Rapid Assessment of User Perceptions of Carbonized Agricultural Waste Briquette Fuels: Haiti 2016

Final report

Prepared for The Global Alliance for Clean Cookstoves by:

Berkeley Air Monitoring Group and the Institut Haitien de l'Energie, Haiti

November 2016

Contents

Report Authors

Berkeley Air Monitoring Group

Dana Charron

Kirstie Jagoe

Jonathan Rouse (HED Consulting)

Institut Haitien de l'Energie

Bétonus Pierre

René Jean-Jumeau

Yvens Chérémond

Stéphanie Dérosier

Support and Acknowledgements

This project was funded by the Global Alliance for Clean Cookstoves, which has recently partnered with the Government of Canada to develop a large-scale plan for transforming the clean cookstoves and fuels market in Haiti. The authors' views expressed in this publication do not necessarily reflect the views of the Global Alliance for Clean Cookstoves, the Government of Canada, the United Nations Foundation, or its partners.

Our thanks go to the many people who helped to coordinate and make this study possible. To all members of the Institut Haitien de l'Energie team not named above who also contributed to this study. To Alexandre Anglade, Carbon Roots Haiti, for timely delivery of the briquettes. Seema Patel, Katherine Arnold, and Neeraja Penumetcha from the Global Alliance for Clean Cookstoves for their facilitation and guidance. As always, we thank the participants who graciously gave us their time and opened their homes. Without them, this study would not have been possible.

Executive Summary

In September 2016, a rapid in-field assessment was conducted to explore the acceptability of carbonized agricultural waste briquettes as a potential cooking fuel replacement for charcoal in Haitian homes and street food vendors. The assessment was conducted by Berkeley Air Monitoring Group and the Institut Haitien de l'Energie (IHE) on behalf of the Global Alliance for Clean Cookstoves, which has partnered with the Government of Canada to develop a large-scale plan for transforming the clean cookstoves and fuels market in Haiti.

Methods

The study, conducted in two communes in the Port-au-Prince Metropolitan area, included two target populations: low to middle income households and street food vendors who currently use charcoal as their primary cooking fuel. Twenty household cooks of mixed gender using either locally produced improved stoves, such as the Plop Plop or the Mirak stove, and/or traditional stoves were recruited. Eight street food vendors of mixed gender were also recruited.

A total of three planned visits were made to the households and street vendors. On the first visit, households and street vendors were randomly selected, selection criteria were applied, and if the cook was found to be eligible, informed consent was recorded. Participants were given sufficient briquettes to meet all of their cooking needs and were asked to use these over the following two weeks. On the second visit, one week after the first, the field team conducted a cooking area observation, and administered a short survey to collect demographic data and establish initial degree of usage and perceptions of the briquettes. A third visit at the end of the two-week study period, entailed further observations and an in-depth interview covering a range of usage and acceptability indicators, and exploring willingness and ability to pay.

Data collection tools were designed to capture both quantitative categorical data as well as many broader more in-depth perceptions, opinions, and reasons. All data collection tools were created in English and translated into Haitian Creole; the final questionnaire was also 'back-translated' into English, and a comparison of the two English versions was used to identify any potential mistranslations, which were then addressed. Data was entered into an Excel database with built-in validation checks, and the entered data was then checked for completeness and consistency. The data analysis was carried out using Microsoft Excel, and responses to open questions were collated and recurring themes identified manually.

Results

The 18 households that remained in the study until its conclusion all reported that they had used the briquettes during the study period. This finding was supported by a visual inspection of the stoves in the cooking area and of the briquette sacks on arrival at the homes at the mid and end-point visits. By the end-point visit, 10 households had emptied their sacks.

All of the 18 study households reported that they liked to use the briquette fuel. The attribute of the fuel that most impressed the study group was that it became hotter than charcoal allowing for faster cooking, meaning that the same amount of food could be cooked with relatively less fuel than if they had used charcoal. This led them to perceiving the fuel as 'economical' even though it had been given to them for free. Multiple participants also cited

that they liked the ease and speed of lighting the briquettes, as well as the cleanliness of handling them. In comparison to charcoal, the majority of participants rated the briquettes the same or better than charcoal across multiple usability parameters: lighting, initial fuel loading, topping up fuel during cooking, simmering, frying, and boiling.

The most commonly cited frustration with the briquettes was the amount of ash produced during the cooking. This problem caused two households to withdraw from the study at mid-point, and was cited by six more as a significant negative factor. Cooks reported that the ash had to be shaken out of the stove in order to keep the fire alight, which meant they had to monitor the cooking more closely than with charcoal. In some case, the ash clogged the ventilation holes in the stove.

Due to the small sample size, the vendor findings were not as clear as those from the household cooks, but similar trends were indicated. Street vendors are a notoriously difficult sector of the population to retain for research, and three vendors withdrew prematurely from the study. All of the five vendors who completed the study reported using the briquettes on each day they cooked during the study, and observation of the cooking areas revealed that most stoves were fuelled with briquettes at the time of the visit. At the end of the study, four vendors reported having used all their briquettes, and the fifth vendor had half a bag remaining.

The vendors generally responded very positively to the briquettes, with all participants reporting that they liked using them. Among the specific attributes highlighted by multiple vendors was the fact that briquettes kept the pots and stoves cleaner and burned for longer than charcoal. However, the latter view was not universally held, as some vendors observed no difference, and some felt the burn was slower. As with the domestic cooks, the majority of participants rated the briquettes the same or better than charcoal across multiple usability parameters: lighting, initial fuel loading, keeping the stove alight, topping up fuel during cooking, simmering, frying, and boiling.

Multiple vendors noted that they disliked the excessive ash produced by the briquettes, however at least two also noted that the ash kept their stoves alight for longer. Two participants also commented on an unpleasant smell when the briquettes were alight.

The clear majority of both household and vendor cooks stated that they would continue to use briquettes if they were easily available in their neighborhood. However, most were willing to pay less than what they currently pay for charcoal. Among the household cooks, the average amount they would be willing to pay for a container known as a '*mamit*' was 24 Haitian Gourde (HTG). The average comparable price for charcoal was 25 to as much as 50 HTG per '*mamit*' which equates to approximately 1kg charcoal. However, this could be a product of how the question was phrased and/or the culture of haggling in Haiti. It could also be a function of the fact that many Haitian families and small businesses are forced to spend a significant portion of their limited cash resources on fuel. The reoccurring positive perceptions of the briquettes suggest that the participants would be willing to pay at least the equivalent price of charcoal if other factors such as accessibility and reliable supply did not create barriers.

Recommendations

The results of the rapid assessment suggest charred agricultural waste briquettes are a potentially promising alternative to charcoal in Haiti. However, as this study examined a limited number of indicators across relatively small samples, further evaluations are recommended prior to scale-up. First, a combination of technical laboratory and controlled cooking investigations, particularly focused on the production and role of ash in the cooking process as well as on the briquette smell, could be conducted to enhance user satisfaction. Second, the understanding of motivations and enablers of briquette purchasing could be strengthened through a full robust willingness to pay exercise; a market-level assessment of distribution channels and outlets and the factors the support or hinder consumer uptake of briquettes; and consumer testing of potential promotional messages. Finally, in order to make wise investment choices that will lead to achieving its impact goals, the Global Alliance may want to evaluate briquettes more completely with regards to their likely effect on environmental, gender, lifestyle, and health targets.

1. Rational and study aim

As one of the poorest countries in the world, Haiti depends heavily on biomass fuels to supply almost all its cooking energy. The potential impacts of a large scale campaign to transition the country to cleaner cooking technology are complex and interrelated but are expected to include health, environmental, gender, and livelihood-related factors. To understand these potential impacts in the Haitian context and to be able to support decision-making, it is critical to have a robust understanding of the stoves and fuels that are or could be available at scale in country, as well as their efficiency, emissions, performance, and acceptability. In conjunction with separate laboratory stove and fuel performance testing, this small pilot study provides a rapid in-field assessment, which aims to explore the acceptability of carbonized agricultural waste briquettes as cooking fuel compared to charcoal. The briquettes used in this study were produced by Carbon Roots Haiti.

2. Methods

This study was conducted in Tabarre and Croix de Bouquet, two communes in the Port-au-Prince Metropolitan area, Ouest department of Haiti. Visits were made during September 2016, a period of dry and sunny weather, with no known significant festivals or holidays in the study area.

The target population was low to middle income households and street food vendors who currently use charcoal as their primary cooking fuel. Twenty low/middle-income domestic cooks of mixed gender were recruited. The participant group included a mix cooks using of locally produced improved[1] stoves such as the Plop Plop or the Mirak stove and traditional stove users. Eight street food vendors of mixed gender were also recruited.

[1] The term improved is used throughout this report in reference to stoves that have been developed with the aim of providing a more efficient and/or cleaner alternative to the traditional stoves. This is a means to differentiate these stoves only and not an endorsement of quality or performance.

A total of three planned visits were made to the households and street vendors. Several unscheduled visits were also made to deliver additional briquettes as needed.

Visit 1: Households and street vendors were randomly selected within the two communes. Participant recruitment entailed applying selection criteria to ensure willingness and availability to participate, as well as a suitable cooking and fuel-use profile. Please see Appendix 7.1 and 7.2 for a copy of the selection criteria. These documents include the language that was used to present the purpose of the study to the participants. Informed consent was also recorded (the forms used are available on request).

Recruited participants were each provided with a bag of briquettes weighing approximately 35kg, which was deemed by IHE to be sufficient for one week of cooking in an average household based on their experience in the sector. Per the instructions from Carbon Roots International (producer of the briquettes), verbal guidance on the lighting and use of briquettes were given to each recruited cook: participants were advised to light and cook with the briquettes as they would charcoal. Most homes used a small amount of kerosene and/or pinewood resin known as '*bois pin*' to ignite the fire. Although common practice, participants were strongly discouraged from using plastic bags as a starter fuel. Any questions were addressed. Participants were requested to use only briquettes for the next two weeks.

Visit 2: After one week, the field team revisited participants at their stall or in their homes. A visual check of the cooking area was made, and a short survey administered to establish degree of usage and initial perceptions of the briquettes, and to collect some essential demographic information. If further briquettes were required for the remaining week of the study, these were also provided and recorded.

Visit 3: At the end of the two-week study period, a final visit was made, which entailed further observations and a more in-depth survey. The survey established degree and nature of usage and explored user perceptions of the briquettes against a range of indicators, such as ease of lighting and versatility for cooking. The survey also looked at likely seasonal impacts and willingness and ability to pay.

As the street vendors had minimal storage capacity, the field team visited the stalls multiple times in between the planned visits to provide them with additional briquettes as needed.

Data collection methods were designed to give as much quantitative – including categorical and ranking – data as possible. However, the nature of the study dictated the need for qualitative responses as well, so there were also many opportunities given for participants to respond to more open-ended questions on perceptions, opinions, and reasons. All English versions of the data collection tools are provided in Appendix 7.3. Haitian Creole versions are available on request.

In recognition of the possible impact on the livelihoods of street vendors, they were given one thousand gourdes of cell phone airtime on completion of the study. Household participants were allowed to keep any remaining briquettes.

Quality assurance

As the visit 3 interview included several open, nuanced questions, the questionnaire was first translated from English into Haitian Creole and then 'back-translated' into English. The two

English versions were then compared to identify any differences, indicating the original intended meaning may have been lost in translation. Any differences were highlighted to the Haitian team and the form edited accordingly.

Data in the completed interview forms was entered into an Excel database with built-in validation checks. The entered data was then checked for completeness and consistency by Berkeley Air staff, and any seemingly irregular entries were flagged and verified against the paper forms by the Haitian team.

Analysis

Due to the rapid turn-around and the relatively small sample size, the data analysis was carried out using Microsoft Excel. Responses to open questions were collated and recurring themes identified manually.

