

WB BEIA stove / briquetting project**PRSP, The Gambia**

2011 / 2012

Preliminary results of stove research between baselines established in August / September 2011 and stove field test results from June 2012

Baseline research:

The baseline research was devised by the visiting project anthropologist Cecil Cook. The research included socio-economic data but with a focus on current cooking habits, fuel use and cost to households and time spent in cooking daily meals. Households in 3 target communities were randomly selected but only household data falling within our marketing target group (up to 8 family members) were processed. One of the baseline research communities (Bakau) dropped out from the programme (it was replaced by the community of Banjulinding) so data from Bakau is not being used in this comparison. In total 150 households were surveyed (50 in each community)

Baseline results expenditure on fuel:**Data comprises:**

Fuel combined wood, charcoal, LPG gas

Cooking of all meals at each household (breakfast, lunch, evening meal where made)

Community: Abuko

Households up to 8 members surveyed:

24

Household sizes: 2 to 8

Average 5.33

Fuel spending:

Per household per month Dalasi (US\$ @ 32/1 July 2012 approx rate)

Average 573 (17.91)

Per person per day

Average 3.7 (0.12)

Community: Sukuta

Households up to 8 members surveyed:

13

Household sizes: 2 to 8

Average 6.5

Fuel spending:

Per household per month Dalasi (US\$ @ 32/1 July 2012 approx rate)

Average 623 (19.47)

Per person per day

Average 3.4 (0.11)

Combined Total:

Households up to 8 members surveyed:

37

Household sizes: 2 to 8

Average 5.8

Fuel spending:

Per household per month Dalasi (US\$ @ 32/1 July 2012 approx rate)

Average 591 (18.47)

Per person per day

Average 3.6 (0.11)

Baseline result cooking time:

A simple water boiling test was used in 20 households. Bring 3 litres of water to the boil from ambient using their normal appliances, fuel and method (in the event where the actual need was more or less than 3 litres the quantity was adjusted after the test)

Data comprises:

Fuel combined wood, charcoal, LPG gas

Cooking of all meals at each household (breakfast, lunch, evening meal where made)

For logistical reasons all 20 households were in the community of Abuko. Compounds were randomly chosen and all data was used regardless of compound size (6 to 20 persons)

Breakfast:

Time to boil 1 litre of water	Average 5 min 16 sec
Using LPG gas	Average 3 min 22 sec
Using charcoal	Average 10 min 59 sec

- 75 % (15) of households used LPG gas bottle with top mounted screw-on regulator and a 4 inch high metal windshield with 3 welded-on pot stand supports.
- 25% (5) of households used a basic charcoal Jiko with a ceramic liner

Lunch:

Time to boil 1 litre of water	Average 5 min 48 sec
Using a 3 stone fire	7 min 03 sec

- 95 % (19) of households used a basic woodstove comprising of a metal skirt with 3 stubby legs, one wood-stick hole (no grate) and 3 welded-on pot stand supports.
- 5 % (1) of households used a 3 stone fire

Field testing of improved cooking stove June 2012

Following our baseline research, Crispin Pemberton-Pigott, the inventor of the VESTO stove, carried out some design modifications without losing the efficiency benefits to create the VESTO Junior. 24 versions of this Gambia specific design have been given to households in 3 target communities for field trials in ordinary daily usage. Two members from each household were invited to workshops to be trained by project field staff in the proper usage of the stoves.

8 families are located in each of these communities:

Abuko

Banjulinding

Sukuta

To avoid any local misgivings and any perceived bias the selection of the test families was left to the community groups working with the project team. The only criteria given was that the households should consist of 7 or 8 members (our target size).

Two project field staff were allocated to each 8-family group for a 4 week intensive monitoring period during June 2012. For 4 days per week each day a different family was monitored in rotation, either over the breakfast or lunch cooking period (ergo each week each family was monitored for one whole meal production process) with other non-recorded random visits in between.

The focus of the survey was on time efficiency of the stove (reflecting burn efficiency of the stove). Data is still being processed. During the lunch session recordings were taken separately for cooking rice and sauce / stews. Due to the large variety of meals recorded with their widely differing cooking times we have extracted the time taken for bringing to boil water for breakfast and rice at lunchtime as an indicator.

Community: Abuko

Cooking time:

Household size:	Average 8
Session data analysed so far	26
Time to boil 1 litre of water	Average 2 min 51 sec

Fuel used:

Out of a total of 26 recordings
58 % (15) using wood
42 % (11) using charcoal

Community: Sukuta

Cooking time:

Household size:	Average 7.9
Session data analysed so far	40
Time to boil 1 litre of water	Average 3 min 28 sec

Fuel used:

Out of a total of 40 recordings
55 % (22) using wood
45 % (18) using charcoal

Fuel costs:

During the last 2 weeks of the 4 week survey the families' daily expenditure on fuel was recorded. From the combined 6 community-weeks from all 3 communities 5 were accepted as valid.

In summary, average per person per day spend on fuel (wood and/or charcoal) was 0.9 Dalasi.

Summary and Conclusion:

The improved cooking stove is reducing cooking times significantly from an average of over 5 minutes to an average of just over 3 minutes for 1 litre of water. In practice this means that verbally recorded overall cooking times for an average meal at lunchtime have been reduced from around 2 hrs to just over one hr.

The improved cooking stove reduces fuel usage and cost drastically from a recorded average of Dalasi 3.6 per person per day to a recorded average of 1 Dalasi. This is a significant saving both in fuel and household expenditure.