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**Energy Efficient Production and Utilization of Charcoal through
Innovative Technologies and Private Sector Involvement in Sierra Leone.**

MARKET SURVEY ON IMPROVED COOK STOVES

Consultant:

TEJ Centre for Agricultural Innovation and Excellence Company Limited (TEJ CAIE Co Ltd)

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Executive Summary

Charcoal is now the fuel of choice for the majority of urban residents in Sierra Leone because: a) It is affordable by all cadres of society; b) It is substantially more efficient than wood and burns with very limited smoke and less fire hazard (preferred by landlords); and c) It has higher calorific value and is easier to transport than wood. The objective of the market survey was to provide relevant and reliable information in order to achieve market analysis of the available cook stoves in the country. The study was deemed crucial for business start-ups and essential for established businesses as it would provide accurate information about customers and competitors that allows the development of a successful innovation.

The study covered Freetown and the provincial headquarter cities and their immediate environs. Coverage was influenced by the following: a) the use of cook stoves is largely an urban phenomenon; b) district headquarter towns could not be included because of the constraint imposed by available financial resources and the time allotted for the exercise; and c) movements were severely constrained by heavy downpours of rain during the months of May and June, when the study was conducted.

Data collection entailed the following measures: a) Review of relevant project documentation; and b) Primary data collection, which entailed administration of questionnaires to fabricators of cook stoves and users of cook stoves; c) FGDs involving input suppliers and marketers of stoves; and d) In-depth interviews with key informants (at UNDP, MoE, NU, etc).

The findings revealed that institutional ownership of cook stove enterprises is uncommon. Most enterprises (79.7% of those studied) are owned by individuals. With the notable exception of Makeni, where 20.0% of the enterprises are owned by women, all cook stove enterprises in the other three localities are owned by males. Less than 10.0% of the staff of cook stove enterprises are women. These women are mainly engaged in marketing. 59.4% of all enterprises (ranging from 13.3% in Makeni to 100.0% in Kenema) are registered. In the provinces, all enterprises are registered with the respective local councils, while in Freetown, registration is with the Ministry of Energy. Apart from Freetown, where 38.5% of cook stoves are graded and certified, cook stoves produced in the provinces are neither graded nor certified.

The majority of cook stove fabricators have very small operations. 31.3% have only 1-5 employees, while 37.5% have between 6 and 10 employees. Only 56.3% of fabricators are housed in permanent structures. The remainder operate from makeshift structures or outdoors. Poor access to training facilities and opportunities is a major problem experienced by most establishments. Approximately 30% of staff have been trained but almost all were trained on the job.

The main sources of investment capital for the majority of cook stove enterprises (84.6%) are the personal savings of proprietors. Such savings are typically inadequate for the developments they envisage for their enterprises. The main sources of credit are

friends/relatives, moneylenders, savings clubs, micro-finance institutions and commercial banks. The problems experienced with the credit sources include: a) Banks insist on collateral, which most enterprises are often unable to provide; b) Moneylenders charge usurious rates of interest; and c) Friends, relatives and savings clubs charge low interest but, owing to shortage of funds, loan units are usually too small for investment behavior. The main sources of inputs are building materials stores (for metal sheets, roofing zinc and cement) and scrap yards. The problems of cook stove fabrication relate to its design. In most stove designs, the clay lining easily falls out when it gets wet or when exposed to shocks (usually when being transported over rough roads). There are three role players in the marketing of cook stoves: a) the fabricators, b) commissioned agents and c) independent entrepreneurs, who buy in bulk from the fabricators and retail the product in their own business establishments.

The main problems of marketing relate to: a) the unavailability of storage facilities for the stoves; b) damage to the stoves when they get wet or in transit to market; c) low awareness among potential users (especially in the provinces) of the benefits of using improved stoves, and d) poor presentation of products by many nascent enterprises.

Based on the findings, it was recommended that provision of financial assistance to cook stove entrepreneurs be made for the following: a) capacity enhancement of staff of cook stove enterprises through training; b) country-wide awareness campaigns to sensitize the populace about the detrimental consequences of using firewood as fuel for cooking and the economic, environmental and social benefits of using charcoal stoves; c) construction of storage and exhibition structures to be owned by associations of cook stove fabricators; d) construction or improvement of work spaces of promising enterprises.

Also, recommended is the provision of networking support to promote the sale of cook stoves; organization of fabricators in particular localities into associations; and the provision of delivery trucks for the transportation of inputs to their enterprises and products to market; establishment of links between cook stove enterprises and banks or other financial intermediaries and the provision for guarantee for enterprises to obtain loans; modalities need to be put in place to ensure that all cook stoves fabricated in the country are graded and certified.

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ACRONYMS

EENRM: Energy, Environment and Natural Resource Management

GEF : Global Environment Facility

MoE : Ministry of Energy

NGO : Non-Governmental Organization

NU : Njala University

UNDP : United Nations Development Programme

Chapter One

INTRODUCTION

1.1 Background

The past decade has witnessed phenomenal growth in the production and marketing of charcoal in rural communities in Sierra Leone. During the 1980s and 1990s, charcoal was the fuel of choice of relatively few urban dwellers. It has gradually replaced firewood and is now the main fuel wood for the majority of urban residents for a number of reasons: a) It is affordable by all cadres of society and the only option available for the many low waged urban employees; b) It is substantially more efficient than wood and burns with very limited smoke and less fire hazard (preferred by landlords) and c) It has higher calorific value and easier to transport than wood. As a result, many people consider charcoal a relatively modern fuel when burnt on improved stoves.

The production and utilization of charcoal and improved cook stoves are now common practices in Sierra Leone. What, however, remains a gap is that there is not enough relevant data on market analysis of the available cook stoves in the country.

1.2 Project Objective

In partnership with the Ministry of Energy (MoE), UNDP has secured funds from the Global Energy Facility (GEF) to implement a project entitled “Energy Efficient Production and Utilization of Charcoal through Innovative and Private Sector Involvement in Sierra Leone.” The overall goal of the project is to bring economic, social and environmental benefits through the production of certified charcoal from sustainably sourced feedstock and through the introduction of improved cook stoves to reduce fuel wood demand, improve health and reduce greenhouse gas emissions.

The project will enable the mitigation of the demand for non-renewable firewood and the access to cleaner alternative energy and renewable biomass in the country’s residential, institutional and industrial sectors in the rural and peri-urban areas through the introduction of a certification and labeling scheme for improved cook stoves and appliances. The project considers increased investment on improved, more efficient charcoal and clean cook stoves as viable inclusive business in Sierra Leone.

1.3 Objective of the Markey Survey

The objective of the market survey was to provide relevant and reliable market information in order to achieve market success, increase accessibility to funds, adoptability of an innovative cook stove and sustainability of investments. The study was deemed crucial for business start-ups and essential for established businesses as it would provide accurate

information about customers and competitors that allows the development of a successful innovation.

It was intended that the study would provide a clear and realistic direction for an innovative cook stove product development, entrepreneurial choice and marketing support to scale up local production and networking support to stimulate increased use of the product.

1.4 Scope of Work

In compliance with the Terms of Reference, and under the joint supervision of the UNDP Energy, Environment and Natural Resource Management (EENRM) Programme lead, and the Directorate of Energy in the Ministry of Energy, the TEJ Centre for Agricultural Innovation and Excellence Company Limited was charged with the following activities:

- A systematic and detailed assessment of community-based organizations that are involved in cook stove production and marketing. The assessment shall outline their strengths, capacity to participate in the project, experience in providing equal opportunities to both men and women, either individually or collectively.
- Based on the findings of the assessment, prepare draft agreements for the most suitable community-based organizations, clearly defining their roles and responsibilities, the modalities and incentives for their participation and funding requirements.
- List of fabricators, business service providers and micro-entrepreneurs that have the capacity to locally produce parts of cook stoves and kilns for demonstration projects.
- A mapping of private sector participants and their potential roles.
- Ranking criteria for categorizing types of charcoal stove producers or entrepreneurs based on capacity analysis and technology.
- Recommendation of modalities and incentives (including funding requirements) for the participation of the most suitable entities in the project.
- Draft survey report for submission to key stakeholders to elicit their comments and inputs.
- Final survey report which incorporates the inputs of the key stakeholders.

Chapter Two

STUDY METHODOLOGY

2.1 Preamble

The technical approach in handling the envisaged tasks and the methodology for carrying out all appertaining activities are presented in the following sub-sections. A mixed data collection approach (employing both quantitative and qualitative data collection techniques) was pursued in conducting the market survey of improved cook stoves. The *Data collection methodology* is discussed in detail in sub-section 2.2 of this report.

The study was conducted in the four regions of Sierra Leone within the following cities and their immediate environs: Freetown (Western Area) and the three provincial headquarters - Makeni (Northern Province), Bo (Southern Province) and Kenema (Eastern Province). Within each city, interviews were conducted with both community-based organizations and individuals that are engaged in the fabrication of improved cook stoves and with their service providers and the marketers of their products. The coverage of the study was influenced by the following:

- At present, the use of cook stoves is largely an urban phenomenon. Rural areas still overwhelmingly use firewood for cooking;
- The study would have covered district headquarter towns but for the constraint imposed by available financial resources and the time allotted for the exercise;
- Movements were severely constrained by heavy downpours of rain during the months of May and June, when the study was conducted.

Baseline data were hard to come by. The number and locations of establishments that fabricate improved cook stoves or of their input suppliers and marketers of their products are not documented. For this reason, the “snowball” approach was pursued: known establishments and operatives along the cook stoves value chain were interviewed first. They assisted the consultants to locate their competitors and service providers.

Data collection methodology

The study employed the following data collection techniques:

Secondary data: As a prerequisite for the commencement of the study, relevant documentation – journal articles, documents relating to the “Energy Efficient Production and Utilization of Charcoal through Innovative and Private Sector Involvement in Sierra Leone” project, relevant Government policy statements, etc. – were reviewed both to learn what already existed and to determine the course the analysis should follow.

Primary data collection: This entailed the following:

(i) Administering *structured questionnaires*:

A structured questionnaire was administered to a sample of community-based organizations that are engaged in the fabrication and marketing of improved cook stoves in Freetown and the provincial headquarter cities of Makeni, Bo and Kenema. Baseline data on community-based organizations that are engaged in the fabrication and/or marketing of cook stoves is not readily available. In each study community, therefore, the first step was to undertake a listing of these organizations. The number of cook stoves value chain operatives identified are listed in Annexes V and VI, while the samples selected are presented in Table 1.

Issues covered by the Questionnaire for Cook Stoves Fabricators included the following:

- Human and material resource capacities;
- Sources of and problems with investment capital;
- Sources of inputs;
- Market outlets and trade flows;
- Perceived strengths, weaknesses and opportunities;
- Capacity to participate in the project;
- Experience in providing equal opportunities to both men and women individually and collectively; and
- Incentives for improving/expanding production and marketing and participation in the project.

Table 1: Sample size for various assessment instruments

INSTRUMENT	Freetown	Makeni	Bo	Kenema	TOTAL
Questionnaire for Cook Stoves Fabricators	18	15	18	13	64
Questionnaire for Users/Potential Users of Cook Stoves	60	50	50	50	210
FGD: Service Providers	20	10	10	10	50

A *second questionnaire* targeted a sample of current and potential customers (i.e households) of improved cook stoves. For this questionnaire, the sample sizes for each community covered in the assessment are also presented in Table 1. Interviews were intended to ascertain their access to, perceptions of and adoptability of the stoves.

Specifically, the questionnaire addressed the following issues:

- Household size and composition;
- Educational levels of household heads;
- Estimated income levels of households;
- Current main household fuel source for cooking;
- Awareness and assessment of improved cook stoves;

- Access to and adoptability of improved cook stoves;
- Constraints in accessing and utilizing cook stoves;
- Demand for cook stoves; and
- Proposed improvements to available cook stoves.

(ii) Informal interviews/Focus Group Discussions: Issues emerging from the questionnaire interviews that concern the activities of input suppliers and marketers of cook stoves were probed with the respective value chain actors through either informal interviews (in the case of individual operators) or focus group discussions (where activities are undertaken by establishments with several employees).

(iii) Key Informant Interviews: Officials in the UNDP Energy and Environment Programme, and the Directorate of Energy in the Ministry of Energy were engaged, through in-depth interviews, to elicit information on the direction, progress and realistic expectations of the project. Relevant in-country technical institutions like the Agricultural Engineering Department of Njala University) were also engaged to gather information on their experiences in promoting improved cook stove fabrication and marketing in the country.

(iv) Stakeholders' validation: Following the submission of the draft consultancy report, it was circulated and the Lead Consultant also did a Power Point presentation on market survey to representatives of all relevant stakeholders for their comments and recommendations. Such comments informed the final report of the consultancy.

