EBAFOSA
Ecosystem Based Adaptation for Food Security Assembly

FUEL BRIQUETTES FEASIBILITY STUDY REPORT FOR BRIQUETTE PRODUCTION, USAGE AND MARKETING IN UGANDA

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Figure 1 Women from Mukono district standing Infront of her stall selling briquettes made by her.

INTRODUCTION

Globally more than 2.6 billion people still lack access to clean cooking, and household air pollution, primarily from cooking smoke, is responsible for roughly 2.5 million premature deaths each year[1]. In the past, progress has been very limited compared to electricity access. While latest data show a gradual decline worldwide in the number of people without clean cooking access, the COVID-19 pandemic is weighing additional challenges reversing this modest progress[2]. The problem in Sub-Saharan Africa is very severe, and the situation is deteriorating. The number of people without access to clean cooking has been rising from about 750 million ten years ago to 890 million two years ago – the highest deficiency globally. In some of the most deficient countries, only 5% or less of the population has access to clean cooking. And the effects are glaring. On average, almost 490,000 premature deaths occur each year in Africa related to household air pollution from the lack of access to clean cooking facilities. In 2019, indoor air pollution deaths reached a new high, accounting for 697,000 deaths across Africa.

In Uganda majority of the populations completely thrive on traditional fuels such as wood fuel, using inefficient conversion technologies to meet their energy demands. Over 90% of the Ugandan population rely on biomass fuel for cooking and heating (Mugabi, P., & Kisakye, 2018). On the other hand, 94% of households in Uganda used firewood or charcoal for cooking (NPHC, 2016) with 20% of the households had access to electricity in 2014. According

1 SDG7: Data and Projections https://www.iea.org/reports/sdg7-data-and-projections/access-to-clean-cooking#:~:text=SDG7%3A%20Data%20and%20Projections

2 IEA (2020), SDG7: Data and Projections, IEA, Paris https://www.iea.org/reports/sdg7-data-and-projections

to (Bizzarri, 2012) Charcoal is the leading source of energy used in urban settings, while firewood is more common in rural areas yet biomass is a source of air pollutants. Over 20,000 deaths, with more than 5,700 being children, occurs each year in Uganda because of indoor pollution. The effects of dependence on fuel wood extend to the environment through escalated deforestation. Deforestation in Uganda threatens to alter the supply of biomass available to households (Jagger & Kittner, 2017). The primary cause of deforestation in Uganda is assumed to be the use of charcoal and firewood for biomass fuel. Furthermore, the use of charcoal and wood fuel in Uganda is claimed to have a negative influence on the health of many mothers and children in the region. According to Global Forest Watch, In 2010, Uganda had 6.93Mha of tree cover, extending over 29% of its land area. In 2020, it lost 73.6kha of tree cover, equivalent to 36.0Mt of CO^2 of emissions[3]. The demand for biomass in Uganda, particularly fuelwood, is projected to grow exponentially in the future. Wood fuel, such as charcoal or firewood, is the most common form of biomass utilized in sub-Saharan African countries especially Uganda (Brenda et al., 2017). Forest degradation is the second highest source of emissions in Uganda and hence addressing it aligns with the country's climate commitments in its revised Nationally Determined Contributions (NDCs).

It is against this back drop that UNEP-EBAFOSA Uganda is bridging the gap of unclean cooking / charcoal usage in households with fuel briquette making training and awareness campaigns. This is being delivered through village saving and loans associations (VSLAs) as a vehicle to development of clean energy solution to impact women, youth, and men of VSLA groups. Focus/study area is greater Kampala area and the Buganda kingdom, and this is because the area is a leading risk of deforestation and major consumers of charcoal. Over 75% of households in Kampala depend on charcoal. In addition, there is significant support / interest from local government to drive uptake of fuel briquettes in the area and this will provide critical lessons for uptake across the country & continent.

OBJECTIVES OF THE FEASIBILITY STUDY

- The general objective of the feasibility study was to establish potential for market uptake of fuel briquettes as a sustainable substitute for unclean cooking fuels in the study area. Specific aims were:
- to evaluate consumer preference for briquettes based on type, price and shape;
- to determine the economic factors and briquette attributes that influence briquette acceptability in the market;
- to determine the marketability of briquettes in the community.
- to evaluate the challenges and opportunities faced in production and use of biomass.

3 Uganda Bureau of Statistics 2016, The National Population and Housing Census 2014 – Main Report, Kampala, Uganda. https://www.ubos.org/wp-content/uploads/publications/03_20182014_National_Census_Main_Report.pdf

METHODOLOGY

The researcher deployed qualitative research method that included: Desk review of existing literature, key informant interviews (at national and local level), focus group discussions, structured interviews and observation. These tools were chosen specifically to gather different sets of data that were used to inform the briquettes feasibility report. Each tool had a purpose to fulfil in the feasibility assessment.

STUDY AREA AND STUDY POPULATION

This study area was in three districts of Uganda; Kampala, Wakiso and Mukono districts most populated districts in Uganda. The study was conducted Banda village. Banda is located in Nakawa Division, with in Kampala the capital of Uganda. The location of the hill is approximately 11 kilometres (6.8 mi), by road, east of Kampala's central business district[4]. In Wakiso district the study was conducted in Bweyogerere town which is one of the six townships or wards that constitute Kira Municipality in Wakiso District in southern central Uganda. Bweyogerere is located 0°09.0‹21»N 49.0‹39°32»E (Latitude:0.352500; and Longitude:32.663611)[5]. In Mukono municipality constituency kiwanga village, Kiwanga village is located in Goma Division, Mukono Municipality, Mukono District, Central Region, Uganda Latitude 0° 22′ 12″ N and Longitude: 32° 41′ 35″ E

The study used both quantitative and qualitative study. including survey interviews and observations. A feasibility survey was conducted in community members of three villages including; Banda, Bweyogerere and Kiwnaga Lwanda village on the marketability and usage of fuel briquettes. Interviews with manufactures of briquettes, village saving and loans association coordinators, youth and women. The quantitative involved structured questionnaires and observations and experiments

GENDERED ROLES, AND ACCESS TO, AND CONTROL OF, ENERGY RESOURCES FOR COOKING BY HOUSEHOLDS

Traditional cooking also creates barriers to women's and girls' equality because they frequently spend hours each day caring for their families and performing routine, unpaid household chores like cooking, cleaning, and collecting water and firewood, time that could be spent on income-generating activities, education, or recreation. For example, girls in homes using polluting fuels spent about 18 hours weekly collecting fuel or water, while girls in homes mainly using clean fuels averaged only 5 hours in 16 African countries surveyed (WHO 2016). Without addressing time poverty that women and girls face, gender equality (Goal 5) cannot be fully achieved.

