



Why Have Improved Cook-Stove Initiatives in India Failed?

MEENA KHANDELWAL^a, MATTHEW E. HILL JR.^a, PAUL GREENOUGH^a, JERRY ANTHONY^a,
MISHA QUILL^b, MARC LINDERMAN^a and H.S. UDAYKUMAR^{a,*}

^a University of Iowa, USA

^b Cornell College, USA

Summary. — An estimated 2.7 billion people cook meals on biomass-fueled brick, stone, and clay stoves. Scarcity of wood and negative impacts on health and environment have motivated efforts to design and distribute “improved” cook-stoves in developing countries. In India, adoption is limited despite massive promotion over many decades. Existing research suggests that many rural women in India do not want improved stoves, and those who do face obstacles to adoption. We step back from the many good case studies to examine the broader story of improved cook-stoves (ICs) in India. We do so by bringing together technical research of applied science and narrative critique of social science. Rather than assuming a priori that traditional stoves require replacement, we ask why Indian cook-stoves been a magnet for so much attention, why adoption rates have remained low, and what lessons might be learned from a broad, multi-disciplinary perspective. Our approach is critical and reflexive, given our own involvement in IC efforts, and puts gender at the center. Our “big picture” review shows that the Indian chulha, for all its problems, is a remarkably successful technology which also satisfies several important household needs. Hence, targeting this device for obsolescence has profound implications that cannot be reduced to energy consumption or environmental hazards. Rural women do not prioritize ICs, but addressing their priorities requires either capital-intensive investment or challenging powerful institutions. In contrast, IC interventions are relatively cheap, decentralized, mechanical and seemingly apolitical, hence their popularity in development programs. Our review of chulha research leads us to reject both the optimism of development planners who frame such problems as technical and the antagonistic pessimism of their critics. Searching for a middle ground requires stepping back from the dogma of efforts to improve biomass cook-stoves.

© 2016 Elsevier Ltd. All rights reserved.

Keywords — India, improved cookstove, technology, gender, history

1. INTRODUCTION: THE COOK-STOVE CONUNDRUM

Cooking with firewood and other biomass fuels is by many accounts among the most urgent problems in the developing world today. An estimated 2.7 billion people cook meals over brick, stone and clay stoves fueled by wood, leaves, dung, etc. (International Energy Agency, 2015). The resulting indoor smoke pollution causes serious health problems, especially for women and children who have the most frequent exposure. The World Health Organization estimates that more than four million people die annually from exposure to indoor or household smoke, and one quarter of these deaths occur in India and South Asia (World Health Organization, 2014, 2016; Yadama, 2013, p. 44). Also at issue is the increasing scarcity of firewood in many parts of the world due to both deforestation and the enclosure or privatization of common lands. Longer and longer treks in search of wood-fuel, combined with illness and death caused by smoke inhalation, exemplify the “slow violence” (Nixon, 2011) that causes profound morbidity and mortality but is not dramatic enough to grab the headlines. Nevertheless, government agencies and development organizations have been researching, designing, and rolling out “improved” cook-stoves (ICs)—also identified as “smokeless,” “clean,” “efficient,” “labor-saving” and “modern”—in many developing countries for nearly a century to address these issues (Barnes, Openshaw, Smith, & van der Plas, 1993; Gifford, 2011; Muniandi, 1993; Sarin, 1986).

In India, efforts to design and diffuse improved cook-stoves began with nationalist organizations in the 1930s; after independence, these efforts were folded into sporadic state-level efforts and then became part of the NGO patchwork of development projects. Very low public demand discouraged the private manufacture and marketing of ICs, but since 2010 official

interest has intensified. New designs, new distribution channels and a new sense of urgency have reached a crescendo with the formation of ministerial-level departments and programs that aim to make biomass combustion in ICs as safe and satisfactory as compressed natural gas (CNG).¹ UN agencies, NGOs and other international organizations have offered technical and material support, and India is under significant pressure to find solutions that will work (Barnes, Kumar, & Openshaw, 2012; Putti, Tsan, Mehta, & Kammila, 2015).² And yet, success has remained elusive. This extended trajectory demonstrates what Sivaramakrishnan and Agrawal call “stories of development” that recognize modernization as a set of stubborn, incomplete projects that draw in a wide cast of authors, activists, and critics (2003, pp. 47–49). This notion of “stories” draws attention not only to the multiple voices joining the fray and the search for heroes (i.e., people or things that solve the problem), but also to the practice of development as an “intimate and unpredictable process” (Sivaramakrishnan & Agrawal, 2003, pp. 47–49).

Our aim in this essay is not to provide new data from field testing of a particular stove, as such case studies exist in abundance, but rather to take a step back and offer a broader view. We synthesize an expansive body of research on cook-stoves in India, which tends to be technical and applied, and bring it into conversation with social science analyses of the power dynamics that shape development and narratives that animate it. Our multi-disciplinary view chips away at disciplinary silos and brings together insights from anthropology, history, gender studies, global health, geography, development, and environmental studies. We summarize medical and technical aspects of this most ordinary kitchen tool, but highlight lesser

Final revision accepted: November 8, 2016

known historical, social, cultural, and gendered aspects of India's IC story. Rather than assuming axiomatically that all hand-built cook-stoves require immediate improvement if not outright replacement, we begin with a different set of big questions: Why have cook-stoves been the focus of so much attention for so long? Why has IC adoption proved so elusive, and what might this delay tell us about the perspectives of those women expected to change their ways and about development more broadly? Our purpose is to demystify the most likely reasons for the long deferment of this development goal. We explore these questions critically and reflexively, even as we ourselves are involved in an effort and ongoing research project to diffuse technology meant to improve cook-stoves in southern Rajasthan. For all its drawbacks the traditional Indian cook-stove, or *chulha*, is a remarkably robust device that has existed in South Asia for millennia.³ Evidence from religious texts, women's songs, and ethnographic studies shows that, for rural women across India, the hearth is primarily associated with home, love, family, and female competence. To target this particular object for change has profound implications that cannot be reduced to either wood consumption or emission of greenhouse gases and particulate matter.

