PROJECT GAIA RESEARCH STUDIES

DELTA STATE, NIGERIA

"MINI-PILOT STUDY"

A TEST RUN IN ANTICIPATION OF A FULL STUDY

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By: Joe Obueh

Centre for Household Energy and Environment
(CEHEEN)

In Cooperation with:

Winrock International
Dometic AB
Stokes Consulting Group
Delta State Ministry of Power and Energy

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EXECUTIVE SUMMARY
December 4, 2003

Dometic AB/Stokes Consulting Group commissioned a 10-stove mini-pilot study of the Cleancook stoves in Delta State. This study is a test-run for the up coming large-scale pilot study due to commence soon in selected locations in Delta State.

Winrock International is collaborating with the Centre for Household Energy and Environment (CEHEEN) to conduct the studies, which is being hosted by the Delta State Government and facilitated by Dometic AB, the Stokes Consulting Group, and the Delta State Ministry of Power and Energy.

Prior to the commencement of the mini pilot, Winrock International recruited the services of a volunteer as part of its International Volunteer Technical Assistance Programme to assist in developing an effective strategy for testing the appropriateness of the Cleancook technology in Nigerian households. The volunteer was given the task of focusing primarily on identifying adequate statistical tools that will effectively provide interpretable information from the data collected, while designing the data collection process to accommodate the requirements of the selected statistical tools.

This report explains what has been achieved so far (outcomes) in this first phase of mini pilot implementation with recommendations made and follow up activities listed.

MINI-PILOT SCOPE OF WORK (SOW)

- Develop survey from the baseline definition (Using the AMORE HHE as a starting point)
- Develop survey form for post-intervention survey of experience with the cleancook stove
- Develop criteria for selecting test families
- Develop survey methodology
- Select survey families for mini pilot
- Map locations of survey families
- Develop logistical plan for visits to families
- Visit five families and conduct baseline survey using the baseline questionnaire
- Based on this experience, revise and finalize baseline surveys
- Submit completed survey forms to Dometic, SCG and Delta State for review and comment
- Wrap up session

RESEARCH TEAM

Project Gaia
- Mr. Bengt Ebbesson (Prior to mini pilot study commencement, assisted with project design)
- Mr. Harry Stokes (Designed mini-pilot scope of work and assisted with final questionnaire design)

Centre for Household Energy and Environment (CEHEEN)
- Mr. Joe Obueh, (Director)
- Mr. Steve Ikheloa (Asst. Project Director)
- Mr. James Agajo (Research Assistant)
- Ms. Geraldine Okwuosa

Winrock International
- Mr. Terry Hart (Volunteer)
- Mr. Ediri Kingsley Iruaga

Delta State Ministry of Power and Energy
- Mr. Theophilus Dafe Oghoro (Director)
- Mr. Endurance Ediri Ikpesikpe (Senior Project Officer)
- Mr. Fidelis Ojobo
- Mr. Josiah J. Efe
- Mr. Christopher Nworah
- Mr. Tata Messiri
- Mr. Chukwuma Nwamah

PROGRAMME OF ACTIVITIES

Month of August:

Thursday 21: Terry Hart (Project Volunteer) and Ediri Iruaga (Winrock staff) arrived Asaba, Delta State from Idah in Kogi State. They were received on arrival by CEHEEN staff led by Joe Obueh and nine staff of the Ministry of Power and Energy. Introduction of participants by Joe Obueh followed by a fifteen-minute debriefing session on project overview. All present discussed project scope of work followed by light refreshment at the hotel. All present reviewed the Amore HHE questionnaire as a starting point. All discussed goals for the days ahead. Broke up to allow Terry and Ediri get over the jet lag.

Friday 22: CEHEEN, Winrock staff and staff of the Ministry of Power and Energy assembled at meeting venue. 8 hours of meeting. The Cleancook stove was formally shown to the research team with a one hour demonstration/training by Joe Obueh featuring stove functionality, fuel denaturing and handling, followed by a general discussion on the many benefits of the clean cooking system being promoted. Ample time was given to all present to try their hands on the stove's operation. A water-boiling test (WBT) was carried out. A general discussion was later held on the pilot study

implementation (Questionnaire design, methodology, data collection and logistical arrangement, marketing, deliverables, impact study and opportunities for improvements).