Despite progress towards universal access to clean and modern cooking systems (more fuel efficient and/or lower emissions), 40% of global households, or around 3 billion people, continue to prepare their daily meals with traditional stoves and fuels, posing risks to their health, the environment, and climate.

4 Location of Banda https://en.wikipedia.org/wiki/Banda,_Uganda#History
5 Location of Bweyogerere town https://en.wikipedia.org/wiki/Bweyogerere#cite_note-3

CUSTOMER FUEL TYPE USAGE AND CONSUMPTION

Introduction

The study objective sought to provide insight into price, main fuel types used, households, expenditure on particular fuel type, trader and charcoal vendor.

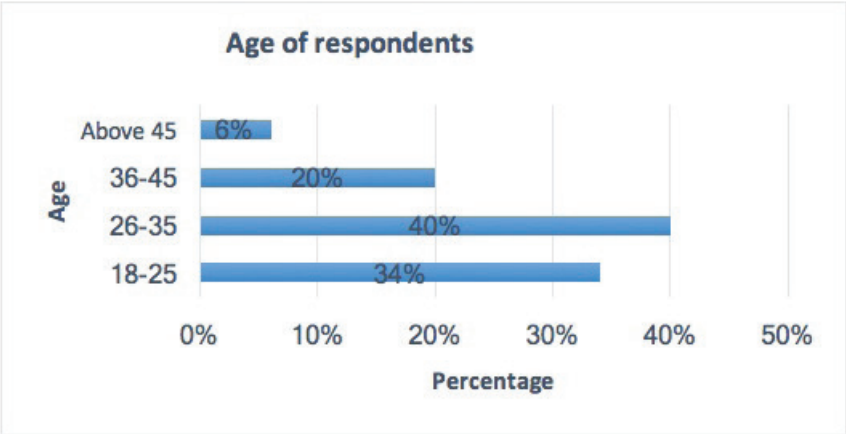
HOUSEHOLDS

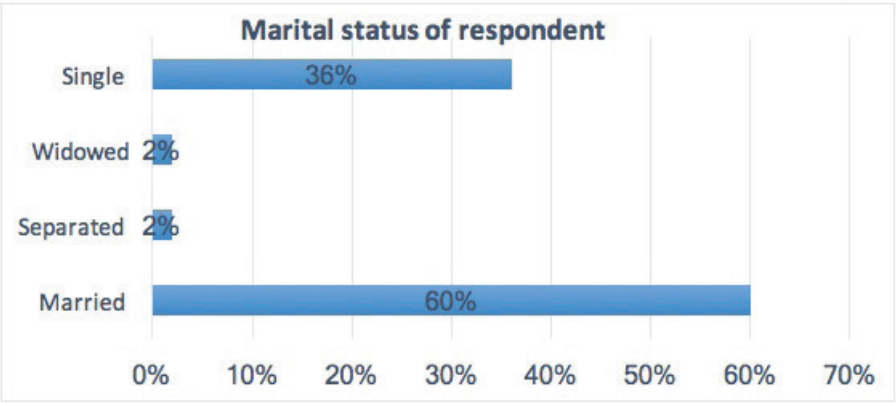
A total of **23** interviews were successfully administered at the household level out of the 50 respondents. The sampled households were located in areas of high income, medium income and low-income areas.

Households Demographic Profile

66% of the respondents interviewed were female and 34% were male. These respondents were drawn from the population in Mukono, Wakiso and Kampala districts. According to the National Population and Housing Census 2014, Kampala had a population of 1,507,114 million, Wakiso Kira Municipality 317,428 million and Mukono Mukono Municipality 162,744 people.

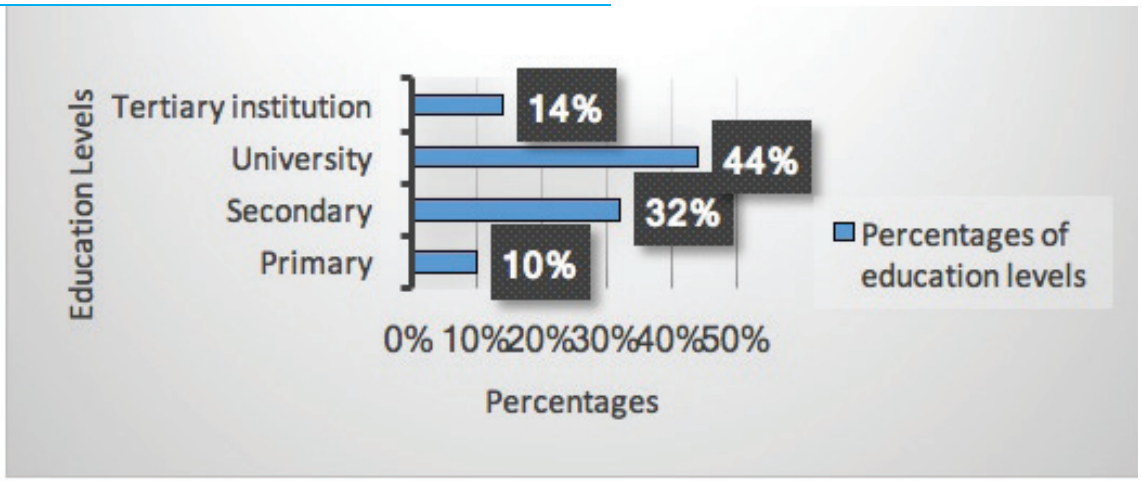
Find below the demographic profile of the 50 respondents by age, marital status and highest education attained.





WHAT IS THE HIGHEST EDUCATION THAT YOU ATTAINED? (Q8)

