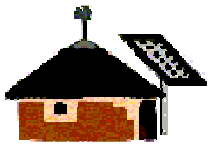
Kitchen Improvement Programme for the Ghana School Feeding Programme

Pilot Project for Twelve Schools in Northern and Upper East Regions

Submitted by: NewEnergy



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Background

1.1 Introduction

One of the challenges facing the Ghana School Feeding Programme (GSFP) that has captured the attention of the Civil Society Organizations (CSO) Platform has been the inadequacy of kitchen facilities and the lack of access to clean energy and improved cooking stoves. The adoption of improved cook stoves in the GSFP is hampered by lack of knowledge and information about the technologies, costs and benefits which are further compounded by inadequate institutional capacity in the programme to provide relevant and comprehensive policy guidelines for the kitchen environment. One of the outcomes of the CSO platform Energy Workshop in May 2009 was a decision to request NewEnergy to lead a process to:

a) Find sustainable solutions to the GSFP kitchen inadequacy.
b) Investigate and make recommendations on sustainable improved cookstove devices for promotion in the GSFP.

The task team was made up of representatives from broad range of GSFP stakeholders; including NewEnergy, Enterprise Works, Ministry of Energy, CSO Secretariat, CSIR-Institute of Industrial Research, 3 Schools selected from the Tamale Metro Area and Ghana Education Service.

1.2 Key Issues Addressed

The key issues addressed by the team over a 6 month period were as follows:

a) Developed a user-friendly model kitchen concept that could be deployed in all GSFP schools with appropriate modifications to cater for varying school population sizes.

b) Demonstrated the technical maturity of the available cookstoves on the market and the conditions for their cost-effective utilization.

c) Clarified the environmental, financial and health benefits of various energy and cookstove options to users and other stakeholders.

d) Assessed the level of acceptance of various cookstove options by users (cooks, matrons and other kitchen helpers) and adapt the devices where necessary to the users' needs with the aim of developing a marketable product.

e) Assessed the opportunities and potential for dissemination of improved cookstoves in the GSFP schools as a starting point, but ultimately to the community at large.

1.3 Activities Undertaken

The following specific activities were undertaken to provide the necessary factual basis for recommending a way forward in the GSFP energy strategy.

- Conducted a Kitchen Performance Test of three commonly used cookstoves, to determine the relative fuel consumptions, time to cook, and obtain user feedback on key performance parameters and user preferences. Annex 1 is a full report on the Kitchen Performance Test, undertaken by staff of Enterprise Works, Ghana.

- Collaborated with CSIR-Institute of Industrial Research, to develop, adapt and field-test a stationery mud/brick stove (CS1).

- Conducted participatory stove performance measurement in three selected schools in the Tamale Metropolitan Area. Table 1, shows a summary of some key performance characteristics of the cookstoves observed.

- Interviewed cooks, matrons and kitchen helpers to gather information on user preferences for kitchen facilities.

- Presented findings on the above tasks undertaken to the CSO platform members in a national workshop in October 2009. 1.4 Outcome and Lessons Learned

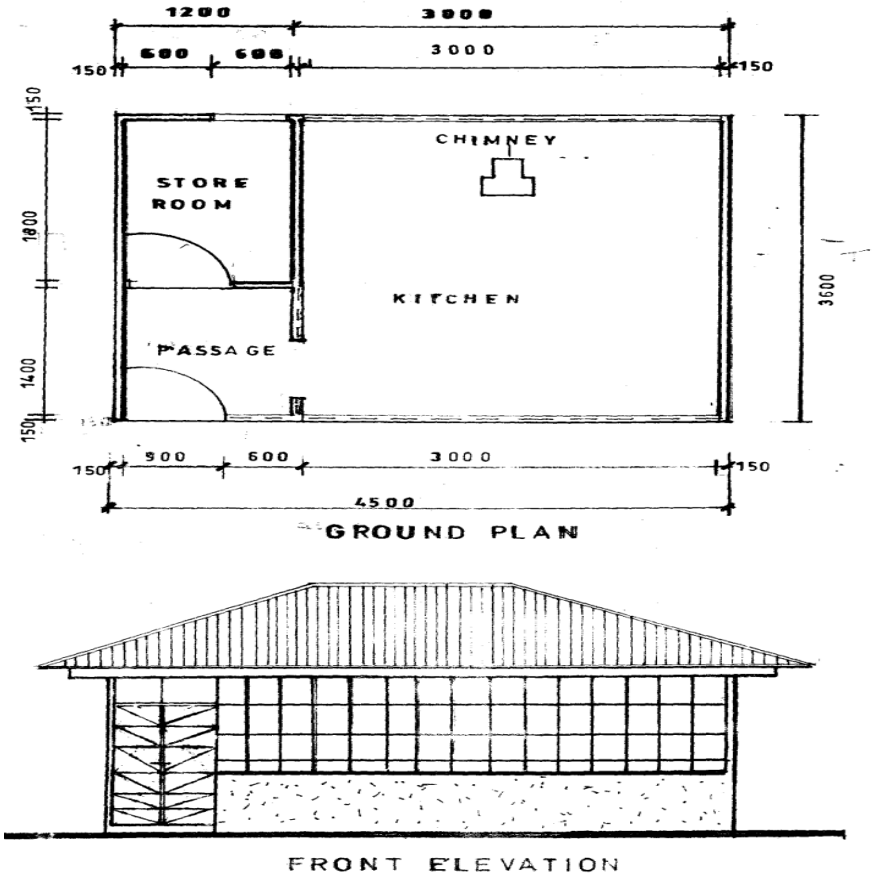
The following key outcomes and lessons have been shared with all stakeholders:

