Brief History of Donor Funded Programmes to Innovate and Institutionalise Improved Charcoal Stoves

- Previous stove improvement projects have **failed to properly appreciate the central role played by one and two person tinsmith enterprises that produce and sell ordinary mbaulas at very low prices.** The tinsmiths of Lusaka constitute a well distributed network of producers and sellers of ordinary mbaulas fabricated from scrap sheet metal who conveniently service all the major markets and townships of the city.

- In addition to underestimating the multiple competitive advantages of a well distributed network of tinsmiths who fabricate and directly sell a charcoal stove that everybody knows how to operate, previous stove improvement projects **failed to appreciate just how poor the bottom 2/3rds of the Lusaka economy really is and how little money low income families are able to save from their daily and weekly income for the purchase of a replacement mbaula when the old one finally breaks down**. It is the initial retail price of an improved stove, not how much money it will save a household during the course of a month, that determines whether they are willing and able to spend two, three, four or more times the K4 000 to K6 000 for a 20cm ordinary mbaula. The ordinary mbaula is the industry standard. Every household without access to firewood, no matter how poor, has to pay out at least K4 000 once or twice a year to purchase a replacement mbaula.

NORAD funded R&D at the University of Zambia:

NORAD supported the University of Zambia, with the cooperation of the Department of Energy, to redesign, fabricate and then launch an improved, more energy efficient mbaula that saved money, charcoal, and the environment. Although historical data is lacking, it appears this improved design was primarily implemented by small commercial metal working enterprises whose operating overheads and profit requirements resulted in an improved stove product that was more than three (3) times more expensive than the ordinary mbaula. The improved mbaula design never managed to win a permanent market share for itself although many tinsmiths were trained in its manufacture. This mbaula redesign process was started in the early 1980's by Professor Yamba and his students at the Dept of Engineering at UNZA. In 2006 there is absolutely no evidence of the fabrication, sale and use of the improved mbaula design pioneered by Prof Yamba.

Dept of Energy:

The approached followed by the DOE in its efforts to introduce improved stoves in Zambia focused on training and supporting existing artisans, namely the tinsmiths who are already fabricating the ordinary mbaulas, and also NGO's with experience motivating and training communities to engage in self help activities. Efforts were made by a DOE stove improvement unit to train both community groups and tinsmiths in the fabrication of metal claddings and the firing of clay liners. For reasons not yet fully understood by the TSA researchers, the joining together of the fired clay liners with metal claddings made by tinsmiths has proved highly problematic. The ceramic liners were often of poor quality, and replacement liners were not commonly available on the market to replace a liner when it broke. D

Care Zambia and USAID:

Care Zambia attempted a mixed artisanal/community enterprise approach to the production of the Jiko/Ziko stove. There apparently was conflict between Care International and Care Zambia over whether the main thrust of its stove improvement project would focus on creating new enterprise groups in the high density, low income compounds to fabricate the liners, with tinsmiths making the claddings (apparently favoured by Care Zambia) versus taking a more private sector approach (favoured by Care International). In the end, Care Zambia became the de facto implementer of last resort and never managed to launch viable community and/or private enterprise units to produce and sell competitively priced Jiko/Ziko stoves on the Lusaka market.

National Institute for Scientific and Industrial Research (NISIR) and Japanese International Cooperation Agency (JICA):

Initially, JICA worked with NISIR to design, fabricate and institutionalise an improved all ceramic cookstove. The all ceramic stove was developed as part of a larger programme to convert coal wastes from the coal mines in Momba into low smoke briquettes that would take the place of charcoal. The coal waste briquette project did not progress beyond the prototype stage. The all ceramic stove, although it did save charcoal, did not manage to establish itself in the mass market, largely because of its higher price and its weight. The initial capital costs of clay working technology and electric kilns and the costs for transporting suitable clays made the production of all ceramic braziers hopelessly unprofitable, given the low retail price at which the tinsmiths sold ordinary mbaulas.

The ceramic braziers were unable to compete for a permanent share of the mass stove market among the lower income residents of Lusaka, who comprise +/- 70% of charcoal stove buyers. The tinsmiths are able to fabricate and sell ordinary mbaulas at an extremely low price because they run survival enterprises that require very little capital and operating funds to sustain themselves.

The NISIR/JICA charcoal stove improvement project evolved into a joint venture with Care and other NGO's like ZENGO where NISIR produced high quality ceramic liners at a modest price (K4000 in 2006) for use in the metal bodies of the Jiko/Ziko stoves. NISIR's present capacity to produce ceramic liners for Jikos/Zikos is limited to +/- 1 000 liners a month.

NISIR has been unable up till today to separate out the ceramic production part of NISIR so that it can operate as a profit making and/or cost recovering project within a public sector organization. NISIR is not profit driven in its operation and therefore it is not well organized to focus scarce financial, technical and management resources on specific functions which are most likely to generate income for the parastatal as a whole, or for particular programmes that are well positioned to generate income. It appears that NISIR needs to be assisted to develop its own aggressive 'privatization' policies and practices that will enable the parastatal to assist embryonic enterprises – growing out of its applications research – to become viable and independent businesses.

Closing the Gap between Consumer Demand and the Supply of Improved Stove Products by Viable Production and Marketing Enterprises: 'technology prescription' for most appropriate improved charcoal stove for Lusaka

The TSA research team, looking backward at past efforts to innovate and promote an improved charcoal stove for Zambia, sees considerable evidence that these previous stove improvement projects were not adequately informed by in depth investigations of the existing stove production and marketing system. The aim of this preliminary investigation would be to discover the production, price and performance profiles of the stove products that presently dominate the Lusaka charcoal economy.

To this end, more than 15 years late, the TSA baseline study will give its recommendations about the production, price and performance (PPP) characteristics of existing stove products already on the market and the PPP profile of an improved charcoal stove most likely to gain a reasonable share of the existing stove market within the shortest period of time (and with the lowest possible start up and input costs)

Cecil Cook
TechnoShare (SA)
cec1863@gmail.com
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