

# SOUTHERN MOUNTAINS ASSOCIATION FOR RURAL TRANSFORMATION AND DEVELOPMENT



## Improved Cook Stove Carbon Project Business Plan

Version 1.0

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## 1. Background

### 1.1 Preamble

Southern Mountains Association for Rural Transformation and Development (SMARTD) was established in 2005 by the communities in the southern eastern mountains of Lesotho. The organization was established by communities after the phase down of the Christian Council of Lesotho programme called integrated rural development programme which assisted communities to fight poverty through livelihood entitlement programmes. Communities wished to continue with the work initiated under the auspices of the Council and formed ecumenical grouping of churches surrounding their area of operation. Communities divided their villages into six clusters for ease of work during operation. The organization registered no: 2004/164 under Societies Act no: 20 of 1966 as a charity organization.

While implementing livelihood entitlement programmes, SMARTD added to its road map issues around climate change as our area is a grassland not a forestland, only shrubs are found and used as a major source fuel wood. Burning solid fuels through inefficient and smoky stoves like Paola and open fire results in a number of negative impacts on both users' health, budget and the local environment. In 2010 SMARTD undertook a study about community vulnerability to climate change. The purpose of the study was to determine to what extent people in the project area are currently exposed to climate hazards and which coping strategies currently exist. The outcomes of this analysis aim to help the organization to better understand the impacts of climate change in the project area and in order to be able to adequately address this new phenomenon and to enhance adaptive capacity to climate change in the region. The results of the report encouraged the organization to look seriously into enhancing community's adaptive capacity by introducing appropriate technologies that use biomass in a more efficient, cleaner and easier way. This being the case, improved cook stoves were seen to fit well in answering these problems our communities are facing. These stoves play a key role in providing poor people with adequate energy access. They also help in reduction of carbon emission which is the main contributing factor to climate change.

## **1.2 Socio economic situation**

Our area of operation comprises of Senqu river valley covering 40 kilometres radius. The populations of the area live in dire poverty because of the diamond rush. The male population migrated to South Africa and other countries as migrant labourers abandoning their farming. Poverty is aggravated by lack of job opportunities, education and the prevailing climate change conditions. Young people tend to give up rural life and migrate to towns in Lesotho and South Africa. As a result, over 60% of the population earn below one US dollar per year. The population we serve is 20,459 or 5,535 households or 128 villages scattered in the district of Quthing, Qacha's nek and Mohale's hoek.

Energy is one of the basic requirements of our societies. Without efficient and affordable energy sources, people living in poor conditions have very limited opportunities for economic and social advancement. The use of solid fuels leads to a number of dramatic impacts not only on the users but also on the environment. In order to gather fuel required for daily energy needs, households have to travel long distances every day carrying heavy loads or have to save significant share of their budget to purchase fuel wood. Besides, the use of fuel wood on open fire or inefficient stoves (Paola) result in a range of health damaging pollutants emissions, often worsened by poor ventilation of the households. Women and young children, who usually spend many hours close to a smoky source, are the most exposed. Such emissions also have significant global warming effects, due to incomplete combustion of the fuel carbon. Moreover, the unsustainable over exploitation of natural resources leads to their fast depletion.

## **1.3 Rationale**

Climate change phenomenon threatens livelihoods and food security for poor and vulnerable people of our area as it poses serious threat to peoples' health and the environment. The severity of extreme weather patterns like prolonged drought experienced lately in our operational area threaten health of the people in that the availability of safe and clean drinking water is reduced. This results in diseases like diarrhoea. On the other hand, drier conditions and severe winters exacerbates the problem of respiratory tract infections, particularly in rural areas where energy resources are scarce. Our communities depend entirely on