1.4.1 Kitchen Preferences

The need for a safe, clean and secure kitchen environment was considered as top priority by all respondents, even in schools where there are already some basic kitchen facilities, the cooks and matrons identified the need for specific enhancements to existing facilities. The following features, represents the broad consensus on features of a model GSFP kitchen, suitable for a pupil population of 300-500:

- Adequate working space: floor area approximately16 square
- Secure space for storage of materials, utensils and fuel.
- Well ventilated with chimney and large windows/honey-com walls
- Ensure high local construction materials content, with a target cost of about GHC 4,000.

Figure 1: Building Sketch of Model Kitchen for GSFP[1]



1.4.2 Review of Currently Available Cook stoves

a) Toyola Charcoal Stove

- Mobile charcoal stove
- Highly fuel-efficient (40-50% less charcoal)
- Low emissions of polluting substances.
- Charcoal is readily available in most places, especially in rural areas
- Product is produced and available on the local market
- Price is affordable, less than GHC 60, landed in Tamale
- Specifically adapted for large pots and local dishes

[1] A Building Technologist has analysed these kitchen preferenc

- Familiarity among users
- Registered on the Gold Standard (Carbon trade) as a tested and proven low carbon stove technology

LPG Stove

- Mobile metal LPG burning stove
- Clean burning modern fuel.
- Fast cooking
- Capital cost is approximately GHC 400
- Operating cost is 10% higher than charcoal, but 27% lower than firewood.
- Most of the cooks in the programme lack familiarity with LPG
- LPG is not accessible everywhere, all the time
- Price instability is a deterrent for adoption

b) Walewale Smokeless

- Fixed wood burning concrete stove
- High fuel wood consumption
- High cost of maintenance
- High cost of construction
- Fixed pots makes cleaning difficult
- Specialized artisan skills required
- Low emissions of pollutants
- Not recommended for further dissemination

c) CS-1

- Fixed wood burning improved stove
- High fuel efficiency
- Low emissions of pollutants
- High cost of construction –GHC 600
- High artisan skills required
- Persistent cracks in stove walls- high maintenance cost
- Needs further design improvements

- Not recommended for further dissemination at this stage

d) Stove Performances Compared

Primary School (300 children, Rice and stew)

Stove performance	**Walewale Smokeless**	**Toyola Charcoal**	**LPG rim stove**	**CS1 firewood stove**	**3-stone traditional stove**
Quantity of fuel used –kg	27	9.6	2.6	12	22
Cost of fuel used- GHC	4.0	1.8	2.1	1.7	3.26
Time to cook	3hr 5 min	2hr 56 min	2hr 40 min	2 hr 50 min	2hr 55min

2.0 Way forward –Pilot Project in Twelve Schools

2.1 Rationale and Scope

Several studies have shown that the heavy dependence on fuel wood for cooking is harmful to the environment and a major contribution to ill-health particularly of vulnerable groups like women and children. A successful rollout of improved cookstoves will contribute significantly to reducing the rate of deforestation and promote the health of the kitchen staff, make the school feeding cooking enterprise more profitable for the matrons, and serve as an entry point for large scale dissemination of improved cook stoves in the community as a whole to maximise the health and environmental benefits.

