PD-ABX-075

SMALL SCALE IRRIGATED HORTICULTURAL ENTERPRISES

ENERGY ENTERPRISES FOR IMPROVED NATURAL RESOURCE MANAGEMENT

QUARTERLY REPORT

JULY to SEPTEMBER 2002

Submitted to:

U.S. Agency for International Development, Accra, Ghana.

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EnterpriseWorks
GHANA

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Introduction:

In support of the efforts of USAID and the government of Ghana to promote sustainable increases in private sector income generation and better manage natural resources EnterpriseWorks is implementing a project to develop small scale irrigated horticulture production and energy enterprises. Horticultural production will be increased through the promotion and sustainable local manufacturer of treadle irrigation pumps and hand augured tube wells. The energy component will result in reduced deforestation and increased householder savings through the establishment of commercially based production and distribution systems for high efficiency charcoal burning cookstoves.

This report describes project activities for the second quarter of the project period:

July 2002 to September 2002.

The project started in April 2002 and will end in January 2004.

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IRRIGATED HORTICULTURE

Irrigating onions from a tube well in Ada

1.0 SUMMARY

Activities during this quarter have focused on the coastal areas in the south east, from Denu to Dzita and around the Ada area. Five demonstrations and numerous trials have been carried out; these have enabled us to compile specifications for a pump that will best satisfy the needs of farmers in this area. Three manufacturers have been trained; again, this has highlighted aspects of the pump design that must be modified so that we have a pump that works for the farmers as well as being profitable for the manufacturers. There are two major issues that could limit pump uptake; the price of the pump and a convenient method of water application. No pumps have yet been sold but with the opening of model farms demonstrating an affordable pump that farmers can use without changing their farming methods, we expect the first sales very soon.

2.0 PRODUCTION

2.1 Training:

PUMP MANUFACTURERS TRAINED				
Target this quarter	Actual this quarter	Target to date	Actual to date	Location
3	3	3	3	Big Ada, Keta and Tema.

Manufacturers and field trials have highlighted several changes required to the pump design for use in Ghana. Any changes made will be minor since the pump is a proven design, and changes that are made will be with the aim of reducing the price or improving the performance of the pump.

2.2 Modifications to the pump

2.2.1 The cylinder

The current design of the treadle pump specifies cylinders that are made by cutting and rolling sheet steel. This design is appropriate for areas where a suitable diameter of low cost pipe can not be found. To avoid the work involved in this method, manufacturers immediately suggest that a stock pipe be substituted instead. Since stock pipe is indeed currently available in large quantities at a competitive price the manufacturers (who are primarily interested in making items with a healthy profit margin) are very reluctant, or sometimes refuse, to manufacture the cylinders using the usual rolling techniques.

The advantages of making the cylinders from stock pipe (rather than rolling) are:

- the pump takes less time to make (and should therefore be cheaper).
- the pump is more efficient, since the cylinders are true and therefore seal well with minimum losses due to friction.
- the pump will look a little more professional.
- the cylinder can be made using unskilled welders, again potentially reducing the cost.

The disadvantage is:

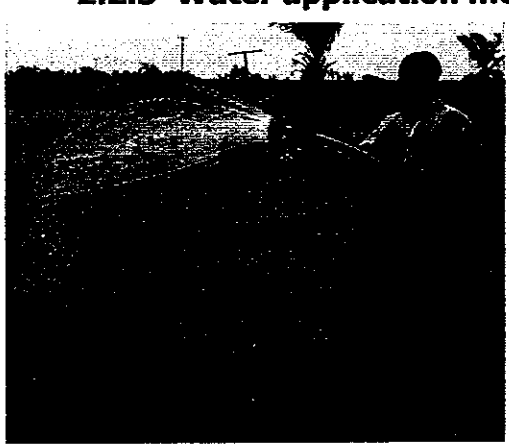
- should the supply of pipe become unreliable then manufacture of the pumps will not be possible.