2.3 Data Quality Control and Assurance Measures

A key consideration throughout the conduct of the market survey for improved cook stoves was to ensure that data collected would be of high quality. The following measures were undertaken:

Field instruments

An important quality assurance measure relates to the nature and design of the field instruments. The draft questionnaires (for fabricators and users/non-users of improved cook stoves), Interview Guide for Informal interviews, Focus Group discussions and Key Informant Interviews were reviewed jointly by the whole survey team (Lead Consultant, Data Analyst and Enumerators) and pre-tested to ensure that: 1) the wording of the questions was concise, unambiguous and relevant to the objectives of the assignment; and 2) the questions were short and to the point thereby ensuring that respondents stayed interested and focused.

Recruitment and training

The recruitment of enumerators was guided by the following considerations:

- 1) Ability to communicate well in the main local language(s) of the respective study districts;
- 2) Field experience in data collection, especially in rural communities;
- 3) Familiarity with the geography and related logistical issues of the survey districts.

For these reasons, enumerators for each survey community were recruited from that particular community. The recruitment of enumerators was also gender-sensitive: equal numbers of males and females were recruited.

Supervision of enumerators was the responsibility of the Lead Consultant and the Data Analyst. They ensured that all completed questionnaires and focus group interview reports were reviewed in the field with enumerators to ensure accuracy, consistency and completeness before being submitted for data entry and analysis.

A vital component of quality assurance is training of field staff. This entailed going through the questionnaire and interview guide, question by question, translation into Krio to make sure that trainees fully understood the survey instruments and their roles. The training emphasized field methods with special focus on ethical conduct in data collection and management. During the training, trainees were required to do role play (mock interviews) to enhance familiarity with the instruments. The survey instruments were also piloted in selected communities both in the Western Area and in the Provinces before the commencement of field data collection.

Chapter Three

MAIN FINDINGS OF ASSESSMENT

Fabricators of Cook Stoves:

3.1 Profile of Cook Stove Fabricators

Basic facts about fabricators of cook stoves are summarized in Table 2:

Table 2: Profile of cook stove fabricators

Locality	Ownership		Gender of owner/head		Is establishment registered?		Are products graded / certified?	
	Individual	Institution	Male	Female	Yes	No	Yes	No
Freetown	12 (66.7%)	6 (33.3%)	18 (100.0%)	-	9 (50.0%)	9 (50.0%)	5 (38.5%)	13 (61.5%)
Bo	18 (100.0%)	0 -	18 (100.0%)	-	14 (77.8%)	4 (22.2%)	-	18 (100.0%)
Makeni	9 (60.0%)	6 (30.0%)	12 (80.0%)	3 (20.0%)	2 (13.3%)	13 (86.7%)	-	15 (100.0%)
Kenema	12 (92.3%)	1 (7.7%)	13 (100.0%)	-	13 (100.0)	-	-	13 (100.0%)
TOTAL	51 (79.7%)	13 (20.3%)	61 (95.3%)	3 (4.7%)	38 (59.4%)	26 (40.6%)	5 (7.8%)	59 (92.2%)

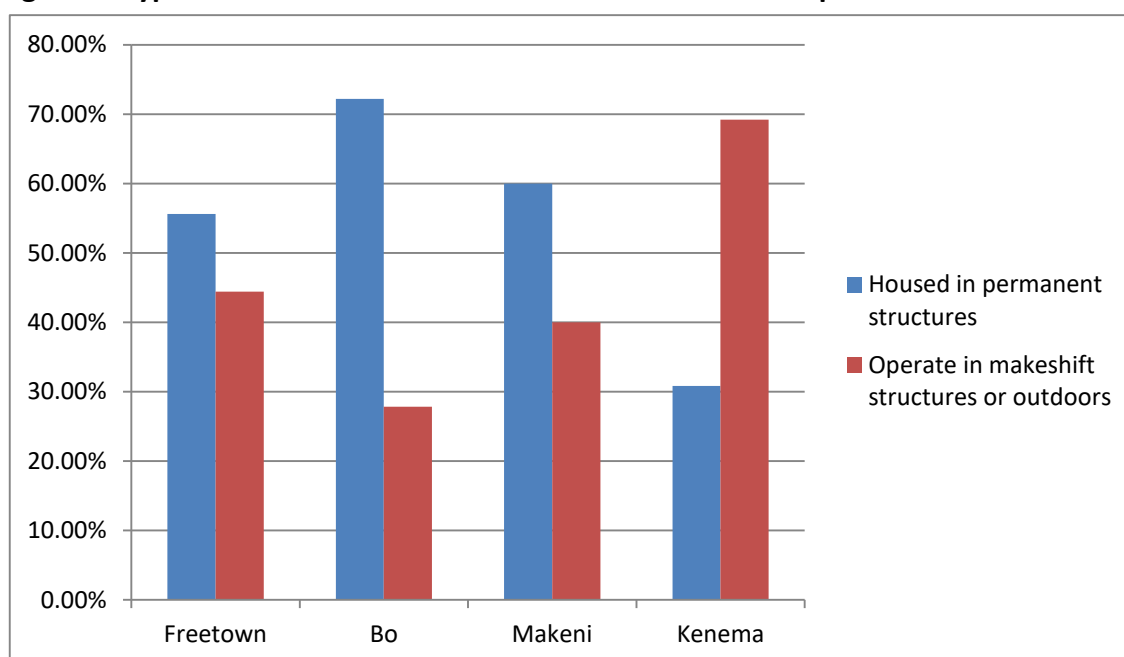
N: Freetown = 18; Bo = 18; Makeni = 15; Kenema = 13

- Institutional ownership of cook stove enterprises is uncommon. Most enterprises (79.7% of those studied) are owned by individuals.
- With the notable exception of Makeni, where 20.0% of the enterprises are owned by women, all cook stove enterprises in the other three localities are owned by males.
- 59.4% of all enterprises (ranging from 13.3% in Makeni to 100.0% in Kenema) are registered. In the provinces, all enterprises are registered with the respective local councils, while in Freetown, registration is with the Ministry of Energy.
- Apart from Freetown, where 38.5% of cook stoves are graded and certified, all other cook stoves produced in the provinces are neither graded nor certified.

3.2 Physical Assets

Figure 1 summarizes the findings of the investigation of the physical infrastructure of cook stove enterprises.

Figure 1: Types of structures in which cook stove fabricators operate



N: Freetown = 18; Bo = 18; Makeni = 15; Kenema = 13.

The figure reveals that 56.3% of all enterprises are housed in permanent structures. The proportion of enterprises in secure and permanent structures ranges from a low of 30.8% in Kenema to 72.2% in Bo. The remainder (43.8% overall) occupy makeshift structures or operate outdoors. The proportion of establishments in the latter category ranges from 27.8% in Bo City to as high as 69.2% in Kenema.

Table 3 reveals that 54.7% of respondents (ranging from as low as to 27.8% in Freetown and environs to as high as 66.7% in Bo and Makeni) consider their current work spaces to be adequate. 45.3% of all respondents do not consider their work spaces to be adequate and would like new or improved structures.

Table 3: Adequacy of available accommodation

Locality	Accommodation ADEQUATE	Accommodation INADEQUATE
Freetown	5 (27.8%)	13 (72.2%)
Bo	12 (66.7%)	6 (33.3%)
Makeni	10 (66.7%)	5 (38.5%)
Kenema	8 (61.5%)	5 (38.5%)
TOTAL	35 (54.7%)	29 (45.3%)

3.3 Human Resource Capacity

3.3.1 Staff strengths of cook stove establishments

Table 4 presents an overview of the human resource capacities of cook stove enterprises in the Freetown and the three provincial headquarters.

Table 4: Staff strengths of enterprises

Locality	Frequency	Number of personnel per enterprises					Total
		1-5	6-10	11-15	16-20	Over 20	
Freetown	Count	5	8	4	0	1	18
	%	27.8%	44.4%	22.2%	0.0%	5.6%	
Bo	Count	6	6	4	2	0	18
	%	33.3%	33.3%	22.2%	11.1%	0.0%	
Makeni	Count	6	4	5	0	0	15
	%	40.0%	26.75	33.3%	0.0%	0.0%	
Kenema	Count	3	6	2	0	2	13
	%	23.1%	46.2%	15.4%	0.0%	15.4%	
TOTAL	Count	20	24	15	2	3	64
	Accruing %	31.3%	37.5%	23.4%	3.1%	4.2%	100.0%

It can be discerned from the table that the vast majority of the establishments are very small operations. Overall, 31.3% have 1-5 employees; 37.5% have between 6 and 10 employees and 23.4% have between 11 and 15 employees. Only insignificant percentages employ more than 15 persons.

3.3.2 Engagement of women

The overwhelming majority of cook stove fabricators (78.1% of all respondents) reported that less than 10.0% of their staff are women. Table 5 reveals that fabricators reporting very low participation of women in the industry ranged from 66.7% in Makeni to 92.3% in Kenema.

Table 5: Women as percentage of total staff

Locality	Frequency	Women as percentage of total staff					Total
		1-10%	11-20%	21-30 %	31-40%	Over 40%	
Freetown	Count	15	0	1	2	0	18
	%	83.3%	0.0%	5.6%	11.1%	0.0%	
Bo	Count	13	1	3	1	0	18
	%	72.2%	5.6%	16.7%	5.6%	0.0%	
Makeni	Count	10	0	1	2	2	15
	%	66.7%	0.0%	7.7%	13.3%	13.3%	
Kenema	Count	12	0	1	0	0	13
	%	92.3%	0.0%	7.7%	0.0%	0.0%	
TOTAL	Count	50	1	6	5	2	64
	Accruing %	78.1%	1.6%	9.4%	7.8%	3.1%	100.0%

The main reasons advanced by fabricators for the poor representation of women in the establishments included the following:

- Women are not interested in this type of enterprise (40.6%)
- Work is too difficult for women (50.0%)
- The establishment does not, as a policy, employ women (3.1%). Informal discussions revealed that several of the enterprises were launched by unemployed young men in reaction to pervasive unemployment and the unavailability of job opportunities in their communities. Typically, women had not been involved in the discussions that resulted in the launching of the enterprises.

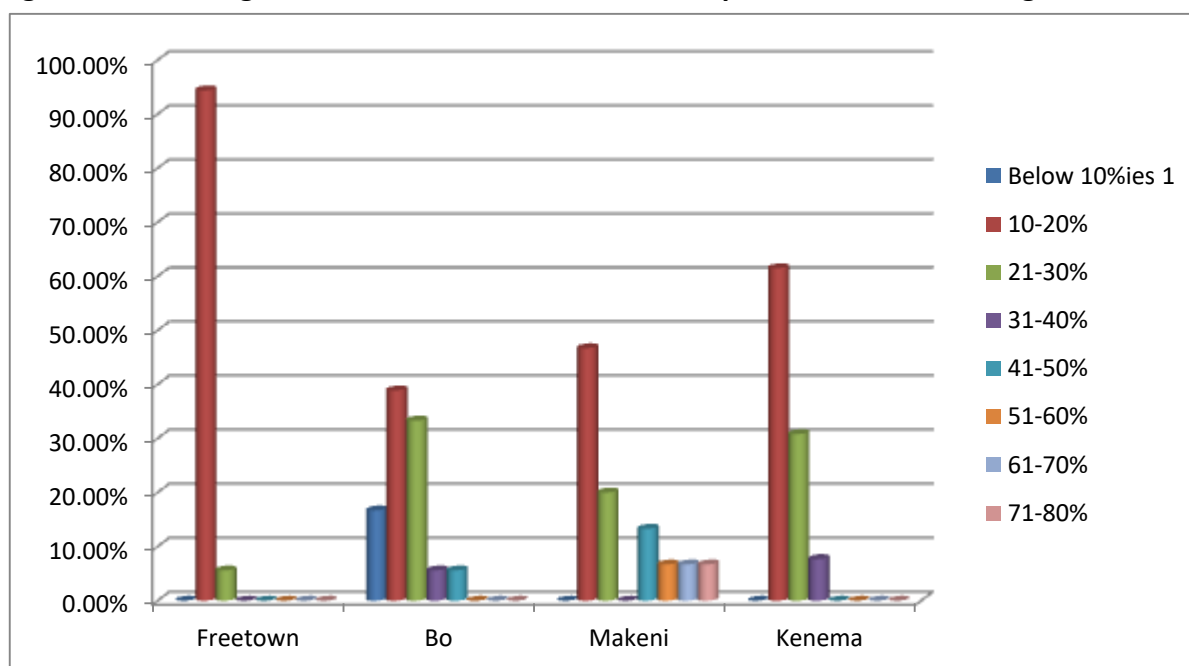
The services of the few women that are engaged in the industry are utilized for the following purposes:

- Marketing of products (32.8%)
- Fabrication of cook stoves (31.3%)
- Book keeping (18.8%)
- Procurement of inputs (14.1%);
- No specific tasks are reserved for women (3.1%). Like their male counterparts, they can be called upon to perform any task.

3.3.3 Training of staff

The percentages of staff that have received required technical training in the different localities are presented in Figure 2. The high concentration of responses in the 10-20% and 20-30% categories, is indicative of the fact that the majority of staff have not received the required technical training. Very few respondents reported that higher than 30% of their staff had received required training.

