

PRES
(Peri-urban and Rural Energy Services)
in Ethiopia, Kenya and Uganda

Ethiopia Country Report

The Shell Foundation
Sustainable Energy Programme (SEP)

An “Increasing Access” Project

Survey Methodology: Survey Planning and Instruments

E.1 Survey Methodology

The PRES survey methodology emanates from discussions during the kick-off meeting, which helped to define information requirements and survey targets, i.e., sources of information in each country.

E.1.1 Research Questions:

The key research questions are:

- *Do rural and peri-urban consumer need and can afford high value energy products and services? IF THEY DO AND CAN...*
- *Can existing distribution infrastructure be used to more cost-effectively market high value energy products and services to wider rural and peri-urban consumers that need and can afford them?*

Therefore, the main theme of the market research (PRES project) being exploring the **demand and opportunities for, and barriers to the marketing of high value energy goods and services in peri-urban and rural areas**, target pilot areas (consumers), companies and commercial outlets were carefully selected to help answer key research questions.

E.1.2 Defining Survey Targets: Companies and Geographic Areas

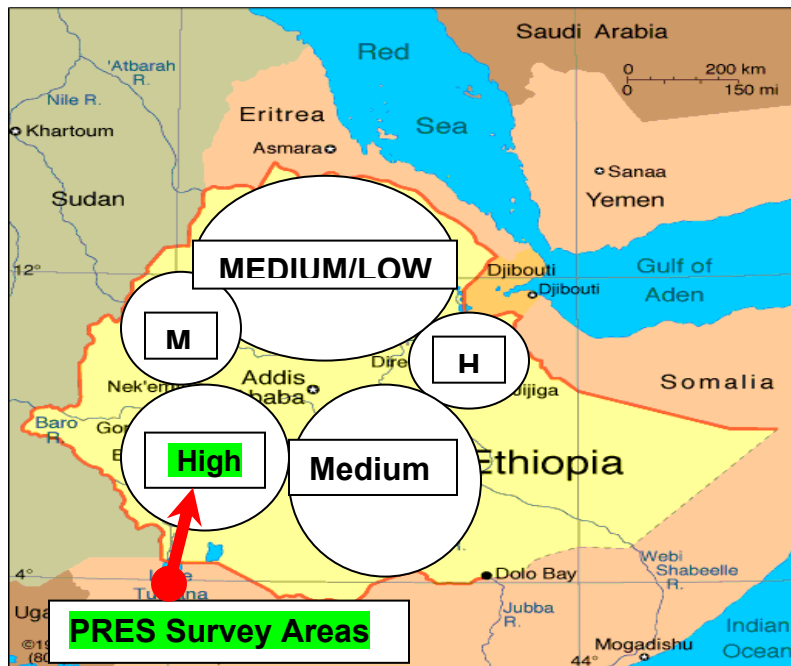
In broader terms, the survey targets could be classified in to two: a) existing commercial market infrastructure with its network and; b) pilot geographic areas with perceived higher potential for certain types of high value energy products and services. Accordingly, companies (suppliers, dealers, distributors) and commercial outlets with existing market infrastructure and or network; and that deal with petroleum products, consumer electronics and general consumer goods were identified and selected for interviews. These include three petroleum products distribution companies and their commercial outlets, four electronics companies and a dozen other trading companies that are engaged in marketing and distribution of consumer goods.

Where there are no commercial networks or when they are not keen on new business opportunities local companies dealing with electronics, hardware and general merchandize were also included.

For consumer (market demand) side of information, based on previous (indigenous) knowledge and information obtained from company level interviews, three pilot areas were selected for catchment (household consumer) surveys. These are:

- Alaba-Alem Gebeya Corridor (Southern Ethiopia),
- Jimma and (South-west Ethiopia),
- Aleta Wondo (Southern Ethiopia). For details see map below.

Map 1: Ethiopia: Potential Market Locations for High Value Energy Goods and Services



Criteria adopted for selection of pilot areas include better disposable income levels, cash crop production, monetization of the local economy, rural commerce and trading centers, higher expenditure on energy for entertainment (dry cell and car battery for radio and TV), previous experience in alternative energy such as PV solar home systems, accessibility, resource requirement for the fieldwork... etc.

E.1.3 Fieldwork Planning and Logistics:

With introductory letters explaining aims and objectives of the PRES project, Company (High Level) interviews in Addis began in early February 2001. This was followed up by personal visits by MGP staff to speed up replies.

Upon completion of a thorough arrangements with local authorities fieldwork commenced in late March in the three pilot areas. To overcome potential cultural and or communication barriers interviews were administered by locally recruited and trained enumerators with two experienced supervisors and one fieldwork coordinator from MGP. Although it was envisaged that the fieldwork would be completed in May 2001, fieldwork in the third site was delayed due to administrative problems; and it is due to be completed soon.

In each of the pilot areas where the fieldwork was completed a sample of over 250 rural and peri-urban households within a radius of up to 40 kms were covered by the survey. Based on income levels, proximity and accessibility, specific survey sites within the pilot areas were selected with the help of local authorities in each site.

E.2 Survey Approaches and Instruments Adopted

Both quantitative and qualitative approaches and survey instruments were adopted to gather data and information that help to determine availability of market, its size, characteristics and infrastructure for delivery of high value energy goods and services to peri-urban and rural consumers in the areas studied.