EDUCATION ATTAINED BY RESPONDENTS

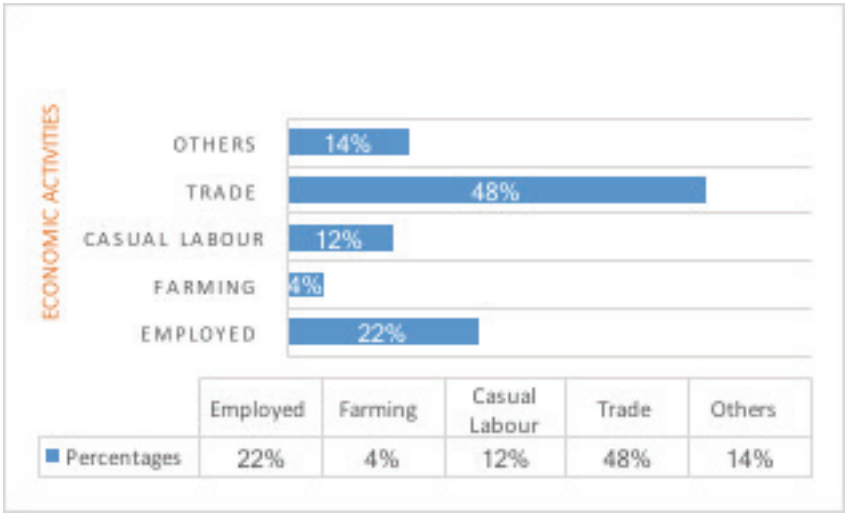


Households Economic Profile

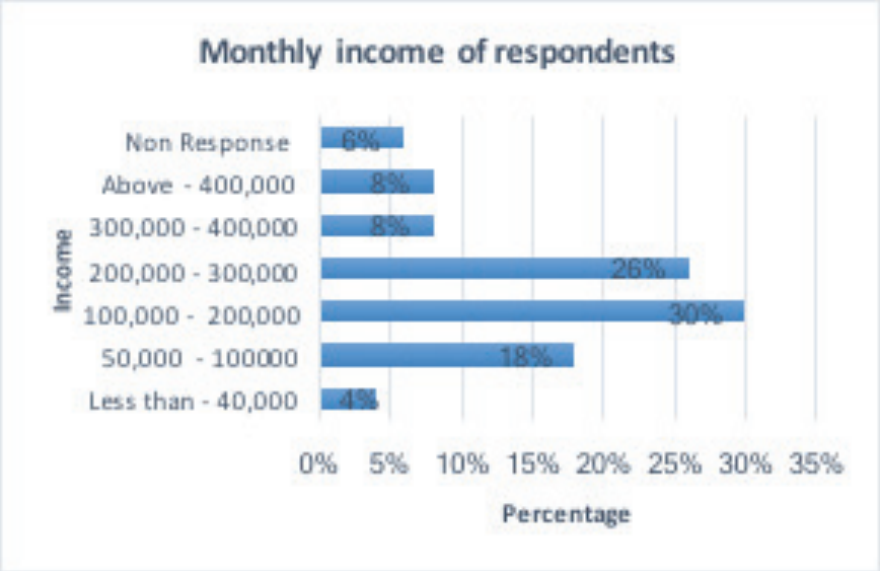
48% of the respondents are traders and engage in business related activities most of them work in markets and business centres. 22% of the respondents earn a monthly. 30% of the respondents are employed earning a monthly income of between 100,000 – 200,000 UGX. As an economic activity, more households are likely to be engaged in trade or business related activities, casual labour and farming is low because the survey was conducted with in urban areas.

Economic Activities engaged by respondents

Economic Activity refers to work people do to increase their quality of life. This involves production of goods and services for sale or own consumption. Information was collected on economic activity for persons aged 18 years and above. Information on economic activity is classified into employed in formal employment, casual labour, trade/ business and those involved in farming.



	Employed	Farming	Casual Labour	Trade	Others
Percentages	22%	4%	12%	48%	14%

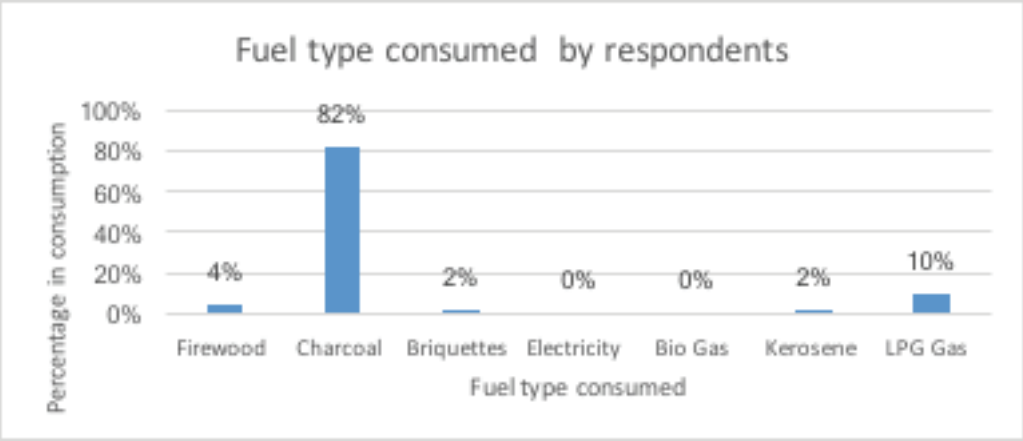


Analysis of Fuel type and consumption

A women in Kampala town purchasing charcoal from a trader

Truck transporting charcoal to Kampala markets.

The Main fuel type consumed by respondents is charcoal at 82%, while 10% LPG Gas, 4% firewood, 2% use kerosene and briquettes and 0% use electricity and Bio gas. This implies that wood charcoal is the leading cooking fuel by way of market share. Gas is used more in high- and medium-income areas as compared to house hold holds in low-income places. Charcoal is used by households in low, medium and high-income areas. Firewood is less consumed standing at 4% due to the setting of the home steads, few stalls and centres sell firewood and many people prepare using charcoal which comes from firewood. In addition, women prepare using charcoal compared to the rest of fuel types because it's a saving fuel type and heats food for longer time while on cook stoves. Women working in restaurants and local hotels prepare using charcoal because it's a saving fuel type compared to gas, electricity and firewood. Of the households sampled, one is currently using briquettes and the rest have at least some information of the briquettes. They have heard of briquettes on radio, watched on television and in community. However, many were citing challenges they interacted when using briquettes, this will be elaborated in the next section of briquettes usage and knowledge.



Households that use more than one fuel often prefer firewood and charcoal to prepare hard-to-cook foods and gas and kerosene for quick foods (like for breakfast meals). With 53% of households using charcoal as a main fuel and consuming above 30kgs and 48% of households using firewood as a main fuel and consuming over 30kgs, there is indication that both firewood and charcoal are bulky fuels. This also indicates that there is a heavy toll on the environment given that the source of firewood and charcoal is trees.

What quantity do you user per month? How much do you spend on this fuel per month?