Figure 2: Percentage of staff that have received the required technical training



Overall, 90.6% of training of personnel is done on-the-job. This holds true for establishments in all localities. The percentages of staff that have been trained by their respective establishments are: 94.4% for Freetown; 86.7% for Makeni; 88.9% for Bo and 92.8% for Kenema.

It is important to observe, however, that almost all establishments are not satisfied with the training they provide for their staff and expressed the intention, if/when they receive the required financial assistance, to send their staff to appropriate technical/vocational institutions for further training. The courses in which they want their staff to be trained are indicated in Table 6.

Table 6: Training needs of cook stove enterprises

Locality	Frequency	Skills for which training required				Total
		Improved fabrication	Community sensitization for stoves	Marketing	Book keeping	
Freetown	Count	18	0	0	0	18
	%	100.0%	-	-	-	
Bo	Count	13	2	3	0	18
	%	72.2%	11.1%	16.7%	-	
Makeni	Count	10	2	2	1	15
	%	66.7%	13.3%	13.3%	6.7%	
Kenema	Count	12	1	0	0	13
	%	92.3%	7.7%	-	-	
TOTAL	Count	53	5	5	1	64
	Accruing %	82.8%	7.8%	7.8%	1.6%	100.00%

It is noteworthy from the table that the majority of establishments (100.0% in Freetown, 72.2% in Bo, 66.7% in Makeni and 92.3% in Kenema) prioritize training to “improve the fabrication of products”. Small percentages of respondents also recognize the need to train their staff in “community sensitization about the advantages of using improved cook stoves” and in marketing.

All establishments visited request external assistance in the form of:

- a) Financial resources to send their staff to appropriate technical institutions both in Sierra Leone and elsewhere in the West Africa sub-region for training.
- b) Technical assistance to enable them organize production and marketing, and networking support to stimulate use of their products.

3.4 Sources of Investment Capital

The various sources of start-up capital for cook stove fabricators are presented in Table 7.

Table 7: Sources of start-up capital

Locality	Frequency	Sources of start-up capital				
		Own savings	Remittances	Development organizations	Bank loan	Informal moneylenders
Freetown	Count	17	0	1	0	0
	%	94.4%	-	5.6%	-	-
Bo	Count	12	1	3	0	2
	%	66.7%	5.6%	13.7%	-	11.1%
Makeni	Count	6	2	0	0	7
	%	40.0%	13.3%	-	-	46.7%
Kenema	Count	11	0	1	1	0
	%	84.6%	0	7.7%	7.7%	-

It is evident from the table that the vast majority of establishments (Freetown- 94.4%; Bo- 66.7%; Makeni-73.3% and Kenema – 84.4%) depend on their personal savings and claim that available resources are grossly inadequate as start-up capital. Only modest amounts are contributed by remittances, development organizations or loans from either formal or informal sources.

When available investment capital is inadequate, proprietors of the enterprises resort to lending from one or other of the following credit sources: Friends/relatives; Moneylenders; Savings clubs; Micro – finance institutions; and Commercial banks.

The main problems encountered with the various credit sources include the following:

- Banks, Microfinance institutions, Commercial Banks are usually averse to lending to small business enterprises and typically insist on loan collateral, which most would-be lenders cannot provide.

- Merchants (who usually double as moneylenders) are major sources of loans, especially in the provinces. Their main disadvantages include short loan duration—usually 1 – 3 months (which makes them unsuitable for investment.) and the fact that they charge usurious rates of interest.
- Other informal lenders (relatives/friends; community members) typically do not insist on loan collateral as lending is seen as assistance to relatives and friends, which is expected to be reciprocated if/when the tables are turned in future. The attractiveness of informal credit sources, notwithstanding, they pose serious problems for businesses: Funds available for lending from these sources are limited, hence the smallness of loan units. A problem associated with all the sources of credit is the short loan duration: typically, loans must be repaid within 1-3 months. This makes the loans unsuitable for investment behavior.
- Community savings clubs charge modest interest on loans but clients do not mind because being members of the club, they will benefit in future from the accrued interest. These savings clubs often do not have enough resources to address all the credit needs of their members.

3.5 Monthly Expenditure and Income

The monthly expenditures of cook stove enterprises (on such items as personnel, inputs, etc) and incomes derived from sales of their products were investigated in a bid to determine whether they could be viable without external assistance. Most of the enterprises studied do not keep reliable records so that data they provided were from memory recall. The larger, more organized enterprises, which do keep records, were reticent about making those records available to the survey team. The findings are presented in Tables 8 and 9.

Table 8: Monthly Expenditures of Enterprises

Locality	Frequency	Monthly expenditure (Leones)					
		Below 3,000,000	3,000,001-6,000,000	6,000,001-9,000,000	9,000,001-12,000,000	12,000,001-15,000,000	15,000,001-18,000,000
Freetown	Count	14	2	1	0	0	1
	%	77.8%	11.1%	5.6%	-	-	5.6%
Bo	Count	11	6	1	0	0	0
	%	61.1%	33.3%	5.6%	-	-	-
Makeni	Count	14	0	1	0	0	0
	%	93.3%	-	6.7%	-	-	-
Kenema	Count	11	2	0	0	0	0
	%	84.6%	15.4%	-	-	-	-

Table 8 reveals that the majority of respondents (77.8% in Freetown, 61.1% in Bo, 93.3% in Makeni and 84.6% in Kenema) have monthly expenditures (to pay wages, for inputs, and other overheads) below Le 3,000,000. This underscores the smallness of their operations.

Only 15.4% (11.1% in Freetown and 33.3% in Bo) reported expenditures between Le 3,000,000 and 6,000,000.

Table 9 summarizes the monthly incomes of the cook stove enterprises interviewed.

Table 9: Monthly Incomes of Enterprises

Locality	Frequency	Monthly Incomes form sale of Products (Leones)					
		Below 5,000,000	5,000,001-10,000,000	10,000,001-15,000,000	15,000,001-20,000,000	20,000,001-25,000,000	25,000,001-30,000,000
Freetown	Count	13	4	0	0	0	1
	%	72.2%	22.2%	-	-	-	5.6%
Bo	Count	9	6	3	0	0	0
	%	50.0%	33.3%	16.7%	-	-	-
Makeni	Count	13	2	0	0	0	0
	%	86.7%	13.3%	-	-	-	-
Kenema	Count	13	0	0	0	0	0
	%	100.0%	-	-	-	-	-

The table reveals that the monthly incomes of the majority of enterprises are below Le 5,000,000 (Freetown- 72.2%; Bo – 50.0%; Makeni – 86.7% and Kenema – 100.00%). Modest percentages of enterprises - 22.2% in Freetown, 33.3% in Bo and 13.3% in Makeni) recorded monthly incomes between Le 5,000,000 and 10,000,000.

The amounts reported are difficult to verify but informal interviews with workers in some of the enterprises implied that in the hope of attracting financial assistance from external donor organizations, there was a tendency to overstate expenditure and to under-report income.

3.6 Fabrication of Products

The main raw materials for the fabrication of improved cook stoves – or so-called “Wonder Stoves”- include metal sheets (for the outer casing of the stove) and clay and/or cement for the inside layer. The main sources of raw materials are as follows:

- 1) **Metal sheets** are obtained either from motor vehicle scrap yards or from building materials stores, where thin metal plates or roofing zinc sheets are obtained. No surprisingly, the main sources of metal sheets cited in all localities visited were building materials stores. The lists of these for the various communities are appended to this study. It is interesting to observe, however, that many building materials stores interviewed are not even aware that they play a vital role in the cook stoves value chain. Most believe that the metal sheets/roofing zinc they sell are for the construction of houses.

Scrap yards have sprung up all over the country, especially in the major settlements. They are regular and, so far, reliable sources of metal plates that fabricators use for the casing of

stoves. Their ability to cope as sources of input, is less certain if mass production of wonder stoves is undertaken to adequately address the government’s plan for almost all households in the country to have and use improved charcoal stoves is realized.

- 2) **Clay** is the material used for the lining of wonder stoves. Most fabricators, especially in Bo and Kenema, reported that they do not buy clay. They know the local sources of the type of clay required and usually dig it up themselves. In Freetown and Makeni/Lunsar, however, there now exists a sizeable group of service providers whose main economic activity is the supply of clay for cook stove fabrication. Over the years, it has been experienced that the clay lining of the stove easily disintegrates when wet or falls out when the stove falls over or is subjected to shocks. This fact is of concern not only to the stove users, who have to replace them frequently but to marketers who reported that they often incur substantial losses because of the unstable clay lining of stoves. Both stove users and marketers are, therefore, desirous that this design flaw be rectified.

- 3) **Cement:** Owing primarily to the design flaw inherent in the use of clay as lining for stoves, some fabricators have sought to improve the design by strengthening the clay lining of the stove by mixing it with cement. For this reason cement, which is also procured from building materials stores, has become one of the key inputs in the fabrication of ‘wonder stoves’.

To a large extent, fabricators are satisfied with the sources of their raw materials. They claim that inputs (metal sheets/roofing zinc, scrap metal and cement) can be accessed easily if one has the financial resources to pay for them.

3.7 Marketing

Table 10 reveals that apart from Makeni, which sells a smaller proportion (40.0%) of its products within Bombali district, all the other localities tend to produce primarily for the local market.

Table 10: Market outlets for cook stoves

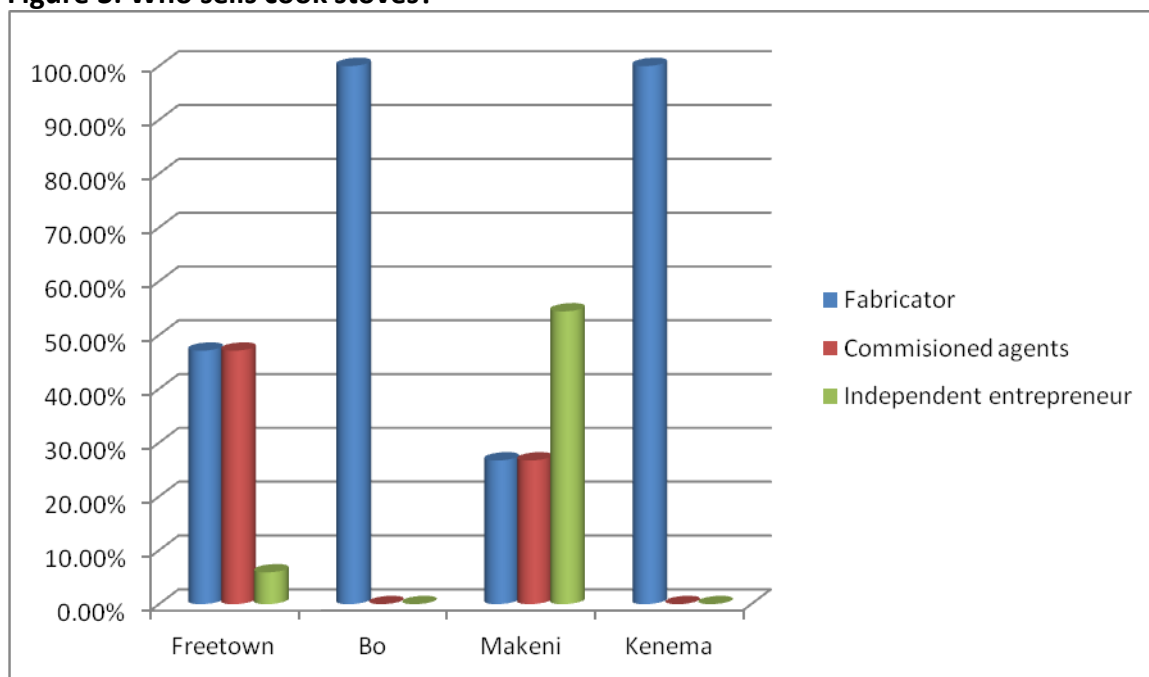
Locality	Frequency	Where products are sold		
		Immediate locality	Within same admin. district	Countrywide
Freetown	Count	6	8	3
	%	35.3%	47.1%	17.6%
Bo	Count	11	3	1
	%	73.3%	20.0%	6.7%
Makeni	Count	3	3	8
	%	20.0%	20.0%	60.0%
Kenema	Count	13	0	0
	%	100.0%	-	-

Thus, Kenema sells 100.0% of its products within the immediate locality; Bo sells 73.3% of its products within the city and a further 20.0% within the Bo district, while Freetown sells 82.4% of its products within the Western Area (35.3% within the city and a further 47.1% within the Western Rural district).

Discussions with fabricators revealed that a major reason for concentration of sales in immediate and nearby communities was that the product easily gets damaged (i.e the clay lining falls out) when transported long distances, especially over rough roads. In Makeni/Lunsar, on the other hand, many cook stove fabricating enterprises are located along the highway to Freetown. Production far exceeds local demand and products tend to be sold for low prices. The combination of low prices and location on the highway may be responsible for the substantial sale to communities outside the Bombali district.

Responses to questions about **who sells their products** identified three main actors: a) the fabricators, b) commissioned agents and c) independent entrepreneurs. Figure 3 captures the dominance or otherwise of each of these actors in the different localities.