E.2.1 Quantitative Surveys:

Various quantitative methods and survey instruments that go along with them were utilized to collect quantitative data from various sources. These include the following:

- **Higher Level (Company) Interviews:** the purpose of this survey was to identify potential suitable partners for the PRES project. Three international petroleum products distribution companies and over 20 other local companies engaged in supply, dealership, distribution and trading of general merchandize were identified as potential partners for the PRES project. Fifteen companies were selected and invited to participate in the project of which only six companies showed interest in and filled the survey forms.
- **Commercial Outlet Interviews:** conducted to determine existing business models, supply modalities, range of products on offer, existing market size and characteristics for those products, and interest in new and or high value energy goods and services. The interview included both petrol stations and other non-petroleum commercial outlets.
- **Service Station Visitors Tally and Interviews:** this tally and interview was made to obtain information on number of visitors per day, modes of transport used, and type of purchase made. Moreover, a sample of consumers were interviewed at the point of purchase to capture some first hand information that will guide the larger catchment survey.
- **Catchment (household Consumers) Survey:** a sample of over 250 households residing in peri-urban and rural areas of 5 to 40 kms were interviewed primarily to determine whether or not demand for higher value energy goods and services exists. This survey instrument was designed to collect data on types of existing appliances and devices for cooking, lighting and entertainment, sources of energy used, prices paid for various sources of energy, awareness and availability; and ability and willingness of consumers to pay for higher vale energy products and services. For details of quantitative survey instruments see annex 1.

E.2.2 Qualitative Assessments:

Although some commercial outlets such as petrol stations were able to provide most of the information needed, many local companies and rural merchants found it very difficult to provide quantitative information about their businesses. This was mainly due to poor record keeping that would enable them to recall volume of sales and performance of their businesses in previous years.

Therefore, using the commercial outlet interview forms (with few additional questions as necessary) as a checklist to guide the discussion, a case study approach was adopted to get the picture of existing business arrangements, determine level of interest in new products, identify market barriers, and examine existing partnership opportunities. As regards to petrol station interviews a hybrid of quantitative and qualitative approach was used whereby qualitative information was collected where and whenever respondents are unable to provide quantitative data as required in the survey forms.

Finally, extensive literature reviews were made both to bridge possible gaps and obtain relevant information from secondary sources.

E.2.3 Key Issues: Difficulties Encountered, Measures Taken and Existing Information Gaps

During implementation of the PRES fieldwork unforeseen difficulties were experienced. The first difficult that was experienced was the extended delay in getting replies for “Higher Level” (Company) interviews. Perhaps due to an unsettled political environment that coincided with these interviews companies were very much reluctant to make quick decisions and explore more business opportunities as they were thought to be initially. Surprisingly, this was even more the case with service stations which were thought to be looking for more business opportunities desperately owing to fixed retail margins on petroleum products (excluding lubs) in Ethiopia. In order to overcome this difficulty, the country PRES team has made frequent personal visits to most of the companies to persuade them to fill and return the forms.

Although there are still a few more potentially suitable companies that could be best partners for the PRES project, some companies have returned filled-in survey forms recently. However, since some of the questions in the forms were not answered adequately, some information gaps [needed to complete viable business model(s)] are already evident; and more companies might show interest even at this late stage, the country team will keep in close contact with the companies to gather the necessary information.

The second difficulty was lack of proper documentation by commercial outlet to provide information on historical performance of their business. As indicated earlier, qualitative approach was used as needed to bridge the gap. Case studies and key informant interviews were also conducted to obtain information rural traders and local economic activities in each of the survey areas. Moreover, given the apparent lack of interest by service stations to explore new business opportunities despite their strategically advantageous position, other local companies that deal with electronics and general consumer goods were included in the survey to broaden the chances of identifying suitable partners.

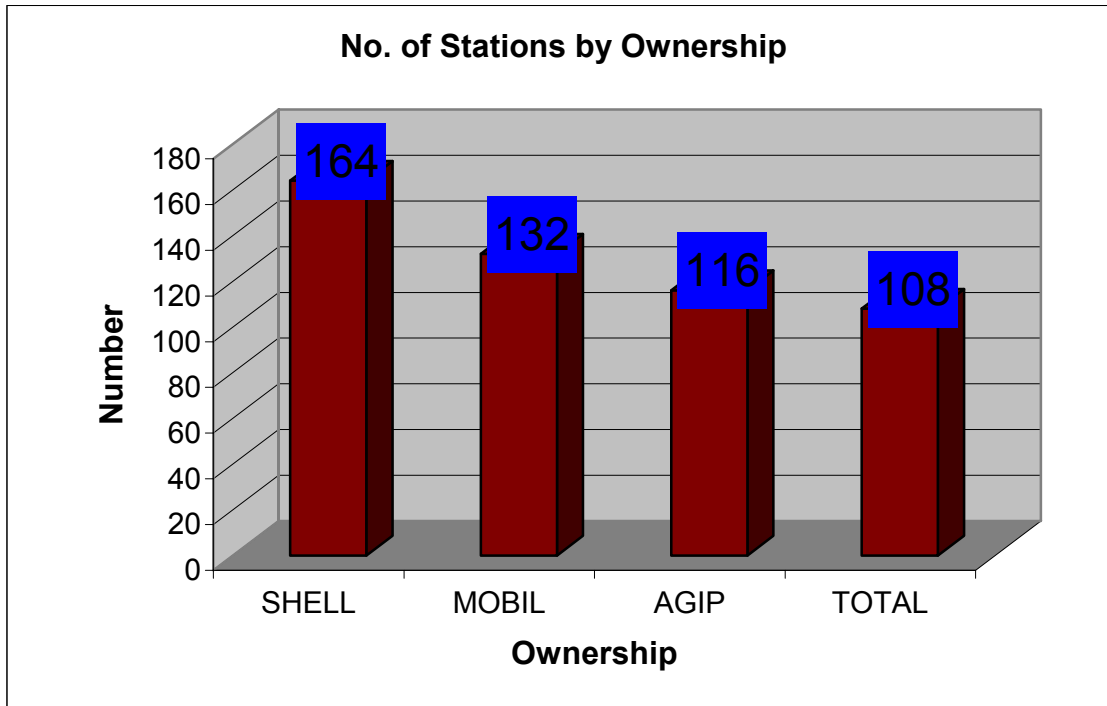
Finally, although it was envisaged to complete the fieldwork as early as May 2001, there were delays due to some administrative difficulties. The third and last survey site (Aleta Wondo) will be completed last week of July 2001.

