

DOWNLOAD PDF PROJECT TITLE: IMPACTS OF RURAL ELECTRIFICATION IN RWANDA

Chapter 1 : Socio-economic impacts of rural electrification in Rwanda: An ex-ante assessment of GTZ activities

IZA Discussion Paper No. December ABSTRACT Impacts of Rural Electrification in Rwanda Rural electrification is believed to contribute to the achievement of the MDG.*

However, evidence on the economic benefits of rural electrification projects remains empirically unexamined Lee et al. These infrastructural investments will be required to improve electricity penetration into rural areas and electricity access for rural households to achieve universal access by the year 2015. The income and welfare impacts of rural electrification in Ghana To quantify the income and welfare benefits of rural electrification, we combined two geographically referenced datasets: A nationally representative household survey. The GLSS dataset and information on grid-connected communities together with the household characteristics allowed for an estimate to be made of the impacts of rural electrification on income and welfare outcomes. Electricity access is found to improve the gross income of households compared to households without access. Measured by real household expenditure per capita, we found that expenditure is about 10% higher for households with access to electricity. Access to electricity improves the incomes of relatively high-income households more than low-income households. This result implies that: Electricity access improves the gross income of all households, irrespective of the initial level of income at the time they are exposed to electricity. High-income households benefit relatively more from electricity access compared to poorer households. Thus, access to electricity has the potential to widen the income gap among rural populations, and to reduce the income gap between urban and rural households. These results are consistent with some studies from Benin, Uganda, South Africa and India Toman, but are contrary to a number of other studies in Rwanda Lenz, and Tanzania Chaplin, Pathways of impact on income and welfare: There are many potential channels through which rural electrification will have an impact on the income and welfare of households. Our study indicates that ownership of non-agricultural enterprises and educational attainment are two important pathways through which access to electricity improves the economic welfare of rural households in Ghana. Ownership of non-agricultural enterprises pathway Access to electricity enables the modernisation of agriculture e. The modernisation of agriculture and extended business hours can provide increased employment opportunities to electrified communities, which can affect welfare. We found that rural households with electricity that own a non-agricultural enterprise and the income from non-agricultural enterprises is likely to be about 4 times higher than those without. Thus, the establishment and operation of non-agricultural enterprises provides an important pathway through which rural electrification affects the income and welfare of rural households in Ghana. In the case of earlier studies in Rwanda, Benin, and Uganda, there are no impacts on firm creation or non-agricultural employment Toman, Education attainment pathway Some existing evidence from Peru Dasso, , Northern El Salvador Barron, , and Bangladesh Samad, show that access to electricity increases study hours for electrified communities leading to improved educational attainment, higher earnings, and a reduction in poverty in the long run. The study supports this evidence in the case of Ghana. Schooling years representing educational attainment is about half-a-year higher, on average, among members of rural households with electricity compared to rural households without electricity. Even though the study does not directly attribute the differences in income and welfare between households with access and those without access to education. However, the effect of education on income and welfare will be realised in the long-run. Policy implications There is clear evidence that rural electrification in Ghana improves the income and welfare of rural households. Therefore, there is economic justification for investment in rural electrification in Ghana. By extending electricity to the economically-vulnerable powerless , there is a potential for speeding the development of rural enterprises, which can lift people out of poverty. Government can realise the benefits of rural electrification in reducing poverty and unemployment by establishing agriculture support enterprises or factories cottage industries in rural areas that have been electrified. This will contribute to the modernisation of agriculture, by allowing for the use of mechanised practices. Moreover, enterprise development programmes should be designed to encourage individual end-users in rural

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communities to utilise electricity productively through incentives such as subsidising the costs of connection and appliances Lee, Electrification and Time Allocation: The Benefits of Solar Home Systems: How much does Sub-Saharan Africa need the grid?

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Chapter 2 : Impacts of rural electrification in Rwanda - EconBiz

Rural electrification is believed to contribute to the achievement of the MDG. In this paper, we investigate electrification impacts on different indicators. We use household data that we collected in Rwanda in villages with and without electricity access.