Figure 3: Who sells cook stoves?



It is revealed from Figure3 that in Bo and Kenema fabricators do all their own marketing. The reasons advanced for doing their own marketing included a) lack of entrepreneurs that are interested in the enterprise, and b) lack of trust in entrepreneurs. In Freetown, fabricators and commissioned agents are equally active in marketing products (each being responsible for 47% of sales) while independent entrepreneurs play only a minor role (5.9%). In Makeni, independent entrepreneurs play a dominant role in the marketing of

cook stoves and account for 54.4% of sales. Fabricators and commissioned agents each account for slightly over 20% of sales.

Owing to the lack or inadequacy of stores or display rooms for their products, fabricators who sell their own products usually display them at roadsides where passing motorists/potential customers can easily see them (See Plate 1). This was observed to be common practice in all localities. This practice has a number of drawbacks: clay lined stoves are at risk of being damaged when it rains and when being transported outdoors in the mornings and back indoors in the evenings.

Independent entrepreneurs usually place orders for the required quantities of cook stoves. Prices are mutually agreed and payment is always up front. The products are collected from the fabrication site by the entrepreneur and transported, at their own cost, to their places of business (which may be shops or supermarkets).

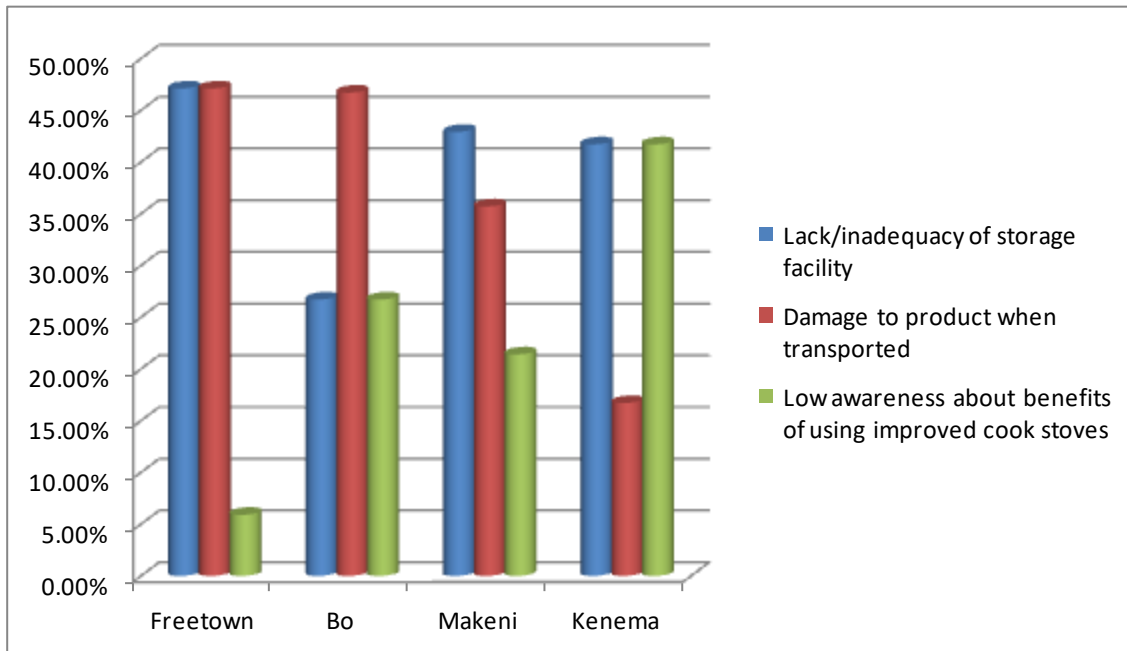
Commissioned agents also collect the products from the fabrication sites and bear the costs of transportation to their places of business. The price of the product and the agent's commission are mutually agreed upon by the two parties. Payment for each consignment is usually effected after sales. Commissioned agents tend to be owners of small provision shops.



Plate 1: Cook stoves on display at a roadside in Bo city

The **main problems** associated with marketing of cook stoves relate to a) Lack/inadequacy of storage facility; b) damage to products in transit to market; and c) low awareness of the benefits of using improved cook stoves (especially in the provinces). Fabricators' assessments of the problems in each study locality are presented in Figure 4.

Figure 4: Cook Stove Marketing Problems



It is evident from Figure 4 that “Lack/inadequacy of storage facility” features prominently in all localities. It was cited by 47.1%, 42.9%, 41.7% and 26.7% of respondents in Freetown, Makeni, Kenema and Bo, respectively. “Damage to product when transported” also features prominently in all localities, with the notable exception of Kenema. The damage referred to here, relates primarily to the dislodging of the clay lining of the stoves. This problem was reported by 47.1%, 46.7% and 35.7% of respondents in Freetown, Bo and Makeni, respectively. The very low percentage for Kenema can be attributed to the fact that all their products are sold in Kenema and do not, therefore, have to be transported over long distances. The final problem marketing problem cited by respondents was the “Low awareness among the populace of the benefits of using improved cook stoves”. Not surprisingly, this problem is mentioned by more respondents in the provinces (41.7%, 26.7% and 21.45 in Kenema, Bo and Makeni, respectively) than in Freetown, where only 5.9% claimed low awareness among the populace of the benefits of the stoves.

3.8 Future Plans of Enterprises

The overwhelming majority of cook stove enterprises (100.0% in Bo, 94.4% in Freetown, 93.3% in Makeni and 91.7% in Kenema) plan to improve their enterprises. To effect the desired improvement, they require external assistance with the following:

- Capacity enhancement of their staff through training and study tours;
- Awareness campaigns to sensitize the populace about the detrimental consequences of using firewood as the main fuel for cooking and the economic, environmental and social benefits of using charcoal stoves.
- Funding for construction or improvement of work space.
- Provision of storage and exhibition structures.
- Assistance with transportation.

Analysis of the circumstances of the cook stove enterprises reveals the following facts which should be taken into consideration in decisions to assist them:

STRENGTHS

- Strong interest in the enterprise for a host of reasons key among which is job creation for participants in a situation of high unemployment.
- Availability of a small pool of reasonably well-trained and experienced personnel.

WEAKNESSES

- Poor physical infrastructure (work places, stores) of many enterprises.
- Inadequate access to training facilities and opportunities for the fabrication of improved cook stoves.
- Generally low income levels of the enterprises.
- Poor access to financial services and institutions.
- The majority of enterprises lack knowledge/expertise in “packaging” and presentation of their products. Most cook stoves fabricated in the provinces are crude in appearance. Poor presentation results in low prices for products. This, to a large extent, accounts for the substantial price differential between products of well-established enterprises in Freetown (which pay attention to the appearance of the final products, and which are also graded and certified) and those of nascent establishments, which are typically housed in make-shift structures and whose products are neither graded nor certified. The difference in presentation between Plates 2 and 3 is glaring. Thus, while cook stoves produced in Lunsar and Bo cost between Le 30,000 and Le 40,000, those fabricated by well-established enterprises and sold at Freetown Supermarket or other reputable outlets cost Le 120,000 or higher.



Plate 2: Finished cook stove on display in Bo



Plate 3: Finished cook stove on display at a supermarket in Freetown

OPPORTUNITIES

- Favorable government policy towards the promotion of charcoal stoves in its bid to promote various economic, environmental and social benefits that are associated with their widespread use.
- High local demand for improved cook stoves especially in urban centres where landlords now forbid the use of fuel wood for cooking.
- Widespread deforestation which has resulted in high costs for fire wood.

THREATS

- Widespread ignorance, especially in the provinces, about the harmful consequences of using fire wood as the main source of cooking fuel and the economic, environmental and social benefits of using improved cook stoves.
- Reluctance of local people to change.
- Pervasive poverty prevents many people from buying stoves.

3.9 Current and Potential Users of Cook Stoves:

3.9.1 Profiles of Current and Potential Users of Cook Stoves

In all study locations, households were randomly selected to ascertain their access to and the adoptability of improved cook stoves. Sample sizes were 60 for Freetown, and 50 for each of the provincial head quarter cities. Basic demographic characteristics such as household size, educational levels of household heads, and income levels were investigated to determine whether they had any significant influence on the adoptability of cook stoves. The findings are presented in the following sub-sections.

3.9.2 Household size

Table 11 reveals high percentages of households in the 3-5 and 6-8 persons' categories.

Table 11: Number of persons per household

Locality	Frequency and accruing %	Number of persons per household			
		Below 3	3-5	6-8	Over 8
Freetown	Count	3	25	22	10
	%	5.0%	41.7%	36.7%	16.7%
Bo	Count	4	27	7	13
	%	7.8%	52.9%	13.7%	25.5%
Makenii	Count	6	22	12	10
	%	12.0%	44.0%	24.0%	20.0%
Kenema	Count	1	14	14	19
	%	2.1%	29.2%	29.2%	39.6%

It is evident from the table that 41.7%, 52.9%, 44.0% and 29.2% of households in Freetown, Bo, Makeni and Kenema, respectively, are in the 3 to 5 persons size categories, while 36.7%,

13.7%, 24.0% and 29.2%, respectively, in those cities have 6 to 8 persons. Informal interviews with household members revealed that substantial proportions of household income, which in most cases are meager and inadequate for the various household needs, are expended on fuel for cooking. The larger the size of household, therefore, the higher the expenditure on cooking fuel. Respondents claimed that the adoption of improved cook stoves was strongly influenced by the need to minimize expenditure on fuel for cooking.

3.9.3 Educational level of household heads

The survey affirmed the overall low level of formal education in Sierra Leone. The percentages of respondents in all study locations that fall in the “No formal education”, “Primary school”, and “Junior Secondary school” categories are high (see Table 12).

Table 12: Educational levels of heads of households interviewed

Locality	Frequency	Educational level attained by household head					
		No formal schooling	Primary school	Junior secondary school	Senior secondary school	Tech/Voc	Tertiary
Freetown	Count	11	5	4	10	9	22
	%	18.0%	8.2%	6.5%	16.4%	14.8%	36.1%
Bo	Count	5	9	7	7	10	13
	%	9.8%	17.6%	13.7%	13.7%	19.6%	25.5%
Makeni	Count	12	9	10	9	3	7
	%	24.0%	18.0%	20.0%	18.0%	6.0%	14.0%
Kenema	Count	20	2	6	5	0	15
	%	41.7%	4.2%	12.5%	10.4%	0.0%	31.3%

Low and no formal education severely limits the opportunities for formal employment, which in turn results in very low household incomes. It is evident from the table, however, that there are substantial numbers of people that have had the benefit of Senior Secondary, Technical/vocational and tertiary education. It emerged from discussions with respondents that the majority of these educated class are either unemployed or only have low paying jobs. Discussions revealed that higher education, per se, does not necessarily translate into lucrative employment and decent income. The level of education of the head of household does not, therefore, appear to be a major decisive factor in the adoption of cook stoves.

3.9.4 Estimated monthly incomes of households

Respondents were required to estimate the total monthly incomes of the respective households. Several of them are in the informal sector (as petty traders, carpenters, mechanics, etc. and do not usually keep records. Their estimates of income, therefore, rely on recall and are, at best, approximations.

Table 13 reveals that the overwhelming majority of responding households, especially in the provinces, have very low incomes.

Table 13: Estimated monthly household incomes

Locality	Frequency	Estimated monthly household income (Leones)				
		Below 1,000,000	1,000,001-2,000,000	2,000,001 - 3,000,000	3,000,001-4,000,000	Over 4,000,000
Freetown	Count	26	17	9	5	4
	%	42.6%	27.9%	14.8%	8.2%	6.6%
Bo	Count	30	13	6	1	1
	%	58.8%	25.5%	11.8%	2.0%	2.0%
Makeni	Count	43	4	1	2	0
	%	86.0%	8.0%	2.0%	4.0%	0.0%
Kenema	Count	47	1	0	0	0
	%	97.9%	2.1%	0.0%	0.0%	0.0%

42.6%, 58.8%, 86.0% and 97.9% of households in Freetown, Bo, Makeni and Kenema, respectively, earn less than Le 1,000,000 monthly. In Freetown and Bo, modest percentages of respondents (27.9% and 25.5%, respectively) have monthly incomes between Le 1,000,001 and 2,000,000. Informal discussions revealed that overall low household incomes is a major factor in the adoption of improved cook stoves which, being efficient fuel users, significantly reduce expenditure on fuel for household cooking needs.