E.3 Survey Findings (Preliminary): Ethiopia Country Report

Company (High-level) Interviews

Company interviews revealed the following service station statistics (Figure 3.1)

Figure3.1: Service stations in Ethiopia by company



The service station tally was used to ascertain the number of visitors to the selected service stations and the type of business they conducted at the station. Figure 3.2 gives the number of visitors to Shell, Mobil and Agip stations in Alaba and Jimma. The results were taken on six separate days.

Figure 3.3 clearly demonstrates that people visiting petrol stations do tend to make a purchase. The majority of the purchases are automotive - fuel and spares.

Figure 3.2 Service station visitors at Jimma and Alaba

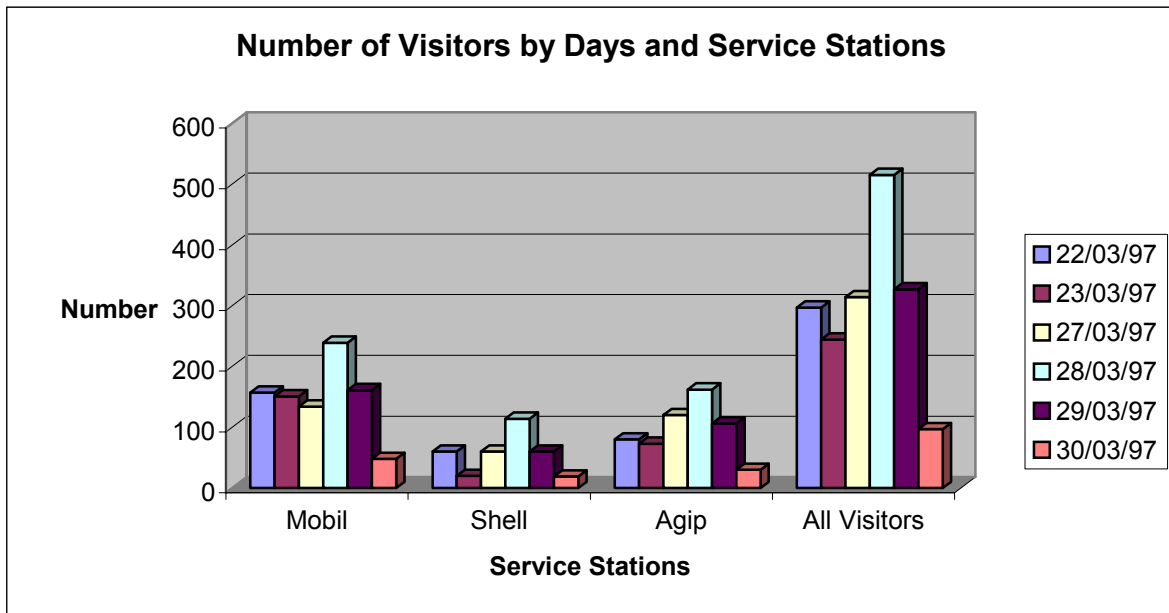
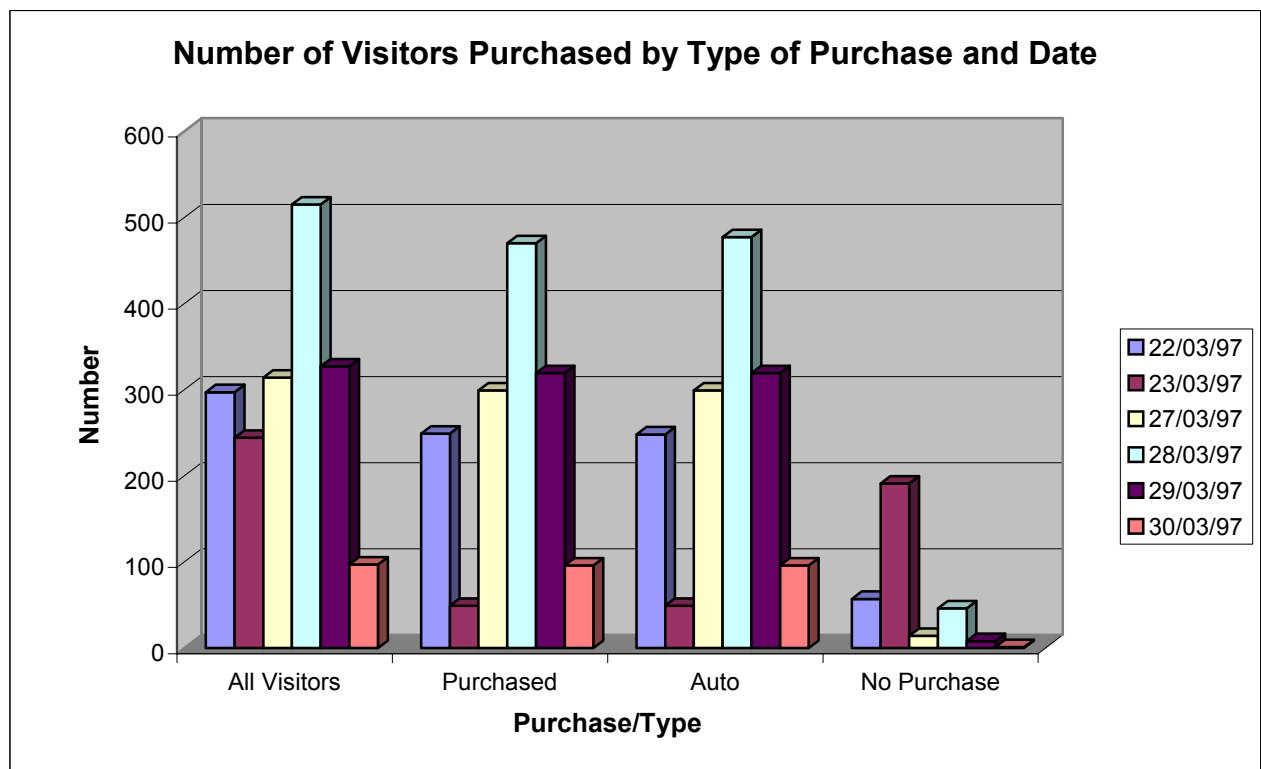
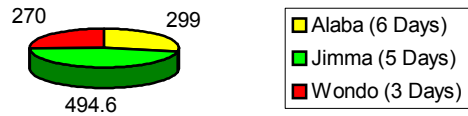