August 23: Six hours of meeting with the entire research team in attendance. Designed a logistical arrangement for project implementation. Worked out a proper schedule for visiting pilot families with Terry Hart making a very useful suggestion on refueling. Met in the afternoon with Tata Messiri. Discussed progress made so far.

August 24: Informal meeting between CEHEEN and Winrock staff. Discussed agenda for the days ahead. Discussed Delta State history and background, project Gaia history and progress recorded so far in Delta State, as well as the state's role in the project. Later in the day we took Terry and Ediri out to see a bit of Asaba and its cultural heritage.

August 25: Full day session that lasted seven hours with entire research team in attendance. Using the Amore HHE questionnaire as template and Harry Stokes' structured baseline topics as guideline, a mini pilot questionnaire was created. All discussed the content of the questionnaire in detail and had it revised and simplified to fit the Delta State context. Later in the day, Joe and Terry paid a courtesy visit on Dafe Oghoro in his office. The project was further discussed.

August 26: Full day session lasting 5 hours with all in attendance. Discussed project implementation. Sent first draft of project questionnaire for typing.

August 27: Another full day session that lasted six hours with all team members in attendance. Picked up the typed draft questionnaire. Did final review with necessary corrections made. Additional questions were added. Discussed goals of post intervention study; designed questions and goals of study; developed criteria for selecting test families; developed data gathering and entry methodology. Later in the day team members took time off for a group photograph.

August 28: Another full day session, which lasted seven hours, with CEHEEN, Winrock and staff of the Ministry of Power and Energy in attendance. Final revision of draft copy of mini pilot study questionnaire. This was followed by final printing and distribution of final questionnaire to project members. Discussed post-intervention impact study. Created five basic mid-term questions to be administered to the pilot families to determine proper usage, acceptance and initial reaction one week following the placement of stoves in the homes of the pilot families. Mapped location of the selected ten families. Visited two of the families and conducted full baseline interviews as test run. This afforded the team the opportunity of determining the time taken to interview one family necessitating the need to reduce the time for logistical reason and for proper time management. We built the confidence of the two families interviewed and identified unfriendly questions that might cause negative feedback. This led to further modification of several questions that we considered unfriendly. Personal observation of the two kitchens were made with notes taken on certain household cooking indicators such as presence of soot, ventilation and position of kitchen. Wrap-up session, where Winrock staff made further recommendations. Vote of thanks on behalf of Project Gaia by Joe Obueh. This was followed by an evening dinner.

August 29: Winrock staff departed Asaba for Abuja by road. They were seen off at departure by CEHEEN staff. Later in the day CEHEEN staff met with the other project

team members from the Ministry of Power and Energy to review the results of the project implementation meetings and strategy for the full project implementation. Roles were assigned to each research assistants.

Month of September:

September 3: CEHEEN and research assistants from the Ministry of Power and Energy converged on Asaba for follow-up activities after a five-day break. Debriefing at the Ministry of Power and Energy. Dafe Oghoro, who seized the opportunity to reiterate the ministry's unflinching support for the project, later addressed the team. All reviewed progress achieved with the Winrock staff and set goals for the next step of the mini pilot implementation.

September 4: Joe Obueh hurriedly left Asaba following a distress call from a hospital in Benin about his wife, who was delivered of a baby girl. The other CEHEEN staff was given clear instructions to carry on with assistance given by the staff of the Ministry of Power and Energy.

September 9: Joe Obueh took time off the hospital to return to Asaba to appraise work achieved by CEHEEN and the ministry staff. Met with Dafe and discussed logistical arrangement (office, storage space, vehicle) being assembled by the ministry preparatory for staff training and actual fieldwork. CEHEEN and ministry staff visited 3 additional pilot families and conducted baseline interviews before Joe Obueh returned to the hospital to join the wife. The rest of CHEEN staff remained in Asaba to familiarize with the total 5 families already interview.