Artisans will therefore be trained in both methods of manufacture.

2.2.2 The piston seal

The seal between the piston and the cylinder is currently achieved using moulded leather. It appears that adequate quantities of suitable leather are not available in Ghana; many days spent by both project staff and artisans combing markets have met with limited success. A PVC seal has been used with some success in other countries and will be tried in Ghana. A specially designed rubber seal has been manufactured locally which gives excellent results, but is currently too expensive for the treadle pump. It is unlikely that this shortage will compromise sales since the limited supplies of leather that are available (so far only in Kumasi) will suffice for the initial stages of the project while an alternative is found.

2.2.3 Water application methods



The soil in the costal areas is very sandy ruling out the unlined channel type of irrigation used in many other West African countries. The current layout of garden beds is ideal for overhead irrigation and this is the preferred method used by farmers with motorised pumps (the method to which all the farmers aspire). Given the time available to prove the treadle pump, a simple overhead shower head system will be promoted. The limitation here is the price of a suitable flexible hose. Garden hose (as used by farmers with motorised pumps) has a very small diameter and this makes pumping with the treadle pump very hard work. Interplast in Accra have agreed to run a few test lengths of a larger bore low cost PVC pipe and their first samples look very promising.

2.3 Tube wells

Tube wells are an excellent low-cost high-yielding source of water and many farmers with motorised pumps use tube wells as a source of water for their vegetable gardens. Tube wells are only around 100mm in diameter and are therefore unsuitable for farmers with bucket type irrigation that can not afford motorised pumps. They are, however, ideally suited to the treadle pump and the combination provides a very effective low cost irrigation package. Tube wells have been drilled at model farm sites by a local commercial small scale well driller using hand auger techniques. Both tube well drilling services and treadle pumps are therefore now available locally.

3.0 PROMOTION

Now that the manufacturers are able to make the pumps and the model gardens have been prepared promotion activities can start. After informal discussions with farmers and manufacturers a name for the pump has been chosen; the Soka pump. Soka is a corruption of the word Sucker (i.e. the pump sucks a lot of water) and the action of pumping is similar to a high stepping footballer undergoing training. The component manager appreciates that the promotion of the pump should concentrate on the amount of water that can be pumped easily rather than the effort required, but feels that the picture of a famous footballer stepping up and down on the pump is a promotion opportunity not to be missed!

Five initial demonstrations were carried out and farmers' comments from these were used to fine tune the pump kit on offer (pump plus flexible hose plus shower applicator).
Large roadside signs will be erected in the next weeks close to model farms and manufacturer's workshops. The extension agent also constantly moves these five sample pumps from farm to farm allowing farmers and their neighbours to try out the pumps for a few days each. The pump has been demonstrated to Mofa staff from Ketu South district and they have agreed to organise farmer days for more formal demonstrations.

PUMP DEMONSTRATIONS				
Target this quarter	Actual this quarter	Target to date	Actual to date	Location
5	5	5	5	Tegbi/Futegato road (3), Dekugbor and Anyanui.

4.0 DISTRIBUTION

To ensure a sustainable supply chain, distribution will be handled by the manufacturer, project staff will only assist with the linking of interested farmers to manufacturers. A starting retail price has been agreed for the pump of around US$75 (compared to around US$625 for the cheapest petrol powered pump) but it is expected that farmers will be able to negotiate their own price and payment schedule since manufacture is local. Another major benefit of local manufacture is ease of follow up. The treadle pump is a new technology for both the farmer and the manufacturer, therefore a fair amount of initial troubleshooting is to be expected. On

farm follow-ups are essential at this stage and any problems will be referred directly to the manufacturers, enabling them to become familiar and confident with the operation of the pump in field conditions.

5.0 ENVIRONMENTAL ISSUES

The use of the tube well with motorised pumps is becoming popular in the current project intervention areas with possible environmental consequences. Large volumes of water are being pumped from the aquifer which receives its recharge from rainfall. As a result the aquifer equilibrium could be disturbed, resulting in the drying up of the shallow wells used by smaller scale rope and bucket farmers (or the intrusion of saline water into the wells).

