**CASE CARE Baseline study (2008)**

CASE Project started in January 2008 and is being implemented by CARE international-Rwanda in partnership with KIST CITT and ADENYA. A total of 24,000 poor Households of Nyaruguru, Huye, Gisagara and Nyamagabe are targeted and the project intends to reduce by 50% firewood used by 2010.

The baseline study brings out the current situation of energy supply and demand as well as household condition in the targeted area. The analysis assessed the time and quantity saved for a household using improved stoves as well as household improved living conditions (income, education, health and environmental impacts) derived from the use of the improved stoves.

Out of 813 households surveyed 771, i.e 95% use firewood as the main source of energy for cooking, 45 use charcoals for cooking and 16 households use both firewood and charcoal. In some areas vegetables and plant residues are used for cooking and lighting. 40% households use Kerosene as the source of energy for lighting. Batteries are used both for lighting and entertainment (radio) by 33% households.

85% of households which use traditional stoves do not pay for firewood but collect them. The percentage of those households which collect firewood is 71% for those households using improved stoves .Most of the time (beyond 95%) , it is the women and children who are responsible for fetching firewood. 94% interviewed people says that the supply of energy and especially cooking energy is less enough for their diary needs.

In order to reduce firewood used, two main types have been introduced; fixed and movable stoves. Households used them depending on areas (rural and per-urban), their size, needs for cooking, row material existing in the region, fuel used as well as cost for acquiring.

A good number of movable improved stoves are made up with metal and clay and utilize charcoal as fuel. Six categories of them, used most the time in urban and per-urban areas, can be found on the Huye or Nyamagabe markets at the cost which varies between Rwfr 500 and 2500.

Fixed improved stove can be found in the most cases in rural areas and built for free to the rural poor population. The population had to provide raw materials available in the region and local authorities offered technical support. In some areas a limited number of the population were trained on improved stove making but in the most cases it is the Rwanda Defense Force (National Army) or other government institutions like PAFOR which built them. Among fixed improved stoves, 4 types are introduced and used and the most popular is the round mud stove which is made with mud and clay. Photos of those different types of (fixed and movable) improved stoves can be found in appendix 7.

Of 813 households interviewed 392 (48.2%) use improved stoves at the level of 100% and 335 (41.2%) do not use them. 86 (10.60%) use both traditional and improved stove at the same time at different levels. This is due to several reasons including the lack of mobilization and sensitization on improved stove use, unavailability of community members who are trained on improved stove making and repairing. Nevertheless, some associations and CARE’s VSLG are engaged in improved stove making businesses.

**CARE interim report (2008)**

Terms of references for baseline study consultant have been designed and produced. A consultancy firm (local private company) named International Business Centre “IBC” has been recruited, following EC and Care procedures. The baseline tools have been drafted and finalized in collaboration with the hired company, the project team and other CARE relevant staff (M&E professionals, economic security progamme team members, project teams based in the Southern Province). Apart a questionnaire developed a number of improved stoves photos had been collected and shown to interviewees in order to know the existing types within the targeted community. The baseline to ascertain the current situation of energy supply and demand in the target area has been conducted by the company. In total 813 interviews have been carried out to collect information. 78.72% of them are female and 21.27% are male. Among female, 41.8% are heading households.

The baseline findings have been presented during a stakeholders’ workshop organised by the project. The Baseline survey has shown that local authorities have motivated and supported households to plant more trees and to use improved stoves as a solution to the deforestation and to the increasing demand of firewood. However more efforts have to be done because the use of exclusively improved stove in the household is at 48.2% and only 58% of households have planted at least one tree around the house during last year and a lot of hectares have to be reforested. Those efforts should be oriented in the promotion and dissemination of improved stoves as well as in trainings in making and repairing improved stoves with emphasis on follow-up strategies for a sustainable use.

In some areas, they use traditional and improved stoves at the same time; damaged stoves are neither repaired nor replaced. A number of households are still using traditional stoves (3 stones) which need too much fire woods. In some of the visited houses fixed stoves have been found, local associations in the target area have shown the types of improved stoves produced and sold in the peri-urban and urban areas. The followings are produced and sold by a local cooperative called Kora, located in Huye District.

**BEST**

**Firewood**

Firewood is used in rural areas and secondary towns for cooking; urban households buy it from the market or from the road side, a few sticks at a time or by the stere (stacked m3). In rural areas, households will first collect as much twigs, sticks leaves, dead wood as possible before buying firewood. For the purpose of estimating the consumption of wood taken from the growing stock of trees, it was assumed that households use between 1 and 1.3 kg per day per person using this fuel. This is likely to be a high estimate, as dead wood and other forms of woody-biomass, etc. are not included in this number.

Firewood is used in a number of stoves; the simplest is the 3 stone open fire, which can be built just about anywhere at no cost. Many Districts have improved stove programs in place and some even claim that they are reaching close to 100% coverage rate. The type of improved stove is a rectangular mud stove with 2 or 3 pot openings, not unlike the Lorena type. While it may be true that households are equipped with such stoves, there is no independent evaluation to demonstrate the level of savings or indeed if these stoves are used at all. This is not irrelevant, as a recent evaluation in Uganda showed that savings compared to the 3 stone open fire were negative, i.e., the improved stoves consumed more firewood than the 3 stone open fire. Thus, one needs to be careful assessing the fuel consumption levels applied. The TOR for the current evaluation did not include rural household use and an average annual consumption of 1640 kg of wood per household for a traditional stove and 1260 kg for an improved stove was assumed.

**Charcoal**

Charcoal is the fuel of preference by most Kigali households and quite a few households in other towns. Charcoal is embedded in the culture and therefore difficult to stop using. Even if rich households have LPG cooker s, the domestic worker often prefers to use charcoal for cooking and simply ignores the instruction to use LPG. Charcoal is available everywhere from dedicated selling spots and there even is a delivery service travelling door by door to sell charcoal.

For the users, charcoal has many benefits compared to firewood: the energy content is higher so only small quantities per day are used; they can buy it in small quantities or in bags that last 2 weeks; most volatiles have been removed during the carbonization process, so the burn is relatively clean; charcoal doesn’t deteriorate over time or attract insects; and charcoal is affordable for most households.

**Charcoal Stoves**

Rwanda is one of a few countries in Africa where improved charcoal stoves have penetrated far. Recent surveys suggest that penetration rates of 50% or higher have been attained and that improved stoves have spread to other cities as well. This is remarkable, as the last specific project to promote improved stoves dates back to the late ‘80s. At the moment, 4 different improved stove models are on the market24, one all metal stove (DUB 10, which originally comes from Burundi) and 3 mixed ceramic-metal stoves. Of the latter, one is the improved KCJ, the Kenya Ceramic Jiko, one is similar in size but without the bell-bottom form, and the third one is an evolved model of the Rondereza: whereas the Rondereza was an all-metal stove, the current model uses a ceramic fire basket the same size as with the improved KCJ. Unfortunately, the USAID stove study only tested the KCJ and discarded all other improved stove models. Based on the existing data, in the BEST analysis an annual consumption of 700 kg of charcoal per household for the traditional stove and 540 kg for the improved stove was taken.