Average consumption of main fuel (Total respondents 41)

Amount of money used to purchase fuel type used for cooking	Number of respondents	Percentage (%)
0 - 5,000	1	2.45
5001-10,000	2	4.87
10,001- 20,000	5	12.19
20,001-30,000	7	17.07
30,001-40,000	12	29.31
40,001-50,000	6	14.6
50,001-60,000	5	12.19
60,001-70,000	1	2.45
Above 70,001	2	4.87
Total	**41**	100

Where fuel is purchased

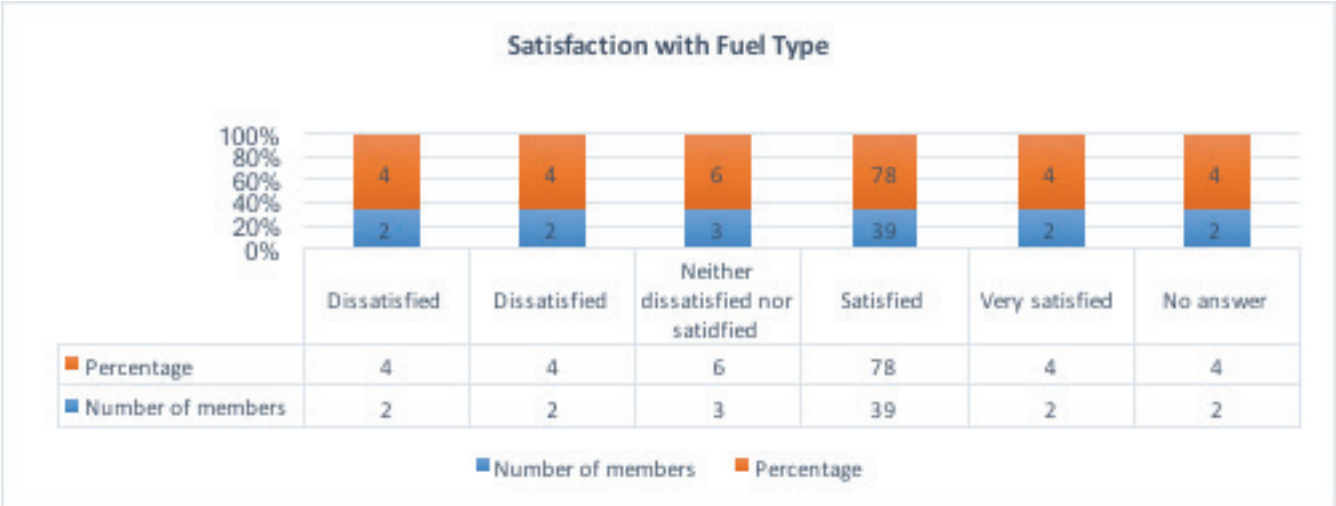
Suppliers of charcoal in the area use mainly Fuso trucks where they sell mostly half a sack of charcoal ranging between 40,000 to 50,000 UGX in Mukono, Kampala and wakiso and Charcoal sellers, charcoal traders with small stalls after buying from the trucks they go furfure to sell in small quantiles of at UGX 1,000 to 5,000 in tins and basins. Gas is mainly purchased from fuel station for example Shell, Total Energies and firewood is collected bought from town venders and kiosks

What other fuel type do you use currently?

A large proportion of households in of respondents have the tendency to alternate fuel. For still use biomass such as charcoal, firewood. For gas and electricity users' charcoal is the immediate alternative, it ranks as top alternative across the board. Gas costs respondents 50,000 UGX to households using gas in duration of two months. Firewood users choose charcoal as their immediate alternative.

Satisfaction with Fuel Type

Households are largely satisfied with their fuel of choice; 66% indicate that they are satisfied and 2% very satisfied. Users of gas are the most satisfied compared to all other fuel users. 6% are very satisfied, while 76% are satisfied and 10% are dissatisfied. 15% of charcoal users are currently dissatisfied with a total of 63% saying they satisfied and 22% are neither satisfied nor dissatisfied. It is interesting to note that none of the households that use firewood as a main source of fuel are either dissatisfied or very dissatisfied; while 38% responded that they were neither satisfied nor dissatisfied. This indicates that 38% of firewood users are indifferent. This may be due to the fact that they are driven to the use of this fuel because of lack of other alternatives. This seeming acceptability of charcoal arises from the fact that communities there are no equally priced cleaner alternatives to charcoal that communities can shift to. It is recorded that availability of clean, affordable alternatives such as fuel briquettes, that are a direct alternative to charcoal, is very low at 10%. This means that 9 out of 10 times, a user is likely to find charcoal in the market than clean cooking fuel briquettes. This is an urgent gap that needs to be bridged to transition communities to much better alternatives. Considering that fuel briquettes can be up to 20% cheaper than charcoal and with added advantages of being cleaner, non-smokey, better flammability hence ease of ignitability, & better burning, the market potential with the briquettes made available is highly significant because these advantages cover the major limiting factors cited by majority of respondents.

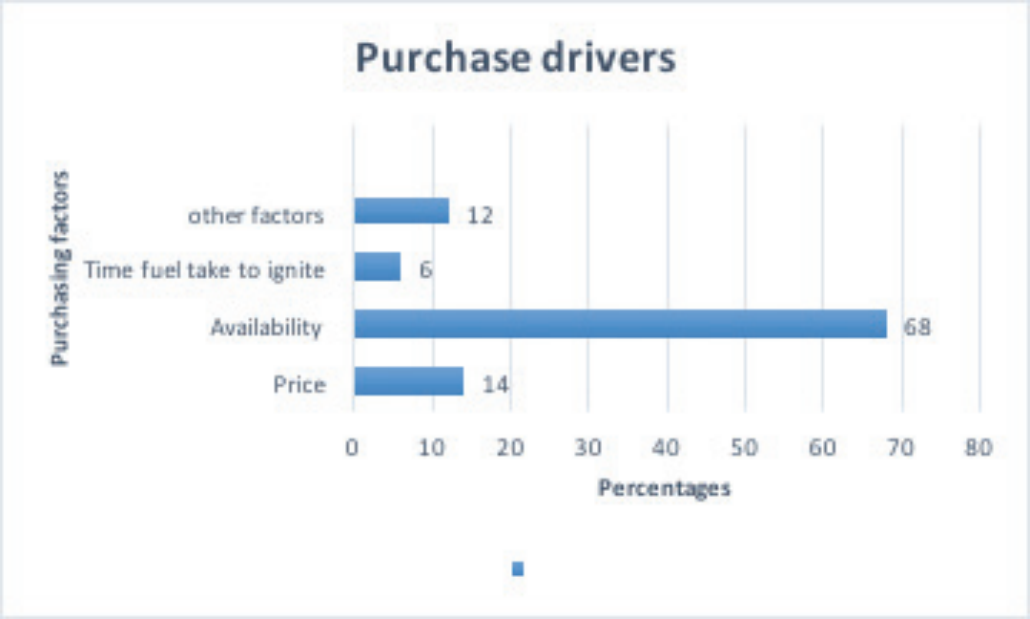


Dissatisfaction Drivers of the fuel type

On average, smoke emissions when lighting the fuel type when cooking is the greatest dissatisfaction element followed by price and accessibility of the fuel. Respondents quoted smoke emissions, expensive to buy and difficult to access where other reasons respondents replied as to why they are dissatisfied with fuel type. Health effects of charcoal and firewood where quoted included respiratory infection such as pneumonia, cough and tears in the eyes, dry skin and most affected are women and children, using open fire cooking using firewood.