To address this fear, the University of Ghana with support from DANIDA has established a monitoring system at Anloga to collect data relevant for assessing the aquifer level. Already some farmers have observed that shallow wells constructed near tube wells are starting to yield less water. As a long term solution and to complement the work at the aquifer observation station, a proposal is about to be submitted by Mr. E Ahiabor, a tube well specialist, to the Keta District Assembly to enact a by-law regulating the construction and use of tube wells. Under the proposal, all tube well owners will be expected to obtain a permit before they can construct a tube well. This permit is renewable after every 3 months and depending on the aquifer level based on data from the observation station, a permit will either be withdrawn or renewed. The idea seems laudable and Mr Ahiabor expects that the assembly will adopt it to save the environment. Treadle pumps are far less wasteful of water than motorised pumps since some physical effort is required to extract and apply the water. Since effort is required farmers make sure every drop that is pumped from the ground goes onto the crop. Encouragingly, the situation is being monitored, and farmers are aware that their livelihoods depend on good management of the aquifer. Project staff will continue to be an active partner in these issues.

6.0 PARTICIPATION OF WOMEN

Farm visits show that a significant number of women are involved in vegetable production. However, only 4 of the 62 farmers who participated in the pump utilisation demonstrations were women. A more direct approach in an attempt to involve women farmers will be used in the next quarter.

7.0 SALES

PUMPS SOLD				
Target this quarter	Actual this quarter	Target to date	Actual to date	Comments
10	1	10	1	Pump kit modifications have delayed promotion.

The first pump was sold at the end of September. Now that the water application method is acceptable to the farmers, the model farms are open and manufacturers are satisfied with the pump design, promotion can start and sales will follow.

8.0 MONITORING

Crop types, yields and gate prices, pump performance and actual use of the pump are recorded constantly and tabulated monthly. These figures will be used to build up a farmer calendar and to calculate increased income from any measured increase in the area irrigated.

Staff were trained in the EnterpriseWorks Impact Tracking System in August.

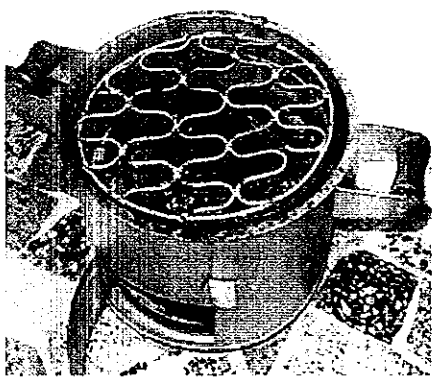
9.0 PLANS FOR THE NEXT QUARTER

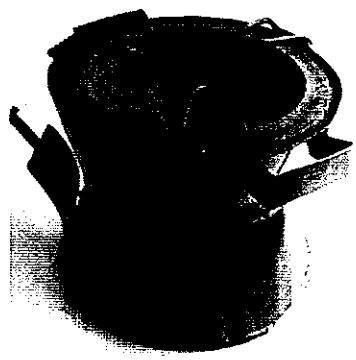
- Survey Accra and Kumasi urban as well as the Ashanti and Brong-Ahafo regions for suitable pump promotion areas
- Visit other Organisations involved in promoting small scale vegetable production
- Finalise supply of low cost hose and synthetic rubber seal.
- Start promotion activities
- Train 2 new manufacturers
- 25 on-farm demonstrations
- 60 pumps sold by end December

HOUSEHOLD ENERGY:

1.0 SUMMARY

The major activity during this quarter was the baseline survey. Four surveyors were trained and hired for a six-week baseline market study comparing households' traditional coal pot to the EW ceramic stove (below right) and another improved stove available in Ghana called the Ahibenso (below left).