Month of October:

October 11-16: Commenced training for the research assistants comprising CEHEEN and selected staff of the Ministry of Power and Energy. Conducted mock interview sessions for research assistants so as to achieve efficiency in time management and with the purpose of testing the friendly interview style and tone adopted for the field interview. Team modified approach for long term benefits. Discussed logistics for family visits and the process of refueling, taking into consideration the observations and recommendations made during team's initial meetings with Winrock staff. Discussed modalities for scaling down the duration of the mini pilot from 3 months to 2 months to make it more manageable and result-oriented. Selection of the 10 mini pilot families, followed by individual interactive session with the head of each family.

Month of November:

November 12-17: High level consultation with key officials of the Ministry of Power and Energy on our readiness for the mini pilot and the urgent need for the ministry to commence process of availing the research team the financial and material support pledged at the on set of project development. The Permanent Secretary, Mr. S.T. Ololobou and Dafe Oghoro formally introduced the project and the research team to the new Commissioner for Power and Energy, Mr. Emmanuel Ighomena, who again reaffirmed the ministry's total commitment to the project. He promised to secure the State Governor's approval, necessary for the final confirmation of the state and ministry's support as well as the release of solicited funds and other resources, before the end of the year. He requested for a demonstration of the Cleancook stove and

lantern. He ordered proper documentation of the demonstration session for which he invited the Delta State Ministry of Information; the state-owned Delta Television and the state-owned newspaper for press coverage. All the Directors and staff of the Ministry of Power and Energy and top officials of the Ministry of Information witnessed the colourful demonstration that lasted one hour in the commissioner's office. The demonstration session has since featured in the prime time news belt of the state television and the newsletter of the ministry of information.

Capacity building benefits

- Greater awareness of survey methodology
- Better understanding of data collection techniques and analysis
- Greater awareness of challenges of survey implementation and a timesaving and cost-effective refueling process.
- Greater awareness of logistical challenges
- Better "people" skills in interacting with interview families
- As a result of the test interviews conducted CEHEEN staff quickly learnt what worked and what did not work, and this made the team to modify survey approach.

Outcomes:

- Improvement in logistics: Simplified number of visits to families and modification of refueling process for easy implementation and management of pilot study.

- Mini-pilot questionnaire: Simplified and shortened to make it easy to administered and for easy response.

- Time-management: Designed the mini-pilot to run for two months without affecting the quality of the expected results. Determined the time taken to administer questionnaire to each family. Initially, an interviewer would use 45 minutes to administer questionnaire to one respondent but further simplification in line with efficiency improvement reduced the time used to administer one questionnaire to 25 minutes.

- Efficiency improvement: Unanticipated topics for personal expressions were designed alongside the questionnaire to address topics that otherwise the respondents would avoid for the fear that such responses would affect their chances of keeping the stove.

- Pilot study implementation: Developed an efficient data collection strategy and designed an evaluation format. Working with Winrock and Delta State staff produced a synergistic result and an improved understanding of collective benefits. First interaction with the 10 mini pilot families on their impression of the Cleancook revealed a general likeness of the design and quality of the stove.

Recommendations:

- Business plan: Increasing the market potential of the cleancook technology by developing a marketing strategy at the on set of the mini pilot. Such strategy should include an opportunity to market the stoves and fuel, product branding and market

awareness through product advertisement. Employ the use of effective marketing tools such as T-shirts with descriptive logo inscribed at the on set of the mini pilot to serve as an awareness and promotional tool and for easy identification of field workers.

- Safety: The instruction manual for stove operation and fuel handling should be translated into the three main Nigerian languages.

Follow-up activities

- Project team is ready to commence placement of stoves to the selected 10 families
- A hands-on training sessions on stove functionality and fuel handling to be preceded by a focus group discussion
- Data collection and preparation of statistical tables for analyzing field results.
- Reporting of end-users reactions based on the functional characteristics of the Cleancook stove.
- A proposal for stove modification as necessitated by field results

Attachments:

- Mini-pilot scope of work (SOW)
- Final questionnaire

PROJECT GAIA-CLEANCOOK MONITORING DATASHEET
IN DELTA STATE

January 2004

<u>Phase 2</u> (After the Introduction of the CleanCook Stove)

Note: All answers will be held in the strictest confidence. Please answer all the questions on the questionnaire. Please tick (✓) as appropriate

(1) The CleanCook is very safe?