3. Household results

Of the 20 domestic cooks recruited, two were lost to follow-up, giving a final study sample of 18; 6 male and 12 female.

Household and participant characteristics

Half of the participants were estimated to be in the 18-30 age group (n=9 50%), 5% were under 18, and none was over 60.

Three cooks had received no formal education, three completed primary level, and the remaining 12 had achieved secondary or higher education.

Twelve of the households had a female household head. Decisions on major household purchase were taken solely by female members in seven cases; in eight homes a female was involved in the decision; and a male household member undertook decisions with no female input in three homes, two of which had a male as the main cook.

Briquette dissemination and compliance

Each household received either one or two 35kg sacks of briquettes over the course of the two-week study. Supply was based on use and demand.

Reported and observed briquettes use: end of week 1

All households reported to have used the briquettes during the first week of the study, with just over half of the participants (n=10) reporting to have used them every day. Some of the participants not using the briquettes daily reported that this was due to them not cooking at home every day. All homes had some briquettes remaining: in six homes the amount remaining was one quarter of the sack or less, whereas the remaining households had more than one quarter of the sack left over. Observation of the kitchen area on arrival at the home revealed 13 households had briquettes in their stoves.

Reported and observed briquettes use: end of week 2

On arrival at the homes at the end of the two-week study, the team found that eight households still had some briquettes remaining in the sack, while the other 10 had emptied the sack. Some of these cooks reported that they had given a proportion of the briquettes to

friends as they wanted to share the briquette cooking experience. Of the eight households that had briquettes remaining, almost all (n=7) said this was because they had been given more than they needed for that period of time but were planning on continuing to use them. Only one reported that the surplus was because they preferred using other fuels. Please see Table 7 in the Appendix for information on the total number of sacks of briquettes provided to each household over the duration of the project alongside the amount of cooking reported.

Stove use and cooking patterns

The amount of cooking per day ranged from three person-meals[2] to 27 with an average of 14 person meals per day.

The average number of stoves seen in the cooking area was 2.0 (SD 1.1, range 1-5); most of these stoves were used at least once per week. Traditional charcoal stoves with one to three burners were the predominant primary[3] stove type used (n=12), four households used an improved stove, such as the Plop Plop or Mirak stove, and two used a liquefied petroleum gas stove (LPG) stove alongside a traditional charcoal stove. Stove stacking (the use of multiple stoves/ fuels in combination) was commonplace (see Figure 1 below). There was no gender-related difference in the patterns of modified/improved vs traditional stove use.

Figure 1: Example of stove stacking seen in one study household [4]

The stoves used and number of people cooked for remained stable during the study period. Three households reported cooking a different number of days during the second week, but the remainder (n=15) cooked as usual.

[2] In this case, the total 'person meals' in a day for a given household is the number of individual meals served, so if the cook serves 5 people for breakfast, 4 at lunch, and 5 again at supper, the person meals will be 14. This unit of measure is intended to be more meaningful than the number of meals cooked, as it accounts for the quantity of food cooked as well as the frequency.

[3] For the purpose of this study the 'primary' stove is defined as the stove the household reported to use 'most of the time'.

[4] The ID label in this household reads KWA, which is the abbreviation for the Creole version of Croix de Bouquet.

Current fuel use

The reported average amount spent on charcoal per week was 575 HTG, (approximately 8.70 USD, range 150-800 HTG). Based on the field team's estimated price of 25 HTG[5] per 0.8kg small bucket or tin known as a '*mamit*' (see Figure 2), this equates to approximately 18kg charcoal per week or 2.6kg per day[6].

Figure 2 Typical 'mamits' of charcoal sold in Haitian markets[7]

Current drivers for using charcoal as the main cooking fuel are described in

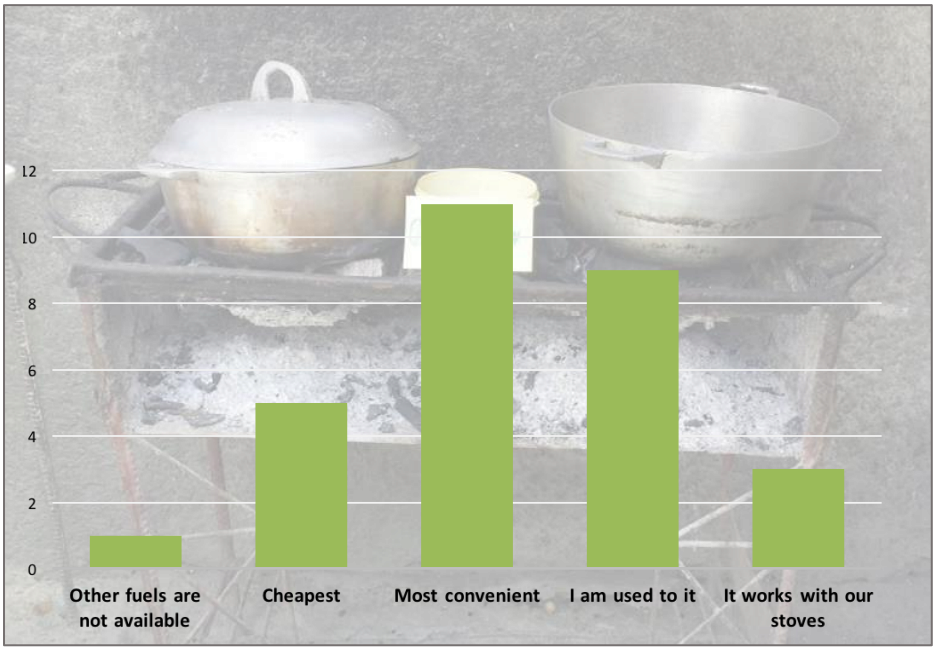
[5] The price and weight of a 'mamit' of charcoal can be very variable between locations and sellers. Most participants reported that they paid 25 HTG per 'mamit', but some reported to pay as high as 50HTG.

[6] This estimate is based on information provided during personal communication with the Energy Director, Le Bureau des Mines et de l'Energie d'Haiti on October 24th 2016. However, this estimate is only indicative and should be interpreted with caution as there are many variable factors i.e. prices vary between vendors and locations, quality of charcoal and the sizes of a '*mamit*' itself is not standard.

[7] Downloaded from http://blog.kulikulifoods.com/2015/11/05/deforestation-in-haiti/

Figure 3**Error! Not a valid bookmark self-reference.** below.

Figure 3: Drivers for choosing charcoal as the main cooking fuel (n=18).



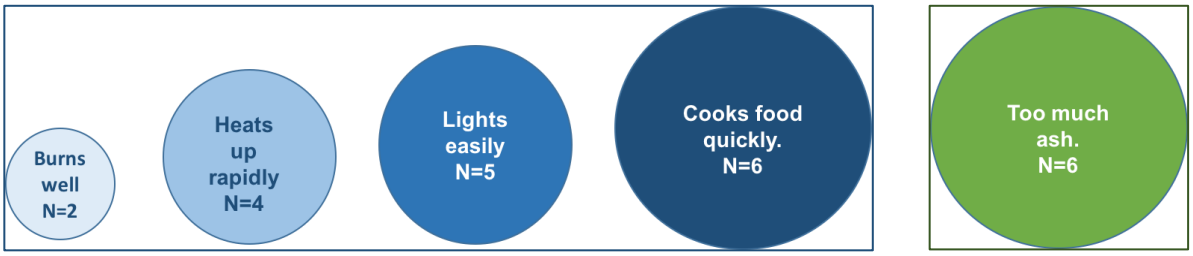
Perceptions of briquettes

Perceptions: end of week 1

One week into the study, the participants were asked if they liked using the briquettes and prompted to provide reasons for their views. The responses were generally very positive, and all participants (n=18) reported that they liked to use the briquettes. The reoccurring reasons

for liking the briquettes, as well as perceived disadvantages after one week, are reflected in Figure 4 below.

Figure 4: Comments mentioned by more than one participant: Positive on the left, negative on the right



Perceptions: end of week 2

By the end of the study, two households had withdrawn from the study citing the large amount of ash production as the reason. The overall perceptions of the briquettes from the remaining participants were very positive (see box below).

> "*We would like it to be available on the market."* HH 02_CdB
>
> *"I am available to make advertising for the briquette, even on the TV."* HH 06_CdB

The participants were asked an open question about what they thought of the briquettes. They were encouraged to give their positive as well as negative thoughts and to provide reasons for their opinions. Comments from the participants as well as field team observations suggest that the ash both makes the kitchen area dirty and interferes with cooking. Specifically, the accumulation of ash can interrupt the cooking process as it sometimes covers the flame and requires the cook to shake the stove to remove it to keep the fire alight.

Table *1* presents their unprompted responses. The perception that the briquettes reached a higher temperature than charcoal ('becomes hotter') allowing for faster cooking was the more frequently perceived advantage. Even though they received the test briquettes for free, the participants described them as 'economical,' as they perceived that food took less time to cook than when they used charcoal.

Echoing the perceptions of the two participants who had withdrawn, the amount of ash produced during the cooking was the reoccurring problem with briquettes. Comments from the participants as well as field team observations suggest that the ash both makes the kitchen area dirty and interferes with cooking. Specifically, the accumulation of ash can interrupt the cooking process as it sometimes covers the flame and requires the cook to shake the stove to remove it to keep the fire alight.

Table 1: Perceptions of the briquettes after two weeks (n=18)

Positive	Count	Negative	Count
Cooks hotter/ faster / more economical (n=9)	𝍸 ||||	The amount of ash produced is a problem (n=13)	𝍸 𝍸 |||
Lights quickly and easily (n=7)	𝍸 ||	Takes longer to cook (n=1)	|
Burns well (n=2)	||	More supervision required (n=1)	|
Cooks food well (n=2)	||	Dirtier to use because of ash (n=1)	|
Lasts longer (n=2)	||	Difficult to differentiate briquettes from ash (n=1)	|
Can reignite (n=1)	|		
Cleaner to handle (n=1)	|		
Pot remains cleaner (n=1)	|		
Can easily be counted (n=1)	|		

Although most users reported that briquettes worked well in all their charcoal stoves, one cook reported difficulties using briquettes on the Plop Plop stove. The field team reported that,

"She can't use the briquettes with the Plop Plop stove because it does not stay alight. The stove design did not provide enough air to allow for good combustion making the briquettes difficult to light. There is not enough air to keep the briquettes alight." Field team notes

However, one other home using the larger version of the Plop Plop stove reported no similar difficulties.

When asked about the speed at which the briquettes burned out compared to charcoal, no conclusive majority opinion emerged. Nine participants reported that the briquettes burned 'more quickly' than charcoal, eight said they were slower, and one saw no difference. However, 15 of the participants described the noted increase or decrease in speed of burn as a positive characteristic, two said it made no difference, and only one felt an increase in burning speed was undesirable. There was no discernible trend when these responses were analysed according to stove type.

The majority of participants (n=17) said there were no foods that could not be cooked with briquettes, although one reported that the briquettes were not sufficiently hot to cook ground corn[8].

