



Report on the Impact Assessment of the POCA (**PO**upa **CA**rvão) Charcoal Stove

Charles Tamai Chidamba

ProBEC Mozambique

Monitoring and Evaluation officer



Maputo, September 2010

Acknowledgements

First and foremost, we would like to express our gratitude to GTZ-ProBEC who made this study possible by their material and financial support; Antonio DNJ Malalane the ProBEC regional coordinator for Mozambique, Lesotho, DRC and Swaziland; Erika Schutze the ProBEC M&E, Public Relations and Knowledge Management Manager who gave guidance throughout the whole process; Elias Norgy who transported the teams throughout the cities of Maputo and Matola; all the local government authorities who co-operated with the teams working on the ground during data collection, the enumerators and the data entry clerks who helped with data collection and data entry respectively.

ABSTRACT

This impact assessment survey report is part of ProBEC's monitoring and evaluation of the implementation of its initiatives to improve biomass use in Mozambique through the promotion of energy efficient thermal products.

Most of the Mozambican urban population rely on biomass fuel for their cooking and heating needs and the main method of cooking is through the use of traditional, home-made metal charcoal stoves, which lead to the deforestation of rural areas as charcoal is made in rudimentary kilns that burn the wood collected from neighbouring areas.

The deforestation rates are rising and there is a need for the introduction of alternative solutions to minimise the impact of the high use of biomass. The ProBEC-commissioned study "Assessment of Non-Renewable Biomass Prevalence and Use in Mozambique," states the following:

"In 1997, the consumption of fuelwood in Mozambique was estimated at 12.000.000 tons/year (PIED, 1997 cited by Pereira 2001). In 2000, this consumption had increased to around 20 million tons/year¹. In 2004, Trosero referred that the woodfuel consumption accounted for a trade value of over \$200 million. This ascending trend was already found by FAO (2003) when stating that the situation of fuelwood consumption is likely to remain unchanged and maybe increase in the years to come on account of the population growth, low incomes and the limited availability and accessibility of alternative energy sources. Also, Cumbe et al, (2008) citing Direção Nacional de Energia (1997) in their projections points that by the year 2014, about 14 million of Mozambicans (about 70% of total population) living in the rural areas will be exclusively using fuel wood for cooking." (Mate, R. S. July 2010)

ProBEC, together with the Mozambican government, introduced improved charcoal cooking stoves in the cities of Maputo and Matola in 2007. The main goal of this intervention was the reduction in consumption of biomass used and consequently the time and money spent and the improvement of health of the affected families.

In order to assess the impact of the introduction of the POCA charcoal stove, Interviews were conducted in the cities of Maputo and Matola during the month of June 2010, to assess the impact of the use of these stoves. In general, results show that the improved cooking stoves have great savings in charcoal and hence savings in money and/or time. ProBEC stoves also emit less smoke which naturally leads to a reduction in smoke related diseases for the stove users.

In 2006 the total population of Maputo and Matola was estimated to be 1.88million people and of this figure roughly 61% use charcoal as their primary fuel source. Assuming average family size is six people in Maputo and 5 in Matola the total number of families using charcoal stoves was estimated to be 187 000 (Cook:2006; based on statistics from the National Statistics Institute).

POCA specifications

ProBEC has spent three years perfecting the ceramic recipe and production process of the POCA stove design, as well as trying to find a suitable partner/producer to make the stove. The POCA is a ceramic, charcoal-burning stove that is made by one factory, in a semi-industrial process involving an electric kiln. The POCA has got a specific fuel consumption of 33% better than the metallic charcoal stove (CCT Tests 2010). The retail price of the POCA is US\$8. The only metal part is the pot rest which is made out of an 8mm round bar.

The stove body has a 235mm combustion chamber which has a height of 70mm and as it goes down it forms a shoulder and a base that is 275mm in diameter. Three grate supports are formed inside the shoulder area and are spaced 120 degrees apart. The grate is conical shaped, 210mm in diameter and has a depth of 70mm. The grate has an array of 13,5mm hole which are primary air inlets and ash drop holes. At the base of the stove on opposite side there are two 85x35mm air inlets. The stove rests on a plate and this plate serves as an ash catcher. At the moment the POCA stove is being produced only as a one-plate stove.



During January 2010, ProBEC's regional technical officer (Mr Dexter Matelakengisa) carried out controlled cooking tests (CCT) on the new POCA in Maputo, Mozambique. The purpose of these tests was to assess the performance of improved cooking stove (POCA) compared to traditional cooking stove (metal stove) through a series of testing procedures. The POCA stove was found to be 33% more efficient than the baseline technology.

EXECUTIVE SUMMARY

This report summarises the findings of a survey conducted to assess the effectiveness of the POCA stove, and also compares it to the other energy technologies available to the target household group. The objective of undertaking annual impact assessment surveys is to verify whether or not the stoves are being used, whether or not they are used correctly, establish the benefits accruing to users, the uptake rate of the stoves as well as, the replacement of baseline technologies by the POCA stove (in this case the metal brazier, with gas stoves being an alternative in some cases) and to ascertain design problems, fuel use patterns and to identify effective marketing and promotional strategies.

The results of this analysis suggest that:

- 90% of the respondents in the study area are women, who are the primary cooks in the household and interviewers were always referred to women in the household if they encountered a man,
- The POCA is used for preparing the breakfast, lunch and dinner,
- 50% of the families cook once a day and use the stove for warming up the pre-cooked food,
- The traditional metallic charcoal stoves and gas stoves are still widely used by more than half of the respondents,
- Close to 60% of the respondents have owned the POCA for less than six months, which is not unusual given that the stoves only went to market in early 2010,
- About 5% of the respondents have replaced their stove and of these 55% replaced it with another POCA stove. This is mainly due to the fact that most of the stoves have only been in use for only six months (the second successful POCA factory only started production early 2010) but there is a good number of stoves which were bought in 2007 from the first factory which are still in use which indicates that the average lifespan of the POCA is three years.

- All the respondents said that the stove saves fuel, 95% said that it saves money, 94% said that it cooks fast, 80% said that it emits less smoke and 87% said that they have a cleaner kitchen as a result of using the stove,
- Only about 30% said that they feel comfortable cooking on the POCA. The metal brazier, which is mainly used in Maputo and Matola, comes with metal legs and people can cook whilst they are upright as compared to the POCA they have to bend over which makes the POCA less comfortable to use,
- Of the people who save money, 95% use it to buy other household stuff, while 73% use the time to do other household chores and 21% invest the time in their small businesses,
- The majority of the respondents buy charcoal in small quantities, with 40% of respondents saying they buy it in 1-2Kg parcels, which costs between US\$1,5 and US\$0.3,
- About 30% of respondents buy bags of 50kg which cost between US\$11 and US\$14 and another 20% buy bags of 90kg which cost between US\$14 and US\$17 per unit,
- About 67% of the charcoal is bought from the market, about 26% is bought from neighbours and only about 7% is bought from roadside vendors,
- Close to 80% of the respondents practice kitchen management techniques. Kitchen management techniques involve practices which save time and fuel are critical for the efficiency of the stove. These include: using a lid whilst cooking, preparing everything (food and utensils) before lighting the fire, cutting food into small pieces so that it cooks fast, using only the sufficient quantity of water to cook food, keeping charcoal in a dry place and breaking it into smaller pieces before use and keeping excess charcoal for future use after cooking a meal,
- Television was very instrumental in the marketing of the POCA stove with 35% of the respondents saying that they saw it on TV which prompted them to try out the stove, and about 30% heard of the stove from a neighbour or friend.

