A WELL FACTSHEET

Indoor air pollution from biomass fuels

Author: Adam Biran and Caroline Hunt, March 2003

Quality assurance:

Edited and produced as a PDF document: May 2020

Up to half of the world's households use biomass fuels as a source of energy for cooking and heating. Biomass fuels are materials derived from plants and animals which are burnt. Their use is much more prevalent in rural areas.

When burnt on simple stoves, they often do not combust completely and the result is a high level of emissions (including particulates) which can cause high levels of indoor air pollution when combined with poorly ventilated conditions.

This indoor air pollution can have a severe impact on health. The respiratory and immune systems can be damaged by the particulates from smoke. This in turn makes those affected more susceptible to illness. The biggest health impact known is on children in the form of acute respiratory infections. At least 1.8 million deaths (mainly child deaths from pneumonia) per year are attributed to biomass fuel use in the home.

Potential interventions to reduce indoor air pollution focus on reducing or removing smoke and changing behaviour.

Although these interventions have been introduced relatively recently, it is clear that new stove designs and/or fuel types need to be locally acceptable and affordable to succeed.

Indoor air pollution

When biomass fuels such as wood, dung or crop residues, are burnt in inefficient stoves a mixture of particles, chemicals and gasses is released. When these fuels are used in poorly ventilated houses, the result is indoor air pollution that is widely believed to have serious health implications.

Biomass fuels

Currently around 3 billion people rely on biomass fuels for cooking, heating or lighting (Bruce et al 2000). In some African countries these fuels are used by over 80% of the population. In some areas their use is increasing (WHO 2002a). It is the poor who rely most heavily on biomass fuels. Women and young children have greatest exposure to the resulting IAP because of the amount of their time spent cooking and being in and around the home. As a result women and children face the greatest health riskssseih(p)9 (e)-5Tean an n9.9 (A)-26.1 (P b-3.)9 (e)-5pnn n9m- w(a)-xp

that it is also the most accurate. This is because it is based on the results of studies of the health impacts of indoor air pollution in developing countries (rather than extrapolating from studies of ambient air pollution in developed countries).

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There are two ways in which indoor air pollution can affect health. Substances in the smoke can themselves be responsible for a health impact (for instance, carcinogens or the toxins that cause cataracts). Alternatively, these substances can pave the way for infection by bacteria or viruses by damaging the respiratory system's mechanical and immune defences. It seems likely that the biggest health impact is due to this damage to the respiratory system.

The following list provides more detail about how indoor air pollution can affect health (Bruce et al 2000);

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In addition to childhood acute respiratory infections, there is moderately strong evidence linking indoor air pollution with chronic lung disease and, in coal burning communities, lung cancer, in women. There is also limited evidence to suggest an association with other health problems including TB, low birth weight (itself a risk factor for acute respiratory infections) and perinatal mortality.

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There are numerous methodological problems in assessing the health risks associated with indoor air pollution.

For instance, measuring pollutant levels precisely can be expensive and ascertaining patterns of exposure can be difficult. There are also many inconsistencies in the definitions of certain health outcomes.

In addition, most of the studies undertaken are observational in design. This means they investigate the health status of those already .8 (t)-a.8a4.3 (t o)3 (f (e a)- 4 (o)-3.8.8 7.3 (hic)-20.6 (y .8)r)0.9 (i)Te0.8 (h s)-14.3 (t)-1

Results from a recent small-scale study in Kenya however, suggest that smoke hoods are a more effective means of reducing indoor air pollution than improved stoves (ITDG 2002). These hoods are constructed around the cooking fire and direct the smoke through a chimney vent in the roof.

Further research is taking place in Kenya, Sudan and Nepal to look for acceptable and affordable interventions that reduce indoor air pollution (ITDG 2002).

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Ultimately the success of any technical intervention will depend on its widespread and sustainable dissemination. This means, in effect, that it must be sufficiently acceptable and affordable to survive in the market place.

Findings from China (Smith et al 1993) and East Africa (Bess and Mazzoni 2001, Owala 2001), suggest that the most effective roles for external funds in this process would be;

- product development
- quality assurance
- training of artisans
- stimulation of demand,

but not subsidising of the final purchase cost as, in the absence of a long term commitment, this reduces the sustainability of an intervention and tends to be an ineffective way of reaching the poorer households.

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More detailed information can be found in the references cited as well as from the websites listed below.

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WHO (2002a) Addressing the Links between Indoor Air Pollution, Household Energy and Human Health http://www.who.int/mediacentre/events/HSD_Plaq_10.pdf

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Author: Gerald Rukunga, AMREF, Kenya

Quality assurance: Adam Biran

Edited and produced as a PDF document: May 2020

Globally, almost 3 billion people rely on biomass fuels (wood, charcoal, crop residues and dung) and coal as their primary source of domestic energy. Biomass fuels have been associated with Indoor Air Pollution (IAP), which is a major risk factor accounting for 4% of the global burden of disease measured by Disability Adjusted Life Years (DALYs).

In Sub Saharan Africa, around 80% of the rural communities depend on biomass fuels for their domestic energy. In all the Countries of East Africa, the majority of the populations live in the rural and peri-urban areas where poverty is rampant leading to extensive use of biomass as source of energy. Exposure to IAP from the combustion of solid fuels is a predisposing factor contributing to morbidity and mortality in developing countries and the worst levels of exposure are closely associated with the poorest households.

Indoor Air Pollution is an emerging area of focus in the health sector due to its increasing risks to Acute Respiratory Infections particularly among children under five years of age. In the East African region, there are policy guidelines for the implementation of interventions on the control of childhood diseases. However, there are no specific policies targeting IAP and the existing ARI policy focuses mainly on curative rather than both curative and preventive interventions. In Kenya for example, ARI policy does not include control measures targeting environmental factors linked to child health and by extension IAP . Consequently, ARI diseases are addressed mainly through case management and seeking prompt treatment, totally ignoring the role of IAP and other
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Prepared by WEDC
Wa E a d D ó p C
Scoo b A c c , B ld a d C l E
b b o U
L c LE11 3TU UK

T: + 44 (0) 1509 222885
E: wedc@lboro.ac.uk
W: www.lboro.ac.uk/wedc