Why did you choose this particular fuel type?

Though majority of rural and poor urban households are dependent on solid fuels to meet their cooking needs, availability and price are the most and main reasons of any fuel type for the household. From the study, 68% of the household chose the fuel type based on availability, 14% based on affordability and 6% of the households based on the time the fuel type takes to ignite, 12% consider other factors to choose and purchase a fuel type. And 26% male and 44% female household members based on availability of the fuel type.



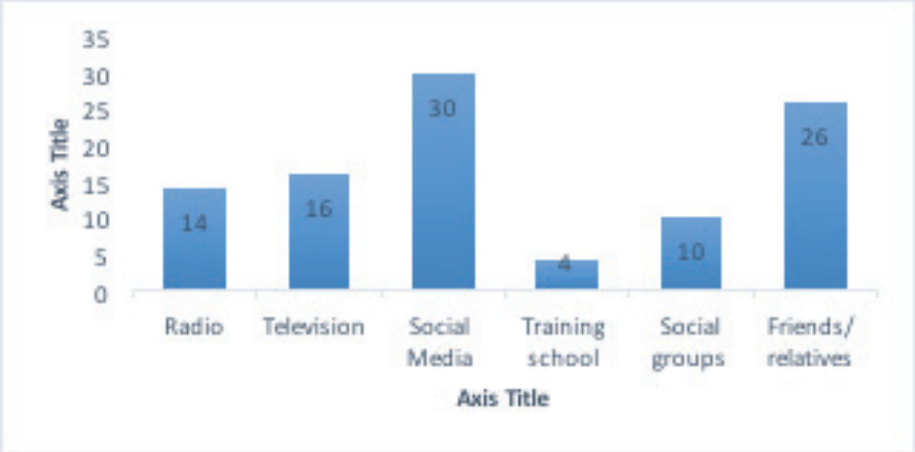
BRIQUETTUES USAGE

This section looks at profiling households using briquettes and its usage and marketing potentials of this product. This is with the aim of recognizing the unique characteristics and preferences of the households in order to inform the project on the customer profile and the strategies that can be adopted when reaching the particular segments of customers. However, Forms of briquettes used by respondents are ball shaped briquettes, they are most used type of briquettes, on the market and most time briquettes are made using hands by women and children at home.

Briquettes users (14 households 28% of the respondents Q 19)

Briquettes are predominantly used by households living in urban and pre urban areas of the study. During the study 92% of the respondents have heard of briquettes and they know they exist on the market, however on the surveyed households 28% of the house use and cook using briquettes in their households. 30% of the Respondents of the study have seen briquettes on social media like Facebook and WhatsApp, 16% have seen this on television shows on development and 14% have heard briquettes on radio talk show during development and business shows, where as 10% of the respondents from social groups. Therefore, friends and relatives contribute 26% as medium of know about briquettes. However actual availability and accessibility of fuel briquettes in their local markets is low and this is a limiting factor for uptake.

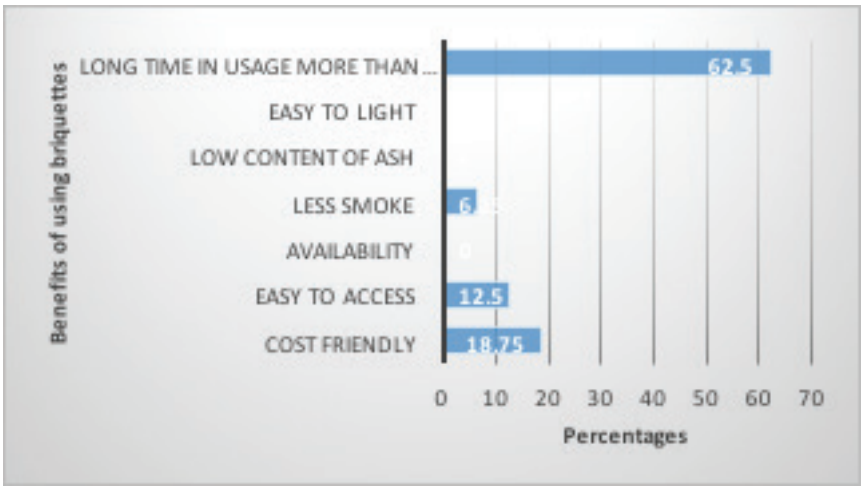
Medium Respondent got to know about Briquettes



Benefits of briquettes

During the study respondents were interviewed on the benefits of using briquettes, 62.5% use briquettes because they take long time in usage more than 4 hours and 18.75% of respondents report that it's because they are cost friendly to low-income earners, 12.5% of respondents easily access the briquettes and 6.25% report that they produce less smoke compared to other energy sources like firewood. However above are some of the benefits of using briquettes**.**

Benefits of using briquettes



FOCUS GROUP DISCUSSION (FGD)

The FGD confirmed that the factors influencing use of briquettes in the household mostly depend on:

- Less costly between UGX 1,000 to 2,000 a kilogram
- Last longer when cooking between 1 to 8 hours of cooking food, sauce and water
- Availability briquettes on the market.
- Less smoke, saving costs
- They are cost friendly
- They light for long hours which makes durable and this makes them cheaper

Challenges faced when using firwood and charcoal as source of fuel for cooking in households.