Figure 3.3 Station visitors and number of purchases

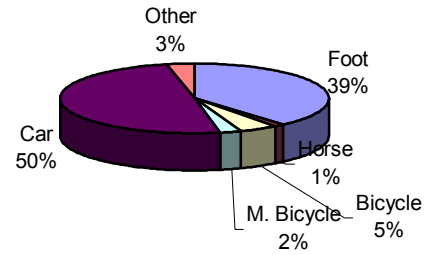


The data collected about the petrol station visitors is recorded in the following figures. It is worth noting that very few people entered the shop at the petrol stations. The shops tend to sell automotive spares and the majority of station users tend to purchase fuel on the forecourt.

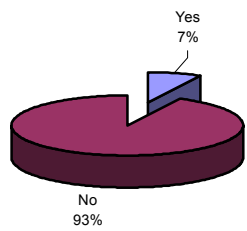
Daily Average Number of Visitors to Service Stations by Survey Site



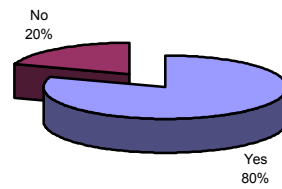
Share of Each Mode of Transport to Service Stations



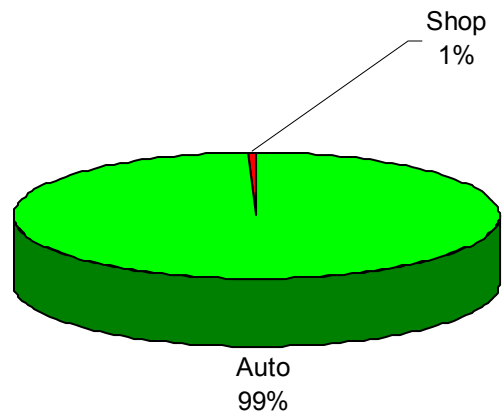
Proportion of Customers that Entered Shop



Proportion of Customers that Purchased at Service Stations

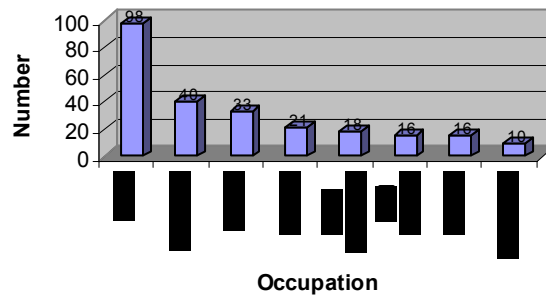


Proportion of Types of Purchase made at Service Stations

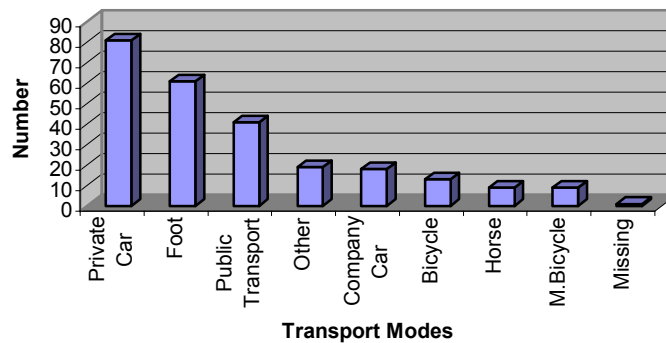


The tally surveys were also used to establish more information about the service station customers and their patterns of energy use. The outcome of this is recorded in the following figures.