rain fed agriculture, this means with long periods of drought food production will be reduced resulting in people not eating balanced meals or forced to reduce the amounts of their daily food intake resulting in malnutrition especially in young children. Smoke from wild fires started by shepherds further degrade the air thus triggering asthma. Not only does the prevailing climate change situation impacts on the peoples' health but also on the environment. On the environmental aspects, although there is very low tree cover in area of operation, indigenous trees and shrubs remain a major source of energy in rural communities. They are also an important source of construction materials, medicines, forage and shelter. This being the case, further predictions of reduced or delayed precipitation under climate change implies a possible loss of these important resources. Also the nutritious grass varieties on rangelands may be lost which leads to serious consequences for livestock productivity. Higher temperatures, lower rainfalls, frequent droughts, rainstorms and strong winds have increased the soil loss further weakening the capacity of the soil to support the agro-ecological and wellbeing of our communities. The changing climatic conditions had also resulted in the rapid loss of biodiversity due to protracted droughts, drying up of many streams and their sources, disappearance of many wetlands, soil wash from accelerated loss of soil fertility, rapid spread of invader species and reduced vegetation cover.

It is against this back ground that communities of the area initiated activities that are facilitated by SMARTD in order to mitigate this prevailing situation by introducing adaptive approaches leading advancement of their livelihoods.

## 2. Project Outline

SMARTD intends to carry on with ICS programme as a way to further learn the ICS technology while at the same time reducing carbon dioxide emissions and smoke from traditional cook stoves like Paola and open fire. Our programme had been encouraging communities to participate in self-help developments activities, but now this programme proposes distributing stoves based on business principles of seller-buyer approach, where SMARTD will procure and facilitate the logistics of transporting the stoves to the beneficiaries, while the beneficiaries will buy the stoves at fixed price at its final destination and use them as regularly as possible.

## 2.1 Business Proposition

SMARTD proposes to source, sell and distribute 1000 Save 80 stoves to households in its area of operation and beyond over a period of 2 years. The 1000 stove sets will be sourced from the local company Solarlights in bundles of 450 stoves in the first year and 450 in the second year. SMARTD will sell and distribute the stoves to households in the project area at a rate of 700 stove sets in the last eight months of the first year, i.e. between 87 and 88 stoves every month. In the second year, the 300 stove sets will be distributed from February until November i.e. 33 stoves will be distributed every month. The sales price to the user will be 1,150 Maloti (approx. 82 EUR), to be paid in monthly instalments of M100/month over a period of 9 months in addition to a down payment of M200. The stove sets and the initial implementation and operation of the project will be pre-financed by Klima-kollekte.

### SMARTD's Experience from the pilot project

From SMARTD's experience when talking with stove users on day to day visits and discussions, they always indicate that cooking is easier with Save 80 compared to the traditional way of cooking that is on an open fire or Paola. Since one can use the wonder box for cooking most dishes like rice, meat, maize porridge, the save 80 stove set does not only save fuel, money and carbon emissions, but also there will be no need to supervise the cooking process when using the wonder box. Users showed that this little time saved from supervising the cooking process and from the collection of fuel wood can be used for other household activities. Operating on the principle of retained heat, the wonder box keeps food warm for several hours. Households always indicates that they boil water the previous day after cooking dinner and put it in the wonder box over night to be used by school children for bathing in the morning, meaning there is no need to wake up earlier the next day. Users indicated that you can create your own comfortable cook space with Save 80 and can cook seating comfortably on the chair.

Users showed that the cast iron pot is necessary as is needed to cook most common dishes which include maize porridge which requires heavy steering. From SMARTD experience when monitoring the use of the stove set, users showed that even the taste of the maize porridge cooked with the cast iron pot tastes better than maize porridge from any other pot because with the

cast iron pot the characteristic crust can be achieved which also contributes to the better taste.

#### SMARTD ANALYSIS OF THE FIRST SOCIAL MONITORING

In addition, the analysis of the 1<sup>st</sup> social monitoring to assess user acceptance and willingness to pay for the stove conducted by SMARTD from their pilot project indicates the following advantages of the save 80 stove set:

- 100% of users showed that meals cook faster with Save 80 than any other stoves as after the water had started boiling you can put the pot in the wonder box.
- 100% said it saves fuel wood as the name implies, it saves up to 80% fuel wood thus reducing the burden on women of collecting fuel wood.
- 93% said Save 80 reduces smoke especially indoor smoke which causes problems on people's health.
- 77% of users showed that this stove set cooks fast.
- 30% of users said it saves money.

