

Research Paper :

A hot water dual purpose improved cook stove- a device to drudgery reduction of rural woman

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Received : December, 2010; Accepted : February, 2011

ABSTRACT

In the rural kitchen cooking and heating of water for bathe are two major operations performed on the chulha. The time for these operations always overlap in the morning hours. This can delay the cooking operation and require more time to spent in the kitchen for rural women otherwise this can be spent in productive work in agriculture. In Jalgaon district two pot mud cookstove is most common. For the study a two pot modified laxmi chulha was selected. The Laxmi Chulha is a two pot mud cook stove with chimney and can be constructed with clay and some readymade parts such as pottery liner combustion chamber, connecting tunnels, chimney pipe, cowl and metal grate. Special "L" shape device of mild steel is inserted in Laxmi Chulha in order to increase its thermal efficiency by absorbing heat lost. Thermal efficiency of a chulha is the ratio of heat actually utilized to the heat theoretically produced by complete combustion of a given quantity of fuel. Special device absorbs the heat lost to the surrounding area, in this way heating the water in special device can increase the heat utilized. It increases the heat utilization and the extra time and fuel wood is saved for heating of water. The efficiency of Laxmi Chulha can be increased by 10 to 12 %. The life of special device is about 8 to 10 years so its operating cost and maintenance cost is very low. The use of fuel wood is very common and widely adopted in rural areas of India. The main purpose of study was to minimize deforestation by saving the fuel wood. Also the time and money of the rural women can be considerably saved.

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Kannor, Dinesh, Gagare, Santosh, Mahajan, Jayshree and Sharma, Deepak (2011). A hot water dual purpose improved cook stove- a device to drudgery reduction of rural woman. *Internat. J. Agric. Engg.*, 4(1) : 78-81.

Key words : Duel purpose cookstove, Efficiency

Energy is a vital input for economic and social development. In most of the developing countries, wood and other biomass fuels are still the primary source of energy for the majority of people, particularly the poor. Most countries in Asia are giving an increasingly higher priority to energy conservation, both in the industrial/commercial and domestic sectors. As cooking in developing countries constitutes a large part of the total energy consumption in the domestic sector, conservation approaches have concentrated on the development and introduction of improved cooking stoves (ICS). In principle an improved chulha can save 30-40% of fuel wood or other bio fuels. Therefore, it is expected that fuel saving per chulha would be about 700 kg/year. In India, the Ministry of Non-Conventional Energy Sources (MNES) recently informed in their stove programs that priority should now given to women's health aspects rather than to efficiency.

For present study a special device of hot water is

designed to get hot water while cooking is in progress. There will be no disturbance to the cooking activity. One can get hot water and cooking simultaneously. It will reduce the drudgery of women handling cooking and providing hot water for different activities. The designed model of improved chulha also can provide hot water even after 10 to 12 hours of cooking and for getting hot water no extra fuel is required to burn. A special device is absorbing the heat loss in the earth material near the chulha and this heat can be utilized to increase the temperature of water present in special device (L Shape Box). Ajmera, (2007), in his article in Dhanyalaxmi magazine, explained the working of a hot water Chulha. This Chulha had various advantages but not tested scientifically.

The objective are to design the improved Chulha, to evaluate performance of Improved Chulha and to compare the improved chulha with existing Laxmi chulha.