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# Duke University: Research on Acquisition and Correct Use of Improved Cookstoves in India

## Research Overview

Duke University was awarded funds in August 2011 to conduct research on introducing various behavior change communication (BCC) components into Project Surya, which has been working to increase dissemination and use of cleaner-burning cooking technologies in Uttar Pradesh, India. After refining common theories of behavior change based on the Indian context and identifying promising BCC interventions, Duke will implement and evaluate the impact of these interventions on improved cookstove (ICS) acquisition and correct use. The study will take into account contextual factors, cost, and reliability of data collection methods. Partners on the project include The Energy and Resources Institute (TERI) of New Delhi, India, Nexleaf Analytics of Los Angeles, California, and Scripps Institution of Oceanography, San Diego.

## Research Design

An initial planning phase will involve extensive research using expert advisors, existing data, and literature reviews. Baseline analysis, consisting of a survey of 2000 households, will lay the groundwork for testing the effects of the intervention on the adoption and correct use of ICS.

Interventions will include:

- Stove Price Modifications – Households will be offered various levels of subsidies, ranging from zero to full subsidy, or financing options that allow households to spread payments over time.



Two women in India using an improved cookstove.  
*Photo credit: Bryan Willson.*

- An information campaign will either give visual feedback to households on indoor air pollution (for example, by showing them dirty air filters placed in their homes), or education on time savings, money savings, and health benefits related to improved stoves.
- A social marketing campaign will use community-level social mobilization to promote the health and environmental benefits of improved stoves.

The analysis of these interventions, using a quasi-experimental study design, will compare data on household stove behaviors before and after the interventions across matched intervention and control communities. Cohorts will be stratified by size and

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Translating Research into Action, TRAction, is funded by United States Agency for International Development (USAID) under cooperative agreement number GHS-A-00-09-00015-00. The project team includes prime recipient, University Research Co., LLC (URC), Harvard University School of Public Health (HSPH), and sub-recipient research organizations. The Duke sub-award is funded under Contract No. FY11-G08-6990, beginning August 1, 2011. The USAID contacts for this research are Neal Brandes, MPH, and Esther Lwanga, MPH.

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type of community (urban vs. rural), presence of institutional structures (NGOs vs. lack of NGOs), and availability of fuel alternatives. Data analysis will also assess correct stove use, household preferences for specific attributes of cooking technologies, the impact of ICS uptake method on sustained use, costs and benefits of ICS, and social and emotional factors that influence ICS adoption.

## Data Collection

Baseline measurements will be collected through focus groups, site visits, and pilot surveys. Intervention impacts will be assessed using household questionnaires, cookstove temperature monitoring (to measure stove use), and cellphone-based air pollution measurement (to quantify black carbon emissions).

## Scale-up

Results of the study will be used to:

- Develop a guide that can be used to determine potential sales and supply of ICS;
- Inform a protocol for monitoring sales, use, delivery costs, and key supply and demand shifters of ICS;
- Inform Project Surya's demonstration and replication phases, the Indian government's National Biomass Cookstoves Initiative, and the work of other stove groups; and
- Apply the identified benefit-cost outcomes for each intervention to other stove programs.

*The Principal Investigator for this research is Subhrendu Pattanayak, MS, PhD, Associate Professor of Public Policy, Environment & Economics at Duke University and Senior Associate at the Center for International Forestry Research (CIFOR).*

## TRAction Project Overview

The Translating Research into Action (TRAction) Project, funded by the U.S. Agency for International Development (USAID), funds studies to develop, test, and compare approaches to more effectively deliver health interventions, increase utilization, achieve coverage, and scale-up evidence-based interventions for priority health problems. Through implementation research, the TRAction Project addresses “know-do” gaps, or delays between discovery of effective ways to combat the causes of poor health and the application of these proven interventions on a wide scale. TRAction research aims to close these “know-do” gaps so that each country's Millennium Development Health Goals can be met in the targeted timeframes. TRAction emphasizes local ownership and partnerships in order to scale up equitable and sustainable efforts to “do what works.”

For more information on the TRAction Project:

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