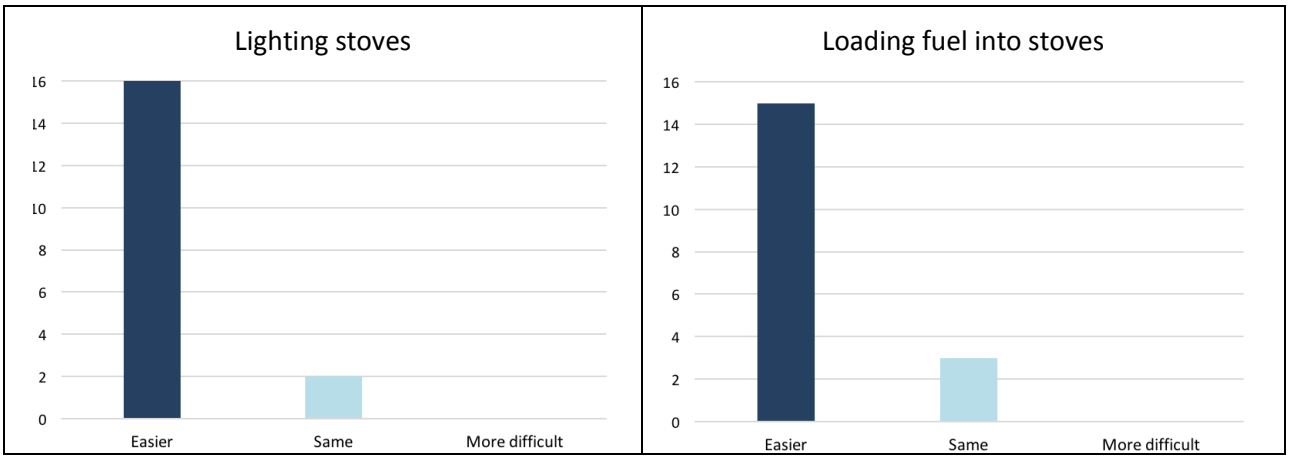
[8] Cooking ground corn requires continual stirring on a hot fire. It was reported by the field team that to keep the fire as hot as possible the cooks needed to shake the stove more often to remove ash when using the briquettes compared to when they use charcoal.

No participants reported the need to make changes to location or any other characteristics of their cooking, as a result of the switch from charcoal to briquettes. No one reported any issues with using the briquettes year round.

The householders were asked about the perceived ease of using the briquettes compared to charcoal for a range of cooking-related tasks. The responses are presented in

Table *2*. When the cooks could articulate a reason for their perception, this information is provided under each graph (with incidence of each reason in brackets).

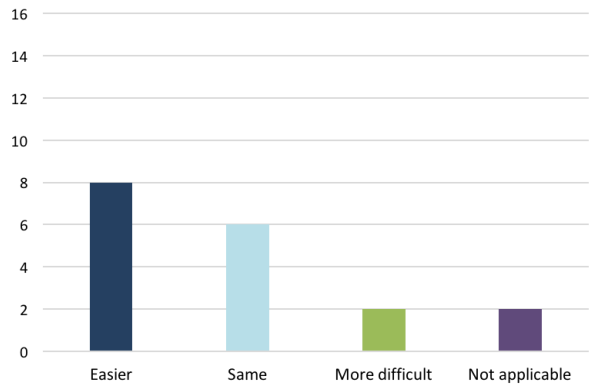
Table 2: Perceived ease of use of briquettes compared with charcoal (n=18)



Comments: *Lights fast (9) Economical (1)*

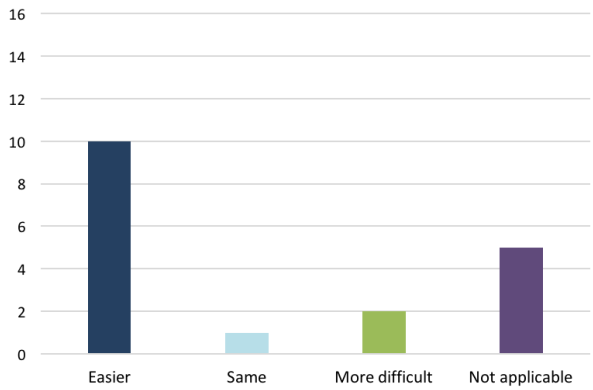
Comments: *Cleaner to handle (7); uniform pieces (3)*

Keeping the stove alight



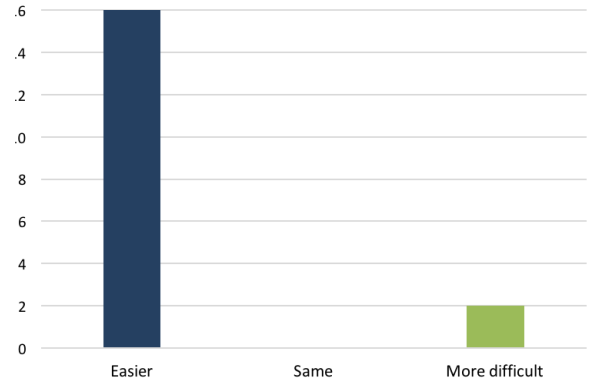
Comments: *The ash keeps the heat and slows the fire*[9] *(2)*

Topping up with fuel *during* cooking



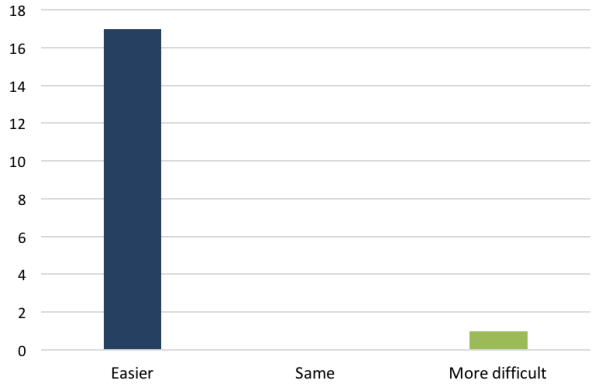
Comments: *Easier to handle uniform briquettes (3)*

Simmering food



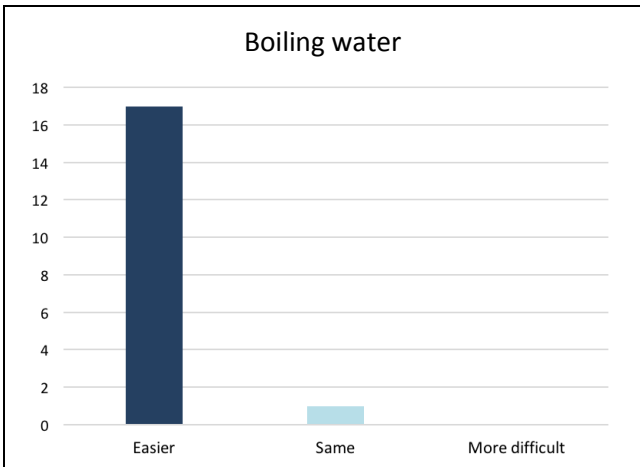
Comments: *Retain heat better / ash covers it (2)*

Frying/ high-temperature cooking



Comments: *Stays alight (1); It burns faster (6); the pot fits better on stove (1)*

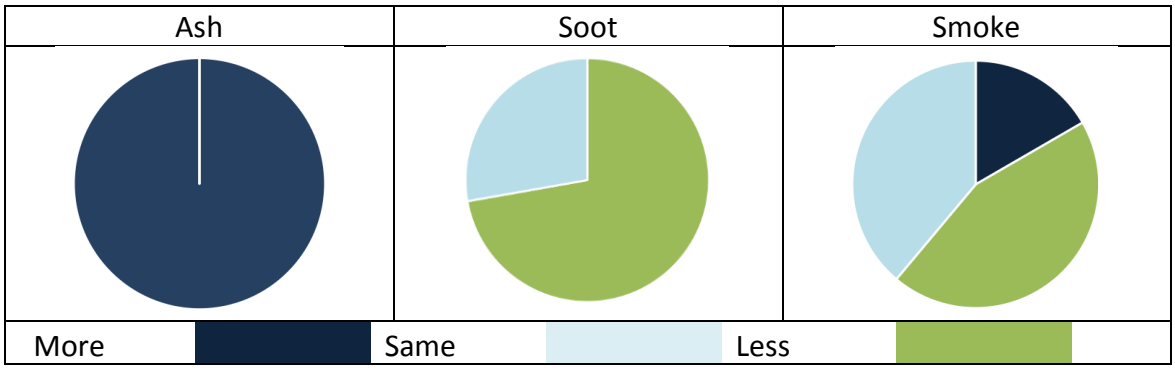
[9] 'Slows the fire' is interpreted to mean that the ash reduces the flame and allows the briquettes to burn more slowly.



Comments: *It is faster* (4)

The participants were asked if briquettes produced more, less, or the same as charcoal of ash, soot, and smoke. The results are *presented* in Figure 5 below.

Figure 5: Relative amount of products of combustion created by briquettes compared to charcoal.

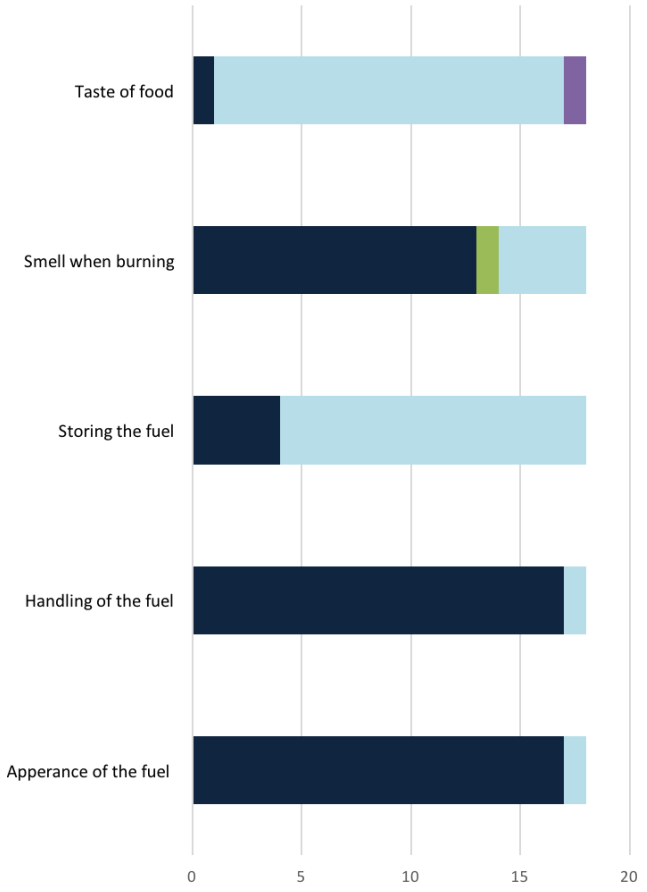


> "*The ash is the biggest problem because one has to be present to shake for removing it."* *HH 01_TAB*
>
> "[The briquettes] *do not give any problem except the ash."* *HH 01_CdB*

The cooks were also asked whether they prefer certain characteristics of the briquettes compared to charcoal. Their responses are presented in

Table *3*. The right hand column provides the reason for preferring briquettes when a definite preference was shown.

Table 3: Preferences between briquettes and charcoal regarding certain characteristics.

N=18	Reasons provided for preferences.
	Overall there was no perceived difference in taste of food when cooked with the different fuels.
	"'Because it [briquettes] does not have any smell." "The briquette has a waste smell."
	Overall no preference but one HH reported, "The briquette does not make dust to dirty the house".
	"My hands do not get dirty." "It does not break down, it keeps its shape." "Much easier to touch as they have the same size."
	"It has a good appearance" "It has a round shape, it's nicer." "Because it has a good presentation and it does not smash."
Briquettes Charcoal No preference Missing data	

4. Street vendor results

Of the eight street vendors recruited, three were lost to follow-up; two female and one male. The final results are based on a sample of five vendors. All street vendors completing the study were female; two had their stall in Croix de Bouquet, and three in Tabarre.

Briquette dissemination and compliance

Each street vendor received either five or six sacks of briquettes, each weighing approximately 35kg. Supply was based on use and demand.

Reported and observed briquettes use: end of week 1

All five vendors reported to use the briquettes on each day they cooked during the first week of the study. On arrival at the stalls for the second visit, the enumerators found all vendors still had some briquettes remaining. Observation of the cooking area revealed that all vendors had either one or two stoves, which were alight and being used (total nine stoves). Seven of these nine stoves were fuelled with briquettes at the time of the visit.

