

The Indian stove programme: an insider's view – the role of society, politics, economics and education

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Introduction

The dissemination of improved biomass stoves throughout the developing world began in the early 1980s. Since an average 75% of biomass energy is used for cooking, widespread rural dissemination of improved cooking stoves was seen as a promising way to reduce the overall firewood requirement.

India has an extensive firewood shortage problem. Per capita consumption of firewood has been steady for the past two decades, while the total population has grown alarmingly by nearly two thirds. A rapid increase in the price of commercial fuels (kerosene, coal and charcoal) over the last two decades has led to poorer groups depending on firewood/biomass as the means of household energy. Again, the firewood shortage in various rural areas has caused many families to turn to burning dung and straw for fuel – thus steering them *down* the energy ladder.

Today India still relies on firewood to satisfy 24% of total energy consumption. India's forests can sustainably provide 41×10^6 m³ of firewood per year, even though current annual demand for wood remains at 241×10^6 m³. (World Resources Institute, 1994). In India, in the household sector, the bulk of energy is spent on cooking. According to 1991 census, about 30% of the urban population uses firewood and twigs whereas in rural sector, about 78% of the population rely on firewood and twigs. According to the NCAER (National Council of Applied Economic Research) survey, conducted in 1978/79, cooking accounted for 85.2% of the total energy consumed in the rural domestic sector. The women in rural India, especially the poor, have to trudge long distances to forage for scraps of firewood.

Le programme indien de foyers améliorés: rôle de la société, de la politique, de l'économie et de l'éducation

L'Inde est sévèrement affectée par la pression sur les ressources ligneuses pour la satisfaction des besoins énergétiques. Afin d'atténuer cette tension, un foyer amélioré à bois a été promu par le Gouvernement indien avec cependant un succès mitigé, notamment à cause de la bureaucratie, des subventions mal ciblées et le manque de ressources. L'article aborde les facteurs ayant conduit à des programmes réussis dans d'autres parties du monde et dont les enseignements pourraient être utiles à l'expérience indienne. Une approche participative est considérée comme une condition évidente de la réussite de tout projet.

The Indian National Programme on Improved Chulhas (NPIC)

Hoping to reduce this need for firewood, the Indian National Programme on Improved *Chulhas* (NPIC) was launched in 1983, to be implemented in all states and union territories. The programme aimed to disseminate improved clay and mud stoves (equipped with chimneys) in order to increase the fuel efficiency of traditional stoves and reduce indoor air pollution. It was managed by the central governmental bureaucracy, along with six regional officers and numerous other state and district officers (Barnes et al., 1994). By September 2000, 32 million stoves of various types had been promoted, touching 25% of the total potential of 120 million households. A 1995–96 survey conducted by NCAER in 18 states indicated that 71% of the cook stoves were in working order and 60% were in use.

NPIC in confusion

The Indian Government invested in a lot of promotion to disseminate the improved stove in rural India through NPIC. Ten-day demonstration camps were held to encourage and engage villagers, local government collaborators and students in the speedy dissemination effort. A key element of the dissemination policy was the provision of a government subsidy to all households purchasing an improved

stove. A minimum of 50% subsidy was available, reducing the cost of new stoves from US\$10 to US\$4.30 (Kammen, 1995; Barnes et al., 1994). However, the primary drawback in this method gradually became evident as multiple levels of government bureaucracy complicated the initiative. Programme administration was truly cumbersome and fragmented (Kammen, 1995). In addition, the budget was insufficient for the level of supervision and assessment which the programme required. Problems were not noticed and rectified in good time. Lastly, the programme was soon scaled down, being only one of several national campaigns occurring at the time.

Effect of subsidy

The presence of a large government subsidy was a big discouragement for the success of the NPIC. As the government automatically paid builders for half the cost of stoves, producers' motivation for building improved stoves was directed more towards the government than towards the consumers (Barnes et al., 1994). Stove producers were only concerned about government specifications and did not respond to the need for consumers' preferences or an aggressive marketing strategy. As a result, local stove construction was often hasty and technically faulty. Many stoves did not accommodate the household cooking pot, or could not withstand the heat

required for cooking. Many of the stoves plainly did not offer the assured savings in household firewood consumption. The heavy government subsidy for cook stoves also suppressed efforts by private entrepreneurs to disseminate their own improved stoves, as they could not possibly compete with the highly subsidized government price.

Failure to target resource-poor regions

Another limitation was that NPIC failed to target regions where fuel scarcity were especially severe, or where firewood was a very expensive. Many rural households could not afford, or were not willing to pay for, the highly subsidized improved cook stove as they were collecting the firewood/biomass for free. The purchase of a new improved stove is never seen an interesting option to those who are very poor in India.

Need for maintenance

Another reason was the lack of interest of women towards maintenance, as they did not perceive the usefulness of the stove. A national survey in 1992–93 noted that some households opted for the stove only for the subsidy in the form of pipes, metallic sheets, etc. In a number of cases, chimney pipes were re-used as links for the sanitary latrine, irrigation channel or even sold in open market, after being removed from the stove.