LIST OF ABBREVIATIONS

GTZ	German Technical Cooperation (Deutsche Gesellschaft fuer Technische Zusammenarbeit)
ProBEC	Programme for Basic Energy and Conservation
CCSA	Carbon Checkers of Southern Africa
ADEL	Agency for Local Economic Development of Sofala
CO ₂	Carbon Dioxide
MDG	Millennium Development Goals
AIDS	Acquired Immune Deficiency Syndrome
HIV	Human Immunodeficiency Virus
SADC	Southern African development Community
ICS	Improved cooking stoves
POCA	Charcoal stove (PO upa CA rvão)

TABLE OF CONTENTS

Acknowledgements.....	2
Abstract.....	3
Executive Summary.....	4
List of Abbreviations.....	7
List of Tables.....	8
List of Illustrations.....	9
Introduction.....	10
Methodology.....	13
Sex of person being interviewed.....	14
Uses of the POCA.....	15
Alternative Cooking Methods.....	16
Uses of Alternative cooking methods.....	17
Length of time with POCA stove.....	18
Frequency of use of POCA stove.....	19
Stove replacement frequency.....	19
Advantages of the POCA.....	21
Cash Savings.....	22
Time Savings.....	23
Costs of charcoal.....	24
Typical amounts of charcoal bought.....	24
Origin of charcoal used for cooking.....	26
Kitchen Management.....	27
Factors which influenced user to buy stove.....	28
Conclusions.....	30
Recommendations.....	31
Bibliography.....	32

LIST OF TABLES

Table 1: Sex of person being interviewed.....	14
Table 2: Uses of the POCA.....	15
Table 3: Uses of other cooking methods.....	17
Table 4: Advantages of the POCA stove.....	21
Table.5: Cost of charcoal.....	25
Table6: Kitchen Management.....	27
Table7: Factors which influenced acquiring stove.....	28

LIST OF ILLUSTRATIONS

Graph 1: Sex of person being interviewed.....	14
Graph 2: Uses of the POCA.....	16
Graph 3: Alternative cooking methods.....	16
Graph 4: Uses of other cooking methods.....	17
Graph 5: Length of ownership of ProBEC stove.....	18
Graph 6: Frequency of use of ProBEC stove.....	19
Graph 7: Stove replacement frequency.....	20
Graph 8: Replacement with ProBEC stove.....	21
Graph 9: Advantages of ProBEC stove.....	22
Graph10: Cash savings.....	23
Graph11:Time savings.....	24
Graph12:Cost of charcoal.....	25
Graph13:Typical amount of fuel bought by users.....	25
Graph14:Sources of charcoal.....	27
Graph15:Factors which influenced acquiring stove.....	29

INTRODUCTION

The Programme for Basic Energy and Conservation (ProBEC) aims to ensure that low-income population groups satisfy their energy requirements in a socially and environmentally sustainable manner. It targets rural and urban households, as well as small businesses and institutions using biomass energy (wood fuel, agricultural residues) for thermal processes.

The programme lead is situated in the SADC Secretariat, Infrastructure and Services Directorate, and the implementing agency is the Deutsche Gesellschaft fuer Technische Zusammenarbeit (German Development Co-operation).

The results of ProBEC interventions undertaken thus far have shown that with a comprehensive package of solutions, it is feasible to attain multiple, long-lasting, environmental, economic, and social benefits. Families and small businesses benefit, on a national level there are savings of foreign exchange from energy imports, and globally, the use of renewable energy sources instead of fossil fuels, reduces net emissions of greenhouse gases, as well as optimizing timber and non-timber forest products.

Some of the interventions include the use of energy efficient devices such as improved cooking stoves and heat retained cookers, profitable production and marketing of these devices, efficient wood fuel use and kitchen management, and substitution with renewable energy sources.

These initiatives also contribute to the UN Millennium Development Goals (MDGs), insofar as additional jobs will be created in the informal sector through the production and marketing of improved technologies. This will help in the eradication of extreme poverty and hunger (MDG 1), which is one of the priorities of the Mozambican government at the moment.

The results from the 2008-9 family expenditure survey which was submitted to the council of ministers in July 2010 and distributed by CIP(Centre of Public Integrity) show that poverty rates have increased from 54% in 2002-3 to 55% in 2008-2009 (*Joe Hanlon, 29 September 2010: tinyurl.com/mz-en-sub*)

There is an emphasis on the training of women in the programme design, which promotes gender equality and empowers women (MDG 3), both intellectually and financially. The engagement of women is done through training in the manufacture and marketing of

household stoves and providing help in starting small businesses through the construction of improved bakery ovens. Basic energy conservation measures also reduce indoor ambient smoke, which in turn reduces respiratory diseases by 50%, and minimises infant mortality (MDG 5). Although the majority of the people report a reduction in smoke emissions from using the improved POCA stove, the absence of records within the health sector makes it impossible to compare the situation now with that at the beginning of the project.

Using energy efficient stoves also reduces the work burden in poorer households for those who have to spend hours a day collecting wood, which is mostly women and children.

Access to modern energy also assists child-headed households of orphans and vulnerable children suffering from HIV/AIDS (MDG 6), reductions in money used to buy wood fuel also eases the economic burden on them. HIV/AIDS awareness is an integral part at all programme interventions thereby enhancing the fight against the pandemic.

Reducing woodfuel consumption protects forest areas, and the use of more energy efficient and alternative technologies will reduce CO₂ emissions. This will directly contribute to environmental sustainability (MDG 7) and thus, to the international Convention to Combat Desertification.

In Mozambique, ProBEC promotes the use of efficient appliances and the implementation of energy saving techniques and practices to improve the access to sustainable energy sources. Adopting a commercial approach, ProBEC supports and trains stove producers to make energy efficient devices. Interventions focus on the demand side to raise awareness among potential users. ProBEC offers regional technical support services aimed at developing standards and testing procedures for improved energy devices.

In 2007 a baseline survey of market and household cooks was carried out by Econ Policy Research group on behalf of ProBEC which concluded that 79% of the people in Maputo and Matola own a one-plate metallic charcoal stove, the replacement rate of these stoves was about 100 000 stoves per year, one third of the home cooks complained about respiratory problems but only 8% of them attributed those problems to smoke coming from their cooking fires. On this basis, work was initiated in developing a low-cost but more efficient stove. Various tests were carried out at the first POCA factory until the present POCA was developed. A break in the supply chain due to organisational problems at the production factory spoiled the market and a second producer had to be engaged.

ProBEC as a SADC project has been in existence for the past eleven years and the year 2010 is its final year of operation. As the project closes, it is critical to understand the outcomes and impacts that the project has achieved. In order to assess the outcomes and impacts of the project in Mozambique, a user outcomes evaluation survey was conducted during the months of May and June 2010. During this exercise, data was collected on different technologies that ProBEC promotes from the users of the technologies.

The objectives of the survey are as follows;

1. To assess the effectiveness of the energy efficient stoves that householders have and understand other energy technologies that the household uses,
2. To understand the fuel sources and use patterns in the house and the method of acquiring the fuel,
3. To understand the typical price of the most commonly used fuel,
4. To assess the change that has been made by the introduction of the energy efficient stove.