Yes • No •

(2) How easy is it to use the CleanCook?

Very Easy • Fairly Easy • Not Easy • Complicated •

(3) How efficient is the CleanCook?

Very efficient • Slightly efficient • Not efficient • No comment •

(4) Does the stove economize fuel?

Yes • No •

(5) If yes, how much fuel is saved compared to your other stoves?

So much • Much • Little •

(6) Does the stove produce soot?

Yes • No • Little soot •

(7) What do you *not* like about the stove?

The stove body • The fuel tank • The pot support •

The regulator • The burner • All of the above •

(8) What do you *not* like about the fuel?

The colour • The smell • None of the above •

(9) What changes would you like to see on the stove?

The stove body • The fuel tank • The pot support •

The regulator • The burner • All of the above •

(10) Would you buy the CleanCook?

Yes • No •

Results of the Phase 2 monitoring test on the CleanCook:

Question (1): The CleanCook is very safe? Yes• No •

	Respondents	%
Yes	9	90
No	1	10
Total	10	100

Discussion:

- 9 respondents, representing 90%, cited safety as one of the most desirable features of the CleanCook stove. They specifically mentioned that the way the fuel does not spill from the tank is a unique safety feature that ranks the CleanCook far above kerosene and LPG stoves. One respondent mistakenly had one of the tanks overfilled, which resulted in flames all over the burner's chamber. The flames were easily extinguished by just a little sprinkling of water.
- One respondent, representing I%, questioned the cross bones and skull on the safety instruction label on the fuel container. The respondent admitted being discouraged to touch the container on seeing the cross bone/skull, which, she said signified "Death" or "Extremely poisonous substance".

Research team suggested a subtle safety sign like "CAUTION" in place of the cross bones/skull.

Question (2): How easy is it to use the CleanCook? Very Easy •
Fairly Easy • Not Easy • Complicated •

	Respondents	%
Very easy	7	70
Fairly easy	2	20
Not easy	—	—
Complicated	1	10
Total	10	100

Discussion:

- 8 respondents, or 80%, had no problem operating and cleaning the stove.
- One respondent, representing 10%, experienced difficulty refilling the fuel tanks when fuel got exhausted while she was still cooking. She said it was not possible to determine fuel level in the canister.
- 2 respondents experienced difficulty lighting the burner with the standard short matchstick in Nigeria. They reported that the burner took extra minutes to ignite with the short matchstick.

Research team is proposing that the 21 holes on either sides of the stove be widened to create two finger-size holes for ease of lifting during refilling process, or, an aperture, lined with a slide, large enough for pulling out the canisters, should replace the 21 holes on either sides.

Question (3): How efficient is the CleanCook? Very efficient • Slightly efficient • Not efficient • No comment •

	Respondents	%
Very efficient	9	90
Slightly efficient	1	10
Not efficient	—	—
Total	10	100

Discussion:

- All, but one, were impressed with the heating power, which they say performed much more than kerosene stove. It was observed that the respondent that rated the stove as being slightly efficient actually cooked "kponmo" cowhide, a delicacy that takes minimum of 3 hours to cook, with less than half litre of methanol fuel which of course got finished midway into the cooking.
- 8 of the respondents, representing 80% of the study group, reported that the potholder (circular grill) does not firmly hold large pots due to its free movement on the stove. Research team proposed that the grill should have clips that could anchor it to the stove in such a way that it could easily be detached during cleaning process.

Question (4): Does the stove economize fuel? Yes • No •

Question (5): If yes, how much fuel is saved compared to your other stoves?

	Respondents	%
Yes	7	70
No	3	30
Total	10	100

Discussion:

- 7 of the respondents, representing 70%, used more than 1 litre to cook per day, even though slightly less than the quantity of kerosene used in a day. It was, however, observed that the 7 respondents permanently set the regulator of their stoves at the maximum level.

- The 3 respondents that used exactly 1 litre per day are small families of less than the average 5 persons per family thus requiring less cooking. Besides, they occasionally set the regulators at minimum level.
- All the respondents preferred a 50-litre fuel container to the 5-litre container.