*Reference: SMARTD analysis of the first social monitoring*

#### SMARTD SALES REPORT

Demonstrations of the three types of stoves namely Save 80, Phillips and Stove Tech were carried out. The purpose of so doing was to let households show their preferences over these three types of stoves. Even though demonstrations were not carried out in all the villages, the platform was to group villages based on their cluster areas. All cluster areas were reached with demonstrations and households were given a chance to pre-register for the stove of their choice. When the pilot project of the stoves started, then the initial social monitoring was conducted to get households preference of different stove types. This study revealed that 74% of interviewed households prefer Save 80 models because of their pots which fit well on the stove thus reducing accidental burning of children. Selling of the stove during pilot also showed preference of communities for big Save 80 model. Selling of the remaining Phillips, Stove Tec and small Save 80s had been a problem until it was discussed that the prices for Phillips and Stove Tec be rather based on value of the stove rather than the purchase price and this lowered the price of Stove Tec from M600.00 to M450 and Phillips was sold for M600.00. Irrespective of the advertisements done by

field staff on the new prices communities showed that they would rather wait for the big Save 80 models. This is further underpinned by the fact that the additional 16 Save 80 B models, eventually obtained from Solarlights in exchange for 41 small save 80 models were sold within less than two months in June 2015.

*(Reference: SMARTD sales Report)*

Despite all the positive features of this product, one negative aspect seen is its high price which makes it unaffordable by the poorest of the poor households. This means that this stove set – even with the subsidy from carbon credits – can only be afforded by average households. However, the quality of this stove still makes number one preference for rural households irrespective of the high price.

One other negative aspect associated with the save 80 stove set from SMARTD analysis of the first social monitoring is it that it turns the pots black. 80% of the users showed that the situation is worse compared to the traditional way of cooking that is using open fire or Paola. This showed that SMARTD still need to get into extra efforts of training stove users on how to protect their pots from turning black. 34% of the respondents showed that one other disadvantage of Save 80 is that it does not heat the room during cold seasons. Stoves does not provide light by 66% and 72% find this situation worse compared to the ordinary way of cooking stove users find it difficult to bake bread with save 80 and this makes the situation worse compared to the traditional way of cooking.

## **2.2 Project Area and Demand**

The area of operation for this project will cover the core project areas which are the six project clusters in which SMARTD is currently operating in. This area roughly covers 5,523 households scattered in 123 villages in the districts on Qacha's Nek, Quthing and Mohale's Hoek. This area falls under five community councils namely Patlong H01 community council, White-Hill H02 community council, Seforong G10 community council, Nkau F13 community council and Qabane F14 community council. From there the project will extend to Rats'oleli H09 with 1500 households in the Qacha's Nek district. In the remote areas of the Mohale's Hoek district the project will cover villages under Qabane community council with 1500 households while in the Quthing district the project will cover 4400 households under Mphaki G05 community council. This core area however

geographically falls within the extended project area. The core area of operation of the project covered only but part of the bigger areas, for example, Tebelling which is within the core areas of SMARTD falls within Maseepho H04 community council.

AREA	COMMUNITY COUNCIL	POPULATION	NUMBER OF HHs
1. Core project area (SMARTD currently operating)	• Patlong H01	• 10,819	• 2,400
	• White-Hill H02	• 3,197	• 700
	• Qabane F14	• 6,924	• 1,500
	• Nkau F13	• 9,092	• 1,900
	• Seforong G10	• 9,720	• 2,100
	• Maseepho H04	• 7,879	• 1,700
2. Extended project area	• Ratsoleli H09	• 6,633	• 1,700
	• Mphaki G09	20,288	• 1,500

(Reference: <http://www.geohive.com/cntry/lesotho.aspx>)

In these areas distribution of the 1.000 stoves either in the core project area or in the extended project areas will depend on user preference and the demand for such stoves. Distribution will start from May 2017 until November 2018. The reason for starting distributions in May is that the first four months of the first year will be used for marketing and trainings. These areas are somehow clustered together hence SMARTD finds it possible to operate within them, distribution and monitoring is logistically feasible.