METHODOLOGY

A sample size of 152 households was selected, which represent just over 10% of the total number of households using the POCA stove for at least three months prior to the survey. Households were randomly selected for the interviews in the different townships of the cities of Maputo and Matola. Enumerators used structured questionnaires to do the interviews and the ideal situation would have been to do the interviews whilst people were cooking, but this was not possible since a significant number of people cook afterhours.

ANALYSIS OF DATA

One of ProBEC's objectives is that 50% of involved women improve their disposable income by 10%, through the use of efficient technologies, from September 2005 to December 2010. As such it was imperative to determine up to which point women were involved in the acquisition and preparation of food and charcoal. Figure 1 below shows us that 90% of the respondents were women and this indicates two things:

1. It is mostly the women who prepare the food or spend most of their time on the fire and therefore are better informed than men about cooking habits and burdens,
2. If cooking conditions were improved, the life of the women and girls would also be improved, since they are the main beneficiaries and users of the product.

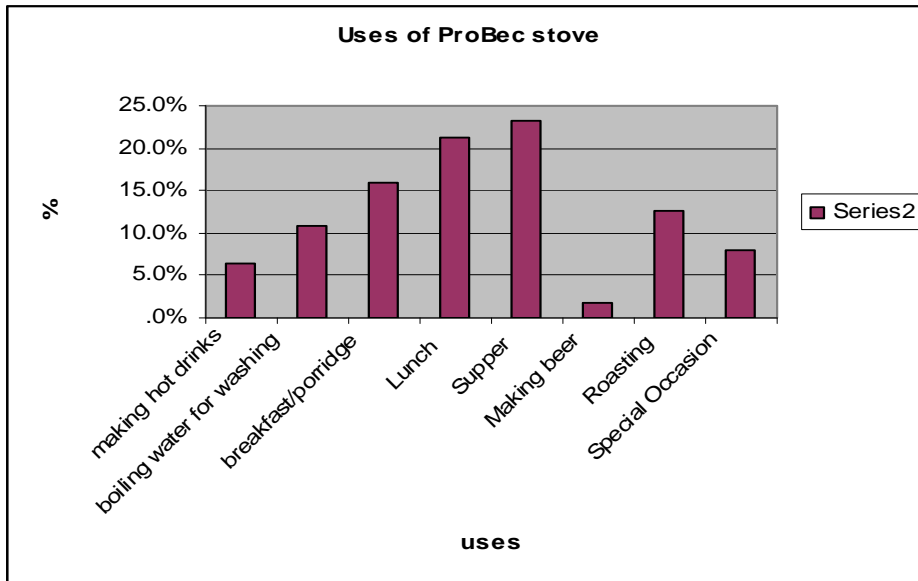
	Frequency	Percent
Male	15	9.9
Female	137	90.1
Total	152	100.0

Table 1: Sex of person being interviewed

Uses of the POCA stove

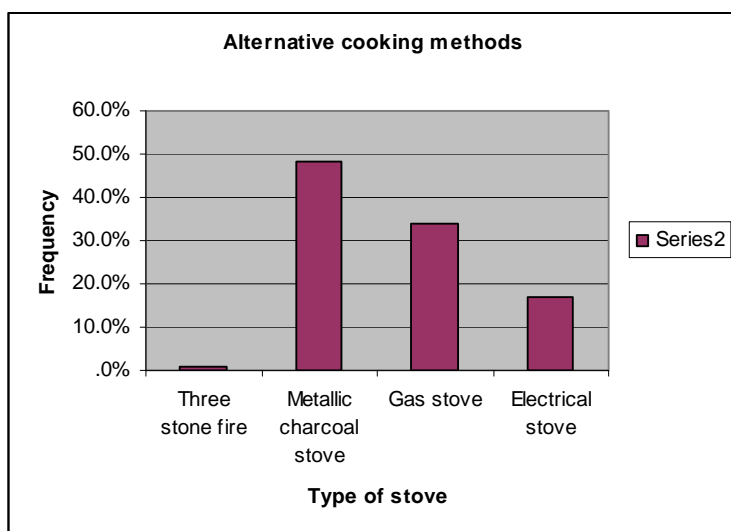
In introducing the POCA, ProBEC aims to replace the baseline technology with a stove that will meet all the demands of the user, in terms of uses, improve the user's health, save their time and money. By looking at fuel use patterns and user habits we can ascertain that an appropriate technology would be one that meets the above named conditions. It is therefore imperative that respondents were asked what they used the stove for. The results in Table 2 indicate that the POCA stove fulfils all household needs.

Table 2: Uses of the POCA stove



The above graph illustrates that most of the respondents use the stoves mainly for preparing breakfast, lunch and supper with a few more who use the stoves for roasting. In the case of the latter, it is usually people who have access to alternative fuel sources such as gas and electricity.

Alternative cooking fuels and technologies



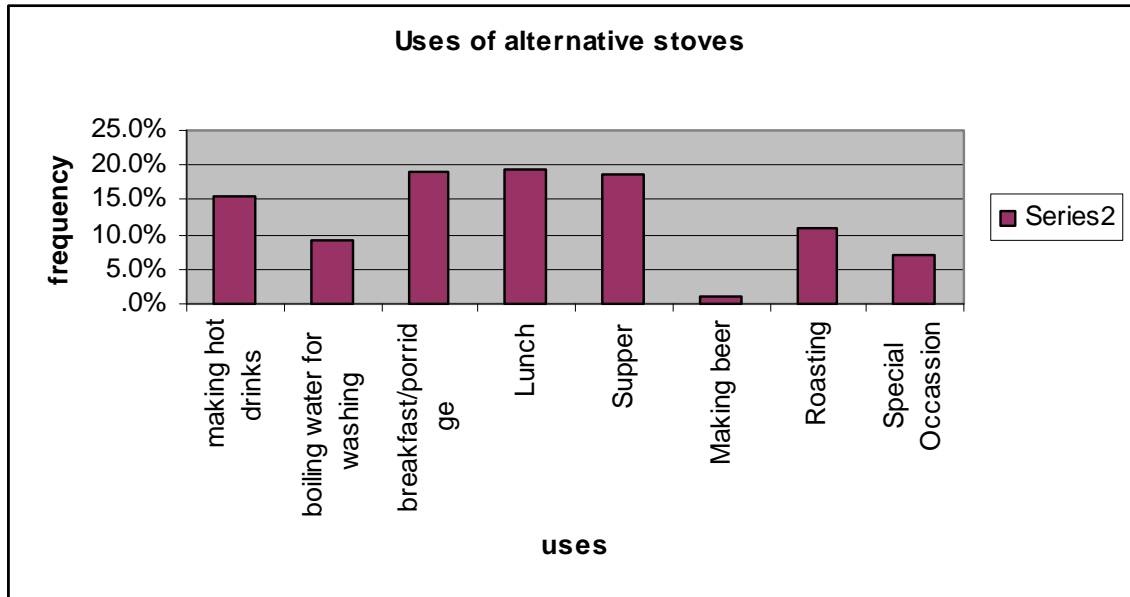
Graph 3: *Alternative cooking technologies and fuels*

The POCA is a one-plate stove and hence results from the study area show that close to 50% of the people who use the POCA still use the metallic charcoal stove and from the illustration below, they use it just for the same purposes as the POCA. It simply serves the purpose of providing a second plate to cook on.

