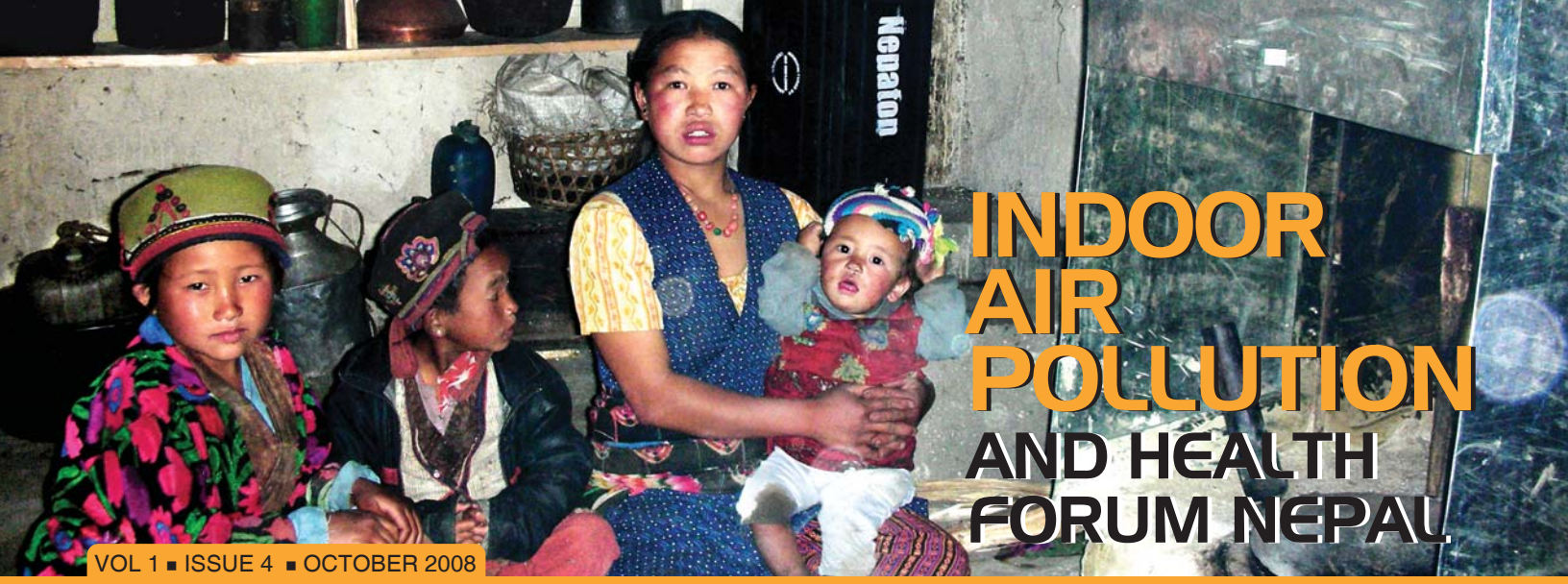

INDOOR AIR POLLUTION AND HEALTH FORUM NEPAL

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INDOOR AIR QUALITY STANDARD GUIDELINES – **A necessity for Nepal**

Clean indoor air is a prerequisite for a healthy living. However, in Nepal about 85 per cent of households (HHs) are compelled to live in poor indoor air quality environment as they use solid biomass as the prime source of cooking energy. Inefficient burning of the biomass fuel creates a dangerous cocktail of hundreds of pollutants. It is the dirtiest form of fuel which lies at the bottom of the energy ladder. The use of solid biomass fuel has been jeopardising millions of people from their right to a healthy life. Women and children suffer the most from Indoor Air Pollution (IAP) as they have to spend most of their time inside the kitchen. The annual death toll caused by IAP in Nepal is around 7,500 (WHO, 2007).

Biomass footprints in coming days will be bigger as energy poverty continues to ruin the economy of the poor. As the price of cleaner cooking fuels (LPG and kerosene) is increasing daily people with lesser per capita income in the developing countries are more likely to switch back to solid biomass fuel use. In Nepal currently, the price of a LPG cylinder is set at NRs. 1200 but still the supply side is very weak. Moreover, difficulties in supporting subsidy on imported fuels, sole dependency in Indian oil supply and failing to pay the dues on time to Indian Oil Corporation (IOC) has further heightened the problem. In this context, managing clean cooking fuel as per growing demand is getting incessantly difficult there by leading to increase dependency on solid biomass fuel to fulfill energy need of the rural and urban poor in coming days.

A serious contemplation over risk imposing biomass use becomes necessary in regard to healthy living in the 21st century. Technological interventions, particularly, the use of improved cooking stoves have contributed to cleaner indoor air but the level of IAP does not meet the safe level recommended by WHO (50 g/m3). Unfortunately, the use of biomass as the cooking fuel is not the only responsible factor for increased level of IAP. Other key factors equally responsible are - poor ventilation, children staying with their mothers near the open fire, cigarette smoking, and some inherent beliefs associated with physical settings of kitchen and ventilation. Given the persistent poverty among the rural and urban poor and heightening energy crisis, it is becoming urgent to learn and adopt different ways to living a healthy life.

To resolve IAP problem massive intervention is needed which is only possible by making conducive policy environment to protect the poor and the marginalised from the harmful effects of IAP. Indoor Air Quality Standard Guidelines (IAQSG) can be an appropriate intervention from the State in this respect. The need of IAQSG can be well justified from the perspective of living a healthy environment in homes, and reducing pressure on wood consumption by enhancing awareness on efficient HH energy management. Nepal has already prepared Ambient Air Quality Standards (AAQS) in 2003; the preparation of IAQSG would be another complementary initiative to control the air pollution at HH level. The World Health Organisation (WHO) has already developed global air quality guidelines (First produced in 1987, updated in 1997 and 2005). But we need to develop our own national air quality standard guidelines considering national context of health risks, technological feasibility, economic considerations and various other social factors, and national capability in air quality management.

The IAQSG will offer guidance in reducing the health impacts of air pollution. Likewise, the guidelines will provide appropriate targets for a broad range of policy options for indoor air quality management in Nepal.

Nepal has guaranteed its citizens as their fundamental rights to live in a clean environment and right to basic and free health services through Interim Constitution, 2007. Implementation of IAQSG will help people to live in a cleaner environment and enjoy their fundamental rights. Thus development and implementation of IAQSG is a must to fulfill the State's accountability for protecting the lives of hundreds of thousands of women and children from IAP.

PROJECT

Scaling-up Indoor Smoke Alleviating Technologies in High Hills of Nepal

With the financial support of the US Environmental Protection Agency (USEPA), Practical Action and Winrock started a two year project from March 2008. Local NGOs (Prayash in Dhading and Goreto in Gorkha) are the implementing partners of this project. The project aims to reduce major health risks of 3,000 women and children caused by IAP in Gorkha and Dhading districts. To achieve the project aims a Sustainable Smoke Hoods Enterprises (SSHE) will be established in each of these districts through innovative financing mechanism. About 6,000 rural people will be empowered with knowledge about the dangers of IAP and smoke reduction strategies and newer technologies so that they can identify ways to reduce their exposure to IAP. Using innovative financing mechanisms. 1,000 smoke hoods will be installed to alleviate kitchen smoke. The project will also develop a sustainable smoke hood enterprise comprising of 10 local entrepreneurs/suppliers for manufacturing, installation, business development and management of smoke hoods.

A Revolving Fund will be established and managed by microfinance institutions and other financial intermediaries to provide loans to the local people for acquiring smoke hoods and starting income generating activities. In addition, the project will facilitate to form 40 community groups. The groups will be strengthened and linked with local microfinance institutions or other financial intermediaries for credit facilities to buy smoke hoods and start income generating activities. The project will also advocate for increase in investment by the Districts Development Committees (DDC) for the improvement of indoor air quality and cleaner HH energy.

Another critical element of this project will be to develop quality control mechanisms to ensure smooth supply of high quality smoke hoods and after sales services. The smoke hoods will reduce IAP mainly the particulate matter (PM) and carbon monoxide (CO) level by 65 per cent, and reduce fuel wood consumption by 30 per cent. Community members will be encouraged to install smoke hoods and improve their stoves and insulation of their kitchen walls. In addition, efforts will be made to change behaviour and practice of the community. The villagers will be motivated to use dry fuel, reduce personal exposure to IAP, reducing cooking time, use of pot lids for improving cooking efficiency, and better hygiene.

TECHNOLOGY

Improved biomass cooking stoves in India

To address the increasing and harmful impact of IAP, Envirofit and Shell Foundation (UK) have recently launched a range of clean burning biomass cooking stoves in India. It is claimed that the stoves reduce toxic emissions by as much as 80 per cent, uses 50 per cent less fuel and reduces cooking time by 40 per cent. These numbers are a result from a five year research and testing conducted by Envirofit in coordination with Colorado State University, Colorado, USA.

The Envirofit cooking stoves burn traditional biomass fuels and are engineered to emit significantly less toxic emissions using less fuel. The stoves are built of durable, high-quality materials and engineered to meet the unique cooking habits of Indian women. Available in five

models and priced between NRs 1280 (£10.00) and NRs 4800 (£37.80), the stoves with single and multi-pot options are currently available in Karnataka and Tamilnadu states. The stoves were successfully tested in Chitradurga and Dharmapuri before it was available for sale.

The project was funded by Shell Foundation India, part of their Breathing Space Program. Shell foundation has targeted to sell 10 million stoves in the next five years. It believes that IAP can only be solved through market approach with private sector involvement. This represents a radical departure from most traditional methods and subsidy approach.

Source: http://www.envirofitcookstoves.org/ and http://www.shellfoundation.org/

Effectiveness of ICS in reducing IAP and improving health

Stove monitoring in a HH with improved stove

Improved cooking stove (ICS) is regarded as one of the most simple and popular technology to help reduce the IAP problem generated from solid fuel burning inside the kitchen. So far more than 230,000 ICS are installed in Nepal. Likewise, AEPC/ESAP has further plans to install 500,000 additional stoves in the second phase (2007-2012) of the project implementation. In this context, the Biomass Energy Programme of AEPC/ESAP carried out a study on "Assessment of effectiveness of ICS in reducing IAP and improving health" in 2007/08 with technical support of Environment and Public Health Organisation (ENPHO).

Study Design: To measure the indoor air quality, measurement of 24 hour mean concentrations of two principal indoor air pollutants – particulate matter of size less than 2.5 micron (PM2.5) and carbon monoxide (CO) was conducted. Likewise, HH questionnaire survey was administered to find the health impact of pollution and HH energy management issues. The study followed the "Before and After" design; hence both pollution measurements and questionnaire based surveys were conducted twice for each HH. The first study was conducted before the installation of ICS or with traditional stoves. The second study was conducted after the installation of ICS – two pot hole mud brick stoves. Centre for Entrepreneurship in International Health and Development (CEIHD) also provided inputs in designing the research methodology. $PM_{2.5}$ was measured using UCB particle monitors, and CO was measured using HOBO CO loggers. Sampling survey was conducted in Dolakha, representing high hills of Nepal; Ilam, representing mid-hills; and Dang, representing the plains.

Key findings: The findings indicate that the pollution levels in houses that use traditional stoves are very high and that the installation of ICS successfully helped reduce IAP. The average 24 hour mean $PM_{2.5}$ concentration was 2127 mg/ m^3 in traditional stove user HH, which has been reduced to 728 mg/ m^3 (about 65.8% reduction) after the installation of ICS. The average 24 hour mean CO concentration was 22.174 ppm with traditional stove and 8.349 ppm after the installation of ICS. Significant reduction in the IAP level (65.73% for $PM_{2.5}$ and 62.34% for CO) was recorded after ICS installation in traditional stove user HH. Likewise, remarkable improvements in the health condition of both women and young children were observed following the installation of ICS. Major health improvements were seen in respiratory infections such as cough, phlegm, influenza, whistling/wheezing of the chest, headaches and eye irritation.

Conclusions: Simple, low cost locally built mud brick ICS reduces the pollution level by more than 60 per cent. Besides improvement in health, ICS also contributes towards other benefits such as reduced firewood consumption, cleaner kitchens, and reduced time for cooking. The study shows that proper operation and maintenance of the ICS is essential for achieving its desired results, and that other factors such as improved ventilation and kitchen management are equally important. For further details, visit http://www.aepcnepal.org.

World Nepalese Student Organisation (WNSO) in association with IAP and Health Forum Nepal organised an orientation programme on "Indoor air pollution problem in Nepal" to the professionals, volunteers and associates of WNSO on 9th May 2008 at WNSO office, Kathmandu. Dr. Sunil Joshi, President, WNSO, shared information on health impact caused by IAP. Mr. Han Heijnen, Environmental Health Advisor, WHO, presented a paper on 'Need of Indoor Air Quality Standard Guidelines in Nepal." Mr. Min Bikram Malla and Keshav Sharma, Practical Action, presented papers on "Cost benefit analysis of indoor smoke alleviating technologies and programme" and, "Right based approach to fight against indoor air pollution problem," respectively.

Ms. Jun Hada, Team Leader, Access to Infrastructure Services, Practical Action, presented a paper on "Scaling up of smoke alleviation technologies in high hills – experience of Practical Action in Rasuwa District" at a workshop organised by Ministry

Jun Hada presenting a paper at a workshop organised by DHS

of Health and Population to mark the "World Environment Day" on June 6 2008 at National Health Education Information and

Communication Centre, Department of Health Services (DHS), Teku, Kathmandu.

Mr. Min Bikram Malla, Project Manager, Practical Action presented a paper on "Burden of Indoor Air Pollution: Viability of its Mitigation Effort" at the 16th Annual Conference of European Association of Environmental and Resource Economists (EAERE 2008) held from 25 to 28 June 2008 at Gothenburg, Sweden. For more details, visit http://www.eaere2008.org.

Environment and Public Health Organisation (ENPHO) presented the findings of the study on Effectiveness of improved cook stoves in reducing IAP and improving health at a workshop organised by AEPC/ ESAP on 11 June 2008.

A formal request was submitted by IAP and Health Forum Nepal to National Human Right Commission (NHRC), Nepal, on May 2008 to seek NHRC's coordination, cooperation and support to implement Kathmandu Declaration - 2008 on Clean Indoor Air: Right to a Healthy Life. Mr. Bishal Khanal, Secretary of NHRC, expressed his commitment in providing necessary support. According to Mr. Khanal, NHRC will be involved in monitoring the health rights of people particularly in relation to IAP and access to clean energy. It is hoped that possible interventions by NHRC may prompt the government to amend, formulate and implement the policies and laws in the areas of energy, environment, health and human rights.

Ministry of Environment, Science and Technology (MoEST) and Practical Action have entered into a Memorandum of Understanding (MoU) on 15 August 2008 to develop an Indoor Air Quality Standard Guidelines for Nepal.

Center for Rural Energy Promotion and Environment Technology Service (CREPET) Pvt. Ltd., organised a training on "Indoor air quality and kitchen improvement using fundamental concepts and theories" from 21 to 25 June 2008 in Surkhet with financial support from AEPC, Nepal. The main objective of the training was to increase and enhance the knowledge and skills of ICS promoters on indoor air quality and kitchen improvements. A total of 25 ICS promoters participated from Baitadi, Dadeldhura, Dang, Dailekh, Jajarkot, Pyuthan, Rukum, Rolpa, Rukum, Salyan and Surkhet districts. Mr. Umesh Kumar Gupta from CREPETS, Mr. Keshav Kumar Sharma from Practical Action and Mr. Pawan Shrestha from Green Studio Kathmandu facilitated the training.

Practical Action organised awareness workshops on "Household energy, indoor air pollution and health" in five districts - Dhading, Gorkha, Tanahu, Nawalparasi and Rupandehi in March 2008. In Gorkha, Mr. Ram Mani Bhattarai, LDO, Gorkha; Pawan Raman Khanal, Secretary, Goreto; Dr. Surendra Neupane, Medical Officer, Gorkha Hospital; Min Bikram Malla and Keshav Sharma, Practical Action and Bhaichandra Shrestha, Acting Chairman, Goreto,

An ICS promoter sharing her success story at the Surkhet workshop, June 08.

presented their papers during the workshop. In Dhading, five papers two from Practical Action and one each from REDP Dhading, District Public Health Office, Dhading and Prayash Nepal were presented. In Rupandehi, Durga Shrestha, Social Development Officer, DDC Rupandehi; Ram Chandra Khanal, Head, District Public Health Office; and Surya Bahadur Thapa, Chairperson, Friend Service Council Nepal presented their papers including two papers from Practical Action. In Nawalparasi, Tikaram Ghimire, LDO Nawalparasi; Dr. Prakash Shah, Head, District Hospital, Parasi; and Surbir Sthapit, Executive Director, HICODEF presented their papers including two from Practical Action. In Tanahun, Uddav Raj Timilsina, LDO and Chandra Mani Adhikari, District Health Office presented their papers along with two papers from Practial Action. At the workshop, Han Heijnen, WHO, spoke about the "Indoor Smoke and Health" and highlighted the need for national network to advocate against the indoor air pollution problem.

Forthcoming Events

The Women's Commission for Refugee Women and Children, New York will host their first major international research conference on firewood and alternative cooking fuels and energy technologies in humanitarian settings from 11 to 12 December 2008 in New Delhi, India. For details visit http://www.fuelnetwork.org/conference.

The Ashden Awards for Sustainable Energy has invited application from inspirational and innovative local sustainable energy projects based in countries with developing economies. Up to seven winners will receive £20,000 each in prize money for project development and one Energy Champion will receive £40,000. The deadline for the application submission is 21 October 2008. For more details visit http://www.ashdenawards.org.

FOR FURTHER INFORMATION
The Secretariat
Indoor Air Pollution and Health Forum Nepal
Practical Action Nepal, PO Box 15135, Lazimpat, Kathmandu, Nepal
Phone: 977-1-4446015, 4434482 | Fax: 977-1-4445995
Email: info@practicalaction.org.np | Website: www.indoorair.org.np