- Charcoal is expensive to buy because you use it daily and also smokey.
- Firewood produces a lot of smoke which makes us cry in the kitchen when preparing food.
- It is costly in the long term; it requires one to cut trees hence w end up degrading the environment.
- Charcoal delay in lighting.
- Firewood produces too much smoke when lighting it, this affects our respiratory system and of children, most times they end up coughing
- A lot of ash is produced when using both charcoal and firewood
- Inconvenience in comparison to other types of fuel used for cooking like gas

Reasons why briquettes are chosen over wood fuel

- It can take long when still cooking a period of 1 to 8 hours
- They are costly friendly and last long because UGX 10,000 – 20,000.
- Briquettes stay long than wood charcoal
- Briquettes save more than charcoal
- No smoke, work for long hours
- They light for long hours, don't emit smoke, are cheaper, don't dirtiness saucepans with soot
- No smoke produced when cooking food
- Easy to ignite by anyone in the household

BUSINESS AND MARKETING OF BRIQUETTES

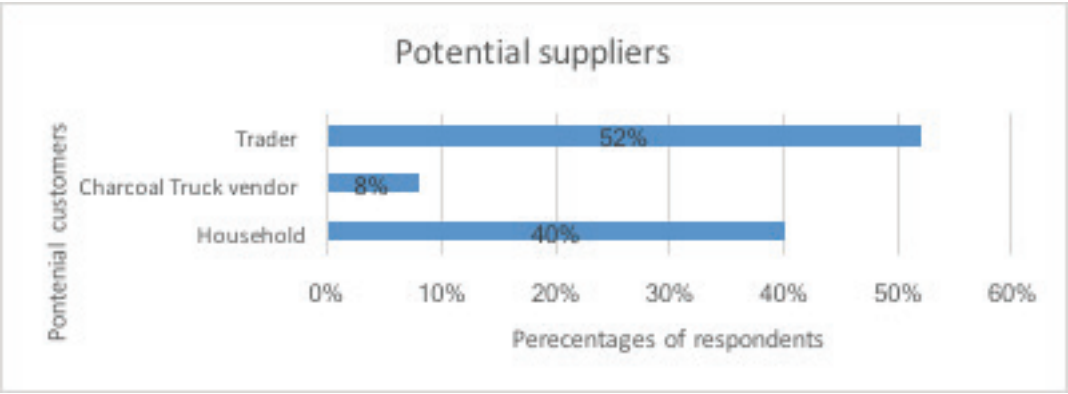
Respondents proved to buy fuel briquettes when produced from raw material of agriculture waste, during the study respondents who have ever used briquettes cited challenged and this work has to correct for its business to persuade new and old buyers. Most of the households interviewed use on average 8 to 12 briquettes to cook in day costing UGX 1000.

Biomass Fuel Distributors

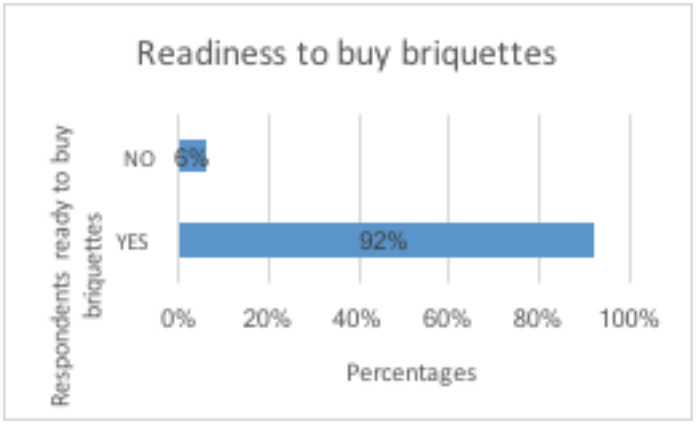
This study objective sought to find out the different actors in the supply chain of fuel briquettes and their roles in distribution. A market observation was also carried out to provide more information on packaging preferences, price and shape of briquettes.

Fuel type	Fuel packaging quantity	Packaging type	Branding	Supplier
Briquettes	1 kg	Polythene & Paper bag	Labelled with names, location, qty	Eco briquettes Lugazi
	2 kgs	Polythene & Paper bag	Labelled with names, location	Eco briquettes Kireka
	5 kgs	Polythene & Paper bag	Labelled with logo of the organisation	Youth group
	10 kgs	Sucker	Sticker label	Youth group
	25 kgs	Sucker	Sticker label	Women group

However, this section shows the potential customers who are willing to be supplied with briquettes and 52% of traders of small businesses in the semi urban areas showed much interest to be suppled, 40% were household members and 8% was to charcoal vendor of trucks who move from one area to another, those showed interest because they find briquettes vendors as their competitor, they also showed interest to venture into this business.



During the interviews 92% of respondents are ready to buy fuel briquettes made by youth and only 6% answered no.



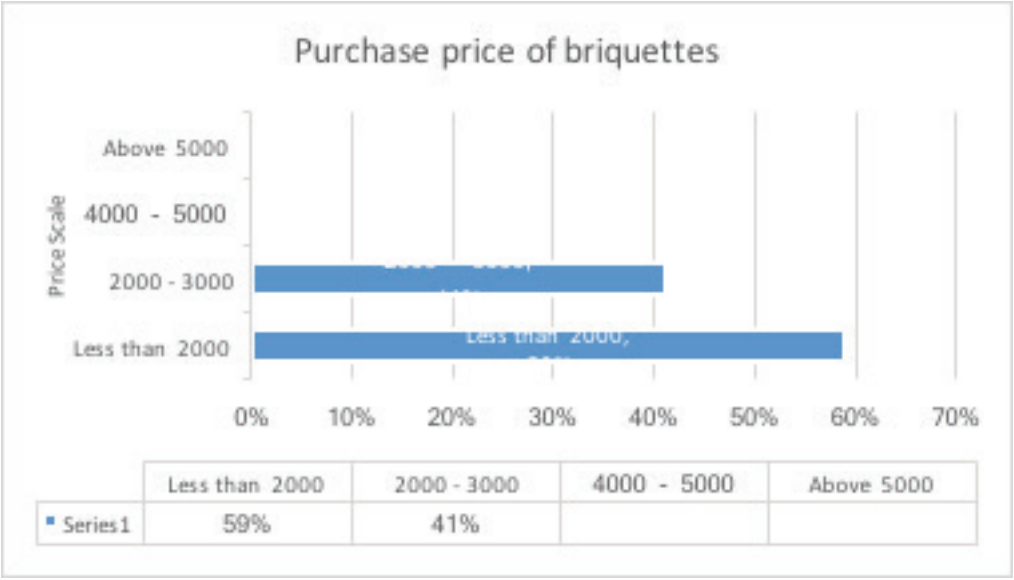
Finding show a high likelihood for briquettes compared to other energy sources. The briquettes made from agriculture waste are more liked by the respondents. As shown below 88% of respondents are willing to purchase briquettes if they are at lower price, while 6% are extremely likely and not at all likely.

Price of briquettes

It is evident that most businesses plan and budget for fuel on a monthly basis. However, schools align their spending as per school terms or semesters since their revenues are dependent on student fees. Only restaurants and hotels purchase their fuel daily, with 23% of those interviewed saying they do so.

It is evident that most businesses selling briquettes prefer selling 1 kilogram less than UGX 2,000. However, when a manufacturer of briquettes sells to business person, the seller is required to sell at whole sell price either at UGX 800 per pack or at least the manufacturer gives to the buyer/ trader extra 1 or 2 packs, this means that he buys at UGX 1,000 per pack. Price at whole sell is negotiable between the buyer and seller.