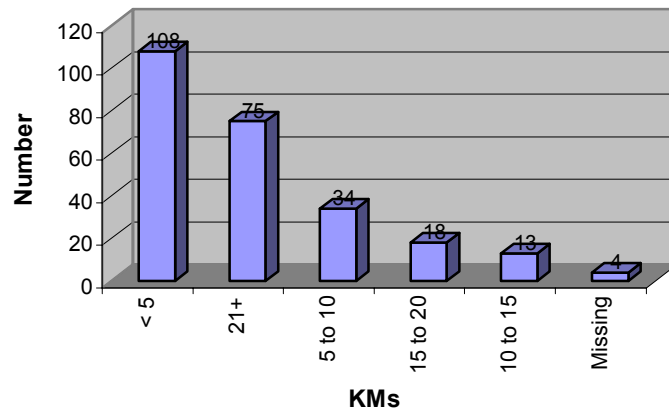
Occupation of Customers Who Visited the Stations



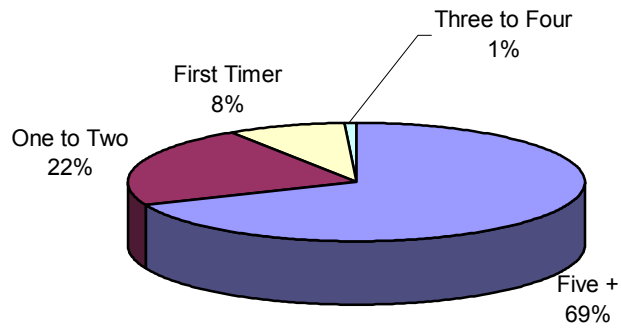
Mode of Transport Used



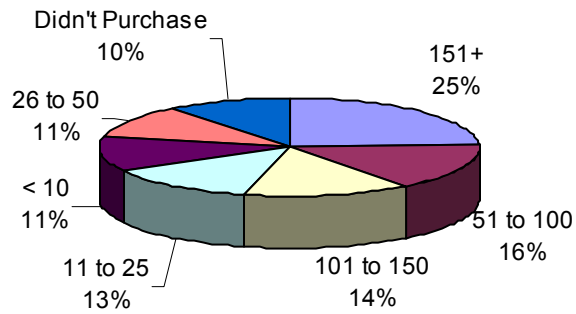
Distance Travelled (kms)



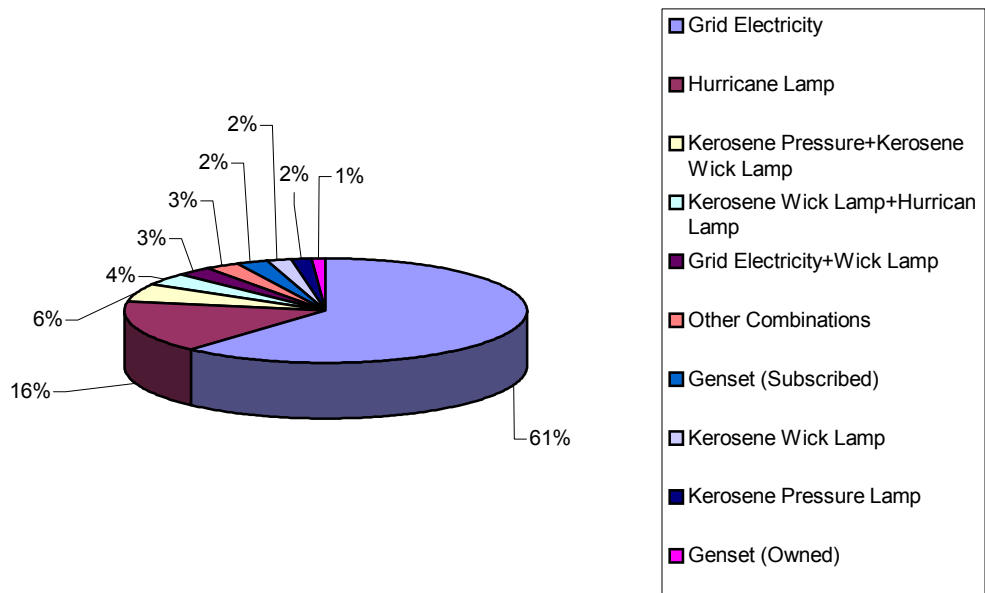
Frequency of Visit to Service Stations Per Week



Amount Spent During this Purchase (Etb)



Lighting Technologies Used



Catchment (Household) Survey

The catchment (household) survey provided useful background on current energy use and a preliminary indication of the likely market for energy products and services. A summary of the findings is given here with additional data tabulated below this.

Currently, wood fuel is the main source of energy in rural areas. The majority of this wood fuel is used for cooking.

Energy Source	Per Cent
Agri residue	4.31%
Charcoal	3.53%
Kerosene	2.35%
Wood	89.80%
Grand Total	100.00%

Wood fuel for cooking is predominantly used on three-stone fires:

Stove used	Per Cent
Improved Charcoal	1.18%
Improved Wood	2.35%
Kerosene wick	1.96%
Three stone	93.73%
Trad. Charcoal	0.78%
Grand Total	100.00%

Examination of energy source and appliance use for lighting reveals that kerosene is by far the most used energy source and it is burned mainly in wick lamps.

Energy for lighting	Per Cent
Candles	2.75%
Diesel	6.67%
Diesel/kerosene	5.10%
Dry cell	5.88%
Grid	3.92%
Kerosene	70.20%
Lead acid battery	0.39%
Wood	5.10%
Grand Total	100.00%

Lighting appliance	Per Cent
Dry Cell	5.10%
Hurricane Lamp	5.88%
Incandescent Lamp	3.14%
Kerosene Pressure	2.75%
Kerosene Wick	82.75%
Solar PV	0.39%
Grand Total	100.00%

No. of Hours Light Used	Per Cent
Missing	1.18%
1 - 3 Hrs	10.20%
3 - 5 Hrs	72.16%
6+ Hrs	16.47%
Grand Total	100.00%

Less than half the people surveyed own entertainment equipment. Those that do mainly use dry cell batteries for energy.