Reported and observed briquettes use: end of week 2

When the survey team arrived for the third visit, four vendors reported having used all their briquettes, and the fifth vendor had half a bag remaining. She reported that she had been given more briquettes than she needed for the study period and was planning to continue using them. Table 8 in the Appendix shows the number of sacks of briquettes provided to each vendor over the duration of the project alongside the average number of dishes or portions served each day.

Vendor characteristics

The majority of the street vendors were in the 30-45 age category, with one 45-60 years old.

The number of meals served per day ranged from 30-80 with an average of 48. Food types cooked was very similar across the vendors: all cooked rice & beans or meat (two pots), and three also cooked '*legim*' or stew in a single pot. All food was cooked from raw/uncooked ingredients at the stall.

Stove use and cooking patterns

Vendors said they chose charcoal primarily because: it was the most convenient (n=3); it was the cheapest (n=2); no other fuel was available (n=2); it worked best with their stoves (n=2); and they did not know about briquettes (n=1).

All vendors except one used the traditional rebar (*fer forge*) stove with 3 burners as their primary stove (Figure 6: left). The remaining vendor used another type of traditional three burner stove (Figure 6: right).

Figure 6: Stove types used by study street vendors.

As with the households, stove stacking was frequently seen at the vendors' stalls, with between two to four stoves been used to complete the cooking tasks.

Two vendors reported to use the briquettes exclusively during the first week of study, the other three used it in combination with charcoal.

The cooking patterns were unchanged at visit 3.

Perceptions of briquettes

Perceptions: end of week 1

One week into the study, the vendors were asked if they liked using the briquettes and prompted to provide reasons for their views. The responses were generally very positive, and all participants reported that they liked to use the briquettes. The participants' responses are shown in box below.

> *"I like the briquettes, but the **price is too expensive**[10]."*
>
> *"Yes* [I like the briquette*], because it **burns well**, it is **fast to cook** with, and it **does not give soot** to the pot."*
>
> *"It **burns well** in spite of the ash, and **even in windy conditions, it stays** [*alight*] longer in the stove."*
>
> *"I like it for several reasons: it **does not burst while burning**, it **does not give smoke** compared to charcoal, and it **burns well, b**ecause of this **I make a lot of savings**."*
>
> *"I like it because **it is fast, it boils the food well,** and it **keeps it hot**."*

It is possible that the street vendor reported 'making savings' as they perceived that it took less briquette fuel to complete their cooking tasks compared with the amount of charcoal required for the same tasks. The participants therefore assumed the briquettes are more economical despite the fact that they did not pay for them during the study nor were told their market price.

Perceptions: end of week 2

Street vendors are a notoriously difficult sector of the population to recruit and retain for research. By the end of the study, three vendors had withdrawn from the trial. One cited the large amount of ash production as the reason. The one male vendor stated he was withdrawing because the 'briquettes smell bad,' and he need to go to the countryside for family reasons. The third vendor was repeatedly absent from her stall.

The overall perceptions of the briquettes from the remaining five participants were still very positive at the end of the two week study period. They all reported to like them and found

[10] The price of the briquettes was not discussed with the participants and so this comment is based on the vendor's own previously formed assumptions and/or knowledge.

them to be a 'good product'. The vendors were asked about their experiences using the briquettes. The unprompted responses are given in the table below.

Table 4: Perceptions of the briquettes after two weeks (n=5)

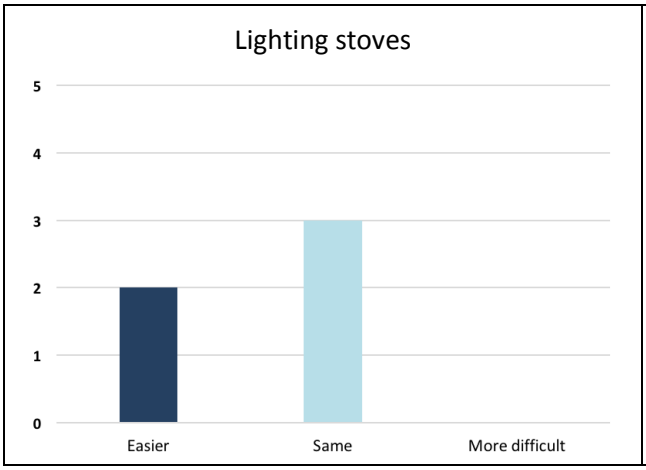
Positive	Count	Negative	Count
Lasts longer (n=3)	|||	Ash is a problem (n=2)	||
Cleaner pots and stoves (n=2)	||	Burns too fast (n=1)	|
The ash is good (n=1)	|	Pungent smell (n=1)	|
		Difficult to relight if wet (n=1)	|

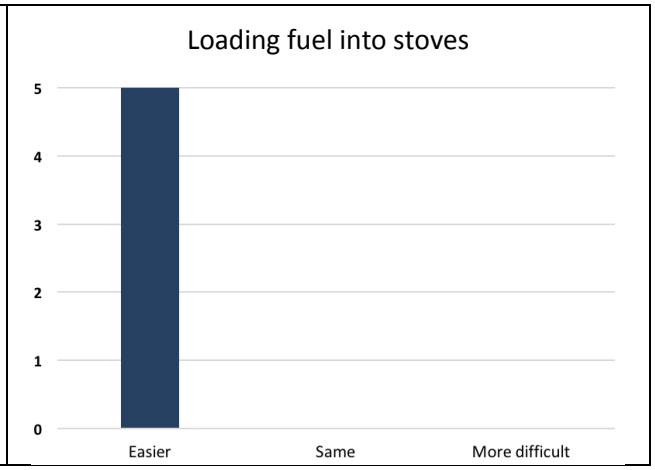
Briquettes were reported to work with all stoves used by the vendors. There was not a consensus of opinion about the speed of burn: when specifically asked about this, two respondents reported that it burned faster, two slower, and one as no different. However, only one vendor considered this difference to be negative.

All vendors were able to cook the normal range of foods with briquettes. No one reported needing to make any other changes to their cooking behaviour as a result of switching to briquettes.

The vendors were asked about the perceived ease of using the briquettes compared to charcoal for a range of cooking related tasks. The responses are presented in Table *5*. When the cooks could articulate a reason for their perception, this is provided under each graph (with incidence of each reason in brackets).

Table 5: Perceived ease of use of briquettes compared to charcoal (street vendors n=5)

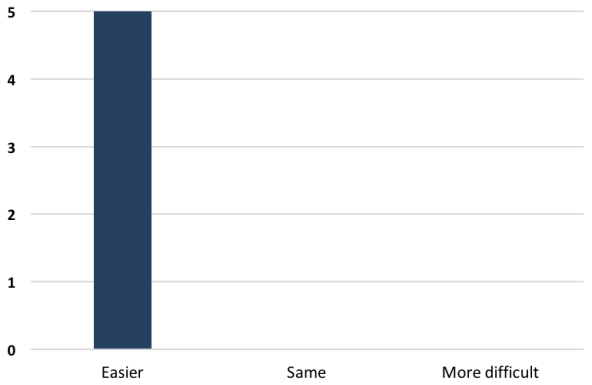




Comments: *Briquettes light faster than charcoal (1), lights quickly (1)*

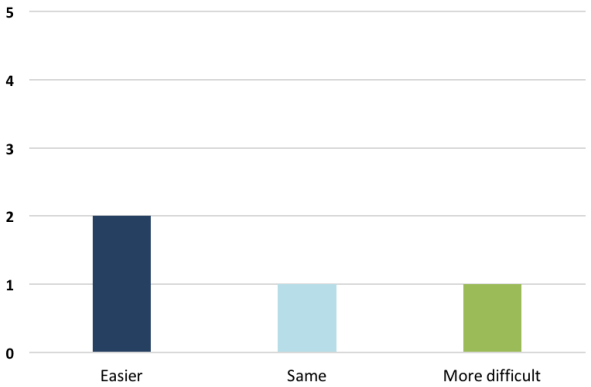
Comments: *Because of its shape (1), it does not dirty the hand and does not make several small pieces (1).*

Keeping the stove alight



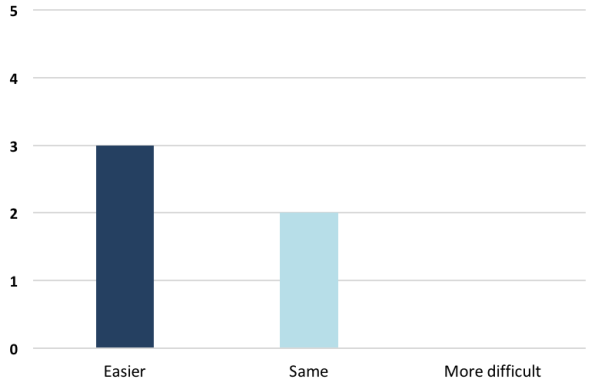
Comments: *Easier because the ash keep the heat (1), it always stays alight (1)*

Topping up with fuel *during* cooking



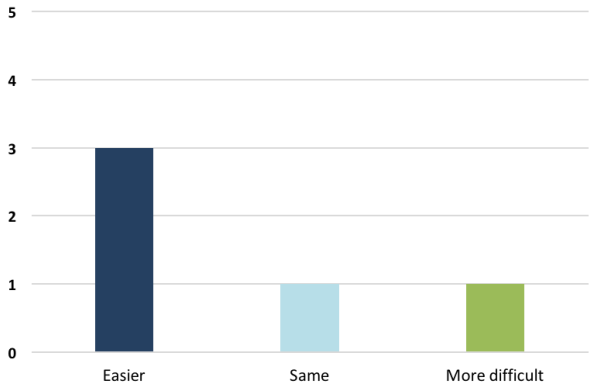
Comments: *Refill is faster because of the shape* (1), *it does not often happen because the briquettes stay alight*. (1)

Simmering food

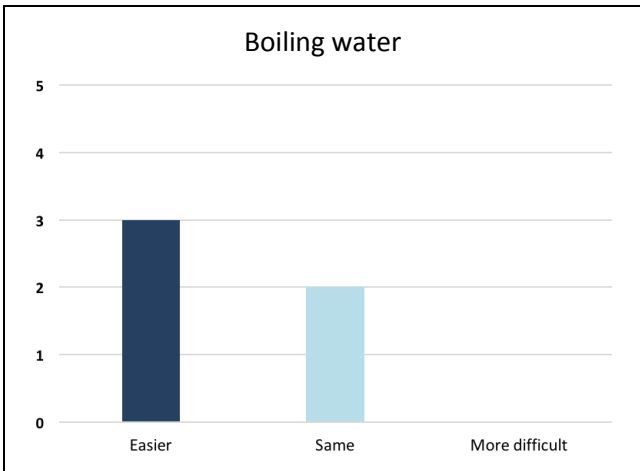


Comments: *The ash keeps it hot* (2)

Frying/ high-temperature cooking



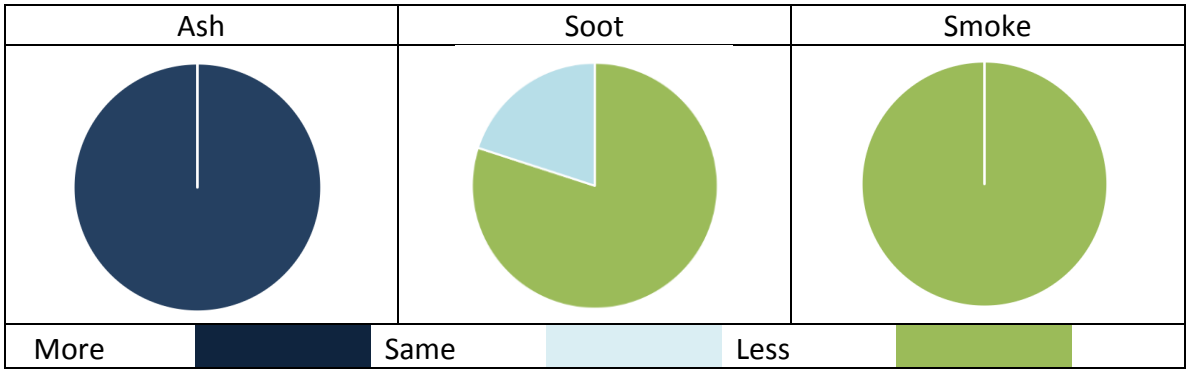
Comments: *The charcoal gives more heat* (1)



No comments

The vendors were asked if briquettes produced more, less, or the same as charcoal of ash, soot, and smoke. The results are presented in Figure 7 below.