NPIC in Maharashtra

Appropriate Rural Technology Institute (ARTI) has been working as the Technical Back-up Unit (TBU) for NPIC for Maharashtra and Goa states since 1996. According to Dr Priyadarshini Karve, of ARTI, the State Government was supposed to implement the programme, but the government officials were totally disinterested. This was the root cause of a lot of problems. In states like Maharashtra, where at least the TBU was active, some things got done in spite of the lack of governmental encouragement, but the TBU had to take up many tasks that were not originally included in its mandate. Secondly, MNES hardly ever consulted the TBU

or tried to assess users' needs before taking policy decisions.

Indoor air pollution as a factor

Indoor air pollution (IAP) was never a key driving factor of NPIC up until the last 3–4 years. Unfortunately, when MNES finally decided to incorporate IAP concerns in the programme, it went for a 'short cut' solution. Instead of giving time to the TBUs to come with user-friendly easy-to-install non-polluting stoves, and to make systematic efforts to make the *chulhas*-users aware of the hazard of IAP, it simply sent a directive that every fixed stove installed under NPIC henceforth must have a chimney.

The consequence in Maharashtra state was as follows: The choice that was offered under NPIC was between fixed stoves with a chimney (Figure 1) and metallic portable stoves (Figure 2). Due to various practical problems associated with installing a fixed stove with a chimney, the state government's implementing agencies went in a big way for metallic portable stoves. Consequently, most of the users ended up with having to accept the portable stove due to 'non-availability' of the fixed one. Traditionally in this region the portable stoves are not used as the main day-to-day cooking stoves. The result is that the government 'target' for stoves has been fulfilled, but the 'beneficiaries' continue to use their traditional stoves for daily cooking. Also, the rural potter-entrepreneurs

(who make the fixed stoves), and who have been trained and nurtured over the years, have lost a lot of business that they used to get through the NPIC, while the city-based industrialists, who fabricate the metallic stoves, have earned handsome profits.

It must be pointed out that, at the same time, there has been a good demand for several inexpensive and chimneyless 'low smoke' stoves (not approved under NPIC) that local potters sell in the open market.

Lessons learnt from other countries

In developing countries, many programmes that had potential for alleviating indoor air pollution and reducing women's labour met with limited success because of the lack of consideration for women's needs and preferences



Figure 1 Government-approved chimney stove, Maharashtra state (photo: ITDG)



Figure 2 Metallic portable stove being demonstrated outside house, Maharashtra state (photo: ITDG)

(Ramana, 1997). The women's choice of continuing to use traditional biomass stoves in a fuel scarce region may be quite rational if the design of the alternative product is not user friendly and if a repair service is not available when they need some assistance.

Experience from other countries

Kenya

In Kenya, a custom-made improved stove failed because women had neither time nor the patience to cut the wood to the small size required by the stove's restricted box. In fact, many of the women who adopted the stove ended up enlarging its firebox, knowingly sacrificing energy efficiency for convenience (Barnes et al., 1994). Kenyan efforts to disseminate improved stoves were first made in rural areas, but they had an early monitoring programme and found out the faults and quickly started disseminating a second generation of cook stoves after getting feedback from the women. They started working through private craftspeople, did market surveys and did marketing in urban and semi-urban areas. Again, the ITDG's RSWK (Rural Stoves West Kenya) project (1993/94) had focused on working with women potters as stove producers in order to deliver benefits to stove users. The logic of the work was that establishing a supply of *Upesi* (also known as *Maendeleo*) stoves has major benefits for many women in terms of reduced fuel wood costs or collection time, savings in cooking time, improved health through lower smoke emissions, etc.

Indonesia

In Indonesia, women were not willing to accept stoves in which the fireboxes were placed one behind the other. Women wanted these fireboxes to be adjacent to each other as it was more convenient to them during cooking (Hulscher, 1997).

China

In China, improved cook stoves have been well accepted, partly because of the involvement of women in the programme. By 1995, 172 million households had efficient stoves that

accounted for 70% of the total rural households. Women were involved in extensive field-testing and discussion concerning what they wanted in a stove. For instance, in one region, shelves for spices were added at the request of the women. In China, the country chose an improved stove programme as it tried to move up the energy ladder (Smith et al., 1993). At this time, due to the liberalization of rural economy (early 1980s), the average income of every rural family was going up. For the mass dissemination of improved stoves, the government played an important but limited role by providing up-to-date latest technical knowledge, designs, training, and indicating potential areas where stoves can be disseminated. The subsidy was limited and stoves were created to suit local community. By and large local producers were aggressive for dissemination of the improved stoves.

Honduras

In Honduras, energy-efficient earthen stoves have become very popular. One researcher attributed the acceptance of this innovation to the fact that women were trained to make them and, therefore, women were introducing this technology to other women. Also, credit facilities through a co-operative made loans available for which the monthly payment for both the stove and the kitchen shelter amounted to the same as the monthly savings on fuel (Elmendorf, 1980).