Question (6): Does the stove produce soot? Yes • No • Little soot •

	Respondents	%
Yes	—	—
No	10	100
Little Soot	—	—
Total	10	100

Discussion:

- All respondents, representing 100%, were impressed about the cleanliness with which the stove burns.
- None of the respondents experienced soot stain on the pots.
- None of the respondents reported of experiencing smoke emissions.
- "This is the cleanest cooking stove available" was the general response.
- One respondent says she never used scouring powder (soot removal) for her pots while using the stove.

Question (7): What do you not like about the stove? The stove body • The fuel tank• The pot support • The regulator • The burner • All of the above •

	Respondents	%
Stove Body	2	20
Fuel Tank	—	—
Pot Support	8	80
Stove burner	—	—
Regulator	—	—
Total	10	100

Discussion:

- 2 respondents, representing 20% of the study group, reported that the finishing line of the base of the stove body is too sharp and could result to injuries. One of the 2 respondents actually had a slight cut on one of his fingers to show for her response.

- All respondents said the tanks are good but easily run out of fuel when cooking time-consuming meals.
- 8 respondents experienced difficulty placing large pots on the circular grill.

Question (8): What do you not like about the fuel?

The colour • The smell • None of the above •

Discussion:

- 9 of the respondents, representing 90%, liked the colour of the fuel, which they say distinguishes it from other cooking fuels.
- One respondent preferred the colour to be either "yellow" or "green" so as not to confuse it with a new table wine in Nigerian market known as "Blue cocktail", which, according to her, could be passed off as the methanol fuel by unscrupulous persons. The bitter agent solves this problem.

Question (9): What changes would you like to see on the stove?

The stove body• The fuel tank • The pot support •

The regulator • The burner • All of the above •

Same response as that in question 7.

Question (10): Would you buy the CleanCook? Yes • No •

	Respondents	%
Yes	10	100
No	—	—
Total	10	100

Discussion:

- All respondents, representing 100% of the study group, say they would buy the stove to replace their current cooking device, if there would be regular supply of methanol fuel to run the stove.

Study was conducted and compiled by:

Centre for Household Energy and Environment (CEHEEN)

For:

Delta State & Dometic AB/Stokes Consulting Group

CLEAN COOK PROJECT
PILOT STUDY QUESTIONAIRE
ASABA, DELTA STATE

Phase 1 – Baseline Study

PHASE 1

Please respond to the following question. All information will be treated as confidential

SECTION A
PERSONAL DETAILS

A1	**Date of interview**	
A2	**Time of interview**	
A3	**Name of interviewer**	
A4	**Name of respondent**	
A5	**Full contact address of respondent and Telephone**	
A6	**Age** 20yrs ☐ 20yrs – 29yrs ☐ 30yrs-39yrs ☐ 40yrs and above ☐	
A7	**Sex** Female ☐ Male ☐	
A8	**Tribe**	
A9	**Religion**	
A10	**Marital status** Single ☐ Married ☐	
A11	**Number of persons in the house**	
A12	**Occupation of household member**	~~Male or Female~~
	1	☐ Male ☐ Female
	2	☐ Male ☐ Female
	3	☐ Male ☐ Female
	4	☐ Male ☐ Female
	5	☐ Male ☐ Female

SECTION B
HOUSE & KITCHEN PRACTICE

B1	**Type of house** ☐ Thatch ☐ Wood ☐ Brick ☐ Concrete ☐ Other specify…….
B2	**Location of house** ☐ On land ☐ On stilt

B3	**Location of kitchen** ☐ Part of main house ☐ Separate building	
B4	**Type of roof** ☐ Asbestos ☐ Iron sheets ☐ Other specify……..	
B5	**Permanent ventilation in roof** ☐ None ☐ Small (Less than 10cm in diameter) ☐ Large (More than 10cm in diameter) ☐ Other specify……..	
B6	**How many windows does your kitchen area have and what is the size?** ☐ None ☐ 1 ☐ 2 ☐ 3 ☐ More than 3	Sizes of windows in feet (e.g 1meter x 1 meter)
B7	**Where do you usually cook during the rainy season?** Inside the house Outside the house (all the time) Outside the house(only to light stove and then go inside) Other structure/ area that serves as a kitchen Explain……	☐ ☐ ☐ ☐
B8	**Where do you usually cook during the rainy season**? Inside the house Outside the house (all the time) Outside the house (only to light stove and then go inside) Other structure/ area serves as a kitchen Explain……..	(pls. check) ☐ ☐ ☐ ☐

