Appliances Guide

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Residential Cooking Stoves and Ovens

Good Practice Technology: Save 80 stove

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Index

1 Good Practice Technology: Save 80 Stove

1.1 Technology description

The stove Save 80 uses 80 percent less wood fuel than traditional fireplaces. The retained heat from the cooker of the stove allows additional energy saving. Once the food reaches boiling point in the cooking pot, it is transferred to the retained heat cooker that keeps the temperature for a long time without using direct heat sources. Users of Save 80 reduce negative environmental impacts by avoiding CO2 emissions due to inefficient burning of firewood. In addition, households could drastically reduce time spent for firewood collection or costs related to the purchase of fuels, depending on respective fuel prices and access to fuel wood.

Introduction

Save 80 is a fuel-efficient biomass stove. The stove is made of stainless steel weighing about 4 kg. The stove basically has three components i.e. a cylindrical container, an integral pot and a wonder box.
It requires 250g of small brittle sticks of wood to bring 6 litres of water to the boil. The stove accounts for using 80% less wood for its fuelling requirements compared to traditional fireplaces. Save 80 is equally suitable for cooking, frying, heating and sterilizing water and for baking flat bread. (PT ENERXI, 2010: 5-6). The local production of the stove will make large-scale dissemination possible.

Figure 1: Save 80 stove

Source: Habiba Ali (2008)

Energy efficiency, environmental and health impacts

The stove is 80 per cent more fuel-efficient than the traditional fireplaces e.g. three-stone fire etc. The retained heat cooker preserves the cooking temperature when food is transferred from the stove's pot after reaching boiling point. As the number of users of Save 80 grows, reduction in CO2 emissions also increases. The distribution of one Save 80 improved cooking stove is estimated to reduce CO2 emissions by 3.3 tons per year in Indonesia. Hence, the distribution of 300,000 stoves would result in CO2 reductions of almost 1 million tons.

Energy efficiency: Only 250g of small wood sticks are sufficient to bring 6 litres of water to the boil using the Save 80 stove, which is about 80% less compared to traditional fire places such as the three-stone fire stove. The 'wonder box' device of the stove allows additional energy saving. When the food reaches boiling temperature, it can be transferred from the integral pot to the wonder box, which keeps the high temperature for an increased period without using direct heat sources. The food in the wonder box can keep cooking (or stay hot) because the temperature falls at a very slow rate (e.g. after two hours the temperature would fall from 100 to about 90 °C and after 12 hours it could still be at 65 °C).
Environmental impacts: The Save 80 stove reduces CO_2 emissions significantly. Through the distribution of 120,000 stoves a reduction of 350,000 tons of CO2 per year is estimated to result in Indonesia (PT ENERXI, 2010: 3).

Figure 2: Use of Save 80 stove in Nigeria

Source: atmosfair

Health impacts: More than 2.5 billion people around the world cook their food at open fireplaces and use firewood, plant waste and charcoal as fuel. This creates hazardous emissions containing carcinogenic substances and leads to various diseases like lung cancer. The World Health Organization (WHO)

estimates that indoor air pollution causes 1.6 million deaths every year (Pieter Arkesteijin, 2010). In contrast, the Save 80 stove ensures burning at high temperatures for complete combustion with low emissions of smoke (USAID, 2010: 55). The stove generates positive effects on families' well-being by avoiding respiratory and eye diseases due to burning commonly used fuels such as kerosene, wood or even charcoal in inefficient open stoves inside houses (PT ENERXI, 2010: 3).

1.2 Advantages / Disadvantages

Industrial production of the stove allows constant quality standards. However, the cost of the stove is relatively high for many people living in poorer countries thus dissemination efforts need to be designed so that the stove's price remains affordable to the poor.

Advantages: The Save 80 stove is a highly fuel-efficient biomass stove, which can be operated by burning small sticks e.g. shrub/tree branches. The stove is associated with economic, environmental and operational advantages such as: high stability, low environmental impact, low smoke generation, creation of jobs through domestic stove production, sales and marketing and increasing environmental awareness and conscience (GIZ, 2011). Industrial production allows constant quality standards (Paul K, n.d.).