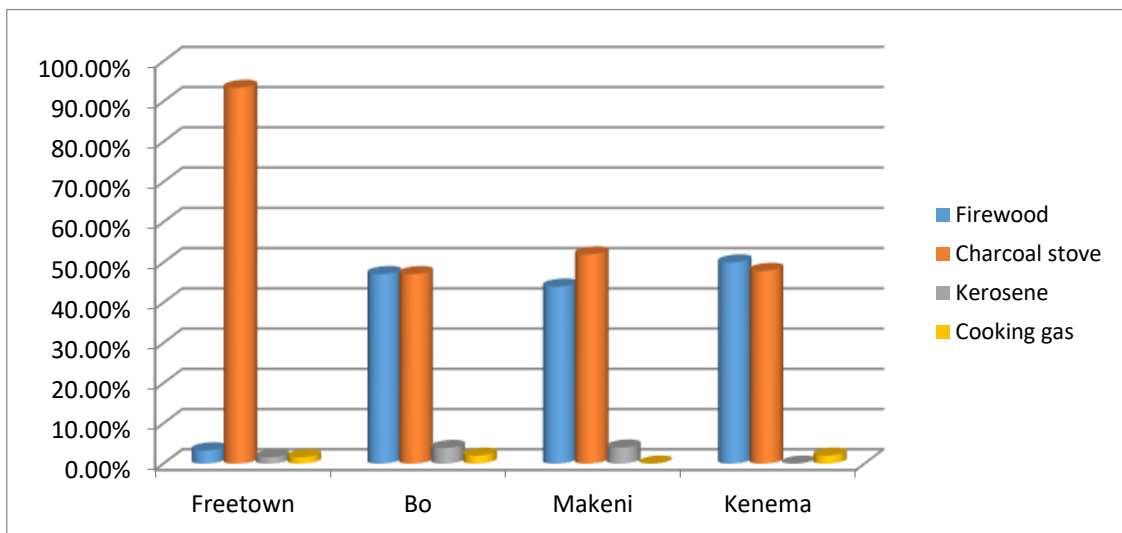
3.10 Access to and Adoptability of Cook Stoves

Table 14 and Figure 5 reveal the importance of cook stoves in all localities covered in the assessment.

Table 14: Main means of cooking

Locality	Frequency and accruing %	Main fuel source for cooking			
		Firewood	Charcoal stove	Kerosene stove	Gas cooker
Freetown	Count	2	57	1	1
	%	3.3%	93.4%	1.6%	1.6%
Bo	Count	24	24	3	0
	%	47.1%	47.1%	5.9%	0.0%
Makenii	Count	22	26	2	0
	%	44.0%	52.0%	4.0%	0.0%
Kenema	Count	24	23	0	1
	% within Locality	50.0%	47.9%	0.0%	2.1%

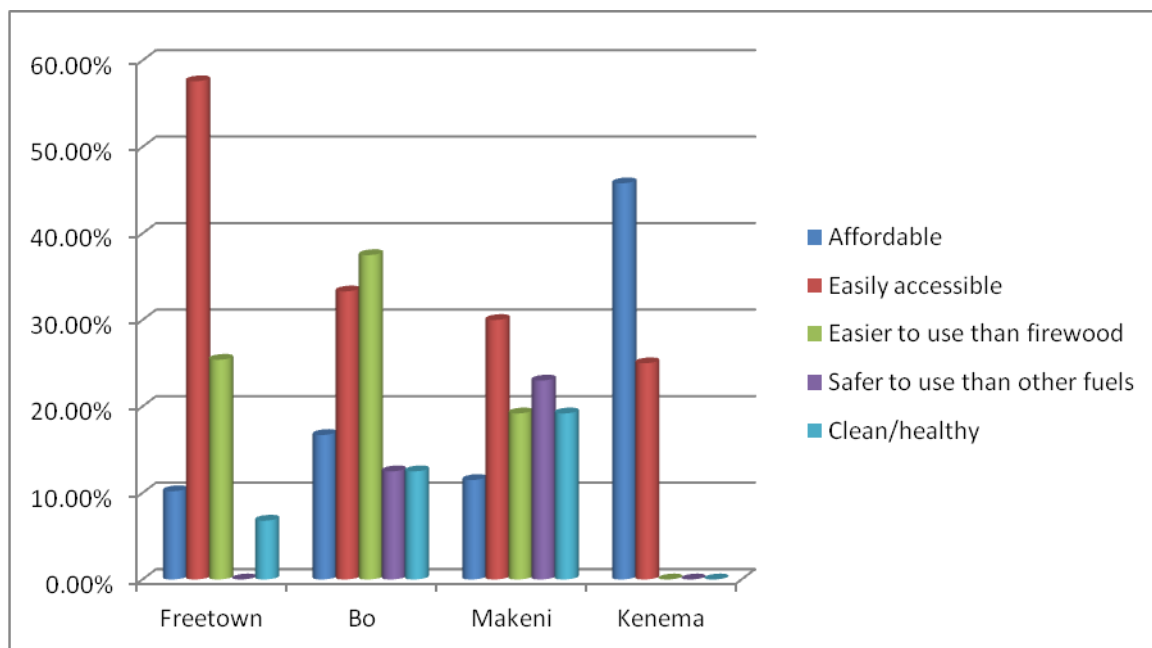
Figure 5: Main means of cooking



It is evident from Table 14 and Figure 5 that charcoal burning cook stoves are, by far, the most important means of cooking in Freetown, accounting for 93.4% of respondents. In the provincial cities, however, the numbers of households that are dependent on firewood and charcoal as the main sources of fuel for cooking are almost equal. Only minor percentages of respondents depend on kerosene stoves (1.6%, 3.9%, 4.0% and 0.0%, in Freetown, Bo, Makeni and Kenema, respectively) and gas cookers (1.6%, 2.0%, 0.0% and 2.1%, in Freetown, Bo, Makeni and Kenema, respectively). The very low percentages for kerosene and cooking gas are owed to their relatively high cost.

The reasons cited by respondents for the preference of improved charcoal cook stoves are presented in Figure 6.

Figure 6: Reasons for using improved cook stoves



N = Freetown- 59; Bo – 24; Makeni – 26; Kenema – 24.

It can be discerned from the figure that “easy access” is a key reason cited in all the survey communities. Another frequently cited reason in communities except Kenema, is that “it is easier to use than firewood”. In Kenema, the most important consideration appears to be “affordability”. Focus group discussions revealed that in Freetown, the overriding reason for using charcoal cook stoves is that landlords forbid the use of firewood in their premises because smoke not only makes the premises dirty but poses a health risk as well. The charcoal stove is preferred because it is the most affordable of the remaining fuel options, it is clean and poses little risk to health. Most houses in the provinces have relatively spacious compounds where outside kitchens can and are constructed. It is quite common for firewood to be the preferred fuel in such scenarios and landlords are less insistent on the use of charcoal or other clean stoves.

3.11 Assessment of Current Cook Stove Designs

All communities studied expressed concern over the fact that the clay lining of the wonder stove easily falls out when wet or when the stove falls over. This fact is of concern not only to the stove users, who have to replace them frequently but to marketers who reported that they often incur substantial losses because of unstable clay lining of stoves. Both stove users and marketers are, therefore, desirous that this design flaw be rectified.

This design flaw has been brought to the attention of fabricators and it is heartening to observe that commendable efforts have been and are being made to improve the design of the stoves. One such effort was observed in Bo City. John Soluku, proprietor of the All Hands

Together Enterprise of 131 Tikonko Road, Bo, has been fabricating “Wonder Stoves” since 2007. He established the enterprise because he and five of his friends were unemployed and unsuccessful in their efforts to secure employment. His customers reported to him that the clay lining of his earlier batches of stoves easily crumbled when wet or fell out when subjected to shocks. In reaction, his current design has a plate at the edge of the stove to prevent the clay from falling out. He has also strengthened the clay lining of the stove by mixing it with cement.

Chapter Four

CONCLUSIONS AND RECOMMENDATIONS

4.1 Summary and Conclusions

The assessment concludes as follows:

- The improved cook stove industry is male-dominated: 95.3% of enterprises interviewed are owned by males, while very few women are employed in the industry. The overwhelming majority of cook stove fabricators (78.1% of all respondents) reported that less than 10.0% of their staff are women. Women are mainly engaged in marketing.
- Only 56.3% of fabricators are housed in permanent structures. The remainder operate from makeshift structures or outdoors.
- The majority of cook stove fabricators have very small operations. 31.3% have only 1-5 employees, while 37.5% have between 6 and 10 employees.
- Training is a major problem that is experienced by most establishments. Approximately 30% of staff have been trained but almost all were trained on the job. All establishments acknowledge that their staff are not adequately trained and require financial assistance to send their staff to appropriate institutions for training.
- The *sources of investment capital* for the vast majority of cook stove enterprises (84.6%) are the personal savings of proprietors. Such savings are typically inadequate for the developments they envisage for their enterprises.
- The main *sources of credit* are friends/relatives, moneylenders, savings clubs, micro-finance institutions and commercial banks.
- The *problems experienced with the credit* sources include the following: a) Banks insist on collateral, which most enterprises are often unable to provide; b) Money lenders charge usurious rates of interest; c) Friends, relatives and savings clubs charge low interest but, owing to shortage of funds, loan units are usually too small for investment behavior.
- *Monthly expenditures of enterprises* (on wages, inputs and other overheads) are typically below Le3, 000,000 for most enterprises (77.8% for Freetown; 61.1% for Bo; 93.3% for Makeni and 84.6% for Kenema). This fact underscores the smallness of their operations.
- *Monthly incomes from sales of products* are below Le 5,000,000 for the majority of enterprises (72.2% for Freetown; 50.0% for Bo; 86.7% for Makeni and 100.0% for Kenema). The implication of low incomes is that development of enterprises beyond their current levels of operation may require external capital injection.
- The main *sources of inputs* are building materials stores (for metal sheets, roofing zinc and cement) and scrap yards. In the Bo and Kenema,, clay is usually obtained by

the fabricators themselves from local borrow pits, while in Freetown and Makeni this task is often delegated to contractors.

- The *problems of cook stove fabrication* relate to its design. In most stove designs, the clay lining easily falls out when it gets wet or when exposed to shocks (usually when being transported over rough roads. Efforts are being made by some establishments to rectify this design flaw. In Bo, for example, a metal plate at the edge of the casing prevents the clay from falling out while the clay lining is reinforced by mixing it with a small amount of cement.
- Apart from Freetown, where 38.5% of cook stoves are graded and certified, cook stoves produced in the provinces are neither graded nor certified.
- There are *three role players in the marketing of cook stoves*: a) the fabricators, b) commissioned agents and c) independent entrepreneurs, who buy in bulk from the fabricators and retail the product in their own business establishments. The majority of customers tend to be located close to the fabricators.
- The main *problems of marketing* relate to a) the unavailability or inadequacy of storage facilities for the stoves, b) damage to the stoves when they get wet or in transit to market, and c) low awareness among potential users (especially in the provinces) of the benefits of using improved cook stoves.
- Charcoal burning cook stoves are, by far, the most important means of cooking in Freetown, accounting for 93.4% of respondents. In the provincial cities, however, the numbers of households that are dependent on firewood and charcoal as the main sources of fuel for cooking are almost equal.
- “Easy access” is a key reason cited by users of charcoal stoves in all communities. Another frequently cited reason in communities except Kenema, is that “it is easier to use than firewood”. In Kenema, the most important consideration appears to be “affordability”. Focus group discussions revealed that in Freetown, the overriding reason for using charcoal cook stoves is that landlords forbid the use of firewood in their premises because smoke not only makes the premises dirty but poses a health risk as well.

4.2 Recommendations

Against the backdrop of the conclusions above, the assessment makes the following recommendations which, to a large extent, conform to the future plans of the enterprises outlined in Sub-section 3.8 of this report:

- Provision of funds for capacity enhancement of staff of cook stove enterprises through training at appropriate institutions and study tours to well-established cook stove enterprises both in country and elsewhere in the West Africa sub-region;
- Funding of country-wide awareness campaigns to sensitize the populace about the detrimental consequences of using firewood as the main fuel for cooking and the economic, environmental and social benefits of using charcoal stoves.
- Provision of networking support to promote the sale of cook stoves.

- Provision of grants for the construction or improvement of work spaces of promising enterprises.
- Provision of financial assistance for the construction of storage and exhibition structures to be owned by associations of cook stove fabricators.
- Organization of fabricators in a particular locality into an association and the provision of a delivery truck for the transportation of inputs to their enterprises and products to market.
- Establishment of links between cook stove enterprises and banks/other financial intermediaries and the provision for guarantee for enterprises to obtain loans.
- Mechanisms need to be put in place to ensure that all cook stoves produced in the country are *graded and certified*.

ANNEXES: TOOLS FOR FIELD DATA COLLECTION

Annex I: Questionnaire for Fabricators of Improved Cook Stoves

Questionnaire Number:.....

Introductory statement: Good morning/afternoon/evening. My name is ----- and I am conducting a Market Survey for the Improved Cook Stoves project on behalf of the UNDP Energy and Environment Programme and the Ministry of Energy. We would be grateful for your assistance in our research. Information you provide will be treated in strict confidence.