Figure 7: Relative amount of products of combustion created by briquettes compared to charcoal (n=5).



Unlike the household cooks, the street vendors did not always perceive the high quantity of ash produced by the briquettes as a problem. See box below.

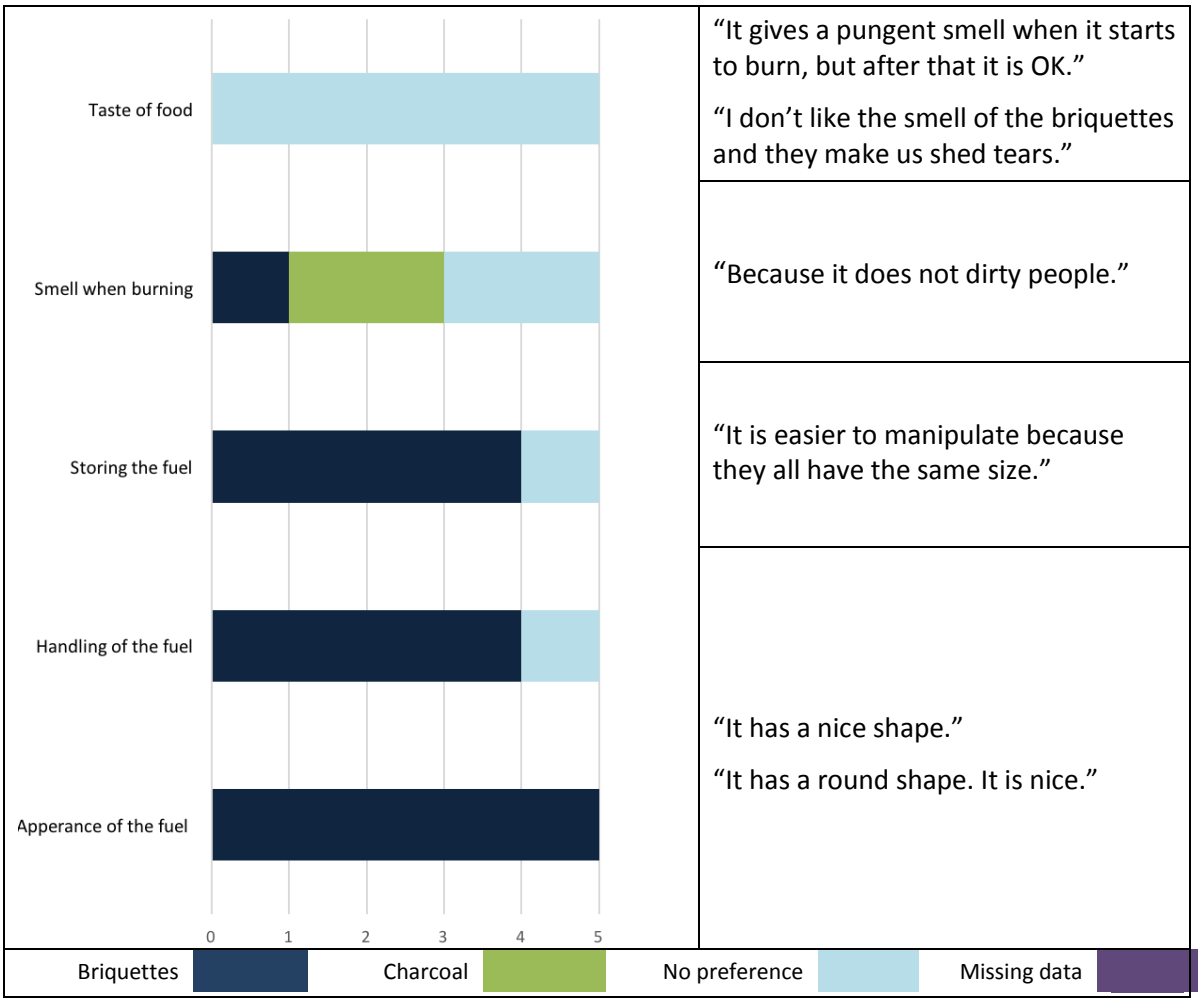
> "*The only problem is the ash."* SV 04_Tab
>
> *"[It is] easier [than charcoal to keep alight] because the ash keeps the heat."* SV2 CdB
>
> *"The ash still keeps it hot [and so allows simmering]."* SV1 CdB

The vendors were asked whether they prefer certain characteristics of the briquettes compared to charcoal. Their responses are presented in

Table *6*. The right hand column provides the reason for preferring briquettes, when a definite preference was shown.

Table 6: Preferences between briquettes and charcoal regarding certain characteristics

N=5	Reasons provided for preferences
	Overall no problem with the briquettes affecting the taste of the foods cooked.



"It gives a pungent smell when it starts to burn, but after that it is OK."

"I don't like the smell of the briquettes and they make us shed tears."

"Because it does not dirty people."

"It is easier to manipulate because they all have the same size."

"It has a nice shape."

"It has a round shape. It is nice."

The reported 'pungent smell' evident on lighting briquettes seemed to be a bigger issue for the street vendors than the household cooks, which might be due to the larger volumes of briquettes they were lighting at one time. It is also worth noting that 'agricultural waste' was translated into a creole word meaning waste or things you discard. People tend to think about contaminated wastes in this context which might have increased the expectation of an odour or made the smell seem worse.

No vendors reported any problems with briquettes caused by the weather and all felt they could use briquettes throughout the year.

"Even when it's rainy, the briquettes light fast." *SV 03_Tab*

5. Interest in future use of briquettes

Household cook interest in future purchase and use of briquettes

Two participants had heard of briquettes prior to the study but had not used them, as they did not know where to purchase them.

All except one person stated that they would continue using the briquettes if they were easily available in the neighbourhood. However, they were willing to pay less for briquettes than they pay for charcoal, stating that they would consider paying an average 24 HTG per '*mamit*' (range 15-25 HTG

This relatively low willingness to pay is somewhat surprising given the overall satisfaction with the briquettes. However, it could be a product of how the question was phrased and/or the culture of haggling in Haiti. It could also be a function of the fact that many Haitian families and small businesses are forced to spend a significant portion of their limited cash resources on fuel. For example, a 2010 USAID study reported that urban households in the Port-au-Prince Metropolitan area spend approximately 30% of their income on cooking fuel[11]. The reoccurring positive perceptions of the briquettes suggest that the participants would be willing to pay at least the equivalent price of charcoal if other factors such as accessibility and reliable supply did not create barriers.

> *"I would prefer to use it [the briquette fuel], but it should be cheaper than the charcoal."* HH 08_tab
>
> "*It is good. I would like to buy it, but they have to sell me at a good price."* HH 05_Tab

Street vendor interest in future purchase and use of briquettes

Three respondents had heard of briquettes previously, but none had used them, mainly because of unavailability in the market.

Four of the five vendors would only be willing to pay less for briquettes than charcoal. However, all said they would choose to continue to use them if they were easily available in their neighbourhood.

"I gave some briquettes to a friend. She likes it and wants to buy it too. We have been trying to find the indicated place to buy it, but we did not find it". SV 02_CdB

Due to the small sample size, no clear trends emerged about willingness to pay.

[11] Assessment of Haiti Alternative Cooking Technologies Program (2010). Prepared by Nexant Inc. for United States Agency for International Development. Available for download from http://pdf.usaid.gov/pdf_docs/Pnadx776.pdf

Combined environmental mandate.

There appears to be some degree of environmental awareness and concern regarding the impact charcoal is potentially having on the Haitian landscape in both household cooks and street vendors. Two household cooks and one street vendor stated that briquettes should be available for environmental reasons. See comments in the box below.

> "*The briquette should be available so that everyone can find it and buy it so that we can avoid deforestation in the country."* HH 10_ CdB
>
> [Interviewer: Will you continue using the briquettes?*] "Only for the environment."* HH 01_Tab
>
> *"I would like to say thank you because the briquette was useful for me. I would like it to continue. The country needs this kind of experience as less trees would be cut".* SV 03_Tab

6. Summary and recommendations

This study indicates that briquettes do have the potential to replace or supplement conventional charcoal as a cooking fuel in some homes and food stalls in Port-au-Prince metropolitan area. Although it was a short study with a small sample, a range of fairly consistent messages that emerged across the both groups of participants are presented below.

- All participants reported to use the briquettes and had an overall positive perception of them.
- There was general consensus that briquettes were easier to light compared with charcoal, burned at a higher temperature, and you could cook the same foods with relatively fewer briquettes (were more 'economical') and;
- Most participants felt briquettes could be used in all stove types (with the exception of the smaller version of the 'PlopPlop' stove) and for cooking nearly all types of food.
- It was unanimously considered that briquettes could be used throughout all seasons.
- Participants perceived that briquettes produced less soot, and most felt they produced the same or less smoke compared with charcoal.
- Briquettes were generally considered to be easier to handle and less messy than charcoal.
- Ash production was frequently cited as a significant drawback to the briquettes, and a reason for dropout from the study. This is clearly a key issue for the acceptance of briquettes by cooks in Haiti, and a likely barrier to wider uptake, although it should be noted that a small number of cooks found it to be an advantage.
- Unpleasant odors on lighting the stove were also cited but with less of a consensus.

- All participants said they would be interested in using briquettes in the future, but the majority stated that they would want to pay less for briquettes than they do currently for charcoal.
- There was a spontaneously expressed concern regarding the environmental impact of charcoal production which might be a potential driver for uptake in some sectors.

Recommendations

Recommended next steps are clustered around three thematic areas: technical improvements to the fuel, enhanced investigation of motivations and enablers for purchase, and a more robust examination of the potential contribution of briquettes to the Alliance's long-term impact goals. It is also worth noting that these recommendations are based on data from a small study conducted over a short duration and so may not be applicable to other populations or areas.

Technical improvements

A combination of laboratory and controlled cooking investigations could enhance user satisfaction with the briquettes, including:

- Explore and quantify the participant's perception of using less fuel than charcoal for equivalent meals.
- Quantify and assess the impact of the ash on the functioning of the stove;
- Identify tasks that can be facilitated by the presence of ash;
- Investigate ways to reduce the incidence of smell and stinging eyes when lighting briquettes;
- Identify cooking techniques that might reduce the production and accumulation of ash;
- Assess the ease of lighting in stove models with enclosed combustion chambers, such as the 'PlopPlop' Stove; and
- Consider the potential for redesigning commonly used Haitian stoves to better accommodate briquette fuel.

Motivations and enablers for purchase

- A full willingness to pay exercise using proven methodologies is needed to provide a robust estimate of the price point where consumers will purchase the briquettes.
- A market-level assessment of distribution channels and outlets should be completed. Particular care should be given to mechanisms that facilitate consumer's ability to switch to briquettes, such as access, product quantities, packaging, and potentially financing mechanisms.
- Potential promotional messages should be explored including some of the product attributes liked by consumers in this rapid pilot assessment: faster cooking, longer cooking due to ash cover, and cleaner fuel handling.