Uses of other cooking methods

Uses of alternative stoves				
		Responses		Percent of Cases
		N	Percent	
What do you cook on these other stoves ^a	making hot drinks	87	15.3%	60.4%
	boiling water for washing	52	9.2%	36.1%
	breakfast/porridge	107	18.9%	74.3%
	Lunch	109	19.2%	75.7%
	Supper	105	18.5%	72.9%
	Making beer	5	.9%	3.5%
	Roasting	62	10.9%	43.1%
	Special Occasion	40	7.1%	27.8%
Total		567	100.0%	393.8%

Table 3: *Uses for alternate methods of cooking*



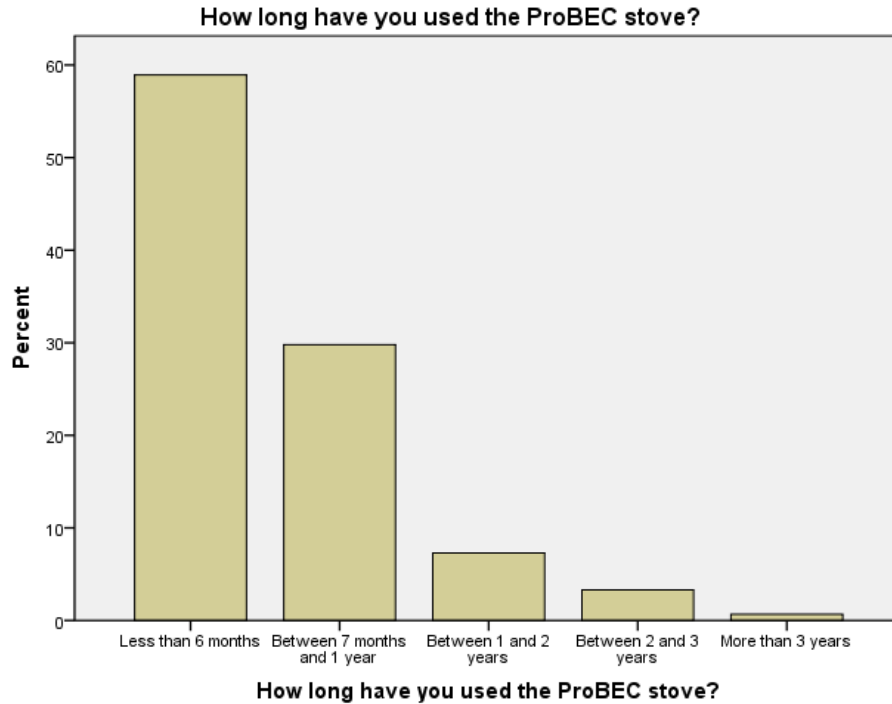
Graph 4: Uses of alternative methods of cooking

Durability of the POCA stove:

To determine the durability and replacement period of the POCA stove, respondents were questioned on the length of time that they have been using the stove. It is important to state that there are two types of POCA stoves which are in use; the stove produced by the first factory which had ceramic pot rests and of which production stopped in 2009.

The second POCA version was only brought to the market by the second factory in early 2010 with the major differences being in the pot rests and the metallic ash plate. Production with the first factory wasn't a success story even the total number of stoves churned out into the market was negligible.

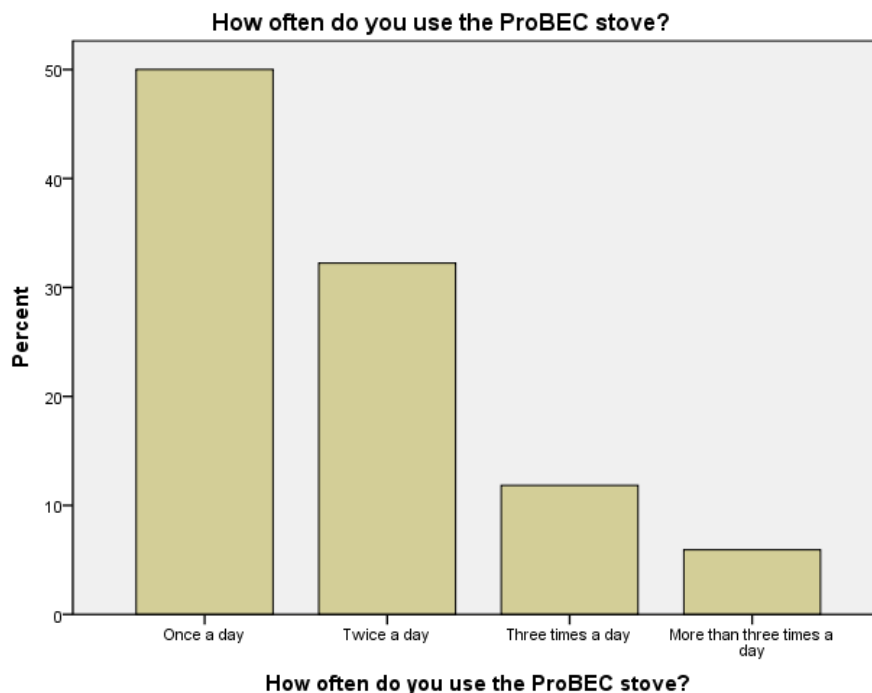
The first factory failed because of internal organisational problems although they had worked hard in product development. As was expected, from graph 5 we can see that most of the people had only used the POCA for less than six months, but it is important to note that the stoves manufactured three years ago are still in use. Much publicity was given to the POCA during the first campaign which was subsequently followed by a stoppage in production which spoiled the market leading to more work and more money being invested to build the confidence of the market in the POCA re-launch.



Graph 5: *Time of use of the POCA stove*

How often do you use your POCA stove?

The frequency of the use of the stove gives us an indication of the daily uptake of charcoal by each household and also the time that the cooks spend on the fire. This also has an effect on the durability of the stove: a stove which is used once a day lasts longer than a stove which is used more than three times a day.

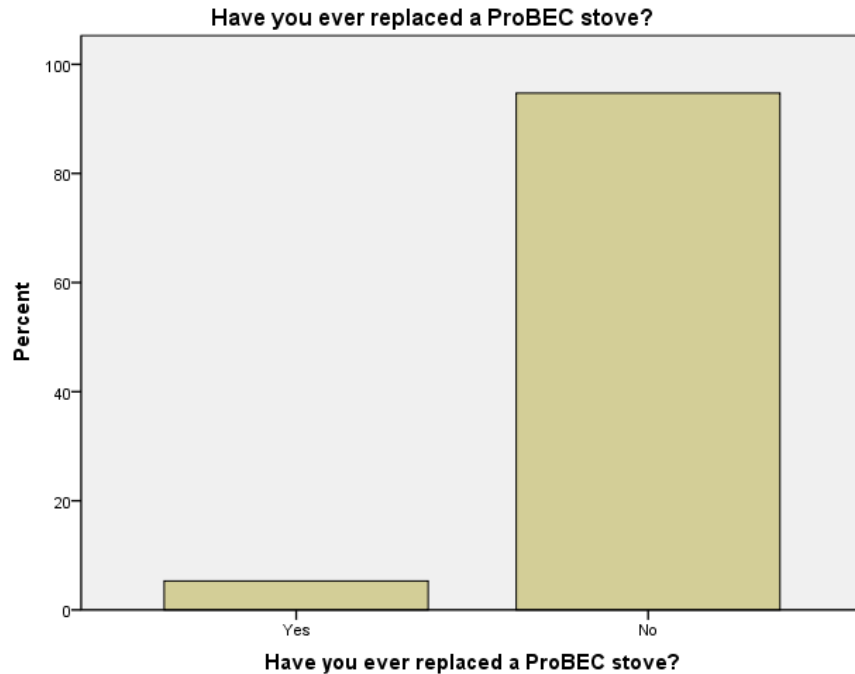


Graph 6: Daily frequency of use of improved charcoal POCA stove

As shown in table 6 above, about 50% of the respondents use their stove only once a day, a pattern which is traditional in this part of the country. Apparently since the respondents said that they use the stove for breakfast, lunch and supper, when probed they explained that normally they cook all their food for 2 or 3 meals in one session and during the rest of the day they will just be heating the already prepared food.