The study shows that 59% prefer buying briquettes less than UGX 2,000 and 41% would need to buy at range of UGX 2,000 – 3,000. However, business found in low income areas prefer buying at less than UGX 2,000, giving reason that they sell to low income earners who most times buy cheap items from their business stalls .



CONCLUSION

This study demonstrated the glaring market gap for uptake of climate action solutions of waste recovery to clean cooking fuel briquettes which cover all the major limiting factors of current major fuels – charcoal & firewood. Accordingly, limitations of smokiness, high ash content, cost, flammability, longevity of burning are among key negative aspects that the over 75% biomass users are tolerating for lack of better alternatives. Fuel briquettes perform better in all these key indicators that consumers consider vital, but availability remains low. Bridging this gap therefore represents an opportunity for cleaner livelihood opportunities as communities will be shifting towards cleaner sources to create a market for cleaner solutions. It represents an opportunity for enhanced environmental sustainability considering charcoal & firewood is a leading cause of forest degradation, which is the second highest source of emissions in Uganda. It will also be in line to drive Uganda's climate commitments in its revised Nationally Determined Contributions (NDCs) through market approaches that have longevity. Socially, this gap bridged will mean enhanced indoor air quality and reduction of health compilations arising from indoor pollution.

RECOMMENDATIONS

- At the introductory stage of the business provide samples to the potential buyers, wholesalers to test on the performance of the briquettes.
- Branding of the briquettes is very key because it helps the buyer to know the producer and contact details in case they need more or want to report any complain.
- Traders asked for samples of briquettes in case production starts, and they will be able to also give them feedback from final customers.
- Consumers living in urban areas mainly renting small room, complain of briquettes producing a lot of ash, hence briquettes produced must not produce ash because it dirty their houses.
- Briquettes consumers consider the duration of burning over charcoal when cooking mainly when cooking beans that consume a lot of time to get ready.
- Cost is considered by both traders and consumers; they need to see that are briquettes cheaper than charcoal then they can start to buy for monthly use.
- Availability of the product is considered. Currently, it is up to 9 times easier to find charcoal than briquettes and bridging this accessibility gap is critical.
- Improvement of the briquette's quality and shape.

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ANNEX

LIST OF RESPONDENTS OF THE STUDY

N/S	NAME	GENDER	WORK PLACE	PLACE OF RESIDENCE	CONTACT
1	Juliet Nakubenga	Female	Kiwanga Market	Kiwanga Mukono	0701323901
2	Robert Ochen	Male	Kiwanga Market	Kiwanga Mukono	0788360115
3	Angella	Female	Shop	Kiwanga Mukono	
4	Kwagala Josephine	Female	Kiwanga Market	Kiwanga Mukono	
5	Nasubuga Annet	Female	Trader	Kiwanga Mukono	
6	Opio Dan	Male	Kiwanga Market	Kiwanga Mukono	0755836803
7	Tina	Female	Kiwanga Market	Kiwanga Mukono	0702410614
8	Nakato Emilina	Female	Ntebettebe Trading Centre	Ntebettebe, Wakiso	
9	Kizire Erisa	Male	Wholesaler	Kiwanga Mukono	0708053456

N/S	NAME	GENDER	WORK PLACE	PLACE OF RESIDENCE	CONTACT
10	Mugeme Samuel	Male	Kiwanga Market	Kiwanga Mukono	0753842746
11	Rose	Female	Kiwanga Market	Banda, Kampala	
12	Yahaya Tenyewa	Male	Shop	Kiwanga Mukono	0755992959
13	Amuzar Tenyuwa	Male	Kiwanga Market	Kiwanga Mukono	0758223495
14	Greg	Male	Banda Railway Market	Banda , Kampala	
15	Matti Magambo	Male	Kiwanga Market	Kiwanga Mukono	0787008200
16	Namatovu Shadia	Female	Kiosk	Kasenyi Banda, Kampala	
17	Nachibule Sumaya	Female	Shop	Kiwanga Mukono	0753322092
18	Nakawudde Faith	Female	Ntebettebe Trading Centre	Bweyogerere, Wakiso	
19	Birungi Esther	Female	Shop	Kiwanga Mukono	0700530225
20	Nisime Viola	Female	Kiwanga Market	Kiwanga Mukono	
21	Mutesa Paius	Male	Shop	Kiwanga Mukono	
22	Kansiime Mary	Female	Kiwanga Market	Kiwanga Mukono	0774653414
23	Brenda	Female	Banda Railway Market	Banda , Kampala	
24	Gloria Kaindu	Female	Shop	Kiwanga Mukono	075715697
25	Kadondi Shalifah	Female	Kiwanaga Trading Centre	Kiwanga Mukono	
26	Namukasa Prosy	Female	Kiwanga Market	Kiwanga Mukono	0702410614
27	Elizabeth Praise	Female	Kiwanga Market	Banda , Kampala	
28	Nabwami Maria	Female	Kireka Market	Janda, Wakiso	0776460458
29	Betty	Female	Ntebettebe Trading Centre	Ntebettebe, Wakiso	
30	Namujju Ritah	Female	Kiwanga Market	Bweyogerere , Wakiso	
31	Shafiq Musa	Male	Shop	Banda Lower, Kampala	
32	Jackie	Female	Banda Market	Banda, Kampala	
33	Mukisa John	Male	Ntebettebe Trading Centre	Ntebettebe, Wakiso	
34	Mbabazi Mildred	Female	Banda Railway Market	Banda (B5), Kampala	0703286288
35	Kirabo Julie	Female	Kakajo Trading Centre	Kakajo, Bweyogerere, Wakiso	

N/S	NAME	GENDER	WORK PLACE	PLACE OF RESIDENCE	CONTACT
36	Ssekanyo Moses	Male	Banda Railway Market	Banda (B3), Kampala	
37	Namuli Eve	Female	Banda Market	Banda, Kamapala	
38	Namusisi Prossy	Female	Shop	Bweyogerere, Wakiso	0790685768
39	Precious	Male	Ntebettebe Trading Centre	Ntebettebe, Wakiso	
40	Nabanda Shaminah	Female	Ntebettebe Trading Centre	Bweyogerere, Wakiso	0777180434
41	Nakatudde Jalia	Female	Ntebettebe Trading Centre	Bweyogerere, Wakiso	
42	Muttaka Joyce	Female	Shop	Kinawataka, Kampala	
43	Musa	Male	Banda Market	Banda, Kamapala	
44	Mwebaza Dorcas	Female	Ntebettebe Trading Centre	Ntebettebe, Wakiso	
45	Rajjab	Male	Banda Market	Banda Upper, Kampala	0778917295
46	Ssebunya Ronald	Male	Banda Railway Market	Banda (B2), Kampala	
47	Sharifa	Female	Banda Market	Banda , Kamapala	0703288889
48	Opio Julius	Male	Roadway Vendor	Banda 1, Kampala	
49	Namugaya Peruth	Female	Banda Railway Market	Banda 2, Kampala	0770898422
50	Peace Kirabo	Female	Shop	Banda, Kampala	

ANNEX

QUESTIONNAIRE

UNEP-EBAFOSA Uganda Fuel Briquettes Feasibility survey for briquettes making, usage and marketing in Uganda.