Contribution to impact goals

It is likely that the investment needed to successfully scale up briquettes in Haiti will compete for resources with other opportunities. In order to make wise investment choices that will lead to achieving its impact goals, the Global Alliance may want to evaluate briquettes more completely with regards to their likely effect on environmental, gender, lifestyle, and health targets. For example, research questions may include:

- What are the full range of consequences to forest cover and other landscape issues of replacing charcoal with briquettes? How does this impact vary across regions?
- Does consistent use of briquettes result in measurable time savings? What impact does it have on drudgery and multi-tasking for cooks?
- What impact could briquettes potentially have on morbidity and mortality from cooking-smoke related diseases in Haiti, particularly in light of the public health status of Haiti?

7. Appendices

Selection Criteria: Households

Please note: we need a total of 10 households using traditional charcoal stoves and 10 with more improved stoves.

Traditional charcoal stoves include	*Improved charcoal stoves include*
Traditional metal charcoal stove- 1 burner round	*Mirak*
Traditional metal charcoal stove- 1 burner square	
Traditional rebar (fer forge) charcoal stove- 1/2/3 burner	

Please approach a home *in the selected communes and ask to speak to the main cook. Note: If the main cook is not available, please arrange to come back later. Once you have the main cook please read the following:*

My name is _____, and I work with the Institut Haitien de l'Energie based in Port Au Prince. Together with a US based company called Berkeley Air, we are running a study in Port Au Prince to explore the acceptability of briquettes as a new cooking fuel. Briquettes can be used on your current charcoal burning stove. Through this study we want to understand the experiences and opinions of the fuel when used by cooks like you. We hope this will lead to better fuels being available across Haiti.

This study would involve us giving you a free supply of briquettes to use on your charcoal stove(s). We would then return to your home after one week and then again after two weeks to ask you some questions about your experiences with briquettes.

Then continue by reading out the following questions;

1.	Would you be willing to take part in a study like this?	No	Finish
		Yes	Continue
	If they are not willing to take part, please ask why and note this on the refusal/non eligible tracking form.		
2.	Are you willing to answer a few questions to see if we can include you? It will take approx. 5 minutes	No	Finish
		Yes	Continue
3.	Do you mostly use charcoal for cooking at home? *[By mostly we mean at least half of the cooking is done with charcoal]*	No	Finish
		Yes	Continue
4.		No	Finish

	Would you be willing to use briquettes when cooking at home every day for the next two weeks? *[Please show them a sample of the briquettes*] We would provide these to you for free for the duration of the study.	Yes	Continue
5.	Do you use charcoal on a traditional stove (check it is on the list above) or one of the following stoves (read out the list of improved stove above)?	No	Finish
		Yes	Continue
6.	Do you do most of your family cooking at home?	No	Finish
		Yes	Continue
7.	Will you be available for us to return to your home to ask some questions next week and again in 2 weeks' time at the end of the study?	No	Finish
		Yes	Continue

If the person does not meet the criteria [one or more of the responses was 'finish'], please thank the participant for their time, record the reason for not meeting criteria on the 'refusal/non eligible' form and move to the next household.

If the person meets the criteria [all seven responses were 'continue'] please now move on to completing the consent form.

If they consent to take part- please give them a study ID number and add them to the 'recruitment list' ensuring you get their address and telephone number.

Selection Criteria: Street Vendors

Please note: we need a total of 8 street vendors. We need a mix of large and small business and male and female vendors.

Please approach a street vendor *in the selected commune and ask to speak to person who normally/regularly works at the stall and is able to make decisions regarding the stall. Note: If the person who normally works at the stall/ makes the decisions is not available, please arrange to come back later. Once you have the person who normally/regularly works at the stall and is able to make decisions please read the following:*

My name is _____, and I work with the Institut Haitien de l'Energie based in Port Au Prince. Together with a US based company called Berkeley Air, we are running a study in Port Au Prince to explore the acceptability of briquettes as a replacement for charcoal. Briquettes can be used on your current charcoal burning stove. Through this study we want to understand the experiences and opinions of the fuel when used by cooks like you. We hope this will lead to better fuels being available across Haiti.

This study would involve us giving you a free supply of briquettes to use on your charcoal stove(s). We would then return to your stall after one week and then again after two weeks to ask you some questions about your experiences with briquettes.

Then continue by reading out the following questions;

1.	Would you be willing to take part in a study like this?	No	Finish
		Yes	Continue
If they are not willing to take part, please ask why and note this on the refusal/non eligible tracking form.			
2.	Are you willing to answer a few questions now about your work to see if we can include you? It will take approx. 5 minutes	No	Finish
		Yes	Continue
3.	Do you mostly use charcoal for cooking at your stall? *[By mostly we mean at least half of the cooking is done with charcoal]*	No	Finish
		Yes	Continue
4	Would you be willing to use briquettes when cooking at your stall every day for the next two weeks? *[Please show them a sample of the briquettes*] We would provide these to you for free for the duration of the study.	No	Finish
		Yes	Continue
5	Do you expect your stall to remain in this location for the next two weeks?	No	Finish
		Yes	Continue
6	Will you be working on this stall for most of the business days in the next two weeks and be available to talk to us in one and two weeks' time??	No	Finish
		Yes	Continue

If the person does not meet the criteria [one or more of the responses was 'finish'], please thank the participant for their time, record the reason for not meeting criteria on the 'refusal/non eligible' form and move to the next street vendor stall.

If the person meets the criteria [all six responses were 'continue'] please now move on to completing the consent form.

If they consent to take part- please give them a study ID number and add them to the 'recruitment list' ensuring you get their address and telephone number.

Visit 2 Survey Form: Households

Please ensure you are interviewing the main cook who you spoke with at the recruitment visit.

Please note: In order to maintain confidentiality of each participant, information from this cover sheet will be entered and stored separately from the data in the completed questionnaire

All notes and guides for field team on the form are in written in *italics* and placed in [*square brackets*]. Please ensure you read all of these carefully.

MA means **multiple answers** are allowed. SA means **single answer only are allowed**.

A. Participant Identification			
A1	Date [dd / mm / yyyy]	_ _ / _ _ / _ _ _ _	
A2	Time of visit [hh:mm] 24-hr time	_ _ : _ _	
A3	Household ID		
A5	Surveyor Name/ ID		
A6	Name of main cook		
A7	Age group of main cook [yrs]	Less than 18	1
		18-30	2
		30-45	3
		45-60	4
		60 or more	5
A8	Weather on arrival at the home	Dry and sunny	1
		Cloudy but not raining	2
		Raining	3
		Other [*describe*]	99

B. Stove and Kitchen Area Observation.							
[Please ask the participant to show you the cooking area. ***If possible, please go to this area rather than the participant bring the stove(s) to you****.]*							
B1	*[Please take a photograph of the main cooking area in the household, including ALL stoves in that location. PLEASE ENSURE THE HOUSEHOLD ID CARD IS CLEARLY VISIBLE IN THE PHOTOGRAPH. Enter '1' when done. If you are unable to take a picture enter 99]*						
B2	B2.1 [*On arrival at the home, what stoves, could you see* ***in the cooking area?*** *Use stove codes. The stoves you see do not have to match the stoves listed in section C]*	Stove 1	Stove 2	Stove 3	Stove 4	Stove 5	Stove 6
	B2.2 [*What was the status of these stoves on your arrival at the home Use 'stove status' codes.]*	Stove 1	Stove 2	Stove 3	Stove 4	Stove 5	Stove 6
	B2.3 [*What fuel was either being burning or present IN or ON the stove on your arrival at the home?* *Use 'fuel' codes. If there is no fuel please enter '0']*	Stove 1	Stove 2	Stove 3	Stove 4	Stove 5	Stove 6
B3	[*Where is the bag of briquettes on arrival at the home?]*	Not present in the home [go to B5]					1
		In the house but NOT stored with the other cooking fuels.					2
		In the house and stored with the other cooking fuels.					3
		In the house with no other cooking fuels present					4
		Other [*please describe*]					99
B4	*[About how much of the original bag of briquettes is remaining on your arrival at the home?]*	Less than 1/4					1
		About 1/4					2
		About 1/2					3
		About 3/4					4
		Bag is totally full					5
		Other [*please describe*]					99

B5	*[If the bag of BRIQUETTES is NOT present in the home please ask where it is. Write everything the participant says down below.]*
B6	[Please note any other relevant observations in the cooking area on arrival at home]

Current Stove and Fuel Use							
C1	How many different types of stoves do you **currently use at least one time** in a week? *[Please note that this refers to number of stoves, not stove types. For example, if a household uses two stoves of the same type, mark 2.]*						
C2	Please list all the stoves that you use at least once per week at this time of year. *[Use STOVE CODES. MA allowed. Ensure they list the same amount as the number given for C1. Describe here if other]*	1st stove type	2nd stove type	3rd stove type	4th stove type	5th stove type	6th stove type
C3	What would **you say** is the stove type you use **most of the time?** [SA]	*[Single answer. Use **STOVE** codes.* *Describe here if other:]*					
C4	What type is your secondary stove?	*[Single answer. Use **STOVE** codes.* *Describe here if other:]*					
C5	In the last week did you use any of the briquettes we gave you for cooking?	No [go to C11]					*0*
		Yes					*1*
C6	Which stove type(s) did you use them on?	*[MA allowed. **Use STOVE codes]***					
C7	How many days in the last week did you use the briquettes?	*[days]*					

C8	What other fuels did you use for cooking in the last week?	*[MA allowed. use FUEL codes]*	
C9	Do you like using the briquettes?	No	0
		Yes	1
C10	Please can you tell me why you like/don't like using the briquettes? [*Ask as appropriate to the response for question C9. Keep probing until you have a full and clear answer. Assume nothing!* ***Write everything the participant says down below. Then go to C13]***		
C11	Why did you NOT use the briquettes in the last week? [*Keep probing until you have a full and clear answer. Assume nothing!* ***Write everything the participant says down below.]***		
C12	Are you planning on using the briquettes in the next week? If yes, why. If no, why? [*Keep probing until you have a full and clear answer. Assume nothing!* ***Write everything the participant says down below.]***		
C13	Do you have any questions about the briquettes or how to use them? *[Please write down the question(s) asked and the response you gave]*		

D. Household Demographic Information			
D1	How many people usually SLEEP in this household?		
D2	How many people usually EAT food from your household stoves each day at this time of year? This can include people outside your direct family but eat from your stove on a regular basis at this time of year.		
D3	How many household members are aged 13 or younger?		
D4	How many rooms are used ONLY as bedrooms?		
D5	Is the household head male or female?	Male	0
		Female	1
Education and work			
D6	What level of education did you reach?	*Use EDUCATION codes.*	
D7	What level of education did the household head reach?	*Use EDUCATION codes*	
D8	What is the main source of income for this household at this time of the year? *[SA Do not prompt.]*	No one in the house has paid work [go to D10]	0
		Refused to say [go to D10]	1
		Street vendor	2
		Laborer [road builder, cleaner, driver]	3
		Skilled crafts [builder, carpenter]	4
		Professional [teacher, doctor, midwife]	5
		Other [describe]	99
D9	On what basis is the main source of income for this household paid? [*SA. Read out the options and allow the participant to choose the best response*]	Self-employed	1
		Paid wages in cash on a daily basis	2
		Paid salary on a long-term basis (weekly or longer)	3
		Other [*describe*]	99
D10	Who makes the decisions in this house regarding the major household purchases?	I do alone	1
		I do with my spouse	2
		My mother does alone	3
		My father does alone	4
		My parents do together	5

		Other [describe]	99
D11 Comments and observations			

E. Providing additional briquettes.			
E1	*[Did you provide the household with additional briquettes this visit?]*	No [go to E3]	0
		Yes	1
E2	*[How many more bags of briquettes did you provide the household with today?]*		
E3 [Notes and observations on this visit]			

Visit 2 Survey Form: Street Vendors

Please ensure you are interviewing the VENDOR who you spoke with at the recruitment visit.

Please note: In order to maintain confidentiality of each participant, information from this cover sheet will be entered and stored separately from the data in the completed questionnaire

All notes and guides for field team on the form are in written in *italics* and placed in [*square brackets*]. Please ensure you read all of these carefully.