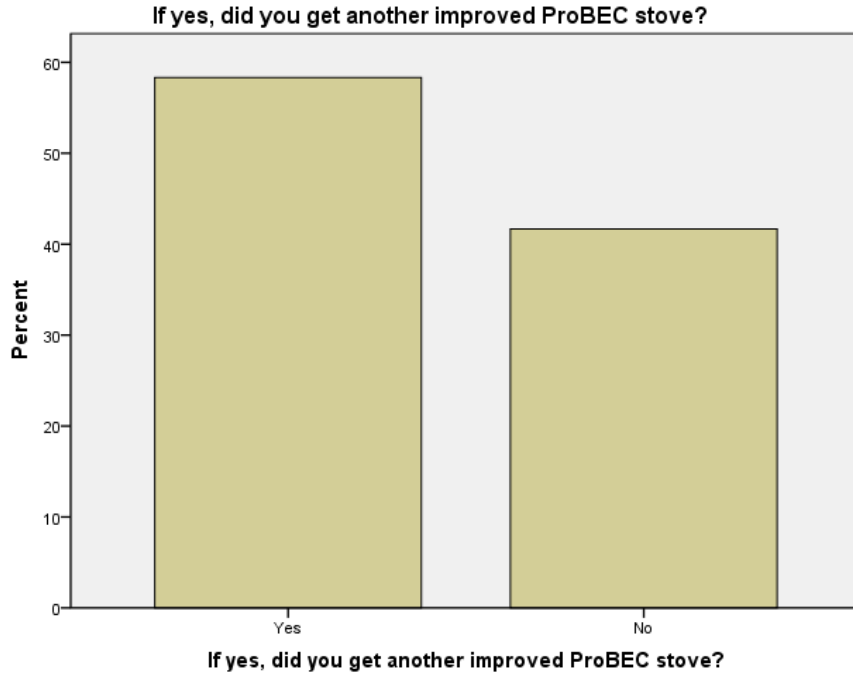
Stove replacement

Although the new POCA was only launched in early 2010 and most of the respondents had only used the stove for less than 6 months it was relevant to know if the changes made to the POCA (the metal pot rests) as compared to the original ceramic ones which broke easily, contributed to customer satisfaction. The POCA being a ceramic stove most people have reservations in buying it because they say it breaks easily and to remedy this perception, stove sellers issue a pamphlet on how to handle and use the stove when it is sold. The replacement rate would also give indications on what needs to be improved or if more public awareness on correct use is necessary.



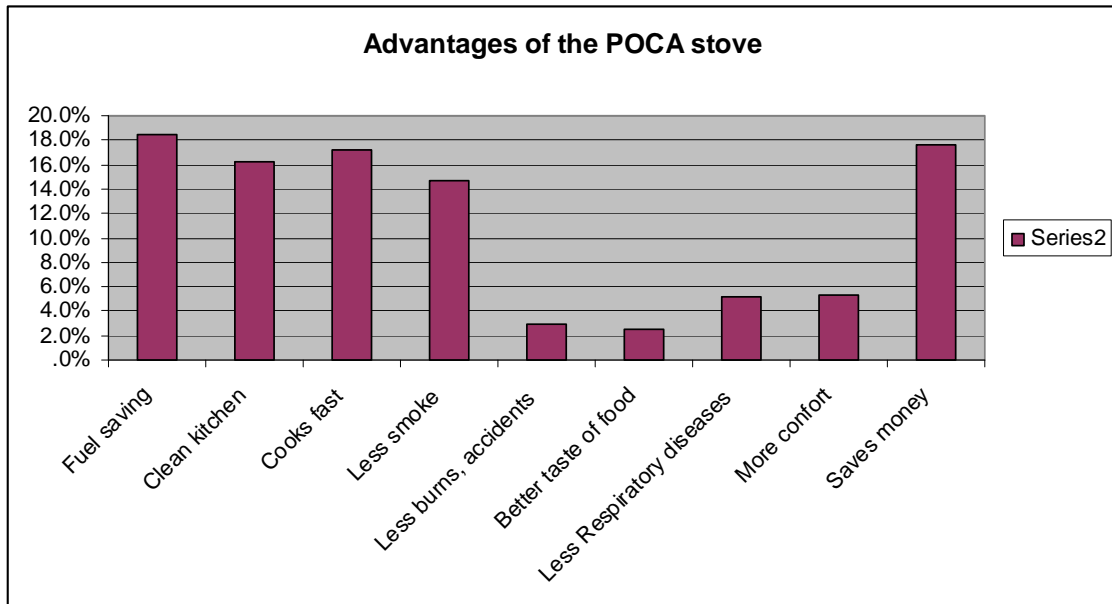
Graph 7: Replacement of POCA

As illustrated in figures 7 and 8, only a very small number of users, about 5.3% replaced their POCA stoves and of this number just over a half replaced them with another POCA stove. This is not surprising given that the new improved stoves only went to market this year. The first batch of stoves easily cracked, and also due to incorrect use, stoves lasted for a shorter period. Another common problem was the breaking of the charcoal grate and ceramic pot rests. The first POCA factory did not manufacture spare parts for the stove and had little or no post-sales support, which resulted in many users not knowing where to buy spare parts. Ceramica Termica, the current POCA producer, currently has a spare-part backup facility for the POCA for the users.



Graph 8: Replacement of a POCA stove by another POCA stove.

Advantages of the POCA stove



Graph 9: Advantages of the POCA charcoal stove

The above graph 9 illustrates that, above 70% of the respondents are saving money, time and have cleaner kitchens with less smoke. This means better health for the stove users and their families, as well.

The respondents did not notice any changes in health as a result of the introduction of the stove. This is possibly because most of them have only been using the stoves for a short time (less than 6 months) and it is too short a time to note the difference. There is also no baseline health information from health centres to compare the situation currently to the one before project implementation commenced.