## **2.3 Marketing**

Different marketing procedures will be done in making the stoves well known within the area of operation and anticipated areas of expansion. The first step of marketing the stoves will be through cooking demonstrations especially in all areas where SMARTD will be operating in. Here the issues on how to use and how efficient the stove could be will be covered. The second step will be through the use of flyers. Save 80 stove will also be marketed or promoted in all meetings of SMARTD like the Annual General Conference, also in public gatherings and government meetings where SMARTD is invited the stoves will be marketed. The other way of promoting the stoves will be by joining centres where the elderly earns their monthly pension, elderly are seen as another target group in stove usage. Lastly the anticipated step of marketing is through the use of SMARTD ambassadors in promoting the efficiency of the stoves.

SMARTD will deliver stoves to beneficiaries with all the overheads included. The destination price will be determined by considerations between SMARTD and Klima-kollekte.

## **2.4 Data Management**

SMARTD will develop an electronic ledger containing information on the stove database, meaning for each stove, the current location and location history of the stove had to be clearly saved including the dates of arrival from the Maseru warehouse. There will be log books at each warehouse recording manually the location of the stove and transfer of stoves. This books will be duplicate books recording stove movement from Maseru warehouse to Ha-Sekake whereby when they arrive at Ha-Sekake then the Data Manager will have to put them into the electronic system. User contracts on

the other hand will be safely filed by the Project Manager and be up to date.

## **2.5 Ensuring regular payments**

From the pilot phase it had been learned that selling the stoves and waiting for people to come and pay their monthly instalments does not work. As a result, SMARTD will ensure monthly follow-ups on the stove users to remind them of their obligation to pay back the stoves in order to ensure regular payment. SMARTD will also ensure that people who do not pay despite the reminders will have to face the consequences by having their stoves taken from them in order to remedy non-compliance and reach maximum levels of payments. The electronic sales and payment ledger will be developed through which records of payment from the stove users could be easily traced. Information on payments will be updated on weekly basis so that SMARTD will be able to identify defaulters from the system and on monthly basis trigger follow-ups. The follow-up procedures for defaulters will be as follows:

- For those who are one month behind with payments, a reminder by phone by either the Data Manager or the Project Manager should be done.
- For those two months behind, a personal visit by field staff and the Project Manager should be done to serve as a reminder to the concerned defaulter. A confirmation proof of the visit should be kept.
- For those three months behind a personal visit and a warning letter authorised by the chief should be made by the Project Manager and the field staff.
- For those four months behind then the stove will be collected by the Project Manager and the field staff. In all these actions record of action should be clearly kept as a proof.

## **2.6 Monitoring**

Monitoring of the stoves will be covered through the stove sales database and user contracts. The deployment date for each stove will be recorded in the stove sales database and the user contract. All households using the stoves will be visited every month by the monitoring team to check visually that the stove is still in operation. Once every year the efficiency of the stoves will be calculated through Water Boiling Test (WBT) which will be

performed with randomly selected households (i.e. between 50 to 80 households). A WBT is a standardized test with a calibrated scale, thermometer and moisture meter during which the amount of energy needed for heating 1 litre of water to the boiling point is measured.

On quarterly basis a sample survey amongst all project households will be undertaken to determine to what degree the old stove, i.e. three-stone fire or paola, is still in use (with fuelwood). All households of the sample have to be visited by the monitoring team and through a structured questionnaire it has to be determined what percentage of fuelwood cooking is still done on the old stove(s).

### **3. Entities, Roles & Responsibilities**

#### **3.1 SMARTD**

The role of SMARTD in the ICS project will be to procure, assemble and distribute 1000 save 80 stoves to the end users, this includes organizing transport logistics from the supplier to the end user. SMARTD will monitor payments and keep meticulous records of payments both manually and electronically in order to easily trace the payments and see on time the defaulters. SMARTD will also have to administer carbon monitoring and together with monitoring of stove usage. SMARTD will also handle issues of promotions of the stoves, campaigns and information dissemination around the stove availability and the logistics of bringing them to areas where they are needed.

#### **3.2 Data/Field Technical Manager**

The Field Technical Manager will ensure that the field operations of the project run smoothly. She will work with other field staff (Village Enumerators) on visiting project beneficiaries including monitoring of the stove performance; encourage people to pay regularly monthly instalments. Provide morale booster to all the beneficiaries in order to do the right thing which is to pay for their stoves. Field Technical Manager should from time to time conduct fake audit where a sample households will be monitored. From to time to time work on revising carbon monitoring approach to increase the responsibility of the results during verification.