MA means **multiple answers** are allowed. SA means **single answer only are allowed**.

A. Participant Identification			
A1	Date [dd / mm / yyyy]	_ _ / _ _ / _ _ _ _	
A2	Time of visit [hh:mm] 24-hr time	_ _ : _ _	
A3	Street Vendor ID		
A5	Surveyor Name/ ID		
A6	Name of main vendor		
A7	Age group of main vendor [yrs]	Less than 18	1
		18-30	2
		30-45	3
		45-60	4
		60 or more	5
A8	Weather on arrival at the stall	Dry and sunny	1
		Cloudy but not raining	2
		Raining	3
		Other [*describe*]	99

C. Stove Observation.							
B1	*[If possible please take a photograph of the stall including ALL stoves in that location. PLEASE ENSURE THE VENDOR ID CARD IS CLEARLY VISIBLE IN THE PHOTOGRAPH. Enter '1' when done. If you are unable to take a picture enter 99]*						
B2	B2.1 [*On arrival at the stall, what stoves, could you see* ***in the cooking area?*** *Use stove codes. The stoves you see do not have to match the stoves listed in section C]*	Stove 1	Stove 2	Stove 3	Stove 4	Stove 5	Stove 6
	B2.2 [*What was the status of these stoves on your arrival at the stall. Use 'stove status' codes.]*	Stove 1	Stove 2	Stove 3	Stove 4	Stove 5	Stove 6
	B2.3 [*What fuel was either being burning or present IN or ON the stove on your arrival at the stall? Use 'fuel' codes. If there is no fuel please enter '0']*	Stove 1	Stove 2	Stove 3	Stove 4	Stove 5	Stove 6
B3	[*Where is the bag/sac of briquettes on arrival at the stall?]*	Not present at the stall [go to B5]					1
		Next to the stall but NOT stored with the other cooking fuels.					2
		Next to the stall and stored with the other cooking fuels.					3
		Next to the stall and the only fuel present					4
		Other [*please describe*]					99
B4	*[About how much of the original amount of briquettes is remaining on your arrival at the stall?]*	Less than 1/4					1
		About 1/4					2
		About 1/2					3
		About 3/4					4
		Bag is totally full					5
		Other [*please describe*]					99

B5	*[If the bag/sac of BRIQUETTES is NOT present at the stall please ask where it is. Write everything the participant says down below.]*
B6	[Please note any other relevant observations in the cooking area on arrival at the stall]

Current Stove and Fuel Use							
C1	How many different types of stoves do you **currently use at this stall at least one time** in a week? *[Please note that this refers to number of stoves, not stove types. For example, if a stall uses two stoves of the same type, mark 2.]*						
C2	Please list all the stoves that you use on this stall at **least once per week** at this time of year. *[Use STOVE CODES. MA allowed. Ensure they list the same amount as the number given for C1. Describe here if other]*	1st stove type	2nd stove type	3rd stove type	4th stove type	5th stove type	6th stove type
C3	What would **you say** is the stove type you use **most of the time?** [SA]	*[Single answer. Use **STOVE** codes.* *Describe here if other:]*					
C4	What type is your secondary stove? [*SA. If no secondary stove enter 77*]	*[Single answer. Use **STOVE** codes.* *Describe here if other:]*					
C5	In the last week did you use any of the briquettes we gave you for cooking?	No [go to C12]					*0*
		Yes					*1*
C6	Which stove type(s) did you use them on?	*[MA allowed. **Use STOVE codes]***					

C7	How many days **in the last week** was food cooked on this stall?	*[days]*	
C8	How many days in the last week did you use the briquettes?	*[days]*	
C9	What **other** fuels did you use for cooking in the last week? [if no other fuel enter a 0]	*[MA allowed. use FUEL codes]*	
C10	Do you like using the briquettes?	No	0
		Yes	1
C11	Please can you tell me why you like/don't like using the briquettes? [*Ask as appropriate to the response for question C10. Keep probing until you have a full and clear answer. Assume nothing!* ***Write everything the participant says down below. Then go to C14]***		
C12	Why did you NOT use the briquettes in the last week? [*Keep probing until you have a full and clear answer. Assume nothing!* ***Write everything the participant says down below.]***		
C13	Are you planning on using the briquettes in the next week? If yes, why. If no, why? [*Keep probing until you have a full and clear answer. Assume nothing!* ***Write everything the participant says down below.]***		
C14	Do you have any questions about the briquettes or how to use them? *[Please write down the question(s) asked and the response you gave]*		

D. Stall Information			
D1	What kinds of foods/ hot drinks do you usually cook at this stall? *[MA Do not prompt.]*	Rice & beans or meat [two pots]	1
		Legim or stew [a single pot]	2
		Fried food such as patties, flattened fried plantains/salami	3
		Roasted or grilled meals such as corn/meat/peanuts.	4
		Hot drinks	5
		Other [describe]	99
D2	Do you cook the food from raw/uncooked here or cook elsewhere and re-heat on these stoves?	Cook all foods from raw/uncooked at the stall	1
		Cook some foods/reheat others	2
		Cook all foods elsewhere and only reheat at the stall	3
		Other [describe]	99
D3	What level of education did you reach?	*Use EDUCATION codes.*	

F. Providing additional briquettes.			
E1	*[Did you provide the household with additional briquettes this visit?]*	No [go to E3]	0
		Yes	1
E2	*[How many more bags of briquettes did you provide the household with today?]*		
E3 [Notes and observations on this visit]			

Visit 3 Personal Interview Form: Households

Field Team Notes:

This is an interview rather than a quantitative survey. We are aiming to get rich information from this interview and so have included several 'open' questions. Please ask the participants reasons for his/her answers and keep on being inquisitive until you feel as though you have all of the information. If something is not clear or contradictory to other answers, please keep asking until you are sure you understand the participants point of view. Please assume nothing!

Please ensure you are interviewing the main cook with whom you spoke during the last two visits.

Please note: In order to maintain confidentiality of each participant, information from this cover sheet will be entered and stored separately from the data in sections B-F

All notes and guides for field team on the form are in written in *italics* and placed in [*square brackets*]. Please ensure you read all of these carefully.

Please follow the 'skips' carefully they are there to help shorten the interview!

MA means **multiple answers** are allowed. **SA** means **single answer only are allowed**.

Please read: Thank you for taking part in this study. This is our last visit and I would now like to take some time and find out about your experiences with the briquettes over the last two weeks. Please tell us truthfully and completely. There is no right or wrong responses. We are wanting to learn from your experiences and improve the cooking fuels available to Haitian cooks like you.]

A. Participant Identification			
A1	Date [dd / mm / yyyy]	_ _ / _ _ / _ _ _ _	
A2	Time of visit [hh:mm] 24-hr time	_ _ : _ _	
A3	Household ID		
A4	Surveyor Name/ ID		
A5	Name of main cook		
A6	Weather on arrival at the home	Dry and sunny	1
		Cloudy but not raining	2
		Raining	3
		Other [*describe*]	99

B. Stove and Kitchen Area Observation.			
[Please ask the participant to show you the cooking area. ***If possible, please go to this area rather than having the participant bring the stove(s) to you****.]*			
B1	[*Where is the bag of briquettes on arrival at the home?]*	Not present in the home [go to B4]	1
		In the house but NOT stored with the other cooking fuels.	2
		In the house and stored with the other cooking fuels.	3
		In the house with no other cooking fuels present	4
		Other [*please describe*]	99
B2	*[About how many briquettes are remaining on your arrival at the home? If the household has two partial bags with briquettes remaining, give the combined TOTAL.]*	No briquettes left- the bag is empty [go to B5]	1
		Less than ¼ of a bag	2
		About ¼ of a bag	3
		About ½ of a bag	4
		About ¾ of a bag	5
		Bag is totally full	6
		Other [*please describe*]	99
B3	Why did you not use all the briquettes? [*MA allowed*]	I didn't like using them	1
		I was given too many and didn't need them all	2
		I preferred using my other fuels	3
		Other [*please specify*]	99
B4	*[If the bag of BRIQUETTES is NOT present in the home, please ask where it is, why it was removed, and how much was still in the bag when it left the house? Write everything the participant says down below.]*		
B5	*[Please note any other relevant observations in the cooking area on arrival at home]*		

C - Check-in Questions.			
C1	Has anything significant changed since our last visit one week ago in terms of the kinds of stoves you are using day-to-day?	Yes. Can you describe how?	1
		No	0
C2	Has anything significant changed since our last visit in terms of the number of people you are cooking for?	Yes. Can you describe how?	1
		No	0
C3	Did you cook at home most days during the last 2 weeks?	Yes	1
		No: Why not?	0
C4	During the last two weeks did you cook as you normally would at this time of year?	Yes [Go to Section D]	1
		No	0
C4.1	How and why did you cook differently?		

D - Using the Briquettes		
D1	What did you think of the briquettes we provided during the last 2 weeks? We would like to hear about all of the good and the not so good experiences you had using the briquettes. Please take your time and describe to us all of your impressions. *[Once they tell you what they think of the briquettes, ask them why they think that. After the first response, ask if there is anything else. Keep asking until the participant has given all of his/her impressions. Encourage him/her to tell you the good and bad impressions.]*	
	Responses	Why? *[Probe as required]*
D1.1		

D1.2		
D1.3		
D1.4		

D2	Did the briquettes work well in **all** of your charcoal stoves?	Yes [Go to D5]	0
		No.	1

D3	Please list all the stoves in which you think the briquettes did NOT work well. *[Use STOVE CODES. MA allowed. Describe here if other.]*	1st stove type	2nd stove type	3rd stove type	4th stove type

D4	What were the main reasons briquettes did not work in this/ these stoves? [*Write down everything the participant says]*

D5	Did the briquettes burn more quickly, more slowly or the same as charcoal?	More quickly	1
		More slowly	2
		The same [go to D7]	3
D6	Was this difference in speed of burning good or bad for cooking, or did it make no difference?	Good	1
		Bad	2
		No difference	3

D7	Are there any foods that you usually cook with charcoal that you were **NOT** able to cook using briquettes?	Yes. Which foods were they and why were you not able to cook them?	1
		No	0
D8	Did you have to change cooking location as a result of using the briquettes?	Yes. How and why?	1
		No	0
D9	Did you have to change anything else about how you cooked as a result of using the briquettes?	Yes. In what way and why?	1
		No	0
D10	[*Please ask If yes to D8 OR D9 otherwise go to D11]* Would you be prepared to permanently make these changes in order to use briquettes?	Yes	1
		No. Which in particular would you NOT be willing to change? Why?	0

D11	Compared with charcoal, did using briquettes make the following tasks the same, easier, or more difficult to perform? *[Read the following tasks out and mark their answer accordingly*]		
		1=Easier 2=More difficult 3=The same 4=Not applicable	If easier or more difficult, why?
D11.1	Loading fuel into your stoves?		
D11.2	Lighting stoves		
D11.3	Keeping your stove alight		
D11.4	Topping up with fuel *during cooking*		
D11.5	Simmering food		

D11.6	Frying/ high-temperature cooking		
D11.7	Boiling water		

D12	Compared with charcoal, did the briquettes produce the same, more, or less: *[Read the following list and mark their answer accordingly*]			
		1=More	2= Less	3=The same
D12.1	Ash?			
D12.2	Smoke?			
D12.3	Soot on pots?			

D13	I'm going to list a few aspects of cooking. Please tell me if you prefer charcoal or briquettes for these, or if you have no strong preference either way:		
		1=Charcoal 2=Briquettes 3=No preference	If charcoal or briquettes, why are these preferred?
D13.1	Appearance of the fuel?		
D13.2	Handling/ touching the fuel?		
D13.3	Storing the fuel?		
D13.4	Smell when burning?		
D13.5	Taste of food?		