SECTION C
COOKING PRATICES

C1	**What do you use for cooking** ☐ Open fire ☐ Wood stove (specify if with or without chimney) ☐ Electric stove ☐ Kerosene stove ☐ LPG ☐ Other stove (specify fuel and if with or without chimney)

C2	**How many times a day do you cook using the following (indicate how many times in the box)** ☐ Open fire ☐ Wood stove (specify if with or without chimney) ☐ Electric stove ☐ Kerosene stove ☐ LPG ☐ Other stove (specify fuel and if with or without chimney)			
C3	**How many people do you cook for?** 1 >1(specify————————————			
C4	**Who does the cooking?** ☐ Husband ☐ Housewife ☐ Sister ☐ Aunt ☐ Grandmother ☐ Other specify————————————			
C5	**How many hours do you cook in a day?**	Morning (indicate #)	Noon (indicate #)	Evening (indicate #)
C6	**What kinds of food do you usually cook and how Long does it take to cook each one?** Rice Fish Beans Tubers (yam,. Cassava etc) Other specify 1———————————— 2————————————	Morning (indicate #)	Noon (indicate #)	Evening (indicate #)
C7	**Are children or babies present/ nearby (2meter) when you cook?** ☐ Yes ☐ No			
C8	**What kind of pot do you use for cooking? (indicate how many in box, specify by checking if bottom is flat or round)** Type Quantity Diameter ☐ Clay ☐ Ceramic ☐ Aluminum ☐ Stainless steel ☐ Other specify	Flat bottom (pls check)	Round bottom (pls check)	

C9	**Aside from cooking food for the household, for what other purpose do you use your stove? (check all that apply)** ☐ Boiling water ☐ Cooking food to sell ☐ Heating ☐ Lighting ☐ Other specify———————————————
C10	**What do you like about what you are presently using to cook?** ☐ It is fast ☐ It is cheaper ☐ Other specify———————————————

SECTION D
COOKING TECNOLOGY

D1	**Who made the decision on the kind (s) of stove (s) to use?** ☐Husband ☐Wife ☐Other person specify———————————————					
D2	**Does he/she (D1) decide on all major purchases in the house?** ☐Yes ☐No (explain)———————————————					
D3	**How did you obtain your stove(s)?**	Wood stove With Chimney (pls check)	Kerosene (pls check)	LPG (pls check)	Electric (pls check)	Other (pls check)
	purchased	☐	☐	☐	☐	☐
	Given by relative	☐	☐	☐	☐	☐
	Other (specify)	☐	☐	☐	☐	☐
D4	**How much did your stove(s) cost, If purchased?**	N	N	N	N	N
D5	**How did you pay/ are you paying?**	Wood stove (pls check)	Kerosene (pls check)	LPG (pls check)	Electric (pls check)	Other (pls check)
	Cash	☐	☐	☐	☐	☐
	Credit	☐	☐	☐	☐	☐
	Borrowed money from somebody	☐	☐	☐	☐	☐
	Other	☐	☐	☐	☐	☐
D6	**Are you satisfied with the performance of your stove(s)?**	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	☐Yes ☐No
D7	**Which stoves do you prefer to cook with? Why?**	☐	☐	☐	☐	☐

D8	**If you do not have access to kerosene, LPG, or electricity, why not** ☐ Not aware of these option ☐ Stove ☐ Fuel too expensive ☐ Stove/fuel not available in our area ☐ Too dangerous ☐ Other explain————————————
D9	**Would you like to own a different stove? If so, what type? What are your reasons?** ☐ Yes ☐ No ☐ Explain————————————————
D10	**If your answer above is YES how much are you willing to pay for it?** ☐ Same as current level of expenses ☐ More (indicate how much more in Naira) N————
D11	**How would you pay for it?** ☐ Cash ☐ Borrow money from relative/friends ☐ Loan from bank or lending institution ☐ Other specify————————————
D12	**Do you know alcohol?** ☐ Yes ☐ No
D13	**How would you feel using it to cook?** Explain————————————————

