

Issue 87 | February 1, 2013 | Focus on Cookstove "Stacking"

This issue focuses on "stacking," which is the use of multiple fuels/stoves at one time. Stacking is a complex factor that influences the adoption and use of cookstoves. In many households, traditional stoves are used at the same time as improved cookstoves, or the different stoves may be used for different foods. Evidence points to the simultaneous use of different fuel regardless of income levels. Households continue to use different fuels as their incomes rise, and they do not immediately abandon the use of fuelwood. Other factors, such as reliability of supply, safety, and taste preferences of food cooked using fuelwood, may be factors under consideration by households.

REPORTS/PRESENTATIONS

- **Assessment of the Improved Stove Market in Bangladesh**, 2012. USAID. ([Full text, pdf](#))

The main conclusions from this study include: there is currently no national-level agency in Bangladesh that establishes quality standards for stoves and conducts monitoring and evaluation; choice is limited at the present to one dominant stove design; promoters have yet to carry out a rigorous assessment of improved cookstoves that users are prepared to purchase.

- **Assessing the Climate Impacts of Cookstove Projects: Issues in Emissions Accounting**, 2013. C. Lee, SEI. ([Full text, pdf](#))

This paper evaluates the quantification approaches of three key variables in calculating emission impacts: biomass fuel consumption, fraction of nonrenewable biomass, and emission factors for fuel consumption. It draws on a literature review as well as on interviews with technical experts and market actors, and identifies lessons learned and knowledge gaps.

- **Determinants of Rural Household Energy Choices: An Example from Pakistan**, 2012. I Jan, Institute of Development Studies. ([Full text, pdf](#))

Rural households exhibit fuel switching according to changes in their economic situation.

- **A Field Assessment of Adoption of Improved Cookstove Practices in Yogyakarta, Indonesia: Focus on Structural Drivers**, 2012. C Geary, FHI 360. ([Full text, pdf](#))

In many households, traditional stoves are used at the same time as improved cookstoves, or the different stoves may be used for different foods. It is not merely the household acquisition of an improved cookstove, but its correct and sustained use to the relative exclusion of less efficient stoves that is critical to improving health, though any movement toward behaviors that reduce emissions are valued.

- **Household Energy Access for Cooking and Heating: Lessons Learned and the Way Forward**, 2012. World Bank. ([Full text, pdf](#))

The energy ladder model assumed that as income levels increase, people will switch from the use of solid fuels to cleaner fuels. Instead of an orderly fuel-switching process based on income levels, evidence points to fuel stacking or the simultaneous use of different fuel regardless of income levels. Households continue to use different fuels as their incomes rise, and they do not immediately abandon the use of fuelwood. This suggests that high income levels alone may not be a sufficient determinant of fuel switching.

- **Putting the Cook Before the Stove a User-Centred Approach to Understanding Household Energy Decision-Making: A Case Study of Haryana State, Northern India**, 2012. F Lambe, Stockholm Environment Institute. ([Full text, pdf](#))

This study seeks to better understand the most important influences over household energy choices to identify practical ways to support communities shifting to cleaner energy use. We use a qualitative “generative” research methodology to investigate energy use and dynamics in four villages in Haryana State. Our results indicate a range of social, cultural, and financial factors that influence the way people make decisions about energy and cooking, including the availability and flexibility of traditional fuels, the type of dishes prepared, the taste of food, problems with smoke, the aesthetic appeal of stoves, and how users perceive alternatives.

- **Socio-Cultural Acceptability of Improved Cook Stoves (ICS) in Rural Malawi**, 2012. Concern Universal. ([Full text, pdf](#))

Even when households have ICS many continue to use three-stone fires in addition to the ICS, a practice sometimes called fuel stacking. This can be due to time pressures, perceived levels of heating power (i.e., low calorific values), or limited power control of ICS and ICS’s limited tolerance to different wood qualities (e.g., higher moisture content, shape, type of fuel) compared to three-stone fires.

- **Stove Performance Inventory Report: Prepared for the Global Alliance for Clean Cookstoves**, 2012. Berkeley Air Monitoring Group. ([Full text, pdf](#))

The inventory shows that liquid and gas fuels along with biomass fan and gasifier stoves have the greatest potential for achieving aspirational health and environmental

benefits but are the least tested types of technologies. While this data on the performance of technologies and fuels is critically important to the sector's progress, an equally important parallel relates to understanding user behaviors and stove adoption, which will be critical for achieving the maximum benefits from clean technologies in the real world. The report recommends a systematic review of adoption parameters and commissioned research to fill identified gaps, including a more nuanced understanding of kitchen management and stove stacking across key geographies.

- **Stove Stacking: The Integration of the Justa Cookstove in One Rural El Salvadoran Community**, 2011. A Redman. ([Presentation, pdf](#))

This presentation concludes that there is no universal hierarchy of cooking technologies. Each has its own advantages and disadvantages for different people, times, and foods. The stacking of stoves is not just a transition; households are taking a strategic approach to their stove choices and use.