Energy Source (Entertainment)	Per Cent
Don't Own	50.20%
Dry Cell	33.33%
Automotive Battery	2.75%
Grid Electricity	13.33%
Grand Total	100.00%

The market exists but it is:

- Highly seasonal (80% November to January like crazy)
- Highly decentralized no chain (network)
- Largely undeveloped, not very innovative in marketing
- Not well organized in terms of supply methods
- Market exist but not well served
- Awareness and availability very poor
- Business climate is cloudy at the moment due to political turmoil, which made many reluctant
- Service stations well placed but least interested
- Other companies just starting to stretch outside the main cities

To illustrate the seasonal nature of the market, Figure 3.4 presents the consolidated income/expenditure profile for the regions surveyed.

Also, the catchment survey revealed that although there is clearly an interest in "modern" energy products and services, there is considerable concern about the price of these products and services (Figure 3.5).

Figure 3.4: Income / Expenditure profile in the surveyed areas.

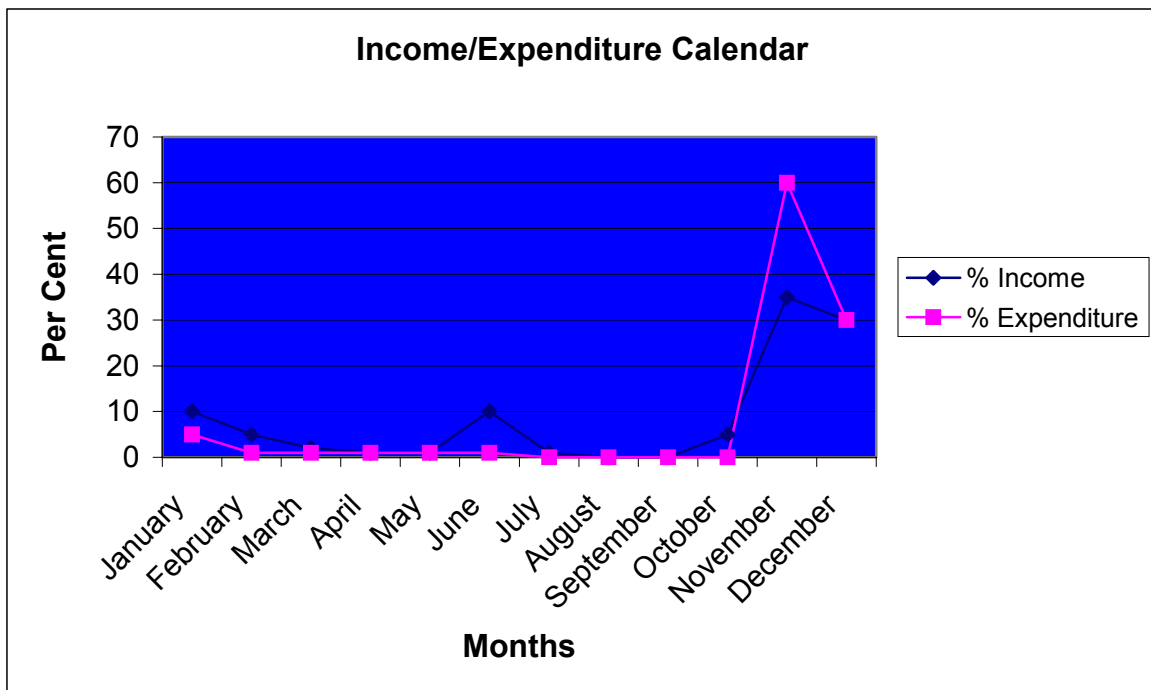
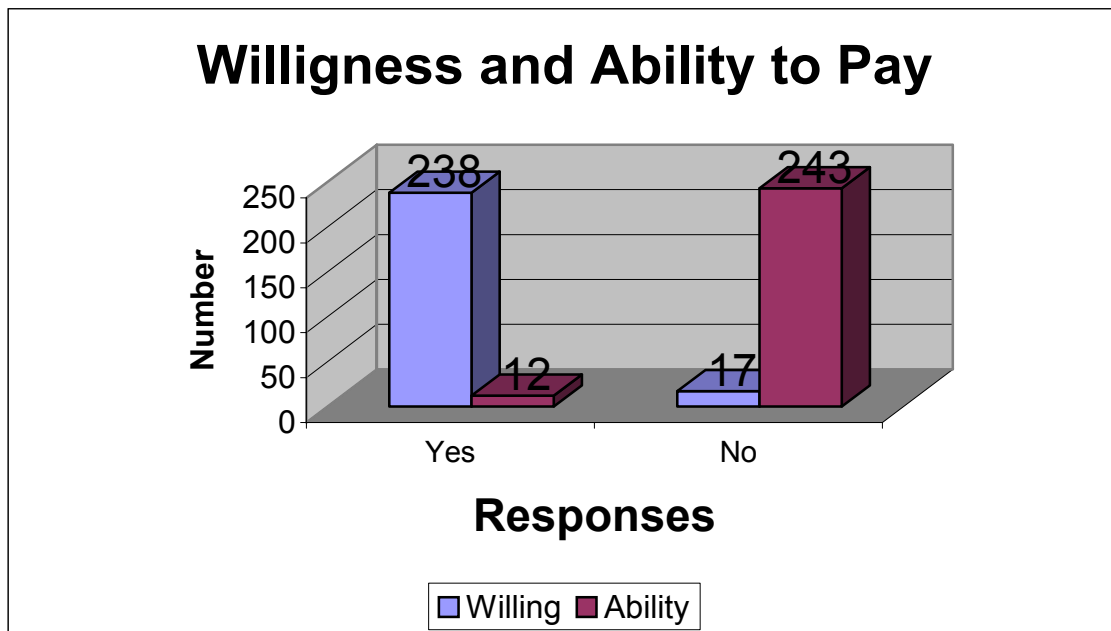