A: Database Control/ Basic Data

No.	Variable/ Question	Response options	Code
A1	District		
A2	Name of community		
A3	Name of enterprise		
A4	Address		
A5	Date of establishment		
A6	Ownership	Individual = 1; Organization = 2	
A7	If owned by individual, state SEX		
A8	AGE of owner		
A9	Is enterprise registered?	Yes = 1; No = 2	
A10	If registered, state registration authority.		
A11	Are your products graded and certified?		
A12	If "yes" to A11, by whom?		
A13	Enumerator	Name: Date:	

B: Physical Assets

Please DO NOT read options

Enter appropriate code(s) in space(s) provided

No	Question	Response options	Code
B1	Is your enterprise housed in a permanent structure?	Yes = 1; No = 2	<input type="checkbox"/>
B2	If "yes", is the structure secure?	Yes = 1; No = 2	<input type="checkbox"/>
B3	If you do not have a permanent structure, where do you operate?	Makeshift structure = 1 Outdoors = 2	<input type="checkbox"/>
B4	Is your work space adequate?	Yes = 1; No = 2	<input type="checkbox"/>
B5	What is your main source of power?	Central electricity grid = 1 Own generator = 2	<input type="checkbox"/>
B6	Do you have an adequate stock of required tools?	Yes = 1; No = 2	<input type="checkbox"/>

B7	What improvements would you like in your work space?	Construction of permanent structure = 1 Expansion/improvement of existing structure = 2 Provision of power source = 3 Assistance to procure tools = 4	<input type="text"/>
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C: Human capacity

Please DO NOT read options

Enter appropriate code(s) in space(s) provided

No	Question	Response options	Code
C1	How many personnel does your establishment have?	1-5 = 1 6-10 = 2 11-15 = 3 16-20 = 4 Over 20 = 5	<input type="text"/>
C2	What percentage of your staff are WOMEN?	0% = 1 1-10% = 2 11-20% = 3 21-30% = 4 31-40% = 5 41-50% = 6 Over 50% = 7	<input type="text"/>
C3	If there are NO or LESS THAN 30% women, what are the reasons?	Women are not interested = 1 Work is too difficult for women = 2 Establishment does not employ women = 3	<input type="text"/>
C4	If women are employed, what specific tasks do they have?	Procurement of raw materials = 1 Fabrication of cook stoves = 2 Marketing of products = 3 Book keeping = 4 No women specific tasks = 4	<input type="text"/>
C5	Do you have enough workers?	Yes = 1; No = 2	<input type="text"/>
C6	What percentage of your staff have received required technical training.	Below 10% = 1 10-20% = 2 21-30% = 3 31-40 = 4 41-50 = 5 51-60 = 6 61-70 = 7 71-80 = 8 81-90 = 9 91-100 = 10	<input type="text"/>
C7	Who provides the training?	My establishment/on the job training = 1 Tech/Voc institute = 2 Others (specify) = 3	<input type="text"/>
C8	What plans do you have for untrained staff?	On the job training = 1 Send them to tech/voc centres = 2 Use them as labourers = 3	<input type="text"/>
C9	What skills do you want to train them in?	Welding/fabrication of stove = 1 Community sensitization about advantages of using improved cook stoves = 2 Marketing = 3	<input type="text"/>

		Book keeping = 4	
C10	Do you require assistance to train your staff?	Yes = 1; No = 2	<input type="checkbox"/>
C11	If "yes", what is the nature of required assistance?	Technical advice on what to train staff in = 1 Financial assistance = 2 Other (specify) = 3	<input type="checkbox"/>

D: Sources of investment capital

Please DO NOT read options

Enter appropriate code(s) in space(s) provided

No	Question	Response options	Code
D1	What are your sources of START-UP CAPITAL?	Own savings = 1 Remittances = 2 Resources from development organization = 3	<input type="checkbox"/>
D2	Is available capital adequate?	Yes = 1; No = 2	<input type="checkbox"/>
D3	If available capital is NOT ADEQUATE, do you have access to credit facilities?	Yes =1 No = 2	<input type="checkbox"/>
D4	If yes to D3, what is/are your main CREDIT SOURCE(S)?	Friends/relatives = 1 Money lender = 2 Savings club = 3 Microfinance institution = 4 Community bank = 5 Commercial bank = 6 Other (specify)	<input type="checkbox"/>
D5	What are the main problems you encounter with your credit sources?	Lack of loan collateral =1 Loan units too small for my needs=2 Loan repayment period too short=3 Interest rate is too high=4	<input type="checkbox"/>
D6	Estimated MONTHLY EXPENDITURE (on personnel, rent, raw materials, energy, etc).	Below Le 3,000,000 = 1 Le 3,000,001-6,000,000 = 2 Le6,000,001-9,000,000 = 3 Le 9,000,001-12,000,000 = 4 Le 12,000,001-15,000,000 = 5 Le 15,000,001-18,000,000 = 6 Le 18,000,001-21,000,000 = 7 Over 21,000,000 = 8	<input type="checkbox"/>
D7	MONTHLY INCOME	Below Le 5,000,000 = 1 Le 5,000,001-10,000,000 = 2 Le 10,000,001-15,000,000 = 3 Le 15,000,001-20,000,000 = 4 Le 20,000,001-25,000,000 = 5 Le 25,000,001-30,000,000 = 6 Le 30,000,001-35,000,000 = 7 Le 35,000,001-40,000,000 = 8 Le 40,000,001-45,000,000 = 9 Le 45,000,001-50,000,000 = 10 Over Le 50,000,000 = 11	<input type="checkbox"/>

E: Fabrication of products**Please DO NOT read options***Enter appropriate code(s) in space(s) provided*

No	Question	Response options	Code
E1	What raw materials do you use in the fabrication of cook stoves?		<input type="text"/>
E2	Source of Raw Material 1: Metal sheet.		<input type="text"/>
E3	Average distance (km) to source of metal sheet.		<input type="text"/>
E4	Source of Raw Material 2: Clay		<input type="text"/>
E5	Average distance (km) to source of clay.		<input type="text"/>
E6	Source of Raw Material 3: Cement		
E7	Distance (km) to source of cement.		
E8	Do your sources of raw materials satisfy your requirements?		<input type="text"/>
E9	Do you experience problems with supply of raw materials?		<input type="text"/>
E10	If "yes", what are the problems?	Availability Cost Transportation	<input type="text"/>
E11	List your various PRODUCTS.		
E12	State number of each product fabricated per month.		
E13	COST per each item		
E14	Suggestions for improving input supply.		<input type="text"/>

F: Marketing and market outlets**Please DO NOT read options***Enter appropriate code(s) in space(s) provided*

No	Question	Response options	Code
F1	WHERE do you sell your products?	In my immediate community = 1 Within my administrative district = 2 Countrywide = 3	<input type="text"/>
F2	WHO sells your products?	Myself/my organization = 1 Commissioned agents = 2 Independent entrepreneur = 3	<input type="text"/>
F3	If 2 or 3 (in F2), state NAMES and ADDRESSES of each.		
F4	If you do your own marketing, what is the main reason?	Lack of interested micro-entrepreneurs = 1 Do not trust micro-entrepreneurs = 2	<input type="text"/>

F5	If you market through agents or entrepreneurs, where are they located?	In my community = 1 Elsewhere in my district = 2 Countrywide = 3	<input type="text"/>
F6	How do you determine PRICES of your products?	Demand for product = 1 Currency exchange rate regime = 2 Prices set by competitors = 3	<input type="text"/>
F7	Marketing arrangement with entrepreneurs.	Payment up front = 1 Payment after sale = 2	<input type="text"/>
F8	What problems do you experience in marketing?	Lack of storage facility = 1 Product damaged in transit to market = 2 Low awareness about benefit of using cook stoves = 3	<input type="text"/>
F9	Do you get networking support to stimulate use of the product?	Yes = 1; No = 2	<input type="text"/>
F10	What do you propose to improve marketing?	Provision of storage facility at market centres = 1 Mass education about benefits of using cook stoves = 2 Assistance with transportation = 3	<input type="text"/>

G. Future plans

Please DO NOT read options

Enter appropriate code(s) in space(s) provided

No	Question	Response options	Code
G1	Do you have plans to improve and/or expand your production?	Yes = 1; No = 2	<input type="text"/>
G2	What assistance do you require?	Funding (for establishment/improvement of physical assets) = 1 Capacity enhancement training of staff = 2 Provision of storage facilities = 3 Awareness campaign about benefits of using improved cook stoves = 4	<input type="text"/>

H. SWOT Analysis

Please DO NOT read options

Enter appropriate code(s) in space(s) provided

No	Issue	Response options	Code
H1	STRENGTHS	Team of trained/experienced personnel = 1 Adequate physical infrastructure = 2 Well established market outlets = 3 Reliable links to financial institutions = 4	<input type="text"/>
H2	WEAKNESSES	Shortage of trained/experienced personnel = 1 Poor physical infrastructure = 2 Poor access to financial services/institutions = 3	<input type="text"/>
H3	OPPORTUNITIES	Favorable government policy = 1 High local demand for cook stoves = 2 Widespread deforestation = 3	<input type="text"/>
H4	THREATS	Widespread poverty/low income levels = 1 Conservatism/reluctance to change = 2	<input type="text"/>

THANK YOU FOR YOUR COOPERATION.

Annex II: Questionnaire for Current and Potential Customers

Questionnaire Number:.....

Introductory statement: Good morning/afternoon/evening. My name is ----- and I am conducting a Market Survey for the Improved Cook Stoves project on behalf of the UNDP Energy and Environment Programme and the Ministry of Energy. We would be grateful for your assistance in our research. Information you provide will be treated in strict confidence.

A: Database Control

No.	Variable/ Question	Response options	Code
A1	District		
A2	Community		
A3	Address		
A4	Name of Respondent		
A5	Age of respondent		
A6	Sex of respondent		
A7	Enumerator	Name: Date:	

B: Household data

Please DO NOT read options

Enter appropriate code(s) in space(s) provided

No	Question /Issue	Response options	Code
B1	How many persons are in your household?	Below 3 = 1 3-5 = 2 6-8 = 3 Over 8 = 4	<input type="text"/>
B2	Formal educational level attained by household head.	No formal schooling = 1 Primary school = 2 Junior secondary school = 3 Senior secondary school = 4 Tech/Voc = 5 Tertiary = 6	<input type="text"/>
B3	Formal educational level attained by wife.	No formal schooling = 1 Primary school = 2 Junior secondary school = 3 Senior secondary school = 4 Tech/Voc = 5 Tertiary = 6	<input type="text"/>
B4	Estimated MONTHLY income of household.	Less than Le 1,000,000 = 1 Le1,000,001-2,000,000 = 2 Le 2,000,001 =2,000,000 = 3 Le 3,000,001- 4,000,000 = 4 Over Le 4,000,000 = 5	<input type="text"/>

C: Access to and adoptability of cook stoves

Please DO NOT read options

Enter appropriate code(s) in space(s) provided

No	Question /Issue	Response options	Code
C1	What is your main source of fuel for cooking?	Fire wood = 1 Charcoal (using cook stove) = 2 Kerosene stove = 3 Gas cooker = 4 Electricity = 4	<input type="text"/>
C2	If you USE cook stoves, what is your main reason?	Affordable (compared with gas and electricity) = 1 Charcoal easily accessible = 2 Easier to use than firewood = 3 Safer to use than other fuel sources = 4	<input type="text"/>
C3	If you DO NOT USE cook stoves, what is your reason?	Not made in the community = 1 Too expensive = 2	<input type="text"/>
C4	Are improved cook stoves available for sale in your community?	Yes = 1 No =2	<input type="text"/>
C5	Do you have difficulty accessing them?	Yes = 1 No =2	<input type="text"/>
C6	How do you rate the DEMAND for improved cook stoves in your community?	Low = 1 Medium =2 High = 3	<input type="text"/>
C7	Are you satisfied with the current design of cook stoves?	Yes = 1 No =2	<input type="text"/>
C8	If you are NOT SATISFIED with current design, what improvement would you like?		<input type="text"/>

THANK YOU FOR YOUR COOPERATION.

Annex III: Issues to Probe in Informal Interviews/Focus Group Discussions

INPUT SUPPLIERS AND MICRO-ENTREPRENEURS:

No	Issue	Response
1	Name and address of enterprise	
2	What specific role(s) do you play in the cook stove value chain?	
3	Perceived strengths	
4	Weaknesses/Limitations	
5	Opportunities.	
6	Main sources of investment capital.	
7	Problems experienced in accessing investment capital.	
8	Capacity to participate in the project.	
9	Markets and trade flows.	
10	Incentives for improving participation in the project.	

Annex IV: FIELD GUIDE FOR ENUMERATORS

Upon arrival in the community:

- Before asking questions, introduce yourself, state the name of the organization you are working for and the general purpose of the survey.
- Request their cooperation and only proceed if consent is given.
- Assure them that information they provide will be used only for the furtherance of the project and that it will be treated with strict confidence.
- To begin with, ask each question exactly as it is written (or with any minor wording changes that were agreed upon during training).
- When an answer is unclear, ask the question again or ask it in a slightly different way, but be careful not to change the meaning—or “lead” the respondent into a particular response. For example, suppose a mother mentions that she gave her child “a special drink” during diarrhea. Do not ask a leading follow-up question such as “Do you mean that you go to moneylenders when you need loans?” Instead ask an open question like “Where do you go when you need loans?”
- Ensure that translations of questions are not leading, as some translations can prompt a particular answer.

