policy formulation by providing current and valuable evidence for promoting the adoption and use of the solar home system and other renewable energy technologies in rural Ethiopia.