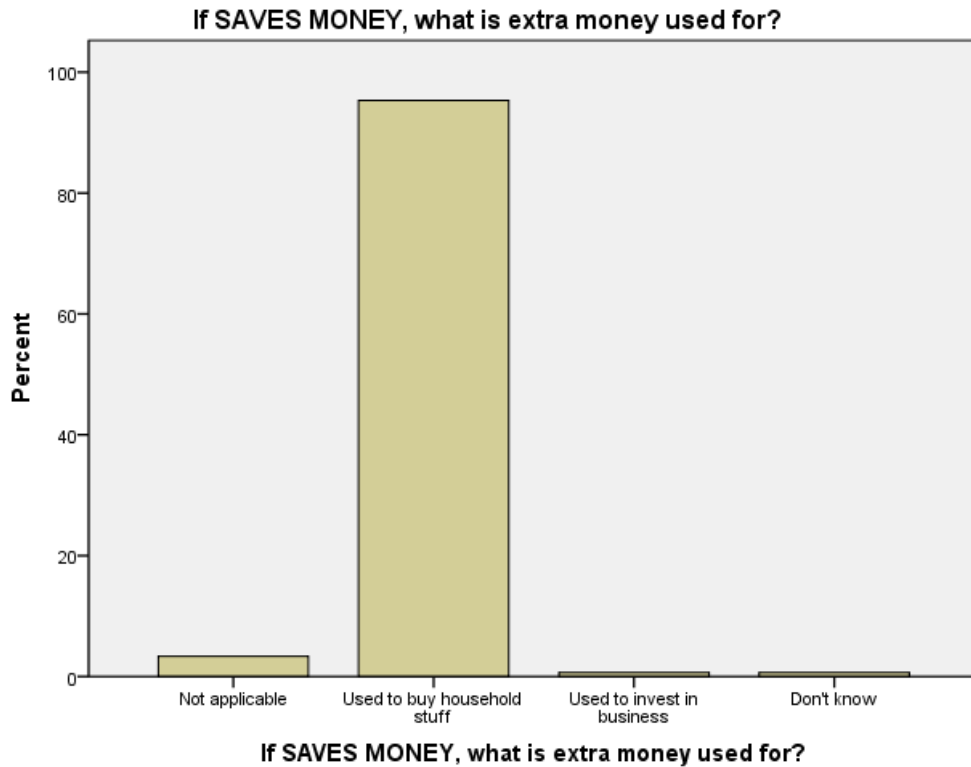
A health-related disadvantage of the stove cited by users is the fact that it sits on the ground and this is an uncomfortable height from which to cook.



Use of money saved

ProBEC's objective is to improve the lives of low-income households by promoting the use of efficient energy saving technologies. If the use of the POCA saves money, this translates into more disposable income for the families leading to an improvement in their lives. Hence respondents were asked what they use the money for that they save through using less fuel with the POCA.

Figure 10 below shows us that about 90% of the respondents have extra cash to spend on other household goods with a very small percentage using the money to invest in their small businesses, which are mainly small tuck-shops for selling groceries non-perishable household essentials like soap and toilet paper.

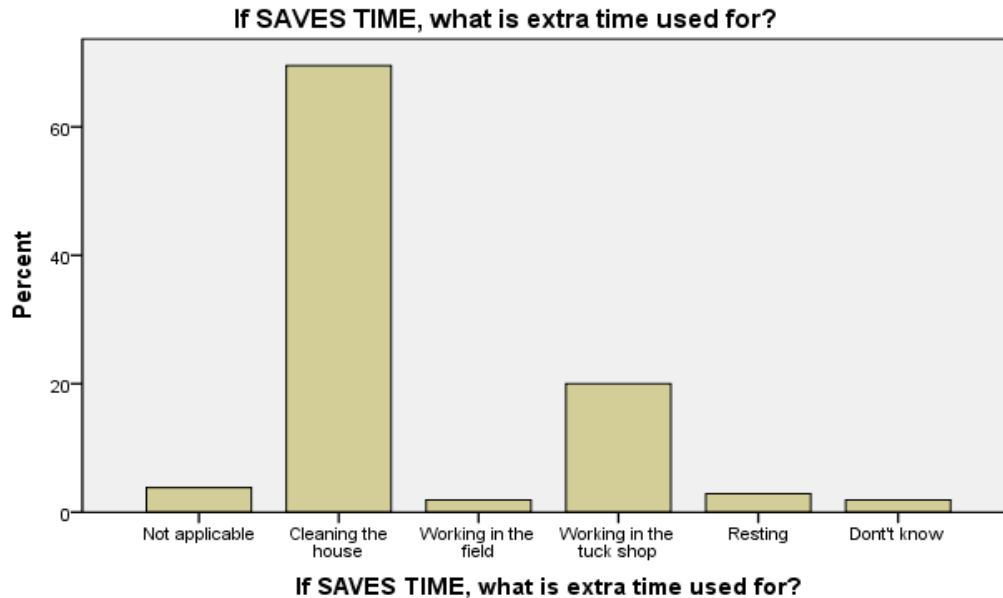


Graph 10: *Uses of cash saved from using improved charcoal POCA stove*

Time Saving

The decrease in the amount of time spent on cooking means there is time left for other productive activities which help in the eradication of extreme poverty and hunger. Women can also engage in other decent productive sectors. This automatically leads to the promotion of gender equality even girls can have more time to study since they tend to perform cooking chores on a daily basis.

The time savings because of rapid cooking with the POCA are very minimal and many respondents did not know if they save time, and if so, what they do with the time saved, an indication of the way the society manages its time and that it is a relative notion at best. However, at least 48% of those who said that they save time use the extra time to do other household chores and about 14% attend to their small businesses.



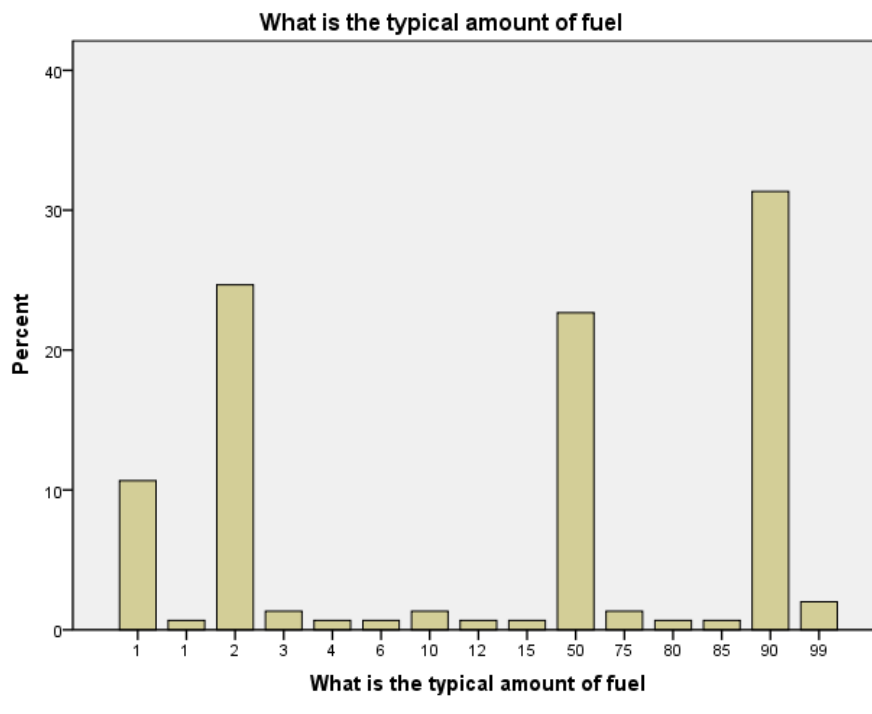
Graph 11: Uses time saved due to reduced cooking time on the improved charcoal POCA stove

FUEL SUPPLY

A preliminary study on the typical fuel quantities and respective cost bought by the respondents was carried out including the sources of the charcoal. A more detailed study on the consumption rate should be carried out for comparison with the baseline carried out in 2007. The quantities help us to see the trends in poverty, whether people have enough money to buy charcoal in large quantities at one given time or they have a subsistence type of living, buying charcoal daily. Another important factor is the source, what type of fuel quantities the market offers.