### **3.3 Field Staff**

Field staff will be responsible for distribution of stoves to the beneficiaries. They will make regular follow-ups that the stoves are used regularly and properly. They will also to monitor payments of beneficiaries and make follow-ups on the defaulters based also on the information they will get from the Data and Technical Manager of the defaulters and the number of months they are behind.

### **3.4 Technician**

The Technician will be the part-time employee responsible mainly for assembling of the stoves once they get into Ha-Sekake warehouse. The technician is expected to assemble at least 180 stoves per month in the first three months of the first year and the same procedure to be followed in the second year until all 1000 stoves are assembled and distributed to the beneficiaries. The technician is also expected to keep track and records of the incoming and outgoing stoves into and out of the Ha-Sekake warehouse based on the stove serial numbers.

### **3.5 Bread for the World**

Bread for the World will source out funds needed for kick starting the implementation. It will also be involved in providing capacity in terms of sourcing expertise where SMARTD is experiencing capacity gabs. From time to time Bread for the World will join with SMARTD in assessing the flow of work during implementation and where necessary adjustments needs to be made, SMARTD will seek advice from Bread for the World.

### **3.6 Solarlights**

Solarlights will supply SMARTD with Save 80 C model stoves based on the purchase volumes done by SMARTD. Solarlights will provide free storage of the purchased stove sets due to shortage of storage space in the Ha-Sekake warehouse as this stoves will be collected from Maseru warehouse in bundles of 500 each year. Solarlights will take care of the transport logistics from the manufacturer to Maseru warehouse.

## **4. Financial Planning**

The financial model had been developed based on different parameters which includes the stove sales conditions, stove purchase conditions, order volumes and the macro-economic parameters. All these parameters have in one way or another an effect on how the entire project should look like and how it will be operated.

### **4.1 Stove sales conditions**

SMARTD intends distributing and selling 1000 stoves at M1150 per stove with the down payment of M200.00 and monthly instalment of M100.00 thereof within a period of 12 months.

### **4.2 Stove purchase conditions**

The purchase price per stove will be M900, the maximum order is 1000 units and will be paid in instalments of 1000 units upon order which will be done in the first year. However, the distribution of the stoves from Maseru warehouse to Ha-Sekake warehouse will be in bundles of 1000 stoves in the first year.



## 5. Implementation and Operational Plan

ACTIVITY	EXPECTED OUTPUT	WHO IS RESPONSIBLE	WHO DOES IT	WHO IS ACCOUNTABLE	HOW	WHEN
1.Procurement of stoves	1000 Save 80 stoves in place	Managing Director	Accountant	Managing Director	Negotiating with Solar Light	Jan. 2017 – Dec. 2017
1.1 Place an order with solar lights of 1000 stoves	The supply of the order should coincide with the start of the project	Accountant	Accounts office	Accountant	Purchasing	Jan.- March 2017
1.2 Stoves stored in Maseru warehouse	Unlimited storage for SMARTD stoves and insurance	Solar Lights	Solar Lights	Solar Lights	Agreement between SMARTD and Solar Lights	March 2017 – June 2018
1.3 Workshop councillors on SMARTD's perceptions on ICS	Councillors are able to assist SMARTD in monitoring stove payments	Data and Technical Manager	Data and Technical Manager	Data and Technical Manager	Holding meetings, forums and workshops	Jan. –April 2017
1.4 Pre-demonstration on stove usage and cooking	500 households know proper use of the stove	Data and Technical Manager	Field Staff	Data and Technical Manager	Carry out cooking demonstrations in new areas	Jan. – April 2017
1.5 Collect stoves from Maseru warehouse to Ha-sekake warehouse	At least 1000 stoves will be collected from Maseru to Ha-Sekake once	Data and Technical Manager	Data and Technical Manager	Data and Technical Manager	Collection and kept records	March 2017

