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Walking for Water and Fuelwood: Welfare Implications for Women in Ghana
Monica Lambon- Quayefio (University of Ghana)

1. Introduction

The slow progress with access to modern energy sources, particularly, non-solid cooking fuels and the lack of access to clean water across many sub-Saharan African countries partially explain the amount of time women and children spend on these house chores. In sub-Saharan African (SSA) countries, about two-thirds of the population report accessing water outside of their homes (Pickering et al. 2012). On average, it takes about 33 minutes to collect water for rural households and 25 minutes for a round trip for households in urban areas. Time spent on collecting fuelwood, as reported by Cundale et al. (2017) and Gwavuya et al. (2012), ranges from 4-20 hours per week depending on the level of deforestation.

In most SSA countries, such tasks are heavily gendered as women and girls bear the responsibility of fetching wood and water within households in addition to other domestic work such as cleaning and cooking. As a result, women and girls are constrained in their ability to directly engage in productive activities due to the simultaneity in the discharge of multiple responsibilities within the households. Existing literature on time use indicate that men’s responsibilities are usually more sequential compared to women. The competing needs for women’s time then compel them to make choices and trade-offs which present challenges for poverty reduction. Women’s time allocation decisions, are therefore, directly associated with their poverty levels, a concept that has been widely discussed in the literature, including Vickery (1977); Harvey and Taylor (2002); Illahi (2000) among others.

In relatively recent literature, studies such as Koolwal and van de Walle (2013) and Bardasi and Wodon (2010) have argued that the long distances women have to travel to fetch water and fuelwood have been associated with their ‘time poverty’. This implies that women are more likely to make difficult trade-offs in the face of the competing demands on their time. The increased time poverty and the physical demands associated with fetching water and fuelwood ultimately restricts their involvement in paid employment and other social and recreational activities. Seymour et al (2017) posit that this sacrificed opportunity has the potential to perpetuate a cycle of gender inequality, poverty and socio-economic empowerment of women in general. The objective of the study is to examine the relationship between women’s time and distance to water and fuelwood on the one hand and indicators of women’s labour market outcomes and well-being in the Ghanaian context.

The current study aims to contribute to the literature by employing precise measures of health and women's employment outcomes. First, beyond the common use of extensive margin measures of employment such as whether or not the individual is currently employed, this research examines impacts on the intensity of women's work. Furthermore, the study is able to measure effects on women's leisure activities- and outcome that have not been considered in previous studies. Second, the paper explores the effects on women's health outcomes. While many of the previous studies have not been able to empirically examine health effects on women due to data limitations, the current study takes advantage of anthropometric measures and subjective health ratings to explore health and nutrition effects on women.

The specific research questions are as follows:

- a. What is the effect of time spent on accessing water and fuelwood on women's labour market outcomes?
- b. To what extent does the time spent on accessing water and fuelwood for household use affect women's health.?
- c. To what extent does the burden of accessing water and fuelwood women's leisure activities?

2. Data

The study makes use of the third wave of the Ghana Socio Economic panel data collected in 2018-2019. This is a nationally representative data of about 5000 households.

Access to water, defined by distance to drinking water and the round trip (in minutes and hours) it takes to fetch fuel wood are the two main independent variables of interest. The outcome variables of interest are: (1) women's employment types; (2) leisure activities (i.e. watching television or sleeping) (3) number of days worked in the past week prior to the survey- measure of intensity women's work. (4) body mass index, waist-to height ratio and women's self-rating of health.

Four employment categories are considered and all constructed as dummy variables where paid employment, ownership and operation of business or farm as well as participation in unpaid work are all coded as 1 and zero otherwise.

Health outcomes are proxied by anthropometric measures such waist-to-height ratio, body mass index and subjective health ratings for women.

3. Empirical Strategy

To get around the problem of simultaneity bias, the study implements an instrumental variable technique which estimates the relationship of interest in two stages. Following Agesa and Agesa (2019), the study considers a set of infrastructure related variables as instruments for the time spent to fetch water and gather fuelwood. These instruments are captured as binary variables, taking on a value of 1 if households are connected to electricity, have access to internet, cook with wood, and 0 otherwise.

4. Preliminary Findings

The preliminary results are consistent with the home production and time allocation framework used by Koolwal and van de Walle (2013) and Agesa and Agesa (2019). The study notes the following preliminary findings for the instrumental variable estimations.

Labour market outcomes

Distance to drinking water and time to fuel wood significantly reduces the likelihood of women in paid employment, of ownership and operation of own farm or business. However, both distance to water and time to collect fuel wood increases women's likelihood of engaging in unpaid work. The study also finds strong evidence for reduced intensity of work with increased distance to drinking water. Similar effects are obtained for time to fuel wood, although this result is marginally significant.

Health Outcomes

Women's health outcomes were worsened with increased distance to drinking water. Specifically, distance to drinking water significantly reduces women's anthropometric measures as well as the subjective well-being. Estimations shows no significant effect of time to wood on women's health outcomes.

Leisure outcomes

Evidence suggests a negative impact of women's distance and time to water on leisure activities. However, the finding on time spent to fetch wood is not statistically significant.

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