Figure 3.5: Households willingness and ability to pay for modern energy goods and services



Survey data

Gender Distribution

GENDER	TOTAL	%
Female	1639	50.31
Male	1619	49.69
Total	3258	100.00

Age Distribution

AGE GROUPS	NUMBER	%
<= 5	416	12.77
6 to 15	941	28.88
16 to 24	696	21.36
25 to 34	509	15.62
35 to 44	363	11.14
45 to 54	181	5.56
55+	142	4.36
Missing	10	0.31
Total	3258	100.00

Level of Literacy

EDUCATION	NUMBER	%
1 No Formal Education	669	20.53
2 Primary	981	30.11
3 Junior Secondary	424	13.01
4 High School	449	13.78
5 College and Above	66	2.03
6 Non-formal Education	199	6.11
Under Age	470	14.43
Total	3258	100.00

Occupation of the Survey Population

Primary OCCUPATION	NUMBER	%
Civil Servant	173	5.31
Wage Employee	57	1.75
Self Employed/Small Business	233	7.15
Trade/Business	40	1.23
Farmer	385	11.82
Pension	37	1.14
Unemployed	101	3.10
Student	1099	33.73
Housewife	408	12.52
Other	166	5.10
Under Age	559	17.16
Total	3258	100.00

Number of Rooms in Housing Units Owned

NO OF ROOMS	NUMBER	%
One	338	39.3
Two	194	22.6
Three	189	22.0
Four	89	10.3
Five	39	4.5
Six	5	0.6
Seven	5	0.6
Nine	1	0.1
Total	860	100.0

Ownership of Cooking Appliances

COOKING APPLIANCES	NUMBER	%
Three Stone Fire	578	44.8
Traditional Charcoal Stove	222	17.2
Improved Charcoal Stove	198	15.4
Kerosene Wick Stove	151	11.7
Improved Wood Stove	71	5.5
Electric Mtad	31	2.4
Refrigerator	13	1.0
Electric Hot Plate	10	0.8
Electric Immersion Water Heater	5	0.4
LPG Stove	2	0.2
Electric Oven	1	0.1
Other	1	0.1
Missing	6	0.5
Total	1289	100

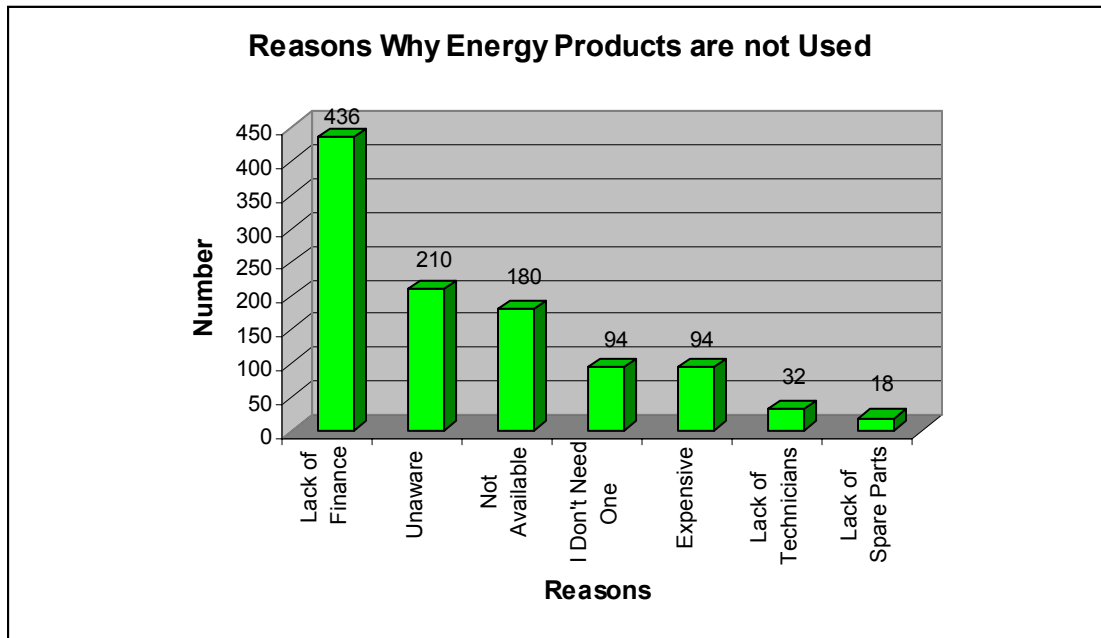
Awareness and Availability: Cooking Appliances

COOKING APPLIANCES	AWARE AND AVAILABLE		AWARE BUT NOT AVAILABLE		UNAWARE	
	Number	%	Number	%	Number	%
Open Fire	591	27.1	32	1.9	6	0.2
Traditional Charcoal Stove	456	20.9	151	8.9	22	0.9
Improved Charcoal Stove	370	17.0	163	9.6	96	4.0
Kerosene Wick Stove	353	16.2	184	10.8	92	3.8
Electric Mtad	163	7.5	264	15.5	202	8.4
Improved Wood Stove	151	6.9	295	17.3	183	7.6
LPG Stove	88	4.0	318	18.7	223	9.3
Electric Stove	5	0.2	160	9.4	464	19.3
Other	2	0.1	101	5.9	526	21.8

		0.0	34	2.0	595	24.7
Total	2179	100	1702	100	2409	100

Number of Hours Lighting is Needed

HOURS	NUMBER	%
Four to Five Hours	461	73
One to Three Hours	119	19
Six and Above	49	8
Total	629	100



