

Beyond the Grid: Women's Empowerment in Energy and Household Well-being: Evidence from South Asia

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Introduction

- Many day-to-day activities that use energy are activities in which women are engaged, but women bear the costs of unequal distribution of energy.
- Little is known about how intra-household dynamics contribute to the heterogeneous relationship between gender and energy access/use.
- Qualitative studies suggest a vital role of women's empowerment in energy access or use, but empirical evidence is limited.

Energy and health?

- In efficient energy use has implications for livelihoods, income and health
- Polluting fuel use affects respiratory health, esp women and children
 - 50% pollution related health due to indoor air pollution
- Time spent in collection of fuel and water, opportunity cost & drudgery
- Climate crisis will exacerbate threat to energy availability hence livelihood and health
- Large scale polluting energy use climate hazard, community level energy insufficiency affects vital services and health facilities

Energy Empowerment Framework

- Access: Women's ability to obtain reliable, affordable, and clean energy sources and energy technologies for both productive and domestic use.
- Individual Agency: Women's power to make strategic choices about energy use, investments, & management in the household, on & off farm.
- Capacity: Women's knowledge, skills, and confidence to utilize energy technologies effectively & participate in energy-related decisions within the home & community.
- Economic well-being: Women's opportunities to generate income, save time, & improve productivity through enhanced energy access.
- Collective agency: Women's representation & active participation in energy-related governance structures, from community groups to policy-making bodies.

Data and methods

- Primary farm and household surveys conducted between December 2022 and February 2023
 - India- Bihar and Jharkhand
 - Nepal- Madhesh and Karnali
 - Pakistan- Rahim Yar Khan- Punjab
- Intra-household survey covered individual demographics, socioeconomic status, agricultural practices, crop economics, A-WEAI, and food consumption patterns.
- Women's Empowerment in Energy Score (WEES) is a set of 8 indicators to assess the empowerment of women in energy use and energy decisions on- and off-farm.
- WEES is designed to supplement WEAI and:
 - Assess the level of women's agency in energy decisions for domestic and productive use relative to men.
 - Assess relationship of women's agency in energy decisions with individual and household outcomes.

WEES, WEAI and Sensitivity analysis

- Correlation between WEES and A-WEAI indicators are weak ($V < 0.3$) across all three countries.
- Weak correlations indicate WEES contributes information about agency beyond empowerment captured by WEAI.
- WEES therefore provides beneficial supplement to A-WEAI in understanding gender differences in energy use decisions on-farm and in the household.

WEES Indicators

	Indicator	Adequacy definition
1	Has unrestricted access to mechanized productive assets	Adequate if respondent has unrestricted access to at least one mechanized asset that the household has access to for income generation (tractor, pump, sewing machine, etc.)
2	Has unrestricted access to mechanized consumer durables for domestic use	Adequate if respondent has unrestricted access to at least one mechanized consumer durable the household has access to for domestic use (television, fridge, cookstove, etc.)
3	Decides on acquiring energy source for domestic use	Adequate if solely or jointly decides which energy source to acquire for cooking, heating, and lighting
4	Decides on acquiring energy source for productive use	Adequate if solely or jointly decides which energy source to acquire for all agricultural and other income-generating activities applicable to the household
5	Decides on changing energy source for domestic use	Adequate if solely decides OR can participate to a medium or high/er extent in decisions about changing from unclean to clean energy sources for domestic use (for all sources needed for cooking, heating, and lighting)
6	Decides on changing energy source for productive use	Adequate if solely decides OR can participate to a medium or high/er extent in decisions about changing from unclean to clean energy sources for productive use (sources for use in all agricultural, post-harvest and non-farm business activities applicable to the household)
7	Acquires energy source for domestic use	Adequate if solely or jointly responsible for acquiring energy source for cooking, heating, and lighting
8	Acquires energy source for productive use	Adequate if solely or jointly responsible for acquiring energy source for all agricultural and other income-generating activities applicable to the household

Results

- Significant disparities between men and women in decision over energy sources for productive use, but not energy assets
- Wealth and energy empowerment negatively correlated in Pakistan, opposite in Nepal. Wealthier HHs more unequal in India
- FHHs have higher WEES in Nepal
- Women with higher WEES more likely to participate in the labor market
- In Nepal & Pakistan WEES positively correlated with clean energy use, but opposite in India
- Relationship between WEES and time poverty ambiguous
- WEES associated with lower food insecurity in Nepal and higher dietary diversity in Pakistan

Discussion

- We develop a metric to measure gendered energy related agency and its relationship with individual and household level outcomes.
- Findings reveal complex context-specific relationships between development outcomes & women's energy agency in South Asia.
- WEES can track progress, guide interventions, and complement other metrics for a holistic view of household deprivation.
- Future research will refine WEES by including additional aspects like time spent collecting fuel and health impacts of polluting fuels.