Typical Amount of fuel bought by POCA users

Figures 12 and 13 below show the typical amounts of fuel bought by the respondents and also the cost of each unit respectively. We can conclude that the majority of the respondents buy their fuel in small quantities which costs less than US\$0.3 and bags of 50kg and 90kg which cost between US\$11 and US\$17.

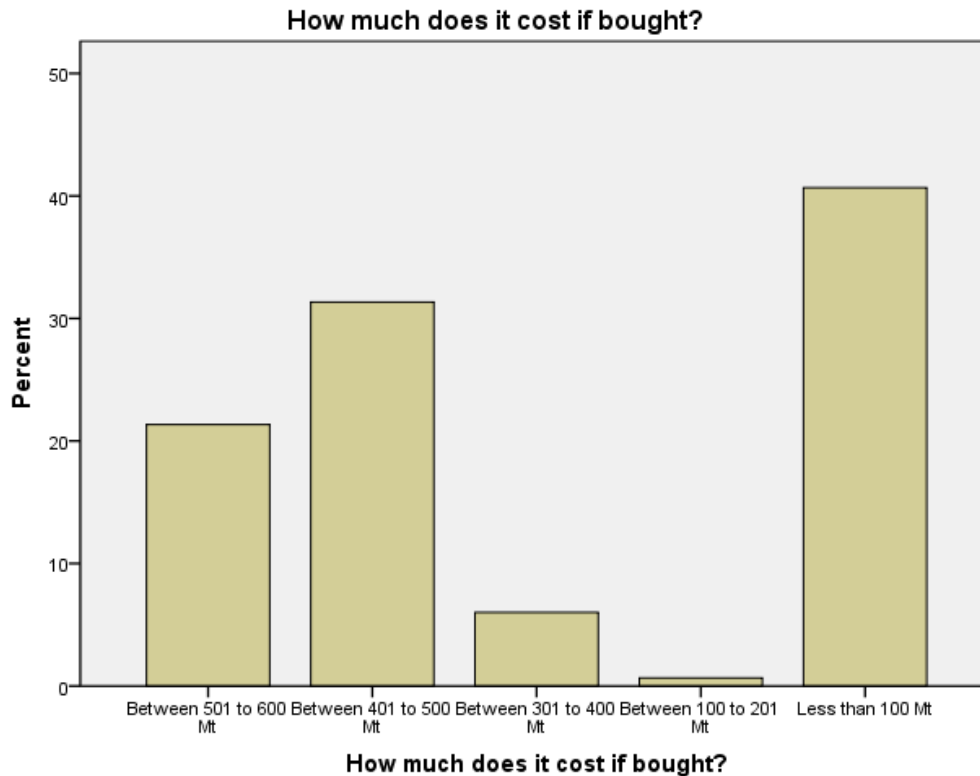


Graph 12: Typical units of fuel bought by households in Kg.

Charcoal Price (USD)	Frequency	Percent
Between 14 to17	32	21.1
Between 11 to 14	47	30.9
Between 8.5 to 11	9	5.9
Between 3 to 6	1	.7
Less than 3	61	40.1
Total	150	98.7
Not applicable	2	1.3
Total	152	100.0

Table 5: Charcoal price ranges

The small plastic bags that people buy from the market or neighbours weigh between 1kg and 2kg and the price varies between US\$0.15 and US\$0.3 from market to market.

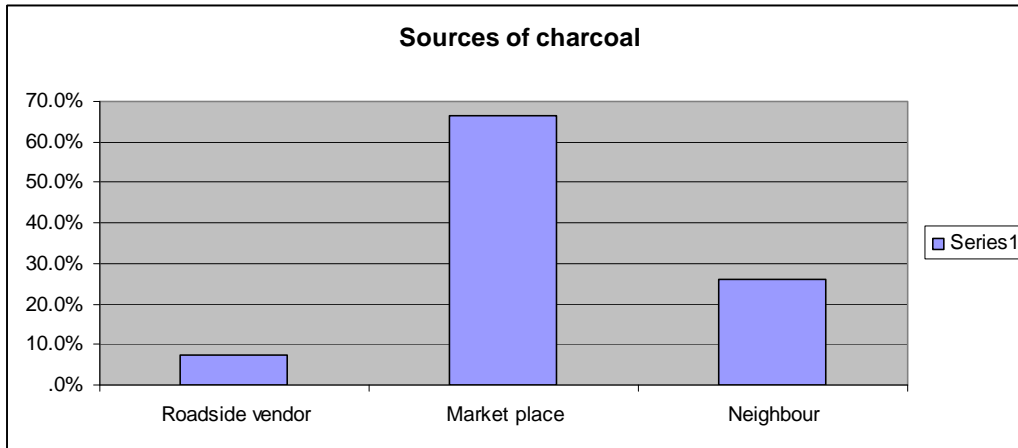


Graph 13: Cost of charcoal per unit bought by a household

Where do you buy your charcoal?

All the respondents in Matola and Maputo buy their charcoal which is usually made in the rural areas and then transported into town. People transport charcoal in large quantities and sell it to retailers who in turn sell the charcoal at the market or in front of their homes in small quantities.

The three main supply sources are from roadside vendors, the market place or from neighbours. Charcoal that is consumed in Maputo and Matola comes from places at times more than 300km away that is why only 7.3% of the respondents said that they buy their charcoal from roadside vendors.



Graph 14: Sources of charcoal

Cooking practices

Do you practice Kitchen Management Techniques?			
	Frequency	Percent	Valid Percent
Yes	113	74.3	76.4
No	35	23.0	23.6
Total	148	97.4	100.0
Non Response	4	2.6	
Total	152	100.0	

Table 6: Frequency of use of kitchen management techniques

At least 70% of the respondents in the study area practice most of the kitchen management techniques which also help in fuel and time savings. These include using a lid on the pot or pan whilst cooking, soaking beans before cooking although practiced is not very common since most respondents believe that the beans will lose taste if soaked, controlling the fire by removing excess charcoal is also practiced, keeping the charcoal in a dry place also helps because for most cooks they reported that wet charcoal is difficult to light.

What are the factors which influenced you to buy a POCA stove?

In order to ascertain the effectiveness of ProBEC's marketing and promotional campaigns, respondents were asked how they knew about the POCA stove and where to buy it. Since the inception of the POCA various campaigns including door to door campaigns by activists from a local partner organisation, Kulima, television campaigns, road shows and cooking demonstrations at various markets were done to market the POCA.

With production under control, an integrated marketing campaign for the new POCA stove was reformulated. A marketing agency was contracted to design a promotional campaign. The campaign will build on concepts developed with previous contractors (for example, retaining the POCA name, value offering of saving money and charcoal) and use materials already produced (such as banners, t-shirts, posters and training brochures).

The main focus of the campaign is to line up a number of retailers in all big informal markets in Maputo to stock the POCA. This is seen as essential for building a sustainable supply chain. Retailers will be supported with marketing material such as posters and brochures of the stove and cooking demonstrations will be conducted in the market by a team of sub-contracted demonstrators. The team was appointed in January 2010 and carried out promotional activities in 32 markets in Maputo. *Cerâmica Térmica* agreed to allocate 300 – 400 stoves as retailer consignments, considered a breakthrough as they were previously very opposed to the idea of making stove available on consignment. Once retailers order new stoves, they would have to pay the money owed on the consignment stoves. It has been agreed that the POCA producer (*Cerâmica Térmica*) would have to contribute substantially to implement the proposed marketing campaign.