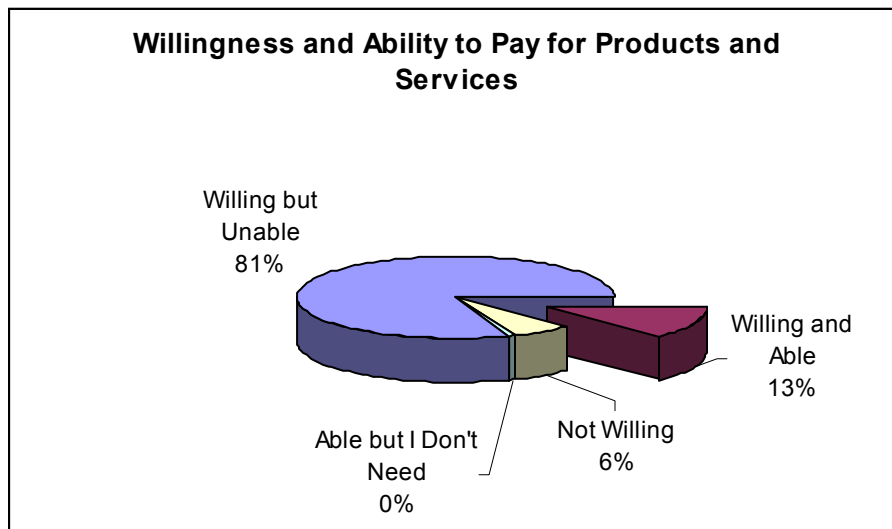
Energy Products Needed

PRODUCT	NUMBER	%
Kerosine Stove	291	18
Electric Mtad	222	14
Solar System	124	8
Imp. Charcoal Stove	124	8
GenSet	117	7
Solar Lantern	106	7
Electric	105	7
Imp. Wood Stove	97	6
TV Set	77	5
Radio/Tape Recorder	66	4
Refrigrator	40	3
Tradi. Charcoal Stove	31	2
Electric Stove	31	2
Fanos	29	2

Masho	27	2
Battery Charging	11	1
Dry Cell Battery	9	1
Electric Water Heater	7	0
Electric Kettle	5	0
Deep Cycle Battery	4	0
Energy Saving Lamps	2	0
Automotive Battery	2	0
I Don't Need Any	49	3
Grand Total	1576	100

Energy Services Needed

SERVICES	NUMBER	%
Electrician	400	28
Household Items Repair	240	17
Radio/Tape Recorder	209	15
Solar Technician	165	11
Spare Parts Supplier	143	10
Car Battery Charger	79	5
General Technician	69	5
Generator Repair	33	2
Supplier of Goods	22	2
Technician	9	1
Dry Cell Battery Charger	5	0
I Don't Need Any	65	5
Total	1439	100



Ownership of Lighting Appliance

COOKING APPLIANCES	NUMBER	%
Kerosene Wick Lamp	438	34.0
Kerosene Pressure Lamp	327	25.4
Incandescent Lamp	252	19.6
Hurricane Lamp	168	13.0
Dry Cell Battery	40	3.1
Fluorescent Lamp	39	3.0
GenSet	6	0.5
Automotive Battery	5	0.4
Other	3	0.2
Missing	11	0.9
Total	1289	100.0

Awareness and Availability: Lighting Appliances

LIGHTING APPLIANCES	AWARE BUT AVAILABLE		AWARE BUT UNAVAILABLE		UNAWARE	
	Number	%	Number	%	Number	%
Kerosene	1235	46.6	377	12.9	112	5.5
Solar Lantern	25	0.9	353	12.1	310	15.3
Ni Cad Battery	17	0.6	351	12.0	318	15.7
PV SHS	54	2.0	339	11.6	236	11.6
LPG Lantern	36	1.4	335	11.5	305	15.0
Deep Cycle Battery	39	1.5	334	11.5	321	15.8
Lead Acid Battery	117	4.4	290	10.0	124	6.1
Genset	110	4.1	278	9.5	91	4.5
Other	31	1.2	160	5.5	154	7.6
Dry Cell Battery	447	16.9	63	2.2	11	0.5
Wood	540	20.4	33	1.1	23	1.1
Total	2651	100	2913	100.0	2029	100.0

Ownership of Entertainment Appliances

TYPES OF APPLIANCES	NUMBER	%
Transistor Radio	153	27.5
Radio/Recorder	301	54.0
TV Set	74	13.3
VCR	10	1.8
Other	3	0.5
Missing	16	2.9
Total	557	100

Awareness and Availability: Services (Repair and Maintenance)

LIGHTING APPLIANCES	AWARE BUT AVAILABLE		AWARE BUT UNAVAILABLE		UNAWARE	
	Number	%	Number	%	Number	%
Electrician	291	17.4	115	16.8	74	7.1
Household Items Repair	142	8.5	121	17.7	140	13.4
Generator Repair	429	25.6	93	13.6	23	2.2
Dry Cell Battery Charger	119	7.1	91	13.3	178	17.1
Kerosene Stove	37	2.2	60	8.8	285	27.3
Radio/Tape Recorder	397	23.7	85	12.4	58	5.6
Spare Parts Supplier	240	14.3	111	16.2	118	11.3
Car Battery Charger	18	1.1	8	1.2	167	16.0
Total	1673	100	684	100	1043	100.0

Purposes Lighting was Used

PURPOSES	NUMBER	%
Domestic Chores	745	59
Recreation	272	21
Study	200	16
Prayer	20	2
Security at Night	16	2
Livestock/Milking	14	1
Trading	10	1
Hosting Guests	5	0
Total	1282	100