1.6 Assemble stoves in the Ha-Sekake warehouse	At least between 83 & 84 stoves assembled every month	Stove technician	Stove Technician	Data and Technical Manager	Manually	March 2017
1.7 Signing of contracts and distribution of stoves to beneficiaries	252 stoves distributed to beneficiaries quarterly	Data and Technical Manager	Data and Technical Manager and Field Staff	Data and Technical Manager	kept records	May2017- Nov 2018
2. Payment and revenue collection	Payments of stoves every month by beneficiaries	Data and Technical Manger	Bookkeeper	Data and Technical Manger	Payment Records	June 2017- Dec. 2019
2.1 Keep accounts ledger	All records of stove paid	Bookkeeper	Bookkeeper	Data and Technical Manager	Updating records	June 2017- Dec. 2018
2.2 Design an electronic ledger for keeping sales records	Electronic records that reveals payments arrears and defaulters	Data and Technical Manager	Data and Technical Manager	Data and Technical Manager	Through Microsoft Excel	June 2017- Dec. 2018
2.3 Synthesise stove sales reports	Information on sales of the stoves	Data and Technical Manager	Data and Technical Manager	Data and Technical Manager	From the electronic ledger	Jan. 2018
3. Monitoring of stoves	Stoves are being paid	Data and Technical Manager	Field staff	Data and Technical Manager	Through questionnaire interviews	June 2017
3.1 Develop first social monitoring questionnaire	Stoves are being used on daily basis and more frequently	Data and Technical Manager	Data and Technical Manager	Data and Technical Manager	Design a structured and informative questionnaire	June 2017

3.2 Administer the first social monitoring questionnaire	First social monitoring report explaining cooking habits, stove usage patterns, stove acceptance, willingness to pay for stoves.	Data and Technical Manager	Field staff	Data and Technical Manager	Questionnaire interviews	September 2017
3.3 Monitor stove payments	Establishment of defaulters and those in arrears	Data and Technical Manager	Field staff	Data and Technical Manager	Through information from electronic ledger	June 2017
3.4 Follow up on defaulters	Encourage up to date payments for all beneficiaries	Data and Technical Manager	Field staff	Data and Technical Manger	By personal visits and phone calls	July 2017
4. Conduct carbon monitoring	To determine to what degree the old stoves are still in use and the percentage of fuel wood cooking still done on the olds stoves.	Data and Technical Manager	Data and Technical Manager	Data and Technical Manager	Carbon questionnaire	March 2017
4.1 Develop carbon monitoring questionnaire	To determine to what degree the old stoves are still in use and	Data and Technical Manager	Data and Technical Manager	Data and Technical Manager	Design a questionnaire with all necessary information	March 2017

	the percentage of fuel wood cooking still done on the olds stoves.					
4.2 Administer fake carbon monitoring	Beneficiaries get used answering similar questions	Data and Technical Manager	Field staff	Data and Technical Manager	Structured interviews	May 2018
4.3 Administer carbon monitoring	The carbon monitoring system (database, tools, templates, procedures) in place	Data and Technical Manger	Field Staff	Data and Technical Manager	Structured Questionnaire interviews	Sept 2017, Jan 2018, April 2018, Sept.2018, Jan 2019, April 2019, Sept. 2019
4.4 Synthesise information from the carbon questionnaire	Analysis of how beneficiaries use energy saving stoves compared to the traditional way of cooking	Data and Technical Manger	Field Staff	Data and Technical Manger	Use random 50 questionnaires for analysis	Dec. 2017
5. Conduct campaigns on marketing and usage of the stoves	Stove users are technically conversant on the proper usage of the stoves	Data and Technical Manager	Data and Technical Manager and Field staff	Data and Technical Manager	Demonstrations and flyers	Jan – April 2017
5.1 Intensify the trainings of the	Households	Data and Technical	Field staff	Data and Technical	Trainings will be done during visits	Every month

stove users on relevance to the amount of fire wood, dry wood.		Manager		Manager	to households for monthly repayments	
5.2 Develop training material to be used in training stove users	Households know the proper use of stoves in order to generate expected carbon credits	Data and Technical Manager	Field staff	Data and Technical Manager	Through flyers, charts and demonstrations	Every month during collection of instalments