According to Global Forest Watch in 2010, Uganda had 6.93Mha of tree cover, extending over 29% of its land area. In 2020, it lost 73.6kha of tree cover, equivalent to 36.0Mt of CO^2 of emissions. With over 90% of household energy is derived from biomass (firewood and charcoal). Most of it is used for cooking, at times in combination with other types of energy such as electricity. Charcoal is the predominant source of energy used in urban settings, while firewood is more common in rural areas. UNEP-EBAFOSA Uganda, Africa Farmers Media Centre (AFMC) are conducting a baseline to enable them reduce on the high rate of deforestation, to understand on the usage, marketability of fuel briquettes and usage of wood fuel in Uganda.

You have been selected as a key stakeholder in your areas to participate in this survey. The purpose of this study is to use the results to develop strategies and policies that can facilitate the growth clean energy enterprise solution for the youth in Uganda using agricultural waste to make fuel briquettes, promote local enterprise competitiveness in the clean energy business development and other sectoral enterprise for value addition purpose.

Please spare **10 minutes** of your time and respond to the questions in this questionnaire.

Your responses will be treated with confidentiality. Kindly consent that you are responding to this questionnaire freely.

Questionnaire No-.....

PROFILE	QUESTION	RESPONSE
	1. Survey Location	District ..... Sub-county..... Parish/Ward..... Village.....
	2. Select Date of the Survey	
	3. Enter name of the respondent	
	4. What is the gender of the respondent	Male ..... Female .....
	5. TELEPHONE NUMBER OF RESPONDENT	
	6. Age of the respondent	18-25 26-35 36-45 Above 45
	7. What is your marital status?	Married Separated or divorced Widowed Single
	8. What is the highest education that you attained?	Primary Secondary University Tertiary institution

ECONOMIC STATUS	9. What economic activity do you engage in consistently?	Employed Farming Casual Labour Trade Others
	10. What is your total monthly income? (Includes money from any source)	Less than 40,000 50,000 100,000 100,000 200,000 200,000 300,000 300,000 400,000 Above 400,000

FUEL TYPE AND CONSUMPTION	11. What main fuel type do you use currently?	Firewood Charcoal Briquettes Kerosene LPG Gas Electricity Bio Gas
	12. What quantity do you use per month? How much do you spend on this fuel per month?	
	13. Where do you buy your main fuel type? (for cooking)	
	14.a What other fuel type do you use currently? (for cooking) b) What quantity do you use per month? c) How much do you spend on this fuel per month?	
	15. How satisfied are you with this fuel?	Very Dissatisfied Dissatisfied Neither Dissatisfied nor Satisfied Satisfied Very Satisfied
	Only answer if you responded Very Dissatisfied |Dissatisfied to Q15	
	16. Why are you dissatisfied with the fuel you are using?	Availability Smoke emissions Expensive to buy Difficult to access
	17. Why did you choose this particular fuel type?	Price Availability Time fuel takes to ignite How long it burns Compatibility with stove

BRIQUETTES	Only answer if you responded Firewood|Charcoal|Kerosene|LPG Gas|Electricity|Bio Gas to Q11	
	18. Have you heard about briquettes?	Yes _____ No _____
	Only if responded answered Yes to Q18	
	19. How did you find out about the briquettes?	Radio Television Social media (Facebook) Training in school Social group Relative / friend
	20. Have you used briquettes before?	Yes _____ No _____
	Only **if responded answered yes to Q20** 21 What are some of the benefits of using briquettes	Cost friendly Easy to access Availability Less Smoke Low content of ash Easy to light Long time in usage more than 4 hours

	22. What form of briquette are you currently using?	Ball shaped Hexagonal Hand made Other
	23. How long have you used them?	Less than 1 year 1yera to 2 years 3years and above
	24. What do you like about the briquettes you are currently using?	
	If stopped using, why did you stop using briquettes	Price Availability Efficiency Compatibility with stove Other (specify)
	25. What don't you like about the briquettes you are currently using?	Cost- got a cheaper option Unavailability A lot of smoke High ash content Difficult to light Took too long to ignite Low heat
BRIQUETTES AND CHARCOAL	26. Do you find briquettes easier to use compared to charcoal?	

	27. Challenges faced using firewood or charcoal as source of fuel for cooking?	
	28. How suitable do you find briquette use with the equipment/stove you use?	Extremely suitable Quite suitable Quite unsuitable Extremely unsuitable
	30. Reasons why Briquettes are chosen over wood charcoal?	List the reasons here;
MARKETING OF BRIQUETTES	Tick the status of the respondent in this section.	Household Charcoal vendor Trader
	30. Would you be ready to buy briquettes made by youth	1. Yes 2 . No
	31. Assuming the price was reasonable, how likely would you be able to consider buying this product?	Likely extremely likely) not at all likely
	*32. When Respondent answer 3 (*not at all likely) ask them this question *Why would you not consider buying?*	

	33. How much are you able to purchase 1 kg of briquettes	Less than 2000 2000 - 3000 4000 - 5000 Above 5000
	(This question must be answered by business persons) 34. If we are to supply you briquettes at reasonable price would you accept to become our agent	1. Yes 2. No
	35. What amount of briquettes do you prefer to be supplied	1. less than 5 kgs 2 5kgs - 10kgs 3. 10kgs and above
	36. What mode of payment do you prefer	1. Cash transaction 2. Mobile money 3. others

THANK YOU SO MUCH FOR YOUR TIME

Annex 2 Summary table for briquettes supplier

No	Name of Supplier	Location	Quantity distributed	Price Per Unit	Telephone / email	Comment about the product
1						
2						
3						
4						
5						

EBAFOSA
Ecosystem Based Adaptation for Food Security Assembly

info@ebafosa.org

P.O Box 30552 00100
Nairobi
Kenya

WWW.EBAFOSA.ORG