E – Seasonal Impacts			
E1	Has the weather in the last 2 weeks had any impact on usability of briquettes **that is different from how it would have impacted charcoal**?'?	Yes. Can you describe how?	1
		No	0
E2	Assuming briquettes were available and affordable to you, do you think you would be able to use briquettes year-round?	Yes	1
		No Can you describe why?	0

F – Availability and willingness & ability to pay

F1	Why do you generally choose to use charcoal as your main cooking fuel? [MA allowed.]	Other fuels are not available	1
		Cheapest	2
		Most convenient	3
		I am used to it	4
		It works with our stoves	5
		Other [*please describe*]	99
F2	Before this study, had you ever heard of briquettes?	Yes.	1
		No [Go to F7]	0
F3	Did you ever use briquettes before taking part in this study?	Yes.	1
		No. [Go to F6]	0
F4	Are the briquettes available in your neighbourhood stores, delivered to you or do you have to travel to buy them?	Available in the neighbourhood	1
		Delivered	2
		Travel	3
		Other [describe]	4
F5	Apart from those given for this study, do you still use briquettes sometimes?	Yes [Go to F7].	1
		No. Why not? [Then go to F7]	0
F6	Why did you choose not to use briquettes before this study? [*Write down everything the participant says]*		
F7	About how much per WEEK do you currently spend on charcoal?	HTG	
F8	Would you be willing to pay more, the same, or less for briquettes than charcoal?	More.	1
		Less.	2
		The same	3

F9	Having tried briquettes for 2 weeks, if they were easily available in your neighbourhood, would you choose to continue using them?	Yes.	1
		No. Why not? [Go to F 11]	0
F10	What is the highest price you would consider paying for a *mamit* of briquettes?	HTG	
F11	Is there anything else you would like to tell us about your experience of using briquettes?		

Visit 3 Personal Interview Form: Street Vendors

Field Team Notes:

This is an interview rather than a quantitative survey. We are aiming to get rich information from this interview and so have included several 'open' questions. Please ask the participants reasons for his/her answers and keep on being inquisitive until you feel as though you have all of the information. If something is not clear or contradictory to other answers, please keep asking until you are sure you understand the participant's point of view. Please assume nothing!

Please ensure you are interviewing the vendor with whom you spoke during the last two visits.

Please note: In order to maintain confidentiality of each participant, information from this cover sheet will be entered and stored separately from the data in sections B-F

All notes and guides for field team on the form are in written in *italics* and placed in [*square brackets*]. Please ensure you read all of these carefully.

Please follow the 'skips' carefully they are there to help shorten the interview!

MA means **multiple answers** are allowed. **SA** means **single answer only are allowed**.

[Please read: Thank you for taking part in this study. This is our last visit and I would now like to take some time and find out about your experiences with the briquettes over the last two weeks. Please tell us truthfully and completely. There are no right or wrong responses. We are wanting to learn from your experiences and improve the cooking fuels available to Haitian cooks like you.]

A. Participant Identification			
A1	Date [dd / mm / yyyy]		_ _ / _ _ / _ _ _ _
A2	Time of visit [hh:mm] 24-hr time		_ _ : _ _
A3	Street Vendor ID		
A4	Surveyor Name/ ID		
A5	Name of Vendor		
A6	Weather during interview	Dry and sunny	1
		Cloudy but not raining	2
		Raining	3
		Other [*describe*]	99

B. Stove and Kitchen Area Observation.			
[Please ask the vendor to show you the cooking area. ***If possible, please go to this area rather than having the participant bring the stove(s) to you****.]*			
B1	*[Where is the bag of briquettes on arrival at the home?]*	Not present at the stall [go to B4]	1
		At the stall alongside charcoal	2
		In the house with no other cooking fuels present	4
		Other [*please describe*]	99
B2	*[About how many briquettes are remaining on your arrival at the vendor? If the vendor has more than one partial bags with briquettes remaining, give the combined TOTAL.]*	No briquettes left- the bag is empty [go to B5]	1
		Less than ¼ of a bag	2
		About ¼ of a bag	3
		About ½ of a bag	4
		About ¾ of a bag	5
		Bag is totally full	6
		Other [*please describe*]	99
B3	Why did you not use all the briquettes? [*MA allowed*]	I didn't like using them	1
		I was given too many and didn't need them all	2
		I preferred using my other fuels	3
		Other [*please specify*]	99
B4	*[If the bag of BRIQUETTES is NOT present at the stall, please ask where it is, why it was removed and when it left the house how much was still in the bag. Write everything the participant says down below.]*		
B5	*[Please note any other relevant observations in the cooking area on arrival at the stall]*		

C - Check-in Questions.			
C1	Has anything significant changed since our last visit one week ago in terms of the kinds of stoves you are using day-to-day?	Yes. Can you describe how?	1
		No	0
C2	Has anything significant changed since our last visit in terms of the number of meals/plates you are cooking?	Yes. Can you describe how?	1
		No	0
C3	Did you cook at your stall most days during the last 2 weeks?	Yes	1
		No: Why not?	0
C4	During the last two weeks did you cook as you normally would at this time of year?	Yes [Go to Section D]	1
		No	0
C4.1	How and why did you cook differently?		

D - Using the Briquettes		
D1	What did you think of the briquettes we provided during the last 2 weeks? We would like to hear about all of the good and the not-so-good experiences you had using the briquettes. Please take your time and describe to us all of your impressions. *[Once they tell you what they think of the briquettes, ask them why they think that. After the first response, ask if there is anything else. Keep asking until the participant has given all of his/her impressions. Encourage him/her to tell you the good and bad impressions.]*	
	Responses	Why? *[Probe as required]*
D1.1		

D1.2		
D1.3		
D1.4		

D2	Did the briquettes work well in **all** of your charcoal stoves?	Yes [Go to D5]	0
		No.	1

		1st stove type	2nd stove type	3rd stove type	4th stove type
D3	Please list all the stoves in which you think the briquettes did NOT work well. *[Use STOVE CODES. MA allowed. Describe here if other.]*				

D4	What were the main reasons briquettes did not work in this/ these stoves? [*Write down everything the participant says]*

D5	Did the briquettes burn more quickly, more slowly or the same as charcoal?	More quickly	1
		More slowly	2
		The same [go to D7]	3
D6	Was this difference in speed of burning good or bad for cooking, or did it make no difference?	Good	1
		Bad	2

		No difference	3
D7	Are there any foods that you usually cook with charcoal that you were **NOT** able to cook using briquettes?	Yes. Which foods were they and why were you not able to cook them?	1
		No	0
D8	Did you have to change anything else about how you cooked as a result of using the briquettes?	Yes. In what way and why?	1
		No *[Go to D10]*	0
D9	Would you be prepared to permanently make these changes in order to use briquettes?	Yes	1
		No. Which in particular would you NOT be willing to change? Why?	0

D10	Compared with charcoal, did using briquettes make the following tasks the same, easier, or more difficult to perform? *[Read the following tasks out and mark their answer accordingly]*		
		1=Easier 2=More difficult 3=The same 4=Not applicable	If easier or more difficult, why?
D10.1	Loading fuel into your stoves?		
D10.2	Lighting stoves		
D10.3	Keeping your stove alight		
D10.4	Topping up with fuel *during cooking*		
D10.5	Simmering food		
D10.6	Frying/ high-temperature cooking		
D10.7	Boiling water		

D11	Compared with charcoal, did the briquettes produce the same, more, or less: *[Read the following list and mark their answer accordingly]*	
	1=More 2= Less 3=The same	
D11.1	Ash?	
D11.2	Smoke?	
D11.3	Soot on pots?	

D12	I'm going to list a few aspects of cooking. Please tell me if you prefer charcoal or briquettes for these, or if you have no strong preference either way:		
		1=Charcoal 2=Briquettes 3=No preference	If charcoal or briquettes, why are these preferred?
D12.1	Appearance of the fuel?		
D12.2	Handling/ touching the fuel?		
D12.3	Storing the fuel?		
D12.4	Smell when burning?		
D12.5	Taste of food?		

E – Seasonal Impacts			
E1	Has the weather in the last 2 weeks had any impact on usability of briquettes that is different from how it would have impacted charcoal?	Yes. Can you describe how?	1
		No	0
E2	Assuming briquettes were available and affordable to you, do you think you would be able to use briquettes year-round?	Yes.	1
		No Why not?	0

F – Availability and willingness & ability to pay			
F1	Why do you generally choose to use charcoal as your main cooking fuel?	Other fuels are not available	1
		Cheapest	2

	[MA allowed.]	Most convenient	3
		I am used to it	4
		It works with my stove(s)	5
		Other [*please describe*]	99
F2	Before this study, had you ever heard of briquettes?	Yes.	1
		No [Go to F7]	0
F3	Did you ever use briquettes before taking part in this study?	Yes.	1
		No. [Go to F6]	0
F4	Were the briquettes available near your stall, delivered to you or do you have to travel to buy them?	Available in the neighbourhood	1
		Delivered	2
		Travel	3
		Other [describe]	4
F5	Apart from those given for this study, do you still use briquettes sometimes?	Yes [Go to F7].	1
		No. Why not? [Then go to F7]	0
F6	Why did you choose not to use briquettes before this study? [*Write down everything the participant says]*		
F7	About how much per WEEK do you currently spend on charcoal?	HTG	
F8	Would you be willing to pay more, the same, or less for briquettes than charcoal?	More.	1
		Less.	2
		The same	3
F9	Having tried briquettes for 2 weeks, if they were easily available in your neighbourhood, would you choose to continue using them?	Yes.	1
		No. Why not? [Go to F 11]	0

F10	What is the highest price you would consider paying for a *sack* of briquettes?	HTG	
F11	Is there anything else you would like to tell us about your experience of using briquettes?		

Quantity of briquettes supplied to and used by households and street vendors.

The tables below show the quantity of briquettes that were supplied to the households and street vendors during the study. However, the amount used should not be used as an indication of how the briquettes were perceived by the participants as they were sometimes given away to friends and neighbours and it the case of street vendors, fellow workers. Also, some domestic cooks did not cook at home every day during the study and so used less briquettes. A full kitchen performance test is needed to accurately quantify briquette use taking into account cooking patterns and the use of other cooking fuels.

Table 7 Quantity of briquettes supplied to and used by each household over the course of the study.

HH ID Number	SEX	Average # dishes cooked per day	Total number of sacks given	Amount remaining at end of study (sacks)	Total amount used during study (sacks)
01_TAB_HH	M	12	1	0	1
04_TAB_HH	F	7	1	0	1
05_TAB_HH	F	20	1	0.75	1.25
06_TAB_HH	M	6	1	0	1
07_TAB_HH	M	15	1	0	1
08_TAB_HH	M	3	1	0.75	0.25
09_TAB_HH	F	21	2	0.75	1.25
01_KWA_HH	F	12	2	0	2
02_KWA_HH	F	12	2	0.75	1.25
03_KWA_HH	F	7	2	0	2
04_KWA_HH	F	6	1	0	1
05_KWA_HH	F	25	2	0.75	1.25
06_KWA_HH	F	8	2	0.5	1.5
07_KWA_HH	F	10	1	<0.25	Just under 1
08_KWA_HH	M	24	2	0	2
09_KWA_HH	F	15	1	0.25	0.75
10_KWA_HH	M	18	2	0	2
11_KWA_HH	F	24	1	0	1

Table 8 Quantity of briquettes supplied to and used by each vendor over the course of the study.

HH ID Number	SEX	Average # of customers served each day	Total number of sacks given	Amount remaining at end of study (sacks)	Total amount used during study (sacks)
01-KWA-SV	F	35	5	0	5
02 KWA-SV	F	45	5	0	5
02-TAB-SV	F	50	5	0	5
03-TAB-SV	F	30	5	0	5
04-TAB-SV	F	80	6	0.5	5.5