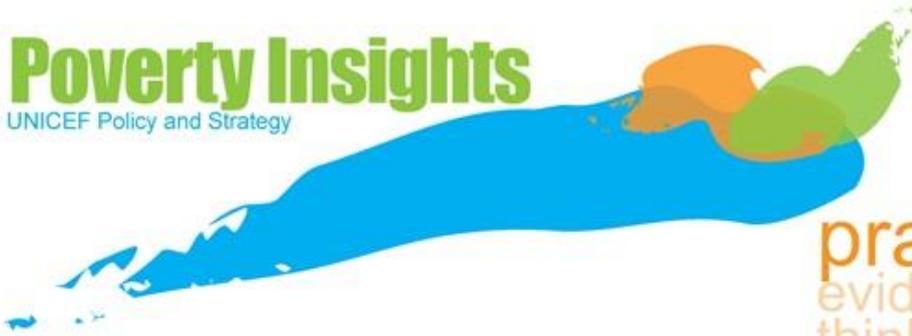


Child Poverty Insights

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practice
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think piece

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Child Poverty Insights disseminates emerging research, practice and thinking on child poverty to a global audience of UNICEF and other UN staff, practitioners and academics.

This edition sets forth evidence and practice from The Energy and Resource Institute in India (TERI) and All India Institute of Medical Sciences (AIIMS) on the potential for cleaner energy to accompany and compliment UNICEF's work with governments to reduce child mortality.

By way of introduction, we asked Dr Rajendra K. Pachauri, Chairman of the Intergovernmental Panel on Climate Change, and Head of TERI to set the scene and introduce the work of his colleagues:

"Almost 1.3 billion people across the globe have no access to electricity, and, therefore, create illumination by combustion of kerosene, candles or other substances. Almost twice this number use biomass for cooking. These activities are a serious source of indoor air pollution, and have extremely harmful impacts on the health of women and children. As it happens, children in poor countries receive inadequate nutrition, and exposure to these pollutants for long periods of time poses a very high health risk.

The global community has to find solutions to this widespread and very serious problem. As we know, solutions are available, but need to be implemented with imagination, the provision of adequate finance and institutional arrangements that are effective at the grassroots level."

Dr Rajendra K Pachauri,
Chairman of the Intergovernmental Panel on Climate Change and Head of TERI



Indoor Air Pollution and Child Health in India



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Why is indoor air pollution harmful to child health?

Indoor air pollution, associated with using biomass cooking fuels, causes an estimated 871,500 child deaths¹ globally every year from respiratory related complications. Children are particularly vulnerable to indoor air pollution because of their higher risk of exposure as they are likely to spend more time in polluted home environments. Children's physiological factors also put them at higher risk, their lungs and immune systems, particularly for respiratory defence, are not fully developed and they breathe more in proportion to their body size.

How does indoor air pollution affect children in India?

In India indoor air pollution is among the most serious threats to the health of children under five years. TERI has actively highlighted the risks associated with indoor air pollution and advocated the adoption of cleaner and sustainable alternatives. Nearly 82% of pregnant women in rural India are exposed to biomass-related indoor air pollution, which increases the risk of low birth weight.² India derives the bulk of its cooking energy needs from biomass solid fuels, such as twigs, wood, shrubs, crop residue or cow dung and utilize crude combustion apparatus cook stoves. The burning of biomass fuels releases various indoor air pollutants, like particulate matter (PM), carbon monoxide and volatile organic compounds. According to the 2001 national census, 82.5% of rural Indian households used biomass as cooking fuel, and the National Family Health Survey in 2005-6 provided similar rates.

Table 1

Estimated post neo-natal under five deaths due to ARI attributable to IAP	100,120 (52,743 – 133,480)
Estimated post neo-natal under five deaths due to LBW attributable to IAP	76,789 (26,744 – 121,308)
Estimated total deaths	176,909 (79,487-254,788)

A systematic review conducted by the *All India Institute of Medical Sciences* of studies on the risk of dying from ARI due to indoor air pollution, showed that children who were exposed to indoor air pollution were two-and-half times more likely to die due to ARI's, as compared to those who were not exposed to indoor air pollution. As is shown in table 1³ it is estimated that

¹ The Acute Respiratory Infections Atlas

² Cooking with Cleaner Fuels in India: A Strategic Analysis and Assessment
http://www.unicef.org/india/Policy_Brief_1-Indoor_air_pollution.pdf

³ Personal communication- Dr. Anand Krishnan, AIIMS, New Delhi

100,120 deaths each year of children under five years can be attributed to indoor air pollution, and it is estimated that 76,789 of all under five deaths due to low birth weight in the post-neonatal period in India can be attributable to indoor air pollution.

There are stark differences between urban and rural households, where the majority of rural homes in India use biomass as their primary cooking fuel, whereas urban households depend on cleaner and more convenient cooking fuels, such as liquefied petroleum gas (LPG) or piped natural gas (PNG).

Is poverty a factor that drives the use of biomass?

The main reason why households in India use biomass is cost and lack of access to modern fuels; biomass is a resource that is available at almost no out-of-pocket cost. The urban-rural dichotomy with regard to type of cooking fuel used can partly be explained by the higher per capita income in urban areas, larger per capita household expenditures, and higher average levels of education as well as greater ecological consciousness. Data shows that as per capita consumption expenditure rises, so does the adoption of LPG in rural and urban homes, as seen in figure 1.