The pilot project will involve:

a) Provision of customized kitchen solutions in twelve schools, covering 5 districts in two regions.
b) Installation of best performing stove models (Toyola Charcoal stove, and LPG Rim stove) and deployment of these two stoves concurrently in twelve selected kitchens.
c) Institute a user education programme to ensure that cooks and matrons are able to operate the improved cookstoves safely and economically.
d) Facilitate the establishment of an effective supply chain for charcoal, LPG and LPG equipment, accessories and services to ensure a smooth operation of the school kitchens.
e) Establish a revolving credit fund for LPG procurement for participating schools
f) Monitor the operation and maintenance of the kitchens and cookstoves.
g) Prepare an up scaling strategy to expand service across the country.
h) Design and implement a social marketing programme to popularize improved cookstoves in the wider community.

2.2 Materials and Equipment Requirement for Pilot phase

No.	Name of school	District	Student Population	Required interventions
1	Kotingli Primary Schoool	Tamale Metro Area	350	Kitchen extension for store LPG stoves and accessories Set of Toyola coalpots
2	Gbanyamli Primary School	Tamale Metro Area	320	Complete kitchenette LPG stoves and accessories Set of Toyola coalpots
3	Kobilmahgu Primary School	Tamale Metro Area	470	Kitchen extension for store LPG stoves and accessories Set of Toyola coalpots
4	Nyolugu Primary School	Savelugu Nantong District	310	Kitchen extension for store LPG stoves and accessories Set of Toyola coalpots
5	Kotintabig Prim School	Talensi Nabdam	510	Kitchen extension for store LPG stoves and accessories Set of Toyola coalpots
6	Foe-Awiisi Prim school	Bongo District	488	Kitchen extension for store LPG stoves and accessories Set of Toyola coalpots
7	Kpalung Primary school	Savelugu Nantong District	350	Kitchen extension for store LPG stoves and accessories Set of Toyola coalpots
8	Akunda primary School	Bongo Distr	311	Complete kitchenette LPG stoves and accessories Set of Toyola coalpots
9	Kpalungu Talensi	Talensi-Nabdam	966	Complete kitchenette LPG stoves and accessories Set of Toyola coalpots
10	Mpaha Primary School	Central Gonja	600	Complete kitchenette LPG stoves and accessories Set of Toyola coalpots
11	Jabalipe Prim School	Central Gonja	450	Complete kitchenette LPG stoves and accessories Set of Toyola coalpots
12	Titidrope Prim Sch	Central Gonja	250	Complete kitchenette LPG stoves and accessories Set of Toyola coalpots

2.3 Project Budget

Item	Description	Qty	Unit cost GHC	Amt GHC
1	Materials and Equipment			
1.1	Complete Kitchenette with secure store	6	2,650	15,900
1.2	Kitchen extensions to provide store	6	1,800	10,800
1.3	LPG stoves and accessories –set	12	550	6,600
1.4	Toyola charcoal stoves set	12	250	3,000
				-
2	End-user training programme/school	12	400	4,800
				-
3	Revolving credit fund (energy supplies)	12	250	3,000
4	Social marketing programme	1	2500	2,500
				-
5	Project Management	15%		6,990
6	Contingency	10%	-	5,359
	Total project Cost- GHC			**58,949**

2.4 Funding Sources

So far no specific funding has been secured for this pilot project. Anticipated sources of funding are: District Assemblies, Community Contribution in labour, and donations from SIGN partners in Holland.

2.5 Implementation Arrangements

The implementation strategy will reflect the present day understanding of the key elements needed to achieve and sustain adoption of improved cookstoves technology: an integrated approach composed of technology selection, adaptation, end-user training and improvement in the supply chain for appropriate energy products and services in the targeted districts.

NewEnergy will set up a technical team to execute the construction of kitchens and provide training to end-users in all the targeted districts. A project oversight committee will be set up to monitor progress, evaluate end-user feedback and lead the process of mobilising funding from district assemblies, donor organizations and the private sector to support the kitchen improvement programme. The Project oversight committee will have representation from: the lead implementing organization, matrons from participating schools, the GSFP, the CSO platform secretariat, stove manufacturers, LPG Retailers and Charcoal marketers in selected locations, the Ministry of Energy and the Ghana Education Service.

The project will be implemented over a period of 15 months with a proposed starting date in March 2010, by which date it is expected that a significant portion of the required funding would have been raised.