Other country initiatives

A stove project proposed for Nepal has suggested sending Nepalese women to India to learn to build stoves; they would then teach other women these skills at home. In Niger, government planned to introduce improved stoves to urban women through a women's organization.

Stoves must be appropriate

But, no matter who introduces the stoves, if they are not appropriate to local conditions they will not be accepted. A stove project in Ghana that was reported to be very successful at the time, was found a decade later to have been a failure. It turned out that stoves had not been designed for

making the local dishes and that they sometimes used more fuel than the traditional and supposedly less efficient models. In certain areas of Upper Volta, the government has put great emphasis and pressure on women to build stoves, and the women's extension service was promoting the project.

In Tanzania, stove makers are involved in the sale of stoves, and the programme has been quite successful (Kinyanjni, 1991). Both in China and Kenya, commercialization of the improved stoves is key for long-term, self-sustained cook stove dissemination.

Household income – the most important aspect?

In considering the various factors in household energy use, the most important is held to be the level of household income (Smith et al., 1992). Within this concept, however, is another serious issue – the lack of value generally placed on women's labour. If women are involved in income-generating activities that will value their time and make it more profitable to purchase firewood than collect it, improved stoves will have higher chances of success. Where employment is available, it may be preferable to earn cash as a labourer and buy wood, rather than collect it. If women have no alternative income-earning opportunities for the potential labour time saved by improved stoves, then even if they are the household decision makers, they will not choose to spend money in acquiring improved stoves. This may possibly explain why, even in matrilineal communities like those in eastern Bhutan, stove programmes have failed.

A sustained change in patterns of fuel use cannot depend on continuous subsidies. What is required is a change in the role of women's labour, or increasing the possibility of women's income-earning opportunities (Nathan, 1997).

Some positive aspects of the NPIC

Despite all the problems, overall, there are three good visible signs in favour of the NPIC programme.

- (1) Women are raising their voices in various fora to demand improved cook stoves.
- (2) Some states have promoted improved cook stoves through people's programmes. For example, Andhra Pradesh is popularizing cook stoves under *Janambhoomi* and Karnataka under *Panch Sutry Yojana*.
- (3) Several non-governmental organizations and local bodies, such as *Gram Panchayats*, are actively participating with the government in raising awareness among women to use improved cook stoves.

Poverty and marginalization

A quarter of India's population belongs to communities classified as Scheduled Castes and Scheduled Tribes (SCs/STs). The levels of human development among these communities have remained below that of the rest of the population. NCAER estimates show that infant mortality rates were 98 and 99 per 1000 live births among STs and STs, respectively, nearly 45 per cent higher than the rate for the rest of the population. Similarly, according to the 1991 census, only 24 per cent of women in SCs and 18 per cent in STs were literate. A literacy rate among rural women belonging to STs was as low as 4 per cent in Rajasthan and 9 per cent in Andhra Pradesh.

Empowering women

Suppressed economic conditions make men more dominating within the household. According to the Planning Commission in 1999–00, the estimate of rural poverty was 27.09%, where as for urban households it was 23.62%. The Human Development Report for 2000 estimated that in 1989–98, over 40% of people lived below the poverty line.

There are other problems like early marriage and the low education level of rural women folk that are hampering the progress of India. A shortage of modern communication technologies mean that people are less connected to the modern world. The NCAER rural household sample survey reported that only 43 per cent of rural households have electricity connections. The pro-

portion of houses connected with electricity varies from 9.8% in Bihar to 15.6% in West Bengal.

Conclusion

Adopting a 'bottom-up' approach

Nonetheless, faced with aggravating population pressures and fuel shortages, India has no other option but to look for improved *chulhas* which can play an important role in mitigating firewood demand. The government has to reverse the 'top-down' approach, as well as beginning to integrate positive aspects of some successful cook stoves programmes from other parts of the world (say, China, Kenya, etc.).

Supporting local differences

There is an alienation of local manufactures for making improved stoves and this should be corrected immediately. There is a need to conduct a market survey and incorporate important regional differences in cooking habits in the stove programme. There should be a proper follow up mechanism as well as women stakeholders' participation.

Empowering the economically vulnerable

The rural poor are too vulnerable economically to give voice to their needs and inform the market of their needs. But is intervention in promoting improved stoves in developing countries necessary? I personally do not think so. India needs basic things first, which I believe are sound income policies, proper education, and good health for all her children. Major advances in poverty alleviation can be achieved with relatively small inputs of energy (Goldemberg et al., 1985). If we empower people to express their needs and develop accordingly, things will change automatically. We should not pressurize them with our own agendas. There should be a free flow of knowledge and people must see all the positive and negative impacts, using all available resources and then decide about their adoption.

In developing countries, leaders should have to show the way – but it is not possible in India. Con-

stitutionally, India purports to be democratic, but the country is deeply divided by caste, religion, language, etc. and leaders choose to believe in a policy of 'divide and rule'. The country needs a visionary leader able to active the strength of democracy and lead the country out of her current crisis.

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