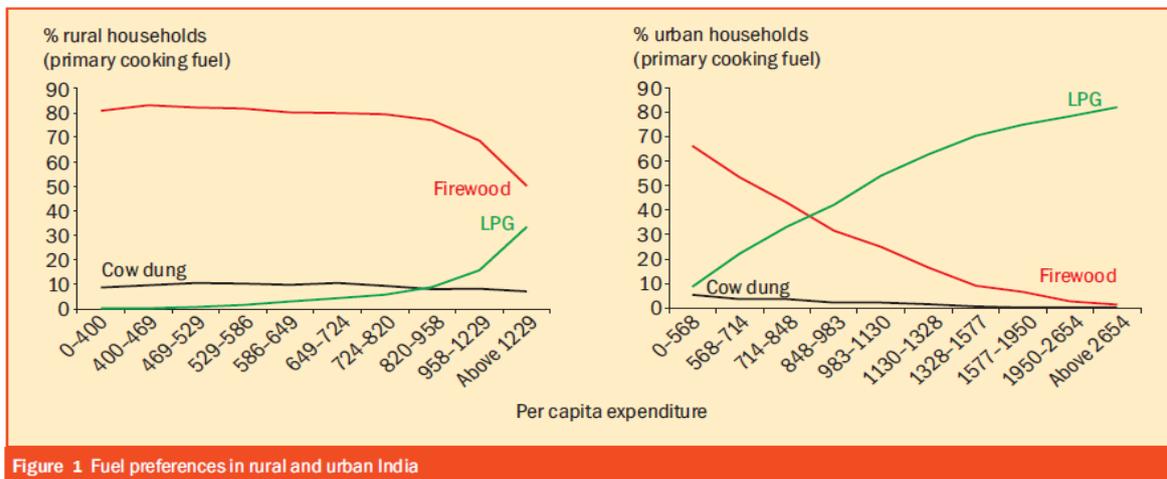


Figure 1 Fuel preferences in rural and urban India

Nonetheless, a significant number of households, even in the higher expenditure category, still use firewood as their primary cooking fuel, suggesting that affordability is not the sole determinant, but other factors, such as tradition, lure of free fuel, education and ecological awareness also determine which type of cooking fuel is used.

A qualitative study conducted by TERI in three villages in Haryana, India, highlighted lack of awareness of improved cook stoves, while at the same time acknowledging that indoor smoke is harmful. Another interesting observation was that the older generation preferred the traditional cook stove using biomass as it has a certain flavour than cannot be obtained using other cooking fuels.

What are the solutions to indoor air pollution? How is indoor air pollution being addressed in India?

Child deaths linked to indoor air pollution are largely avoidable. There are two prominent types of interventions for addressing indoor air pollution. The first is to replace biomass fuels with safer fuels, while the second intervention is to improve combustion of bio-fuel to reduce the amount of smoke that is generated.

There is no clear consensus regarding future preferred choices of cooking fuel in India. TERI has proposed a multi-pronged approach to addressing indoor air pollution, which includes promoting the use of improved cook stove models and the adoption of cleaner cooking fuels such as biogas, kerosene, liquefied petroleum

gas (LPG), piped natural gas (PNG) and renewable energy. Customized strategies need to be developed, for different segments of users within a given geographical region of the country.

There is a preference to the adoption of LPG or PNG as a cleaner energy supply. However, it is unlikely that LPG or PNG can be adopted nationally in the near future, and in the meantime the use of energy efficient and less polluting biomass based fuel stoves should be promoted. The development of a *Clean Cooking Index* could be used to track progress in the transition to cleaner cooking fuels. Raising awareness on the adverse health effects of indoor air pollutants is also important, in particular among the rural poor. The choice of cooking fuels can be influenced by policies that enhance awareness, affordability and availability of more desirable fuel options.

How is TERI addressing the issue of indoor air pollution?

Since early 1990 TERI has been involved in the promotion and adoption of improved cook stoves. The end user receives improved cook stoves under various financial support mechanisms but a market centered approach has yet to be attempted. Indian oil companies, Ministries and UN bodies have supported these activities. By 2015 TERI aims to facilitate the delivery of cleaner cooking stoves in at least 100,000 households, through a strategic approach of market seeding and development. Particular attention will be paid to the states of Gujarat, Himachal Pradesh, Odisha, Uttar Pradesh, and West Bengal. TERI liaises with state-level authorities, regional rural banks, micro-finance institutions, and local NGOs to disseminate improved cook stoves and to ensure awareness generation, ground-level implementation, and financing for the programme.

In addition, TERI is undertaking an intervention study in rural households with pregnant women. The intervention would include raising awareness on the adverse effects of indoor air pollution and promote adoption of improved cook stoves. The study would compare health outcomes amongst users of traditional stove and intervention homes. A major objective of this study is building scientific evidence to estimate effect of air pollution on foetal growth and acute lower respiratory infections (ALRI) episodes in early childhood.

References/Further Reading:

TERI website

<http://www.teriin.org>

TERI Annual Report http://www.teriin.org/about/Annual_Report_2011-12.pdf

Policy Brief 1 - Cooking with Cleaner Fuels in India: A Strategic Analysis and Assessment

http://www.unicef.org/india/Policy_Brief_1-Indoor_air_pollution.pdf

Policy Brief 2 - Cooking Fuels in India: Trends and Patterns

http://www.unicef.org/india/Policy_Brief_3-cooking_fuels_in_India.pdf

Policy Brief 3 - Choices for Change: Evaluating Cooking Fuels

http://www.unicef.org/india/Policy_Brief_3-cooking_fuels_in_India.pdf

Policy Brief 4 – Call for Change: Catalysing a Cleaner Future

http://www.unicef.org/india/Policy_Brief_4-Policies_and_directions.pdf

The Acute Respiratory Infections Atlas Indoor

http://www.ariatlas.org/drivers_of_aris/air_pollution

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