As part of developing the supply chain, a public workshop was held for interested retailers and wholesalers on 27 April 2010. An advertisement was placed in major newspapers and potential interested retailers and wholesalers were invited to attend a half-day workshop to be informed about the opportunity and to discuss costs and pricing issues. *Cerâmica Térmica* also set up and operated two telephone hotlines to be available to field questions and recruit wholesalers and retailers. Four branded push-cars operate in the streets to sell stoves directly to the public.

As of June 2010, it was evident that POCA distribution and marketing activities were taking effect: Petromoc petrol stations will carry the POCA stove in their product range. *Cerâmica Térmica* has signed an MOU with Gespetro to this effect and the first delivery took place at the end of June. The list of petrol stations which will receive the stoves include some of the

most visible petrol garages such as, the Petromo-Sasol Station by the N4 highway Maputo-Witbank and the flagship Jardim petrol station.

POCA push-cars become more and more visible. These mobile shops in and around Maputo have salespeople carrying and selling the POCA stove. Building on the first three cars which went to the marketplace in May, it is believed that an increase of these mobile points of sale for the POCA will yield greater sales of the stoves. The push-cars also work as free publicity stands and the growing interest from people in the streets is encouraging.

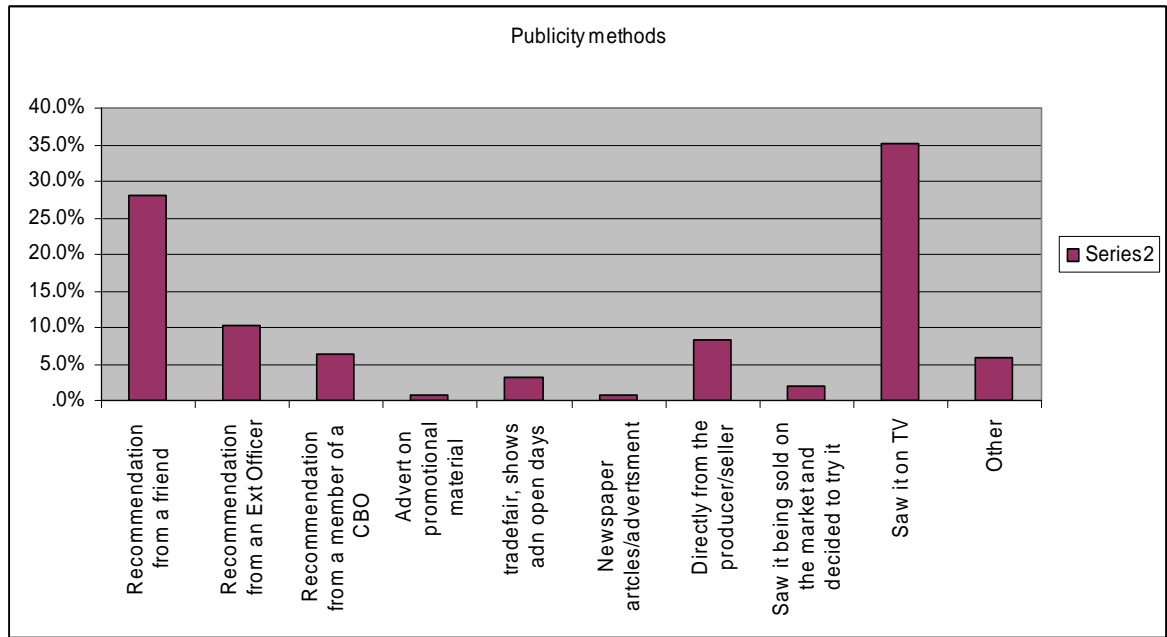
In October an arrangement was made to extend the agreement for TV coverage of the POCA show until December 2010. At the same time, until December 2010 there will be the placement of POCA jingles in two national radio stations and in one community-radiobroadcaster. These and other activities will mark the end of the technical assistance that ProBEC is giving to *Cerâmica Térmica*.

What influenced you to buy a POCA stove				
		Responses		Percent of Cases
		N	Percent	
what influenced you to buy a POCA stove ^a	Recommendation from a friend	44	28.0%	29.5%
	Recommendation from an Ext Officer	16	10.2%	10.7%
	Recommendation from a member of a CBO	10	6.4%	6.7%
	Advert on promotional material	1	.6%	.7%
	Trade fair shows and open days	5	3.2%	3.4%
	Newspaper articles/advertisement	1	.6%	.7%
	Directly from the producer/seller	13	8.3%	8.7%
	Saw it being sold on the market and decided to try it	3	1.9%	2.0%
	Saw it on TV	55	35.0%	36.9%
Other	9	5.7%	6.0%	
Total		157	100.0%	105.4%

Table 7: POCA marketing methods

As shown in table 7, television advertisements and talk shows contributed a lot to building awareness among the respondents, with more than a third of the people mentioning that their first exposure to the product was through TV and the second largest group (30%)

having heard about the stove from neighbours and/or friends and decided to try it out. Therefore it can be concluded that in the urban area, television was the most effective method of advertising the POCA stove.



Graph 15: POCA marketing campaign methods



Cooking demonstrations using the POCA

CONCLUSIONS

From the above results we can conclude that there are fuel and therefore cash savings which result in the increase of disposable income within the households. Less emission of smoke means that there is improved health mainly for the women and girls who spend most of their time cooking, but the households in general benefit from cleaner indoor air.

Television is the most effective media for raising awareness about the POCA.

Charcoal which is used in the cities of Maputo and Matola is manufactured outside these towns resulting in most people buying their charcoal from the markets, and the small quantities that it is bought in tends to indicate that it is bought on a need-to-have basis, when money is available and when cooking is done. The poor economic condition of the people makes them buy charcoal on a daily basis in small quantities rather than in larger quantities.

Most people practise kitchen management techniques which boost the efficiency of the stove and minimise fuel use, thereby saving time.

In Maputo and Matola, most families have two meals a day and most of them cook everything once and later use the stove to heat the stove for the second meal.

RECOMMENDATIONS

The demand for the POCA stove is growing fast and production has to be stepped up to meet demand.

With the benefits being reported by the POCA users, it is suggested that the experience be implemented in the rest of the country. Beira City in Sofala, Quelimane in Zambézia or Nampula are all ideal locations, based of the market demand and the widespread use of charcoal. These could be the sites for a second POCA factory.

Although ProBEC has not subsidized the POCA, a great deal of financial and technical support was channelled to the producer, Cerâmica Térmica, in order to bring it up to speed with the demand for an affordable and, yet, efficient cooking stove. Similar support would be needed to erect another factory.

A more integrated marketing approach has to be adopted so that people would know their nearest retailers or distributors marketing the stove.

In term of ergonomics, many of the families interviewed were suggesting that the stove be manufactured a bit higher so as to make it more comfortable to cook on and also to have a two-plate stove so that they could avoid using the traditional metal charcoal stove to prepare meals.

Calls on the TV show, reveal that there is greater demand for the stove all over the country, therefore, steps have to be taken to ensure proper packaging for the stove so that it can be transported to all parts of the country without incurring breakages.

BIBLIOGRAPHY

- Report on the Baseline survey of market and Household cooks of Maputo and Matola, Peter Coughlin, Econ Policy Research Group 2007
- Assessment of Non Renewable Biomass Prevalence and Use in Mozambique, Rosta Mate, 2010
- Joe Hanlon – The Mozambique Paradox 29/09/2010 – tinyurl.com/mz-en-sub
- Cook (2006) based on statistics from the National Institute of Statistics