Examples of Improper Interviewing Techniques:

The following examples describe techniques that should never be practiced during a survey:

- Not making sure that the respondent fits into the group that you want to interview.
- Asking leading questions. For example, "Do you think that the interest rate charged by moneylenders is too high?" instead of an open question such as "What is the interest rate charged by moneylenders?"
- Not asking a question for the first time exactly as it is written on the questionnaire.
- Explaining a question before a respondent indicates that s/he did not understand the question the first time it was asked.
- Assuming an answer without asking the relevant question. Interviewers must follow the directions on the questionnaire and ask all questions unless instructed differently.
- Leading the respondent to a particular answer during follow-up questions clarifying a response.
- Commenting positively or negatively about the respondent's answer. This includes facial expressions or other actions that also can imply positive or negative feelings.

FACILITATION OF FOCUS GROUP DISCUSSIONS

(Culled from *Focus Group Discussion Guide*, Girl Education Challenge).

Being a focus group discussion facilitator is a major responsibility. Every focus group discussion must be administered objectively and consistently while protecting the rights of participants. Facilitator must assure that participation is **voluntary, confidential, and open**.

Focus groups require a facilitator who can help focus and structure the discussion and, at the same time, encourage group ownership. The facilitator's main task is to create an atmosphere for democratic deliberation, one in which each participant feels at ease in expressing ideas and responding to those of others. The focus group facilitator does not **"teach"** but instead is there to guide the group's process. He or she does not have to be an expert in the subject being discussed, but must know enough about it to be able to ask probing questions and raise views that have not been considered by the group. **Above all, staying neutral and helping the group to do its own work are central to good focus group facilitation.** This takes practice and attention to one's own behaviors. Make sure to ask for the group's help in making this work well for everyone.

Good FGD Facilitators...

- ✓ are neutral: the facilitator's opinions are not part of the discussion.
- ✓ help the group set its ground rules, and keep to them.
- ✓ are organized and prepared
- ✓ dress 'properly'
- ✓ are polite and disciplined
- ✓ help group members grapple with the content by asking probing questions
- ✓ write brief notes on the question paper or in a notebook as they lead the discussion
- ✓ help group members identify areas of agreement and disagreement
- ✓ create opportunities for everyone to participate
- ✓ create opportunities for everyone to participate
- ✓ focus and help to clarify the discussion
- ✓ summarize key points in the discussion, or ask others to do so
- ✓ take jottings during the FGD and expand on notes after each discussion
- ✓ take time for a debriefing session at the end of each FG

And

- ✓ are self-aware; good facilitators know their own strengths, weaknesses, "hooks," biases, and values.

- ✓ are able to put the group first.
- ✓ have a passion for group process with its never-ending variety.
- ✓ appreciate all kinds of people.
- ✓ are committed to democratic principles.

TIPS FOR EFFECTIVE FGD FACILITATION

Be Prepared

The facilitator does not need to be an expert on the topic being discussed, but should be the best prepared for the discussion. This means understanding the subject, being familiar with the discussion materials, thinking ahead of time about the directions in which the discussion might go, and preparing questions to help further the discussion.

Set a Relaxed and Open Tone

- Welcome everyone and create a friendly and relaxed atmosphere.
- Well-placed humor is always welcome, and helps to build the group's connections.

Establish Clear Ground Rules

At the beginning of the focus group, help the group establish its own ground rules by asking the participants to suggest ways for the group to behave. Here are some ground rules:

- Everyone gets a fair hearing.
- Seek first to understand, then to be understood.
- One person speaks at a time.
- Share "air time". Allow other people to contribute
- Conflict is not personalized. Don't label, stereotype, or call people names.
- Speak for yourself, not for others.
- Limit movement
- Speak through the facilitator
- Put phones on silence
- What is said in this group stays here, unless everyone agrees to change that.

Ask participants to add any more ground rules, but make sure these are not too many to ensure that they could remember and able to keep them. Write these rules on a flip chart and past on a wall or tree.

SUGGESTIONS FOR DEALING WITH TYPICAL FGD CHALLENGES

Most focus group discussions go smoothly because participants are there voluntarily and have a stake in the program, e.g. our bursary girls and teachers. But there are challenges in any FGD process. What follows are some of the most common difficulties that FGD facilitators encounter, along with some possible ways to deal with those difficulties.

Challenge: *Certain participants don't say anything, seem shy.*

Possible response: Try to draw out quiet participants, but don't put them on the spot. Make eye contact—it reminds them that you'd like to hear from them. Look for nonverbal cues (e.g. a **back-of-the-neck scratch**) that indicate participants are ready to speak. Frequently, people will feel more comfortable in later sessions of a focus group discussion session and will begin to participate. When someone comes forward with a brief comment after staying in the background for most of the FGD session, you can encourage him or her by conveying genuine interest and asking for more information. And it's always helpful to talk with people informally before and after the session.

Challenge: *An aggressive or talkative person wants to dominate the discussion.*

Possible response: As the facilitator, it is your responsibility to handle domineering participants. Once it becomes clear what this person is doing, you **must** intervene and set limits. Start by limiting your eye contact with the speaker. Remind the group that everyone is invited to participate; **“Let’s hear from some respondents/people who haven’t had a chance to speak yet.”** If necessary, you can speak to the person by his/her pseudo name or identifier. Example, **“T3 (for teacher 3), we’ve heard from you; now let’s hear what T5 has to say.”** Be careful to manage your comments and tone of voice—you are trying to make a point without offending the speaker.

Challenge: *Lack of focus, not moving forward, participants wander off the topic/question*

Possible response: Responding to this takes judgment and intuition. It is the facilitator’s role to help move the discussion along. But it is not always clear which way it is going. Keep an eye on the participants to see how engaged they are, and if you are in doubt, check it out with the group. “We’re a little off the topic right now. Would you like to stay with this, or move on to the next question?” If a participant goes into a lengthy digression, you may have to say: “We are wandering off the subject, and I’d like to give others a chance to speak.” Say this in a polite manner!

Challenge: *Someone puts forth information which you know to be false. Or, participants get hung up in a dispute about facts but no one present knows the answer.*

Possible response: Ask, “Has anyone heard of this information?”

If no one offers a correction, offer one yourself. And if no one knows the facts, and the point is not essential, put it aside and move on. If the point is central to the discussion, encourage respondents to think and speak out and if no one speaks, move on to the next question. Remind the group that experts often disagree.

Challenge: *Lack of interest, no excitement, and no one wants to talk, only a few people participating.*

Possible response: This rarely happens in focus groups, but it may occur if the facilitator talks too much or does not give participants enough time to respond to questions. People need time to think, reflect, and get ready to speak up. It may help to pose a question and go around the circle until everyone has a chance to respond. Occasionally, you might have a lack of excitement in the discussion because the group seems to be in agreement and isn’t coming to grips with the tensions inherent in the issue. In this case, the facilitator’s job is to try to bring other views into the discussion, especially if no one in the group holds them. “Do you know people who hold other views? What would they say about our conversation?”

Challenge: *Tension or open conflict in the group. Perhaps two participants lock horns and argue. Or, one participant gets angry and confronts another*

Possible response: If there is tension, address it directly. Remind participants that disagreement and conflict of ideas is what a focus group discussion is all about. Explain that, for conflict to be productive, it must be focused on the issue: It is acceptable to challenge someone’s ideas, but personal attacks are not acceptable. You must interrupt personal attacks, name-calling, or put-downs as soon as they occur. You will be better able to do so if you have established ground rules that disallow such behaviors and that encourage tolerance for all views. Don’t hesitate to appeal to the group for help; if group members bought into the ground rules, they will support you. As a last resort, consider taking a break to change the energy in the room. You can take the opportunity to talk one-on-one with the participants in question.

Annex V: List of Cook stove fabricators

A) FREETOWN and ENVIRONS

No	Enterprise	Address	Contact person	Mobile
1	Tamenisu Trading	Borrow Pit, Waterloo	Sheku Kargbo	077 696159
2	Bah Trading Center	Banga Farm	Mohamed Bah	088 850654
3	Umaru Jalloh	Goderich, Lumley Road	Umaru Jalloh	077 641352
4	Bah Trading Enterprise	1 Kroo Bay	Amadu Bah	077 712749 076 567438
5	Mohamed Jalloh Trading	7 Kroo Bay	Mohamed Jalloh	077 328711
6	Kamara's Workshop	57 Old Railway Line, Brookfields	Mohamed Kamara	077 691142
7	J-Man Trading Center	3 Congo Town Road	James Tarawally	077 849661 079 472778
8	Muloma Workshop	MOP Drive , Kamayama	John Squire	079 562719
9	Young Talented Base	Section E, Kissy Town	Abdulai Kamara	088 112881
10	Computer Base	Section E, Waterloo	Sullay Koroma	088 969321
11	A&F Trading Workshop	Section C, Waterloo	Francis Kamara	030 859141
12	AKA Cook stove W/shop	Kissy Town Section D 23	Mohamed Sesay	088 390241
13	Handicap Action Movement	Synor Drive, Calaba Town	-	088 884890
14	AKA General Cook stove Center	Kissy Town, Waterloo	Abubakarr Kabia	076 961669 079 091752
15	Original Culture Stove Trading	67 Old Railway Line, Brookfields	Macauley Conteh	076 330351 077 534933
16	United Trading Center	24 Goderich Road, Lumley	Umaru Jalloh	077 641 352
17	MB Trading Center	32 Peninsula Road, Goderich	Mohamed Barrie	088 881197
18	Musa Trading	2 Big Waterloo Street	Musa Tarawally	079 221184
19	TASCOS Enterprise	19 Sesay Drive	Mohamed Sow	088 141302
20	Samie, New England	24 King Harman Road	Samuel Vandy	079 121518

B) BO CITY

No	Enterprise	Address	Contact person	Mobile
1	Gateway Metal Workshop	Bo/Kenema Highway	Sheku Lansana	076 737556 030 077742
2	Home Pride	19 Bo/Kenema Highway	Mohamed Feika	076 441293 077 906414
3	Dogbo Metal Workshop	16 Old Railway Line	Bamba Dogbo	-
4	Soba wan Coal Pots Enterprise	Batiama Section Layout	Alfred Muana	077 254542
5	Barrie Tinsmith/Metal Workshop	1 Ahmaddiyya Road, Bo	Muctaru Barrie	076 968 877
6	Makaya Metal Workshop	32 Bo/Kenema Highway	Ibrahim Makaya	076 888942 088 331289
7	Momoh Bundu's Workshop	39 Old Railway Line	Momoh Bundu	077 779612
8	Mustapha Bundu's Workshop	106 Mahei Boima Road	Mustapha Bundu	078 414942
9	Abdulai's Workshop	1 Sambo Street	Abdulai Barrie	078 327838
10	Mohamed's Workshop	35 Sewa Road	Mohamed Conteh	078 178128
11	Mofoi Garage	9 Bongo Street	Aruna Hanar	078 542481
12	Dyfan's Workshop	7 Ngalu Road	Morie Dyfan	099 497 186
13	Loma Workshop	10 Bo/Taiama Highway	Mohamed Sefoi	076 719216 030 692749
14	Joko's Workshop	63 Sewa Road	Mr Joko	076 341502
15	Mohamed Yansaneh	116 Tikonko Road	Mohamed Yansaneh	077 722064
16	All Hands Together Workshop	131 Tikonko Road	John Soluku	-
17	Deigh Metal Workshop	Old Koribundo Road	Bassiru Deigh	076 273254
18	Fefegula's Workshop	Bo/Kenema Highway	Alfred Fefegula	030 352186
19	Kamalay's Workshop	129 Tikonko Road	Jeremy Kamalay	077 015091
20	Tamba Benjamin	29 Tikonko Road	Tamba Benjamin	076 354254

C) MAKENI CITY/LUNSAR

No	Enterprise	Address	Mobile
1	Emmanuel Mbaowmeh	140 New Spain Junction, Lunsar	
2	Mohamed Gabar Kanu	137 New Spain Junction, Lunsar	
3	Mohamed Kamara	New Spain Junction, Lunsar	
4	Isata Kamara	Royeama-Mabetor, Lunsar	
5	Aminata Bah	c/o Osman Sankoh, Mabetor, Lunsar	
6	Bashiru Mansaray	New Spain Junction, Lunsar	
7	Esther Koroma	c/o Mohamed Conteh, Royama Village, Lunsar	
8	Nabie Turay	13 Savage Square, Makeni	
9	Ibrahim Bangura	68 Station Road, Makeni	
10	Alimamy Samura	12 Station Road, Makeni	
11	James Kamara	2 Agriculture Road, Makeni	
12	Abdul Kanu	Fullah Central Mosque, Makeni	
13	Amara Turay	29 Savage Square Ferry, Makeni	
14	Ibrahim Kanu	Back of NP Filling Station, NP Park, Maakeni	
15	Abass Thullah	Mabettor, Lunsar	
16	Mabinty Bangura	Mabettor, Lunsar	
17	Mohamed Bangura	Lunsar	
18	James Kargbo	Shelter Sure Clay Factory	
19	Mohamed Jalloh	Lunsar	088 872582
20	Momoh Kamara	Lunsar	077 265782
21	Mohamed Sankoh	Lunsar	030 893776
22	Mohamed Bendu	Lunsar	088 814070
23	Abu Yankaday	Lunsar	077 257412
24	Daniel Sasay	Lunsar	077 477259
25	Alimamy Kamara	Lunsar	077 197015

