

The national importance of the NERD Gasifier Stove and the need for greater focus on the role of the kitchen in national social development

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It gives me great pleasure to make this presentation at this important occasion. My task is to highlight the national importance of introducing the NERD gasifier stove. Many people would realise that this is an important intervention in the energy field. It is indeed so, but I believe that it also has a broader range of impacts covering several development sectors not necessarily confined to energy. The introduction of the gasifier stove promises significant returns to our economy and benefits to natural environment through savings it is able to bring in the use of energy in household cooking. In my view it is also an important intervention that fills a void in our social development policy. To illustrate my statement I would like to present a few facts on the role of kitchen in social development. Kitchen performs many functions to elevate the social status of the society. Nevertheless kitchen is given low priority in our development thinking.

Please see **Annex 1**

A woman carries a heavy load of firewood. This is a very common sight in the rural areas. For whose benefit is she carrying this heavy load? She is in fact carrying the burden of the society. It is a journey that sustains the quality of life of the people. I would call this the journey for survival. But who cares?. How would she get her firewood in another 5 years time? We have national plans for LPG, Electricity, or Diesel. But where are the plans for the firewood, which is our major source of energy. The entire burden of fetching and using the firewood under the most pathetic conditions falls on the women in our society. Poorer the woman, the greater the burden and the suffering. Unfortunately, the development and energy planners are blind to the issues involved.

To understand the wide range of issues involved it is necessary to focus on the kitchen in its totality. The kitchen has three basic components. The woman, stove and the firewood, which can be, called the holy trinity of the kitchen. These three components are strongly interrelated to each other. To focus on these individually is to overlook several development issues related to the kitchen. Effective solutions to the issues involved would require a holistic and a multi disciplinary approach.

The box below shows some facts, which highlights the importance and the multi dimensional role played by the kitchen in the society.

BOX 1

Characteristics of a Kitchen (The need for a Development Focus)

- The kitchen accounts for nearly 50% of the total energy consumption in Sri Lanka.
- About 88% of the kitchens use firewood for cooking.
- Almost 90% of energy used in the kitchen are from firewood
- Stores food, water and related equipment.
- Enables cooking which impact significantly on the health, nutritional levels and the quality of life of the family members.
- Generates and stores waste, garbage and poison.
- Women and Children spend most of the time in the kitchen.
- Allows socialising inside the kitchen.
- Maintains cultural and traditional practices.
- Creates unhealthy environment and drudgery.
- Produce smoke, heat and moisture, which affect the comfort level of the house.

You will see that there are positive as well as negative characteristics. Therefore to enhance the positive impacts it is necessary to mitigate the negative impacts. In fact this is the role of science and technology. The introduction of the NERD Gasifier stove is a landmark step in this direction.

To further emphasise the need for a holistic approach towards kitchen improvement, I will focus on one critical aspect, namely, the unhealthy environment in the kitchen.

BOX 2

WHO Report

WHO reveals that solid fuel use is responsible for nearly 2 million deaths in the developing countries majority being women and children.

It is the 4th highest risk factor of mortality and morbidity in the developing countries next to malnutrition, bad water and sanitation and unsafe sex practices.

It accounts for 2.2% of the total number of deaths and 2.7% of the life years lost due to illness.

The **Annex 2** gives some of the diseases, which are caused by wood smoke.

The following table gives the harmful gases in wood smoke and the pollution levels

Component	Mechanisms of Health systems	WHO Std (mg/m ³)	Typical Levels
CO	Absorption into blood from lungs. HbCO levels -up. O ₂ to body tissues- down. Possible impact on lung clearance	10	150
Particulates	Inhalation into respiratory system. Deposition in respiratory tract. Irritation and toxicity	0.1	3.5
Formaldehyde	Irritation of Mucosa. Toxicity to Cilia. Reduction in lung clearance ability. Possible carcinogen	.1	.7
Benzene	Absorption into blood from lungs. Leukamia	.002	.8

Note: Emissions from 1 Kg of wood/hr in 40m³ kitchen

The evidence available has strong significance in the case of Acute Respiratory Infection (ARI) and Chronic Obstructive Pulmonary Disease (COPD) and fairly moderate in the case of the other diseases. Several studies conducted internationally have proved that wood smoke is a serious health hazard. This is an important point for the justification of health workers to be concerned of the kitchen.

BOX 3

Plausible Ranges of Relative Risk in Solid Fuel Using Households

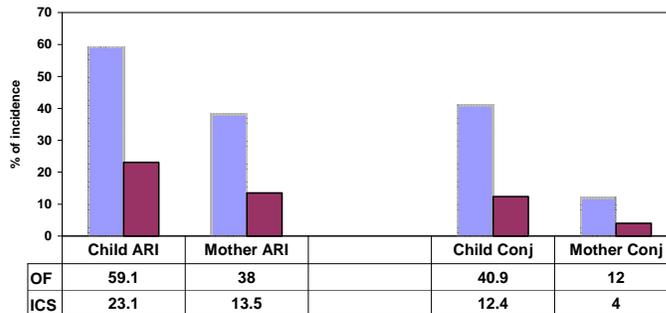
Health Outcome	Population Effected	Relative Risk	Evidence
Acute Lower Respiratory Infection(ALRI)	< 5years	2.0 – 3.0	Strong
Ashtma	Females	1.4 -- 2.5	Moderate
Blindess(Catarracts)	Females	1.3 – 1.6	Moderate
COPD	Females	2.0 –4.0	Strong
Tuberculosis	Females	1.5 -- 3.0	Moderate

If the use of firewood is such a disaster why do we continue to use firewood? Please don't jump into conclusions and ask why not use LPG? Switching completely to cleaner fuels such as LPG or electricity is the most effective way of eliminating the health hazards of using biomass. However the incremental cost of switching completely to modern fuels is prohibitive for many households. It will also exert pressure on the foreign exchange reserves of the country. There are cheaper and more appropriate solutions, which can be adopted within the socio-economic and energy context in Sri Lanka. The NERD Gasifier Stove, improved cookstoves and biogas are such interventions. Several research studies done in developing countries have proved that use of improved wood stoves and influencing the behavioral patterns within the kitchen are effective in mitigating the adverse effects of wood smoke.

From the chart below it can be seen that incidences of ARI and Conjunctivitis on women and children are less in the case of using improved stoves as compared to open fire

Relationship of stove type used & the % of incidence of ARI and Conjunctivitis: Study in Kenya by GTZ

OF=open fire ICS=improved stove



Improving the kitchen environment, while improving the health status of women and children is a critical input for economic growth and eradicating poverty, has positive impacts in a number of other development sectors. The benefits accrued can have a favorable impact at global, national, community and individual levels.

Please see **Annex 3**.

I would like to highlight the national impact of the NERD Gasifier Stove.

BOX 4

Positive Impacts of the NERD Gasifier Stove

- Helps to elevate the social status and health of the woman and children which contribute towards poverty eradication and economic growth.
- Enables the transfer from a primitive technology to a modern technology.
- Enables a lower grade fuel to compete with modern fuels.
- Reduce firewood consumption and drudgery in the kitchen.
- Improves the kitchen environment and related health hazards.
- Promotes the use of an indigenous and a renewable energy resource.
- Enhances the quality of life of the society by the use of an efficient and modern technology and equipment.

I have seen the demonstrations of many gasifier stoves developed by other countries at international seminars and it is not an exaggeration to say that the NERD gasifier stove is so far the best gasifier stove developed in the world.

I congratulate the Ministry of Science and Technology, the NERD Centre and the Inventor Mr. Punchi Bandara for this remarkable success. But please take care. Designing an appropriate stove is not the end. It is the beginning of a difficult path. Realising your ambitions of reaching a sizable user market would require a sound medium term strategic vision, a determination and a commitment, and a robust implementation effort'.

In conclusion, I wish to take this opportunity to request the Hon Minister of Science and Technology to include the rural and cottage industries also in his target group as they could also profit from the application of the gasifier technology developed by the NERD Center.

I thank you.