The study was conducted in 16 selected areas with high visibility and high charcoal consumption rate. The survey areas were zoned into four;
Zone 1 La, Teshie-Nungua, Nima and Madina-Adenta
Zone 2 James Town, Kole Gonno, Mamprobi and Abossey Okai
Zone 3 Mallam -Gbawe, Alajo, Kasoa, and Odorkor
Zone 4 Pokuase, Nsawam (2 areas) and Dome -Taifa.
A total of 80 respondents were selected using stratified random sampling methods. A conventional structured questionnaire was used for the interview, which started on 15th August and ended on 25th September 2002. The summary report is yet to be written but preliminary findings are as follows:

- Charcoal consumption per day per adult equivalent in Ghana is about 0.82kg and the EW Ceramic stove uses around 40% less charcoal than the traditional coal pot, the other improved stove (the Ahibenso) uses 30% less. Full statistical analysis will give a more accurate figure.
- Respondents' comments about the EW ceramic stove were:

Plus	**Minus**
Uses less Charcoal	Heavy
Clean (ash is contained within the base)	Not sure that the ceramic liner is durable
Easy to light	Dull colour
Cooks fast	
Heat regulation is possible	
Good stability	
Requires little fanning	
Looks modern	

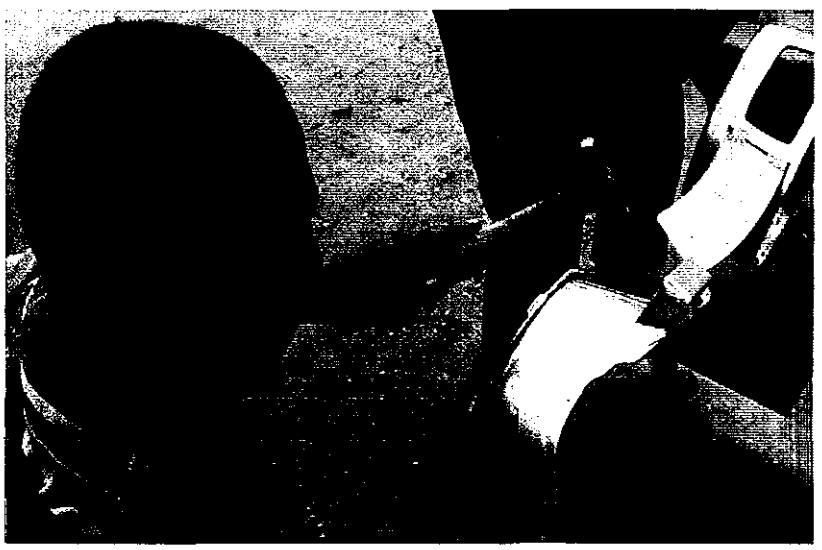
A full summary of the baseline report will be available during the next quarter.

2.0 PRODUCTION

2.1 The liner

Two ceramicists, Ekem and Ceramica Tamakloe (CT), were assisted with the design and manufacture of moulds for the production of liners. Tests were carried out to identify and select the most suitable clay mixture for high quality liner production. One of the manufacturers (Ekem) has managed to blend a high quality refractory ceramic that has passed the accelerated ageing tests and has been given an initial order for 500 liners. Ceramica Tamakloe are still testing clay bases and attempting to reduce shrinkage rates. Ekem has agreed on a price of Cedis 10,000 per liner (US$1.25) for the first 500, though once he has started to supply the metal cladding manufacturers and CT provides some competition this may change. The price is similar to that of ceramicists in neighbouring countries and a little cheaper than the liners bought from Lomé.

2.2 The metal cladding



Four cladding manufacturers and 2 trainers from Kokompe have been trained by Prosper Fadonougbo, from EW Benin. The manufacturers were immediately given an order for 50 stoves each and the second training course was started on September 30th.
The training covered the manufacture of the necessary tooling and the metal stove body as well as the correct installation of liner into the metal stove body.