D) KENEMA CITY

No	Enterprise	Address	Mobile
1	Mohamed Bobor Bendu	153 Hangha Road	076 875484
2	Samba Barry Enterprise	Jenneh Street	079 969009
3	Sheku Sesay Enterprise	27 Dakyai Street	-
4	Kandeh Jalloh	27 Dakyai Street	-
5	Bailor Mamadu Enterprise	11 Kandeh Street	088 652219
6	Morrison Tarawally	60 Koroma Street	076 349017
7	Sao Alie	135 Hangha Road	077 774954
8	Amara Kawa	62 Sombo Street	076 872770
9	Opportunity Training Centre	Off Maxwell Khobe Street	-
10	Malike Kargbo	Dakyai Street	076 541892
11	Sarguehun Metal Workshop	14 Kandeh Street	-
12	Mohamed Bangura	41 Dakyai Street	099 766465
13	Vandy Koroma	14 Kandeh Street	077 988026
14	Kamara Obai	26 Sieyah Street	088 843227

Annex VI: LISTS OF SERVICE PROVIDERS

A) FREETOWN AND ENVIRONS

No	Enterprise/Service provider	Address	Service provided
INPUT PROVIDERS			
1	Fawaz Building Materials	Various locations in city	Roofing zinc, metal plates
2	Freetown Building Materials	Various locations in city	Roofing zinc, metal plates
3	Roundabout Building Materials	Lumley	Roofing zinc, metal plates
4	Jeety Trading	Various locations in city	Roofing zinc, metal plates
5	Scrap yards	Numerous locations	Scrap metal
MARKETING			
6	Goodwill Enterprise	18 Congo Town	Stove sales agent
7	Mohamed Jalloh Enterprise	13 Frazer Street	Stove sales agent
8	Freetown Supermarket	Wilkinson Road	Stove sales agent
9	Amsays Enterprise	17 Freetown Road, Lumley	Stove sales agent
10	Fatmata Dabor	18 Goderich Road, Lumley	Stove sales agent
11	Hawa Bangura	Goodwill Enterprise, Waterloo	Stove sales agent
12	Rama Bah	28 Kroo Bay	Stove sales agent
13	Top-Up Solution	16 Freetown Road, Lumley	Stove sales agent

B) BO CITY

No	Enterprise/Service provider	Address	Service provided
INPUT PROVIDERS			
1	Fawaz Building Materials		Roofing zinc, metal plates
2	SKAITEL Building Materials		Roofing zinc, metal plates
3	Metal scrap yards	Various locations in city	Scrap metal

C) MAKENI/LUNSAR

No	Enterprise/Service provider	Address	Service provided
INPUT PROVIDERS			
1	Sorie Conteh	Magblah Village	Clay
2	Adama Conteh	Mabetor, Lunsar	Clay
3	Aminata Kamara	120 New Spain Junction, Lunsar	Clay
4	Aminata Kabia	126 New Spain Junction,	Clay

		Lunsar	
5	Adama Contah	133 New Makeni Highway, Lunsar	Clay
6	Mohamed Bentah Bah	3 Piston Lane, Makeni	Scrap Metal
7	Abdulai Sie	11 MacRobert Street, Makeni	Scrap metal
8	Mohamed Mansaray	4 Mac Robert Street, Makeni	Scrap metal
9	Gbessay Bangura	21 Wusum Street, Makeni	Scrap metal
10	Abubakarr Tunkara	60 Teko Road, Makeni	Scrap Metal
11	SABASSCO Enterprise	79 Lunsar Road, Makeni	Scrap metal
12	Isha Enterprise	63 Stock Road, Makeni	Cement, Iron Rod
MARKETING			
13	Kelfala Turay	11 Savage Square, Makeni	Stove sales agent
14	Marie Tarawalli	11 Savage Square, Makeni	Stove sales agent
15	Alpha .I. Kamara	68 Station Road, Makeni	Stove sales agent
16	Fatmata Kamara	68 Station Road, Makeni	Stove sales agent

D) KENEMA CITY

No	Enterprise/Service provider	Address	Service provided
INPUT PROVIDERS			
1	T.A.S Stores	1 Hangha Road, Kenema	Roofing zinc, metal plates
2	A.H.Trading	Hangha Road, Kenema	Roofing zinc, metal plates
3	Metal scrap yards	Various locations in city	Scrap metal

Annex VI: Terms of Reference -Build Capacity of Clean Cooking Entrepreneurs

UNITED NATIONS DEVELOPMENT PROGRAMME

Terms of Reference



Empowered lives.
Resilient nations.

I. Position Information

Post Title:	Biomass technology institution/firm/enterprises to build the capacity of clean cooking entrepreneurs for the fabrication and distribution of energy efficient cookstoves and charcoal production.
Location:	Freetown, Sierra Leone Application
Type of Contract:	Professional Service
Application Deadline:	25 February, 2017; 13:00 hrs
Duration of Initial Contract:	120 working days between 15 th March and 30 th November 2017

Background

Biomass (firewood, charcoal and crop residues) provides the bulk of the energy supplied in the household, commercial and service sectors of the economy in Sierra Leone. It provides almost all the energy used to meet basic needs of cooking and water heating in rural and most urban households, institutions and commercial buildings and it is the main source of energy for rural industries. The biomass energy situation has transformed dramatically over the past decade with a significant increase in charcoal production nationally and in charcoal consumption in urban areas – most notably in Freetown. This has seen a massive rural growth industry of the production and trade in charcoal in Sierra Leone.

At this rate, the pressure on natural resources will be exacerbated even further as communities produce more charcoal to meet their livelihood demands and urban charcoal consumer demand. Interventions should be focused on making the trade and business more efficient, resilient and sustainable by promoting the production and utilization of efficient cook-stoves/kilns to reduce the demand for charcoal.

The Ministry of Energy (MoE) through UNDP secured fund from the Global Environment Facility (GEF) on Energy Efficient Production and Utilization of Charcoal through Innovative Technologies and Private Sector Involvement in Sierra Leone project. The goal of the project is to reduce GHG emissions in the domestic and industrial sectors of Sierra Leone through integrated and sustainable biomass resource production and utilization, and promotion of sustainable biomass energy technologies in Sierra Leone using output based and market based approaches. A key objective of the project is to bring economic, social and environmental benefits through the promotion of improved cook-stoves to reduce fuel wood demand, improve health and reduce greenhouse gas emissions. This GEF funded project is partnering with ministries, communities and entrepreneurs to achieve its goal.

On behalf of MoE, UNDP is seeking a consultancy of an energy and biomass technology institution/firm/enterprise for capacity building oriented towards clean cooking entrepreneurs on the production, utilization, maintenance and benefits of energy-efficient furnaces/stoves.

III. Duties & Responsibilities

Under the supervision of the UNDP Energy and Environment Programme lead, and in close collaboration with the Directorate of Energy in the Ministry of Energy, the contractor will be expected to develop technical skills and capabilities of members of communities, government agencies and institutions so that there will be a pool of individuals who could be tapped for the construction, operation or maintenance of new projects, in order to enable the growth of cookstove and kiln service market. The contractor carries on preparation work and organization of training on the installation, operation and maintenance of energy-efficient furnaces/stoves/kilns. The contractor therefore performs but not limited to the following key functions:

- Prepare handouts and other preparatory activities.
- Identify and select 100 participants from among the public, private and CSO stakeholders at the national and districts levels according to the protocol of UNDP and MoE.
- Select the dates of the trainings, and booking of the venues
- Identify and invite resource persons and participants.
- Conduct cost effective and result-based trainings on efficient charcoal production, maintenance and utilization that are not limited to academic presentations and documentations but will include a dominant share of pragmatic hands-on, 'learning by doing' and peer to peer training.
- Conduct two awareness campaigns on the use, maintenance and benefits of energy-efficient kilns.
- Design drawings, construction procedures and manuals for the construction and operation of energy-efficient stoves
- In consultation with relevant parties, propose draft agreement between the Ministry of Energy and local fabricators on the production of the furnaces/ stoves and training on their design and operation features.
- Support the production, installation and dissemination of furnaces/stoves to end-users.

IV. Deliverables & Timelines

Based on the scope of work outlined above, the contractor will be expected to deliver the following outputs:

- Detailed work plan including activities and timelines that the contractor plans to undertake in order to complete this assignment for review and approval by UNDP with copy to the Director of Energy within 5 working days upon contract signature.
- Comprehensive participants list from among the public, private and CSO stakeholders at the national and provincial levels approved by MoE by third weeks in March and May, 2017.
- Training modules or handouts for target communities within three weeks of contract signature.
- First cost effective and result-based trainings on efficient charcoal production, maintenance and utilization training reports in April and second training report in June 2017 to be

reviewed by UNDP and the Ministry of Energy.

- Submission of design drawings, construction procedures and manuals for the construction and operation of energy-efficient stoves by April.
- Two reports on awareness campaigns on the use, maintenance and benefits of energy-efficient kilns in April and second in July.
- Submission of proposed agreement between MoE and local fabricators for the production of the furnaces/ stoves in in first week May.
- Draft consultancy reports to UNDP and the Ministry of Energy by 15 November 2017 to be reviewed by UNDP and the Ministry of Energy.
- Final report presented to UNDP and the Ministry of Energy by 30 November 2017 to be approved by UNDP and the Ministry of Energy including the following Annexes:
 - Overview of report
 - Recommendations.
 - Attendance lists

V. Payment Modalities

Payment to the contractor will be made in three instalments upon satisfactory completion of the following deliverables:

- 1st instalment: 20% upon approval of the detailed work plan by UNDP.
- 2nd Instalment: 50% upon review and approval of all tasked due by April 2017.
- 3rd Instalment: 30% upon review and approval of the final report, including annexes.

VI. Qualifications

This assignment requires the services of a firm/consortium/enterprise that can demonstrate adequate analytical capacity and that can provide a team with expertise in clean energy and technologies relevant to efficient cookstove production and utilization. The team should include (but is not restricted to) the following (note that the Team Leader could fulfil a dual role as one of the technical experts):

Team Leader

- Advanced University Degree in an area relevant to this assignment.
- At least seven years of relevant working experience, at a senior level.
- Experience in facilitating stakeholder engagement processes, including training workshop.
- Excellent communication skills, and fluency in spoken and written English.
- Experience working for an international organization would be an advantage.
- Excellent knowledge of the Sierra Leone context

Sustainable Energy Expert

- Advanced University Degree in Environmental Studies/ Renewable Energy or other professional area relevant to this assignment.
- Demonstrated expertise in areas relevant to renewable energy, including biomass conversion and rural charcoal production, as well as issues related to marketability.
- Excellent analytical and research skills.

VII. How to Apply

1. Qualified firms registered in Sierra Leone are hereby requested to apply. The application must contain the following:
 - a. Brief letter of application.
 - b. Personal CV of each team member, indicating relevant academic background and professional experience.
 - c. Brief description (max. 2 pages) of the proposed methodology on how to complete the assignment.
 - d. Financial proposal that indicates the all-inclusive fixed total contract price supported by a breakdown of costs (including professional fee, local transport, and specified other costs if applicable).

Note:

- The information in the breakdown of the offered lump sum amount provided by the offeror will be used as the basis for determining best value for money, and as reference for any amendments of the contract.
- The agreed contract amount will remain fixed regardless of any factors causing an increase in the cost of any of the components in the breakdown that are not directly attributable to UNDP.
- Approved local travel related to this assignment will be arranged and paid by UNDP Sierra Leone.

Please note that applications will only be considered if they include ALL of the items listed above. Also note that the UNDP job portal website only allows for one document to be uploaded, so please combine all of the abovementioned items into one single Word or PDF document before uploading.

VIII. Evaluation Criteria

Offers received will be evaluated using a Combined Scoring method, where the qualifications and proposed methodology will be weighted 70%, and combined with the price offer, which will be weighted 30%. Only consultants obtaining a minimum of 49 points in the Technical Evaluation will be considered for the Financial Evaluation. Criteria to be used for rating the qualifications and methodology:

Technical evaluation criteria (total 70 points):

1. Professional qualifications and experience with respect to the TOR: 25 points.
2. Methodology of approach (max 2 page) in accomplishing the consultancy including though not limited to (a) stakeholder engagement strategy, (b) timeline: 45 points.

Financial evaluation (total 30 points):

All technically qualified proposals will be scored out 30 based on the formula provided below. The maximum points (30) will be assigned to the lowest financial proposal. All other proposals receive points according to the following formula: $p = y (\mu/z)$ where: p = points for the financial proposal being evaluated; y = maximum number of points for the financial proposal; μ = price of the lowest priced proposal; z = price of the proposal being evaluated.

Approval

Name:

Designation:

Signature: _____ Date: