

# Inyenyeri Clean Cooking Pilot in Kigeme Refugee Camp

## SOCIAL IMPACT ASSESSMENT

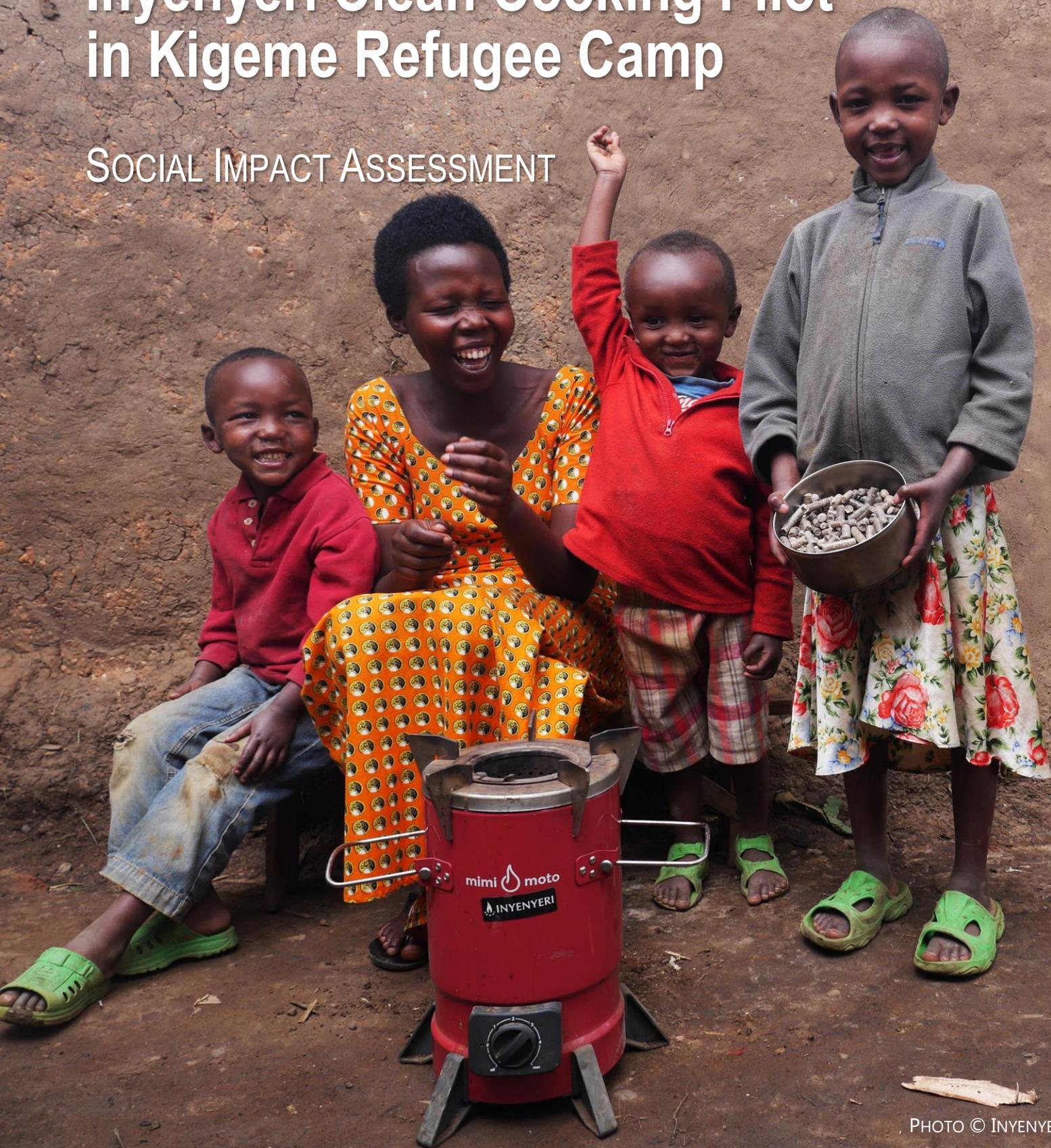


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## ACKNOWLEDGEMENTS

This report was commissioned from the International Center for Research on Women (ICRW) by the Global Alliance for Clean Cookstoves (the Alliance), with support from the Ministry of Foreign Affairs of Finland. It was authored by Allie Glinski, Kathryn Farley, and Shelby Bourgault of ICRW with Dr. Dieudonne Uwizeye of the University of Rwanda. It was edited by Kathleen Callaghy and Krista Riddley of the Alliance. The authors would like to thank Suzanna Huber and the staff of Inyenyeri for their collaboration, as well as the Rwanda country office of UNHCR for their guidance to enable ICRW to collect monitoring data within the camp.

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# EXECUTIVE SUMMARY

## Background

In 2016, with support from the Ministry for Foreign Affairs of Finland, the Global Alliance for Clean Cookstoves (the Alliance) partnered with the International Center for Research on Women (ICRW) to assess the social and economic impacts of a pilot cooking intervention in Kigeme Camp, Rwanda, implemented by Inyenyeri – a Rwandan social benefit company. The project employed a market-based model – essentially treating refugees as customers – to introduce [Mimi Moto](#) fan-gasifying stoves and Inyenyeri biomass fuel pellets into 300 refugee households. Each household leased a Mimi Moto stove from Inyenyeri in exchange for committing to purchase a set amount of pellets each month using money they received from the World Food Programme, which was originally intended to be used for purchasing food. Inyenyeri established a retail location in Kigeme and opened for business in September 2016.

The Alliance, UNHCR, and Inyenyeri are interested in exploring how well a market-based approach might work in a humanitarian setting, and what program model will be most effective. The goal of collecting and analyzing this monitoring data is to enable Inyenyeri, UNHCR, and the Alliance to measure and understand how the stoves and fuel are being used, what is working well, and what could be improved in future phases of the project, as well as to gain a more nuanced understanding of some of the social and economic impacts of using the stoves and fuel in this particular setting.

## Findings

### Adoption and usage of the Mimi Moto stove and Inyenyeri fuel pellets

**Intervention households used the Mimi Moto as the primary cooking device for all cooking tasks besides beans.** However, they also frequently used other cooking devices – chiefly the three-stone fire, fixed mud stove, and the traditional metal frame stove. Below are the percentages of Inyenyeri user respondents who listed the Mimi Moto as the primary cooking device for the following dishes:

- Porridge: 69% in rainy season and 67% in dry season
- Rice: 66% in rainy season and 65% in dry season
- Beans: 22% in rainy season and 19% in dry season
- Ugali: 68% in both rainy and dry seasons
- Potatoes: 50% in rainy season and 69% in dry season

Despite the above findings, intervention households continued to supplement Inyenyeri products with their traditional cooking devices and fuels (“stove stacking”). Through observation and anecdotal conversations with Inyenyeri users, ICRW found that intervention households were often purchasing one sack of pellets and using the Mimi Moto as their primary cooking device for most cooking tasks while they had pellets to cook with; however, when the pellets ran out, they would resort to other, cheaper cooking methods rather than purchase more pellets.

## Socio-economic Impacts on Users and Households

### Cooking Time

The overall time required for all cooking tasks each week decreased for both intervention *and* comparison households between the baseline and endline surveys. However, cooking beans represented an outlier, as this task takes an exceptionally long time and was rarely conducted on the Mimi Moto due to the large quantity of pellets required. Taking this into account, **Inyenyeri customers experienced a five times greater reduction in cooking time across all cooking tasks except for cooking beans**, compared to the non-user households (See Tables 1 & 2).

**Table 1: Change in Cooking Time (*With Beans*)**

	Baseline	Endline	Change
<b>Intervention Households</b>	1155 minutes per week (2.7 hours per day)	599 minutes per week (1.4 hours per day)	-48%
<b>Comparison Households</b>	1581 minutes per week (13.8 hours per day)	939 minutes per week (2.2 hours per day)	-41%

**Table 2: Change in Cooking Time (*Without Beans*)**

	Baseline	Endline	Change
<b>Intervention Households</b>	638 minutes per week (1.5 hours per day)	353 minutes per week (0.8 hours per day)	-45%
<b>Comparison Households</b>	661 minutes per week (1.6 hours per day)	611 minutes per week (1.5 hours per day)	-7%

Users’ perceptions of time savings were also assessed. Of respondents from intervention households, **100% reported the perception that it took less time to cook using the Mimi Moto.**

ICRW also assessed how Inyenyeri customers used the time they saved on cooking. Among those that reported saving time on cooking, the main tasks that they reported spending their saved time on include, from most to least common:

- Cleaning the house and childcare;
- Recreational activity;
- Social activity;
- Helping children study; and
- Income-generating activity.

When asked in focus group discussions how they spend their time now that they use the Mimi Moto, most participants chose ‘social/leisure activities’ or ‘cleaning activities’. A few respondents also said that they spent most of their time after receiving the Mimi Moto on ‘taking care of children’ or ‘making money’. No one ranked ‘cooking’ as their top choice, explaining that, “cooking activities can no longer be described as an activity that takes too much of their time.”

### Fuel Procurement Time

While the average amount of time required to purchase or collect fuel among intervention households remained relatively constant between the baseline and endline surveys (only 8% decrease), there was a large increase (38%) in the average amount of time required for fuel procurement among comparison households for all fuel types except for those who collected agricultural waste (Table 3).<sup>1</sup> Given that it is generally more difficult to procure fuel in the rainy season (when the endline was conducted) due to scarcities of dry biomass, ICRW believes that **participation with Inyenyeri has enabled households to balance this challenge and spend approximately the same amount of time on fuel procurement in the rainy season as they did during dry season**, when the baseline was conducted.

**Table 3: Average Change in Fuel Procurement Time (Excluding Collected Agricultural Waste)**

	Baseline	Endline	Time Difference	Change
<b>Intervention Households</b>	53.11 min	48.92 min	-4.19 min	-8%
<b>Comparison Households</b>	57.31 min	79.05 min	+ 21.74 min	+38%

<sup>1</sup> ICRW excluded the collection of agricultural waste in Table 3 since very few households in either group (two intervention and five comparison) were engaging in this activity at the end line, but those few spent large amounts of time doing so, since it is necessary travel further outside of the camp to find dry fuel during the rainy season. More households instead spent time purchasing vs. collecting fuel.

Interestingly, while there was very little difference in the measured time associated with fuel procurement from baseline to endline for intervention households, the vast majority of intervention respondents *perceived* the amount of time spent on fuel procurement to be less after receiving Inyenyeri.

## Fuel Expenditure

There was an increase in fuel expenditure among both comparison and intervention households between the baseline and endline surveys, but this increase was much greater among intervention households (See Table 4). **Expenditure greatly increased among intervention households due to the need to purchase pellets.** It is important to note that households were choosing to spend money given to them to purchase food (by WFP) to instead purchase pellets. This demonstrates that they saw value in using the Mimi Moto. Among comparison households, the increase in fuel expenditure is likely due to the fact that households are more likely to purchase fuel during rainy season, which was when the endline survey was conducted.

**Table 4: Average Change in Fuel Expenditure (\$USD)**

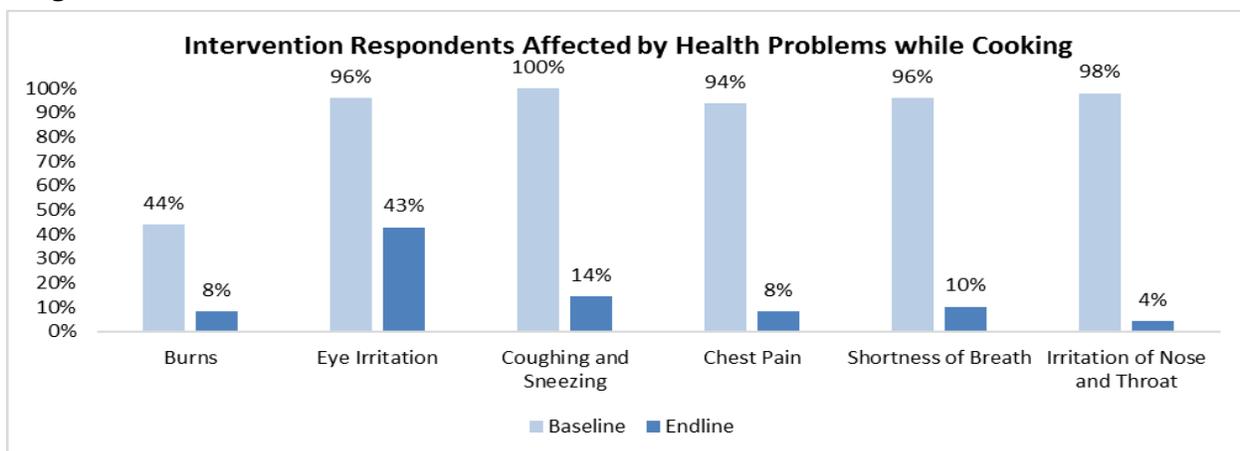
	Baseline	Endline	Spending Difference	Change
Intervention Households	\$3.67	\$7.05	+ \$3.38	+92%
Comparison Households	\$3.52	\$4.02	+ \$0.50	+14%

In responses related to customer satisfaction, respondents were most likely to “strongly disagree” or “somewhat disagree” with the statement: “Inyenyeri is a good price,” highlighting that **price is one of the main challenges respondents find with participating in Inyenyeri’s program.** When asked what other challenges people experienced with Inyenyeri, about half (52%) reported nothing, and about half (48%) reported the cost of the pellets. Findings from the FGDs similarly reflected that cost is the main barrier households face in using Inyenyeri more frequently. Participants in all four FGDs noted that they buy pellets when they can, but when money runs out they must supplement with charcoal or other fuels.

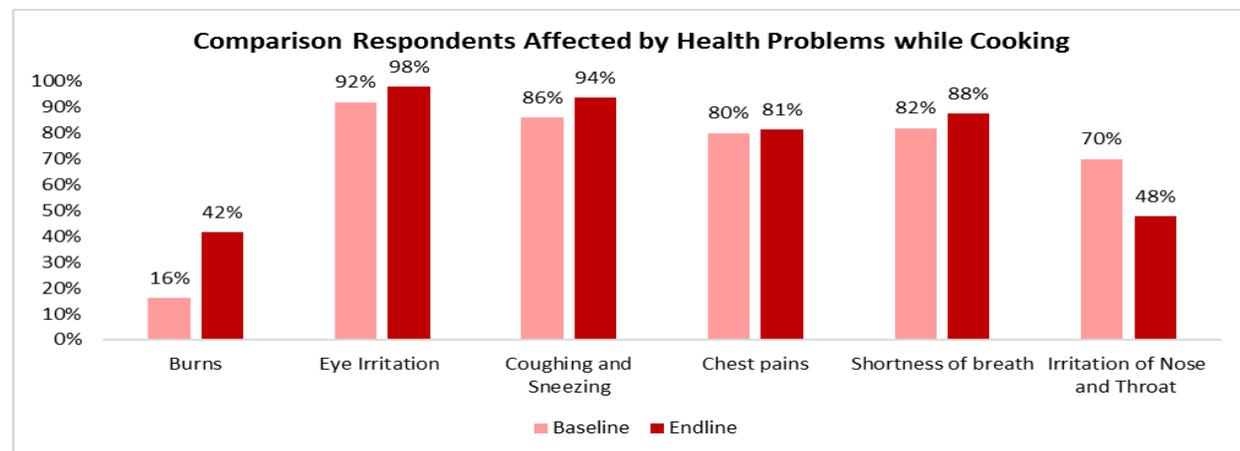
## Health & Safety

ICRW assessed the incidence of burns and several health-related quality of life (HRQoL) indicators among comparison and intervention households before and after Inyenyeri's program. Overall, there were large decreases in burns and HRQoL indicators by refugees in Inyenyeri customer households, while there were relatively few changes among refugees from the comparison group (see Figures 1 and 2). For example, **among intervention households there was an average 83% decrease in the experiences of burns, eye irritation, irritation of the nose and throat, coughing and sneezing, chest pain, and shortness of breath among both the participants themselves and also among their other household members.** Alternatively, there was actually an overall 25% *increase* in the percentage of respondents from comparison households who experienced these HRQoL indicators and a decrease of only 28% among other household members.

**Figure 1**



**Figure 2**



The HRQoL indicators that saw the greatest decrease among respondents from intervention households were irritation of nose and throat (96% decrease), chest pain (91% decrease), and shortness of breath (89% decrease). The health issues with the greatest decreases among other household members in intervention households included eye irritation (100% decrease) and irritation of the nose and throat (94% decrease).

Among intervention respondents, **100% reported feeling safer while cooking and 96% reported feeling safer during fuel procurement.** Inyenyeri customers noted that risks have not diminished altogether, since they still are forced to use wood because of the high price associated with Inyenyeri. Backaches and headaches, which are often associated with queuing to receive wood, have also reduced.

### Drudgery

On average, intervention households reported a **72% decrease in the level of drudgery associated with cooking.**<sup>2</sup> The level of drudgery associated with cooking reported by intervention households at the endline was 73% lower than that reported by comparison households. Intervention households also reported a **71% decrease in the level of drudgery associated with fuel procurement.** The level of drudgery associated with fuel procurement reported by intervention households at the endline was 73% lower than that reported by comparison households.

### Social Status and Relationships

Since joining Inyenyeri's program, **about half of the intervention respondents (44%) felt more respected by others and the remainder (56%) felt about the same.** Among respondents who felt more respected, 89% believe their increased social status is because community members think they are rich since they have the Inyenyeri stove, and 11% believe their increased status is because community members think they are smart for having the Inyenyeri stove.

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<sup>2</sup> Drudgery refers to the amount/level of effort needed to complete a task. For cooking, drudgery consists of the effort or workload associated with collecting and preparing/processing fuel, as well as cooking, such as lighting and managing the fire.

## Additional Qualitative Impacts

Inyenyeri customers who participated in all of the FGDs agreed that cooking with “Inyenyeri” (i.e., the MimiMoto stove and fuel pellets) is easier than with wood or other stoves. They commented that after completing the training that Inyenyeri provides to new customers, both lighting the stove and cooking was very easy. Specifically, users noted that Inyenyeri saves them work before and after cooking: there is no need to prepare the pellets as one needs to prepare wood (e.g. chopping), and the Mimi Moto keeps pots clean, so there is less clean-up afterwards. Users also appreciated the convenience of being able to cook inside the home. Participants who were previously using charcoal said they no longer had to wash their hands after handling the fuel, thus saving them water as well as time.

Another notable benefit of Inyenyeri cited by the FGD participants was that the intervention contributed to reducing the risk of conflicts within and between families. Female participants explained that quarrels with husbands over delayed food had reduced, and when husbands or children need food in a hurry, they were able to quickly prepare food on the Mimi Moto.

## Impact on Refugees Engaged as Inyenyeri Employees

There are a number of economic, social, and empowerment impacts experienced by refugees who were hired as Inyenyeri staff as a result of their employment. Below are some of the impacts and relevant quotes from staff.

- **Increased financial stability:** For several staff members, increased financial stability was the first benefit they mentioned when asked how becoming an Inyenyeri employee has changed their life. *“Before I could not provide basic needs for my family,”* one employee said.
- **Increased decision-making power:** Three of the four staff who were interviewed noted experiencing increases in their decision-making power, and noted that this was in part because they are now the ones providing for the needs of the family. One female employee explained: *“I am the bread winner... all the eyes are turned on me.”*
- **Increased self-confidence:** Inyenyeri has also changed the way staff members see themselves, increasing their belief in their own abilities. One said: *“It [Inyenyeri] was an opportunity for me to indicate what I can do. I managed to demonstrate my abilities.”*
- **Increased status:** Employees noted feeling more respected as a result of their work with Inyenyeri. According to one staff member, at least some of this newfound status is a direct result of her increased economic status. One employee said: *“I have respect from my neighbors since I have money. I can lend money to neighbors and friends.”*

- **Increased access to networks:** Accessing new social networks was another added benefit of employment with Inyenyeri, though most of these new relationships were at the staff-client level.
- **Increased communication skills:** All staff members who were interviewed reported increases in communication skills because of their exposure to new people and to public speaking through their work with Inyenyeri. One said: *“Inyenyeri exposed me to many people and I am now able to speak to big people.”*

## Methods and Limitations

ICRW used a mixed methods approach to gather quantitative data from Inyenyeri users and non-users, in addition to qualitative data from users and employees to explore initial impacts of Inyenyeri’s model. ICRW used the [Social Impact Measurement System](#) for the clean cooking sector that it developed and piloted with the Alliance over the past two years. Quantitative data, using the social impact surveys, was collected at the baseline and endline of the project, with 50 individuals representing households that participated in the Inyenyeri pilot, as well as 50 individuals representing households in a non-participating comparison group. Qualitative data was collected through four focus group discussions with Inyenyeri users, in-depth interviews with four refugees who were employed as Inyenyeri customer service representatives, and one key informant interview with a health worker.

The surveys and discussions with Inyenyeri users in this study aimed to capture changes that occurred due to use of the Mimi Moto stove and Inyenyeri fuel pellets. However, it should be noted that this was a pilot project, and Inyenyeri was testing the model over a short time period. Only four months passed between the baseline and endline surveys. Moreover, the study sample size was relatively small – only 50 intervention and 50 comparison households. It is therefore difficult to draw statistically significant conclusions. While this data can be used to elucidate patterns to be further explored in future programming and research, it should not be used to generalize results to all Inyenyeri users.

## Conclusions

Inyenyeri’s cooking intervention in Kigeme camp resulted in some significant benefits for its refugee customers and employees, as well as attained a high level of customer satisfaction. However, the high cost of pellets remains a significant barrier to wider adoption of Inyenyeri’s model.

## ACRONYMS & ABBREVIATIONS

<b>Alliance</b>	Global Alliance for Clean Cookstoves
<b>CSR</b>	Customer service representative
<b>FGD</b>	Focus group discussion
<b>HRQoL</b>	Health-related quality of life indicator
<b>ICRW</b>	International Center for Research on Women
<b>IDI</b>	In-depth interview
<b>RWF</b>	Rwandan francs
<b>UNHCR</b>	United Nations High Commissioner for Refugees
<b>WFP</b>	World Food Programme

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## BACKGROUND

In 2016, with support from the Ministry for Foreign Affairs of Finland, the Global Alliance for Clean Cookstoves (the Alliance) partnered with the International Center for Research on Women (ICRW) to monitor the social and economic impacts of a pilot cooking intervention in Kigeme Camp, Rwanda, implemented by Inyenyeri – a Rwandan social benefit company. The project employed a market-based model – essentially treating refugees as customers – to introduce [Mimi Moto](#) fan-gasifying stoves and Inyenyeri biomass fuel pellets into 300 refugee households.<sup>3</sup> Each household leased a Mimi Moto stove from Inyenyeri in exchange for committing to purchase a set amount of pellets each month using money they received from the World Food Programme (WFP) that was originally intended to be used to purchase food. Inyenyeri established a retail location in Kigeme and opened for business in September 2016.

The Alliance, UNHCR and Inyenyeri are interested in exploring whether a market-based approach can work in a humanitarian setting, and what program model will be most effective. The goal of collecting and analyzing this monitoring data is to enable Inyenyeri, UNHCR, and the Alliance to measure and understand how the stoves are being used, what is working well, and what could be improved in future phases of the project, as well as to gain a more nuanced understanding of some of the social and economic impacts of using the stoves and fuel in this particular setting. Additionally, Inyenyeri and UNHCR can use this information to demonstrate the project's impacts and to raise additional funding to scale the work.

This report summarizes and analyzes the collected data. In it, ICRW explores adoption and usage; the socio-economic impacts of the project on users and households, including household living standards; and the impact on the refugees employed by Inyenyeri as customer service representatives.

## METHODS

ICRW used a mixed methods approach to gather quantitative data from Inyenyeri users and non-users, in addition to qualitative data from users and employees to explore initial impacts of Inyenyeri's model. ICRW employed user surveys from the [Social Impact Measurement System](#) for the clean cooking sector that it developed and piloted with the Alliance over the past two years. This framework provides the cookstoves and fuels sector with a standardized method of defining and measuring the social and economic impacts associated with cooking initiatives. The system

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<sup>3</sup> This assessment only covers 50 of the 300 customer households. Inyenyeri started its intervention among approximately 100 households and scaled up to 300 by the end of the project.

was developed in consultation with key stakeholders in the field, including impact investors, clean energy experts, gender researchers, clean and efficient cooking implementers, and measurement experts. ICRW supplemented quantitative findings from the user surveys with focus groups discussions (FGDs) with users, in-depth interviews with four refugees that Inyenyeri employed as Customer Service Representatives (CSRs) in Kigeme, and a key informant interview with a health worker who was serving as a chief nurse at the health clinic in the camp. These interviews were conducted in Kinyarwanda and then translated into English.

For the quantitative data collection, ICRW conducted baseline and endline (follow-up) social impact surveys with 50 individuals representing “intervention” households that participated in the Inyenyeri pilot, as well as 50 individuals representing “comparison” households. This comparison group was comprised of households who had not yet participated in the Inyenyeri pilot, but who may be invited to participate in the future. Baseline data collection was carried out in December 2016, and the endline data collection was conducted in March 2017.

The intervention sample was created by randomly selecting 50 households on the list of 100 intervention households.<sup>4</sup> The comparison sample was created by randomly selecting the same number of households from each camp Quartier as were in the intervention group. Annex 1 depicts a map of Kigeme camp, which shows the camp regions (A & B), the geographic Quartiers (1-8), and shows the approximate percentage of intervention and comparison households sampled from each Quartier. Households within these Quartiers were assigned a number, and then numbers were randomly selected. Researchers then traveled door-to-door within each Quartier asking whether households would be interested in voluntarily participating, until they reached an equal number of comparison households as intervention households in that Quartier. Baseline data was collected from all 50 intervention and 50 comparison households. Due to some difficulty in tracking down particular household members, endline data was collected from all 50 intervention households, but only 48 comparison households.

For the qualitative data collection, ICRW conducted four focus group discussions with Inyenyeri users, for a total of 21 participants. These explored some of the patterns that were emerging in the quantitative data and delved deeper into the project’s impacts. Focus group participants were selected from a representative variety of Quartiers, providing a geographic diversity of participants. ICRW also conducted in-depth interviews with the four refugee CSRs employed by Inyenyeri within the camp, as well as one key informant interview with a health worker. The in-

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<sup>4</sup> Inyenyeri’s pilot project was carried out in two phases. At the time of the baseline study, Inyenyeri had recruited 100 customer households in the camp. By the end of the project, their customer base had expanded to 300 households; however, ICRW’s endline study only focused on the same 50 Inyenyeri customer households and 50 non-customer (comparison) households that were surveyed in the baseline.

depth interviews provided initial insights on how the CSRs were impacted by their employment with Inyenyeri, and the interviews with both Inyenyeri employees and the health worker were used to elucidate findings from the quantitative data.

## Limitations

The surveys and discussions with intervention households (i.e. Inyenyeri users) were meant to capture changes that had occurred as a result of using the Mimi Moto stove and Inyenyeri fuel pellets. While ICRW was able to capture some interesting results, it should be noted that this was a pilot project, and Inyenyeri was trying to test the model over a short time period. Only four months passed between the baseline and endline surveys. Comprehensively measuring the social impacts of the project would require more time to pass between surveys so that users could cook with the Mimi Moto for several months, through both rainy and dry seasons, and experience the full range of potential benefits. In the surveys we asked about respondents' experiences in both rainy and dry seasons (two rainy seasons and two dry seasons, each approximately three months in Kigeme), and then averaged the responses for the entire year.

