WASHplus Weekly
Supportive Environments for Healthy Communities

Issue 159 | August 29, 2014 | Focus on Cookstoves Monitoring & Testing

Product performance monitoring and field testing are important for establishing the credibility and comparability of various cookstove technologies and product offerings for end users. This issue of the WASHplus Weekly highlights recent cookstove performance monitoring and field testing research and studies.

ARTICLES/PAPERS/REPORTS

A Laboratory Based Comparative Study of Indian Biomass Cookstove Testing Protocol and Water Boiling Test, *Energy for Sustainable Development,* Aug 2014. P Arora, TERI University. (Abstract)
This study was carried out to compare cookstove performance using the water boiling test and the Indian Standard on Solid Biomass Chulha Specification developed by the Bureau of Indian Standards for testing cookstoves.

Improved Test Method for Evaluation of Bio-mass Cook-stoves, *Energy*, July 2014. P Raman. (Link)
One of the major challenges of existing cookstove testing protocols is to narrow down the gap between the test results obtained under lab conditions and actual cooking conditions. This paper makes recommendations to reduce the gaps in test methodology in such a manner that the test results obtained in the lab are comparable with the results of actual cooking carried out in the kitchen.

Guidelines for Testing Charcoal Stoves with WBT 4.2.2, 2013. United Nations Foundation. (Link)
The following guidelines are intended to improve repeatability and reduce variability both from test to test and from site to site. The Water Boiling Test 4.2.2 protocol, supplemented by these guidelines, should be followed for those tests where the results are intended to be consistent with what would be obtained at other testing centers around the world following this same protocol.

Field Trial Testing of an Electricity-Producing Portable Biomass Cooking Stove in Rural Malawi. *Energy for Sustainable Development*, June 2014. M O'Shaughnessy. (Abstract)
This study details the results of an 80-day field trial of a thermo-electric generating device that has been integrated with a cooking stove. The stoves were equipped with temperature

and power data logging equipment. Users were able to charge mobile phones, lights, and radios from the stove generator. The field trial will inform a redesign of the generator.

Exposure Assessment: New Innovations in Methods and Modeling, and Practical Lessons from the Field, May 2014. Global Alliance for Clean Cookstoves. (Link)
This report from the Clean Cooking and Child Survival Workshop Meeting covers intervention choice, design considerations to maximize optimal use, in-field performance, new innovations in exposure assessment methods and modeling, and outcome assessments. Health and exposure assessment experts working in Ethiopia, Ghana, Guatemala, India, Kenya, Malawi, Nepal, Nigeria, and Peru attended the meeting and shared research plans, progress, interim results, and lessons learned to date.

Assessing the Impact of Water Filters and Improved Cook Stoves on Drinking Water Quality and Household Air Pollution: A Randomised Controlled Trial in Rwanda. *PLoS One, Mar 2014.* G Rosa. (Link)
The authors conducted a five-month household randomized controlled trial among 566 households in rural Rwanda to assess uptake, compliance, and impact on environmental exposures of a combined intervention delivering high-performance water filters and improved stoves.

How Many Replicate Tests Are Needed to Test Cookstove Performance and Emissions? – Three Is Not Always Adequate, 2014. Y Wang. (Link)
The authors describe a practical approach, useful to both stove testers and designers, to assess the number of replicates needed to obtain useful data from previously untested stoves with unknown variability.

Standard Stove Performance Testing, 2014. K Weinbaum. (Link)
The author recommends a two-pronged approach to testing: laboratory testing using local food preparation within the controlled laboratory environment, and controlled cooking cycles in the field for verification. Field trials would require local users in their own households to prepare the same meals in order to reduce variability in stove performance testing results due to differences in number or types of meals.

Numbers Don't Lie: New Monitoring Devices Measure the Impact of Improved Cookstoves, December 2013. *Engineering for Change*. R Goodier. (Link)
How can stove developers learn about cooking practices in the millions of open-fire kitchens worldwide? And how much, if at all, are the stoves reducing air pollution and fuel consumption? New monitoring technologies coming online now may have some answers.

Quantitative Metrics of Stove Adoption Using Stove Use Monitors (SUMs), 2013. *Biomass and Bioenergy.* I Ruiz-Mercado, et al. (Link)
Quantifying stove adoption requires affordable tools, scalable methods, and validated metrics of usage. This research quantified the longitudinal patterns of chimney-stove use of 80 households in rural Guatemala, monitored with stove use monitors over 32 months.

A Summary Review of Global Standards and Test Protocols Relating to Product Quality Standard Development for Household Biomass Cookstoves. D Kaisel, Berkeley Air Monitoring Group. (Link)
The scope of this document is to provide a high-level review of biomass-fueled stove performance and emissions standards, and relevant test methodologies as adopted by

standardization or regulatory authorities worldwide, with the objective of providing empirical reference points for the development of national stove evaluation criteria and product standards.

PRESENTATIONS

Measuring Performance and Reporting Results, Clean Cooking Forum 2013. D Charron, Berkeley Air Monitoring Group. (Link)

Integrating Monitoring and Evaluation into Cookstove Programs, Clean Cooking Forum 2013. D Charron, Berkeley Air Monitoring Group. (Link)

International Standards and Next Steps for Clean Cooking, Clean Cooking Forum 2013. R Chiang, Global Alliance for Clean Cookstoves. (Link)

Measuring Progress During Phase I: Building on the IWA Interim Guidelines, 2014. S Mehta and R Chiang, Global Alliance for Clean Cookstoves. (Link)

WEBINARS

Results from CCT Studies and Stove Design and Performance Testing Workshops in Vietnam, Mexico, and Nepal. EPA/Winrock Webinar, July 2014. (Link)
In 2012 and 2013 Aprovecho Research Center, with support from EPA and Winrock International, conducted controlled cooking test field studies and provided technical training for organizations working to promote cleaner, more efficient cooking technologies in Vietnam (2012), Mexico (2013), and Nepal (2013). In July 2014, Winrock and EPA hosted a webinar to present results and lessons learned from the studies and information about how these results can inform and improve cookstove design, performance, and use.

Advances in Cookstove Field Monitoring. EPA/Winrock Webinar, September 2013. (Link)
Experts provide information on new and innovative technologies/platforms used for monitoring cookstove performance and use in the field, and discuss how field monitoring can be used to better inform implementers, funders, and policy makers. Dr. Michael Johnson from Berkeley Air Monitoring Group presents on the Platform for Integrated Cookstove Assessment, Dr. Nithya Ramanathan from Nexleaf Analytics presents on low-cost remote sensors, including the Black Carbon Cellphone Based Monitoring System, and Dr. Charles Rodes from RTI International presents on the MicroPEM™.

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