Manufacturers trained					
	Target this quarter	Actual this quarter	Target to date	Actual to date	Comments
Ceramicists	2	2	2	2	Winneba and Afienya
Metal cladding	5	4	5	4	Extra trainer trained as backup.

3.0 PROMOTION

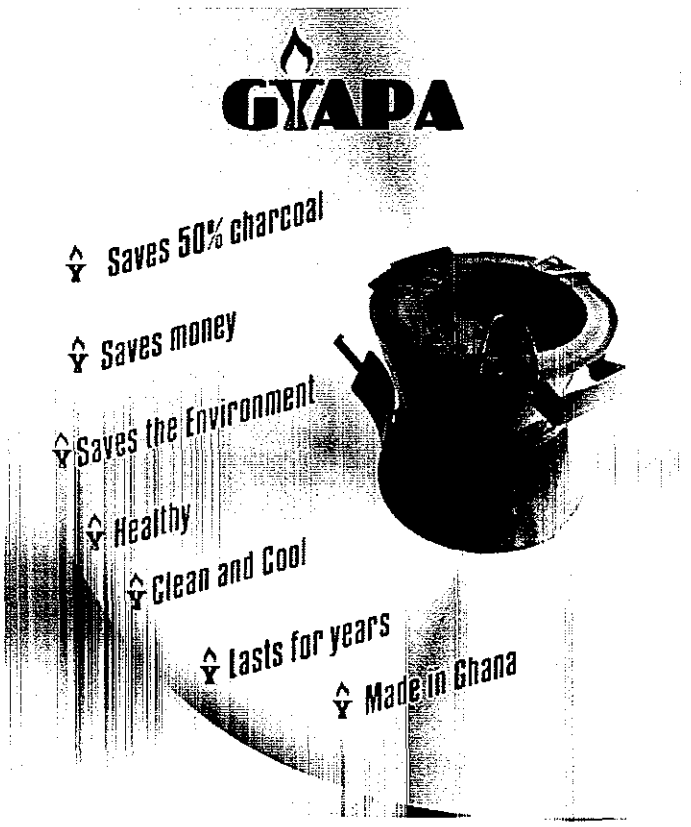
3.1 Brand name and Logo

After many debates and various consultations with potential customers and marketing agents, the brand name 'GYAPA' (good fire) was chosen. Work continues on a suitable logo, some examples under consideration are shown below:

GYAPA GYAPA

GYAPA GYAPA

3.2 Posters and flyers



Flyers and posters are also being designed, a first draft example is shown below:

The baseline survey was also used to collect some information that can be used in stove promotion. Examples include: most listened to radio stations: *Peace FM, Obonu, Adom and Joy* FM in decreasing order of preference. Popular radio programmes are *Wo hao ni sen, Woba ada anaa, Ken kan me, Mpu ni Mpu and Asomdwe Nkomo* while favourite TV programmes mentioned include *Akan Drama, Cantata, Concert party, Mmaa Nkomor, African Movies and Asanka delight.*

3.3 Strap line

Some of the strap lines under consideration are:

"Aben da da" (already cooked)
"Enue clean" (cooks clean)
"ye asisi mu" (new thing / way)

4.0 DISTRIBUTION

Two interviews were conducted for short listed candidates for the posts of Sales Agents. We are hoping to recruit one woman and one man. The male candidate was successful, the search continues for a suitable saleswoman.

The wholesale price of the stove will probably be around ¢36,000 (US4.5)

After the baseline survey, the last batch of 20 respondents were offered either of the 'improved' stoves at a reduced price of ¢20,000 for the Gyapa and ¢15,000 for the Ahibenso. Seven bought the Gyapa, three bought the Ahibenso.

5.0 ACTIVITIES FOR THE NEXT QUARTER

- Build up an initial buffer stock of at least 500 stoves before starting promotion campaign
- 20 retailers stocking stoves
- Start promotion activities
- 10 new stove manufacturers trained
- Ceramic liner supply chain working
- >1000 stoves sold (hopefully many more with a Christmas promotion)