- **Will African Consumers Buy Cleaner Fuels and Stoves? A Household Energy Economic Analysis Model for the Market Introduction of Bio-Ethanol Cooking Stoves in Ethiopia, Tanzania, and Mozambique**. T Takama, Stockholm Environment Institute. ([Full text](#))

This report presents a study conducted by the Stockholm Environment Institute to empirically assess the role of socio-economic attributes and product-specific attributes as determinants of cooking stove choice at the household level. The findings of this study illustrate the respective roles of socio-economic and product-specific attributes as determinants of stove/fuel choice and permit estimation of the relative strengths of product-specific attributes in determining stove/fuel choice at the household level.

- **The Changing Climate of Household Energy: Determinants of Cooking Fuel Choice in Domestic Settings in Axim, Ghana**, 2011. N Manyo-Plange. ([Full text, pdf](#))

This study aims to answer what are the determinants of fuel use in domestic settings in Ghana and identify women's attitudes to fuel-switching to understand why some households use multiple fuels for cooking, and to determine how women respond to energy stress. The current approach to understanding household cooking fuel usage has been to focus on institutional barriers and bridges to provide poor households access to modern fuels. Much attention has also been given to the health impacts of biomass use and indoor air pollution, but it appears that little has been done to identify the determinants of cooking fuel use in poor households in any depth. In light of this gap in knowledge, this study seeks to provide further insight into the attitudes and behaviors of women in Ghana regarding their choice of cooking fuel.

- **The Stoves Are Also Stacked: Evaluating the Energy Ladder, Cookstove Swap-Out Programs, and Social Adoption Preferences in the Cookstove Literature**, 2012. J Gordon. ([Free download but registration is required](#))

Households base their fuel use and cookstove technology preferences on highly

personal, localized factors that are the key component to a public or private model's success. Several studies have attempted to explain adoption by using diffusion of innovation theory, technology adoption theories, and social-psychology based approaches, including the theory of planned behavior. Although these theories allow for a better understanding of household energy decision making, the multifaceted behavioral, cognitive, and social processes applied in these decisions are still not well understood.

JOURNAL ARTICLES

- **Cooking Practices, Air Quality, and the Acceptability of Advanced Cookstoves in Haryana, India: An Exploratory Study to Inform Large-Scale Interventions.** *Global Health Action*, Sept 2012. R Mukhopadhyay. ([Full text, pdf](#))
Twenty-eight of the 32 participating households had outdoor primary cooking spaces. Twenty households had liquefied petroleum gas (LPG) but preferred traditional stoves as the cost of LPG was higher and because meals cooked on traditional stoves were perceived to taste better. The Philips stove, which burns biomass and requires minimal fuel processing, was used more often and for more hours than the other stove in the study.
- **Evaluating the Relative Strength of Product-Specific Factors in Fuel Switching and Stove Choice Decisions in Ethiopia: A Discrete Choice Model of Household Preferences for Clean Cooking Alternatives.** *Energy Economics*, Nov 2012. T Takama. ([Full text](#))
This paper reviews some key theoretical dimensions of household consumer behavior in switching from traditional biomass cooking stoves to modern efficient stoves and fuels. It then describes the results of empirical research investigating the determinants of stove choice, focusing on the relative strength of product-specific factors across three wealth groups. A stated preference survey and discrete choice model were developed to understand household decision making associated with cooking stove choice in Addis Ababa, Ethiopia. The study found that, with the exception of price and usage cost factors for the high wealth group, the product-specific factors that were investigated significantly affect stove and fuel choices.
- **Reducing Cardiovascular Disease through Improvements in Household Energy: Implications for Policy-Relevant Research.** *Global Heart*, Sept 2012. J Baumgartner. ([Full text, pdf](#))
Rather than substituting one fuel for another as income increases, households instead add fuel/stove combinations in a process of stacking. Modern energy forms are often used sparingly at first and for specific tasks (e.g., electricity for rice cookers or liquefied petroleum gas for boiling water) rather than entirely substituting an existing energy form that already meets household needs. Consequently, introduction of cleaner stove/fuels often has less pollution benefit than would be estimated in advance unless an allowance is made for this stacking phenomenon.

- **Who Adopts Improved Fuels and Cookstoves? A Systematic Review.** *Env Health Perspec*, May 2012. J Lewis. ([Full text, pdf](#))

This study considered 135 analyses from 25 articles that examined fuel switching from solid fuel (dung, agricultural residue, biomass, charcoal, or coal) to a cleaner fuel. All variables of interest except access to credit were included in at least one of the fuel choice analyses. Only three variables—head of household education, income, and household size—were considered by more than half of the analyses.

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