August 15, through August 14, Project Amount: Dartmouth Humanitarian Engineering brings sustainable electricity to rural populations in Rwanda through small-scale hydropower systems. We operate our sites as battery-charging kiosks, renting out batteries on a monthly basis. The relatively small size of our systems minimizes environmental impact while still allowing even remote community members to replace kerosene lamps with LEDs, charge their cell phones, and use other small electric appliances. Our use of local labor and materials not only engages communities in the development phase, but ensures the long term sustainability of the project. By involving the local community throughout the process and training people in the operation and maintenance of the system, our projects empower local people, create business opportunities and stimulate the economy. Moreover, we aim to transition our project towards a future in which Rwandan entrepreneurs can build and operate sites like ours without outside assistance. To accomplish this goal, we are working on designing our projects to be entirely locally fabricated. This involves developing the metal pelton turbine, the turbine used for our previous projects, while in Rwanda, which we aim to do through a process called sandcasting, which will be described below in the proposed phase II objectives and strategies. Once we identify a team of Rwandans committed to taking over the project, DHE has a three-year plan to phase out involvement while ensuring a successful transition to Rwandan ownership. By passing the project on to local Rwandans, we will both make the small-scale hydro projects in Rwanda even more sustainable, as well as enable our organization to direct our attention to another country, and begin implementing hydro sites there. DHE, in collaboration with the Wildlife Conservation Society, designed and implemented the inaugural hydropower system in Banda, Rwanda. The two sites implemented in Banda - Nyiragasigo and Kigogo - have provided electricity for the village since its construction in . The hydro team has since worked with graduate students to create a more efficient, aluminum cast turbine and implemented a site close to campus to conduct testing. In the summer of , the group went back to Rwanda to update the pilot systems in Banda and assess new sites for future implementation. The updated system utilizes the custom turbine created on-campus at Dartmouth. In the summer of , DHE sent a 7 person team to Rwanda with a prefabricated custom- designed pelton turbine to implement a site at c in the southern province of Rwanda. Despite some initial complications with bureaucratic approval and logistic, the team successfully implemented the Rugaragara site, which produces 1kW of electricity. While in Rwanda, the team also checked up on the sites implemented in and upgraded . They found that the Nyiragasigo site would benefit from some electrical upgrades, specifically the use of a better generator and the switch to an AC electrical system. However, they were pleased to find that the site was still producing a significant amount of power over W and was still being successfully run by Rwandan site operators. The Kigogo site was running even more smoothly, with a W power output, and was charging many batteries for households, churches, and schools in Banda. In terms of generating revenue and making profit, the two sites at Banda appeared to be doing well. However, the team determined that even more profit could be created by rearranging the system of shopkeepers and managers. We determined that our system can draw enough revenue to become profitable. Moreover, our hydropower sites are enduring, as they are all still functional and providing electricity via charged batteries. Our use of local labor in building the sites has created jobs for members of the communities we work in. Moreover, we have created long-term positions by setting up a system of shopkeepers and site managers. Most importantly, we have generated thousands of kilowatt hours of energy that has provided electricity for schools, homes, shops, churches, and individual devices like cell phones in the communities we have worked in. However, the system needs some improvements in order to become entirely self- sustainable. First, our current systems employ imported

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turbines, rather than turbines that have been made in country. This has prevented local entrepreneurs from being able to employ a similar system. Thus, we have concluded that we must be able to build our entire system, turbine included, in country in order to create an entirely sustainable business model. Top of Page The perspectives, information and conclusions conveyed in research project abstracts, progress reports, final reports, journal abstracts and journal publications convey the viewpoints of the principal investigator and may not represent the views and policies of ORD and EPA. Conclusions drawn by the principal investigators have not been reviewed by the Agency.

Chapter 3 : Impacts of Rural Electrification in Rwanda

This paper analyzes impacts of rural electrification on the basis of ex-ante data from Rwanda. The baseline study is designed in a way that allows for an ex-ante impact assessment. To this end, we proceed in three steps.

Chapter 4 : afrol News - Senegal strengthens rural electrification

Rural electrification is believed to contribute to the achievement of the MDG. In this paper, we investigate electrification impacts on different indicators.

Chapter 5 : Rural electrification in Rwanda : an impact assessment using matching techniques - EconBiz

Impacts of Rural Electrification in Rwanda 16 [5.] Conclusion - Study design of rural electrification project allows for ex ante impact.

Chapter 6 : POWER AFRICA IN RWANDA | Power Africa | U.S. Agency for International Development

Rural electrification is believed to contribute to the achievement of the MDG. In this paper, we investigate electrification impacts on different indicators. We use household data that we collected in Rwanda in villages with and without electricity access. We account for self-selection and regional.

Chapter 7 : Impacts of Rural Electrification in Rwanda - calendrierdelascience.com

Rural electrification is believed to contribute to the achievement of the Millennium Development Goals. In this paper, we investigate electrification impacts on different indicators. We use household data that we collected in Rwanda in villages with and without electricity access. We account for.

Chapter 8 : EconStor: Impacts of rural electrification in Rwanda

Rural Electrification in Rwanda: A Measure of Rural Electrification in Rwanda: A Measure of Willingness to Contribute Time and project of gas extraction. 88%.

Chapter 9 : Powering the powerless: Economic impact of rural electrification in Ghana - IGC

In rural Rwanda, the electrification rate is even considerably lower at % (UNDP/WHO). As part of the efforts to achieve the MDGs it is among the national.