SECTION E. FUEL USE, COLLECTION, & SUPPLY

E 1 . FOR OPEN FIRE / STOVE (S) USING UNPROCESSED FUELS (animal dung, crop residues, wood)

Type of Fuel Used	Who collects?	How long does the fuel last during the DRY season?	How long does the fuel last during the RAINY season?	Where obtained?	How do you get there? (walking, boat, cart, etc)	How long does it take to get there?
Animal dung						
Crop residues (specify)						
Wood						

E 2. FOR STOVE (S) USING PROCESSED FUEL (charcoal, coal, kerosene, LPG)

Type (s) of Fuel Used	Collect (C) or purchase? (P)	Who collects / purchases	How much per unit during DRY season? (if purchased)	How much per unit during RAINY season? (if purchased)	Unit (liters, #/size of cylinders)	How long does the fuel last during DRY season? (e.g. 3 days, 1 week, etc)	How long does the fuel last during RAINY season? (e.g. 3 days, 1 week, etc)	Where obtained?	How do you get there (walking, boats, cart, etc)	How long does it take to get there?
Wood										
Charcoal										
Coal										
Kerosene										
LPG										
Other *(specify)*										

E 3. FOR USERS OF WOOD FUEL

E.3.1	**What type of wood do you use?** ☐ Rubber ☐ Bamboo ☐ Other specify———
E.3.2	**How is the wood harvested?** ☐ Dry ☐ Fresh
E.3.3	**Where does the wood come from?** ☐ Family land ☐ Tribal land ☐ Unclaimed/open land ☐ Other specify———
E.3.4	**Who gathers /buys the woods?** ☐ Father ☐ Mother ☐ Children ☐ Other specify———
E.3.5	**How long does it take each day to gather woods?** ☐ Buy (no time needed to gather the wood) ☐ ……. Hour
E.3.6	**How do you transport wood to your home?** ☐ Walk ☐ Bike ☐ Car ☐ Other specify
E.3.7	**Is gathering wood a burden for your family?** ☐ No ☐ Yes, if yes why———
E.3.8	**If you buy wood, how much do you pay?** ———(example N per bundle, N per log)

SECTION F
HEALTH IMPACTS (should be addressed to the person in charge of cooking)

F1	**Is smoke emitted when you cook using..**		
	Firewood	Yes ☐	No ☐
	Kerosene	Yes ☐	No ☐
	LPG	Yes ☐	No ☐
	Other specify———		

F2	**Is there an offensive smell when cooking with?**		
	Firewood	☐ Yes	☐ No
	Kerosene	☐ Yes	☐ No
	LPG	☐ Yes	☐ No
	Other specify———————————————		
F3	**Are you concerned about fuel spills and or / explosion?**		
	Kerosene	☐ Yes	☐ No
	LPG	☐ Yes	☐ No
	Other specify———————————————		
F4	**Which fuel causes soot stains on your pot?**		
	☐Fuel wood ☐Kerosene ☐LPG ☐Other specify———————————————		
F5	**If your family gather woods, what are the health impacts of the labour?**		
	☐Backaches ☐Headaches ☐Tiredness ☐Other specify———————————————		
F6	**Are you aware of the health risk from inhalation of smoke?**		
	☐Yes ☐ No		
F7	**If your answer to F6 is yes, what have you done /do you intend to do about it?**		
	☐Nothing ☐Build another kitchen ☐Cook outside ☐Increase size of opening(window and eaves space) ☐Put/add windows ☐Use another stove ☐Increase door size ☐Install chimney ☐Install hood ☐Other specify———————————————		
F8	**If your answer to F7 is " Nothing ", why ?**		
	☐Too expensive to make changes ☐Smoke has perceived benefit-specify(e.g. keeps away mosquitoes) ☐Preserves wood material(of house), etc——————— ☐Other explain———————————————		

F9	**In general, how would you rate your health today?** ☐ Very good ☐ Good ☐ Moderate ☐ Bad ☐ Very bad
	Time interview ends |