However, as we analyzed the survey data, it was clear that respondents often provided answers that were biased to their current season. For example, if the survey was being conducted during the rainy season, they may have said that they spent a very long time collecting agricultural waste and then said that this was the same in the dry season, when in reality, they spent much less time collecting agricultural waste in the dry season. Because of this, responses were slightly impacted by the season in which the survey was conducted. We have tried to include this explanation where relevant throughout this report. To eliminate this bias, the survey could be conducted at multiple points throughout the year and averaged to better represent average annual changes.

Additionally, it is difficult to draw statistically significant conclusions with a relatively small sample size – only 50 intervention and 50 comparison households. **This data can be used to elucidate patterns to be further explored in future programming and research, but it should not be used to generalize results to all Inyenyeri users.**

It should further be noted that all data collection was conducted through the work of a local consultant, so ICRW had limited ability to explore some of the more nuanced patterns and behaviors. While the local consultant who was responsible for both the quantitative and qualitative data did an excellent job of conveying observations and insights, there are still limitations that arise from not being able to see the context firsthand.

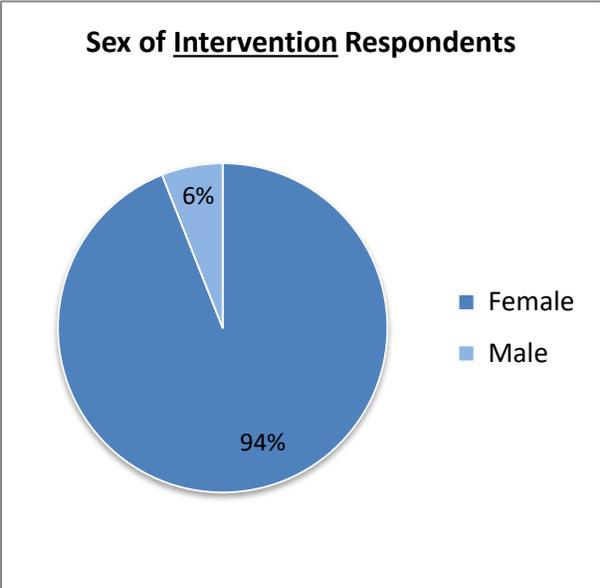
# SURVEY DEMOGRAPHICS

## Respondent Profile

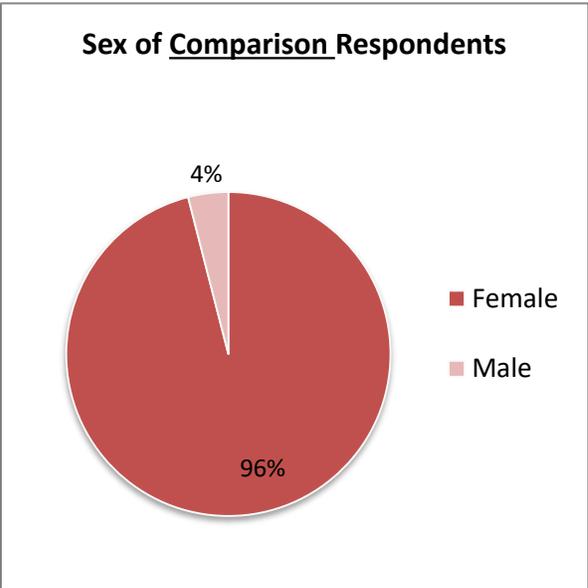
As noted above, ICRW conducted social impact surveys with 50 individuals representing households that participated in the Inyenyeri pilot, as well as 50 individuals representing households in a comparison group. This section summarizes key demographic features of survey respondents and their households.

ICRW purposely sampled mostly women as survey respondents, as they are typically the ones who are most knowledgeable about cooking practices. Our enumerator made an effort to conduct the survey with the person primarily responsible for doing the cooking, as this person would be most knowledgeable about issues related to cooking time, drudgery, and related issues. However, in some cases this person was not available, so the enumerator conducted the survey with another member of the household who could reflect on cooking and fuel procurement behaviors within the household.