Disadvantages: USAID conducted an evaluation of five wood-burning stoves including Envirofit, StoveTec, Philips, Vesto and Save 80 to ascertain these stoves' fuel efficiency, cooking time, acceptability to end user and ease of use at Dadaab refugee camps, in Kenya. According to the survey, which tested the ease of use during cooking with each of the five stoves, with regard to the Save 80 stove the size and location of the stove's fuel feedings port made it difficult to get the pieces of wood into the stove. It also needs more frequent tending of the fire than the other stoves. Another negative feature observed was that the Save 80 stoves put out too much heat. For new users the wonder box (complementary accessory) of the stove – that cooks the food without a direct energy source – was not a familiar feature so some of them felt that it caused them to burn the food, creating an unpleasant taste (USAID, 2010: 30-38). However, the original price of the stove (around 100 Euro) is beyond the purchasing power of many families living in poorer countries. Although this initial investment would, in economical terms, be out-weighted by the value of saved biomass or reduced collection time, it remains an important barrier on the ground. Therefore, the dissemination projects need to be supported by the mobilization of climate protection funds, micro-finance facilities, and tax-free import in the short run, or at long sight - local production of the stove if possible (Paul Krämer, n.d.).

1.3 Policies supporting dissemination of the Save 80 stove

The Save 80 has been introduced in refugee camps in countries such as Chad or Kenya. Furthermore, the Clean Development Mechanism (CDM) has helped to disseminate the Save 80 stove in several countries including Indonesia and Nigeria.

Large-scale adoption of the stove has been promoted in the refugee camps and places suffering from wood shortage. The United Nations High Commission for Refugees (UNHCR) has been supplying Save 80s to the families in refugee camps in Chad and Kenya. Other initiatives to disseminate the stove are designed and based on the Clean Development Mechanism (CDM). The CDM executive board has registered projects seeking the distribution of Save 80 in countries like Indonesia, Nigeria and Zambia.

Refugee camps: Save 80 provides a more fuel-efficient cooking solution, especially in refugee environments and relief situations typically suffering from fuel shortage. At such places the interest in finding more-fuel efficient technologies is growing (USAID, 2010: 14).

The UNHCR is supplying households with Save 80 stoves at the UNHCR supported camps in Chad. For example, the Camp 'Kounoung' provides shelter to approximately 11,000 refugees, Camp 'Mile' accommodates approximately 13,000 refugees and the refugee camp 'Bahai' hosts about 30,000 refugees and is located in an arid desert area. Until June 2008, more than 40,000 deliveries of Save 80 stoves were ordered by the UNHCR. On-site cooking demonstrations are conducted for the refugees to show them the special abilities of the 'Save 80' stove (Koch, 2006).

1.4 Implementation case studies

The German NGOs atmosfair gGmbH and Lernen-Helfen-Leben (LHL) e.V. along with the Nigerian Development Association for Renewable Energies (DARE) have begun the initiative 'the Efficient Fuel Stoves for Nigeria' beginning in June 2007 (GIZ, 2010). In February 2008, the LHL/DARE received seed funding from atmosfair in the amount of US $50,000 that made it possible to disseminate the stove at a subsidised price of around €60. Up to 12,500 Save 80 stoves are being disseminated in multiple states located in the Guinea Savannah Zone of Nigeria (PCIA, 2010: 5-6).

A similar project also exists in Indonesia. The 'CDM cook stove project' seeks to distribute 300,000 fuel-efficient stoves to the households in Indonesia during 2010 and 2011. The main objective is to reduce green house gas emissions, provide the stoves to households at a reduced price (€80 per stove), enhance family well being by reducing the chances of diseases caused by burning of commonly used fuel kerosene, wood or charcoal in inefficient open stoves inside houses and finally to reduce deforestation.

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Figures

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