In this review we first demonstrate that the *chulha* has been a target of modernization for almost a century, for some good reasons to be sure, but these efforts are simultaneously part of a larger development logic that frames social, economic, and environmental improvement with familiar narratives. In this first section, we also identify five goals—all worthy and particularly urgent in South Asia—that have motivated various actors in the *chulha* story (improving health, solving the fuel-wood crisis, slowing deforestation, addressing climate change, securing women's empowerment), argue that the Indian *chulha* is an artifact deeply embedded in history and culture, and note its persistence. Second, we summarize current knowledge about the successes and failures of improved cook-stove models and programs in India and identify multiple reasons for the striking lack of their diffusion. If the *chulha* can be described as stubbornly persistent, the same can be said for development efforts to improve on the *chulha* that continue with relentless optimism even with little evidence of success. Third, we suggest that complex gender issues converge around food preparation and the cook-stove conundrum and help to explain the low adoption rates. Finally, we argue that stepping back from the dogma of cook-stove improvement (without abandoning concerns we share about cooking with biomass) not only offers insight into the obsessive nature of modernist development and its undesirable effects (such as the wasteful reproduction of failure), but may help us to imagine a broader range of potential solutions. Historicizing and demystifying the cook-stove conundrum in India offers some useful lessons.

2. THE LONG HISTORY AND STRIKING PERSISTENCE OF THE INDIAN CHULHA

Hand-crafted *chulhas* made from stone and clay and fueled with biomass are standard fixtures in 150–200 million rural Indian households.⁴ It is common for a family to have two *chulhas*, one inside and one outside, and to shift between them seasonally. These *chulhas* found in rural India today have surprisingly deep roots. Excavations in southeast Rajasthan (precisely in the zone of our current research) have unearthed 3800-year-old U-shaped cook-stoves that were used domestically by the Ahar (or Banas) people circa 1800 BCE (Hooja, 1988; Misra, 1997).

The ubiquitous Indian *chulha* has long drawn the notice of outsiders. A medieval language scholar observes that “many Persian, Turkish and Central Asian historians were very interested in the Indian kitchen, their cooking practices and cuisines” (e.g., Leyden & Erskine, 1921).⁵ In the later colonial era, when foreign administrators kept troops in reserve and strove to rule by survey and census—the so-called “ethnographic state” (Dirks, 2001)—the *chulha* made several unusual appearances. For example, in 1902 British census commissioners stipulated that persons sharing meals prepared on a single *chulha* constituted a household (India, 1902, p. 18). In another example a highly placed Victorian official worried about the poor state of India's farming practices and recommended much greater use of manure to increase grain output (Hume, 1879). Where should this manure come from? He pointed to the only practical source: dung produced in vast quantities by cattle and buffalo. But Indian women, especially in arid districts, regularly scavenged dung to burn in their *chulhas*. Reasoning that “very few natives will cook with cow-dung cakes if they can procure sticks,” he proposed to wean women away from manure by planting wood-fuel groves in every village, thus releasing manure for cultivation (Hume, 1879, p. 52). Nothing came of this proposal, but it shows that asking Indian women to alter their cooking practices for grand state causes has a long lineage leading up to the present.

Two distinct narratives about this common household fixture circulate in different disciplines. In the first, *chulhas* are not simply a tool for heating and cooking but are a perennial focus for women's cultural work. This benign narrative focuses on food-preparation and consumption rituals that hold Indian families together. Indeed, ethnographic literature underlines the centrality of the *chulha* for the worship of deities and the transmission of gendered skills (Herman, 2000; Khare, 1976; Mohanty, 2004, p. 581). A second narrative articulates the views of outsiders from foreign countries or India's urban centers that understand (often for good reason) the *chulha* to be an unhealthy, dangerous or wasteful means of combustion, one that needs urgent correction for the sake of familial, national, or even global goals (Hager & Morawicki, 2013; Kammen, 1995). This narrative assumes that *chulhas* and cooking over open flames will eventually be replaced by safer, more efficient and industrial sources of energy. These two narratives, one emphasizing continuity and the other striving to accelerate change, are often interwoven. However, only the first acknowledges the views and cooking-related competencies of women, which are essential not only for implementation of IC programs, but also for defining the problem in the first place.

Despite the hearth's positive cultural associations, it is clear that from the colonial era to the present *chulhas* have been marked as “traditional” in the negative sense of the term—as backward, inefficient, unhealthy, and destined for obsolescence. Experts share a rational desire to replace the literally dirt cheap and hand-crafted *chulhas* with newer, costlier designs, technologies and materials that women will no longer be able to fabricate locally. Yet despite a plenitude of programs (Table 1), there is little evidence that efforts to popularize ICs in India have met stated goals. Indeed, of the roughly 35 million improved (biomass) cookstoves distributed by the National Programme on Improved Chulha in India from the early 1980s onward, by the late 2000s, virtually none were in use. In contrast of the over 148 million distributed by the National Improved Stove Program in China over the same time-period, over 100 million were still in use in 2010 (Sesan, 2014). By and large, rural Indian women do not seek ICs on their own initiative; where they are adopted it is largely

Download English Version:

<https://daneshyari.com/en/article/5105022>

Download Persian Version:

<https://daneshyari.com/article/5105022>

[Daneshyari.com](https://daneshyari.com)