**Figure 1**



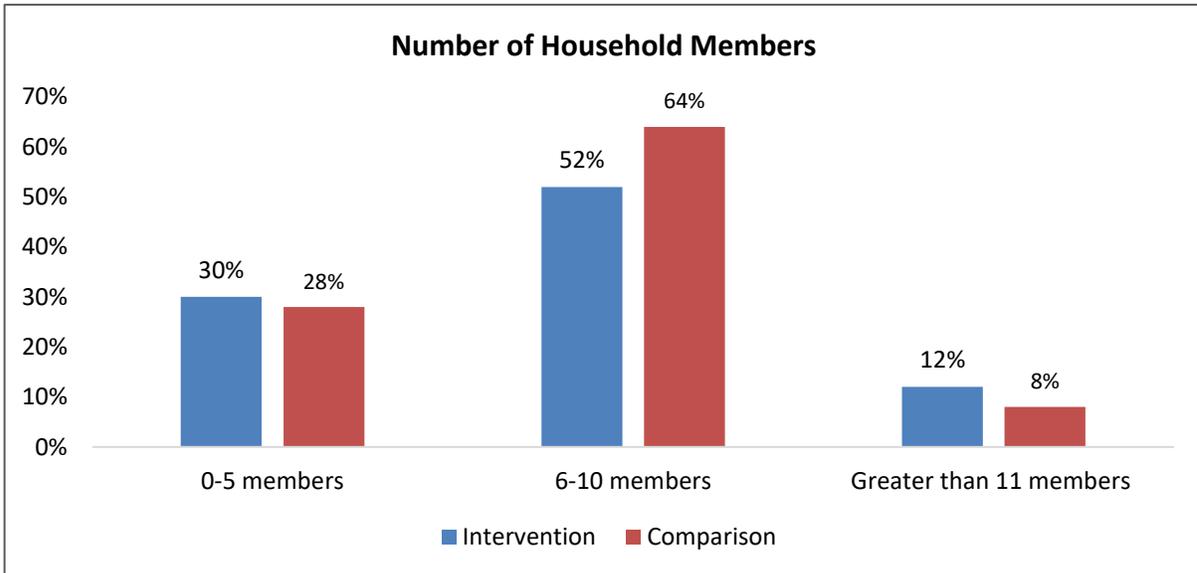
**Figure 2**



As Figure 3 shows, the majority of both intervention and comparison households had 6-10 members. Intervention households had an average of 6.86 members, comprised of an average of 3.44 females and 3.36 males. Comparison households had an average of 7.08 members, comprised of an average of 3.7 females and 3.38 males. While the comparison group had a slightly higher

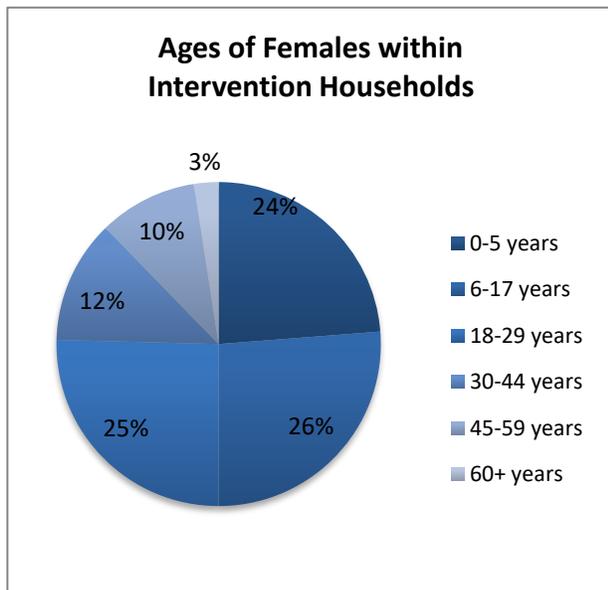
average number of household members, there were a few households in the intervention group with household sizes that appear to be outliers – one 15-person household and one 13-person household.

**Figure 3**

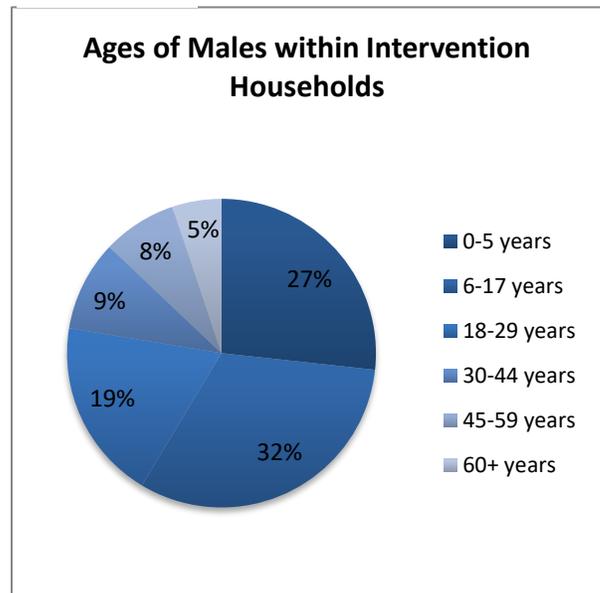


Figures 4-7 show the breakdown of household size by age for males and females. The majority of household members from both intervention and comparison households range from age 0 to 29.

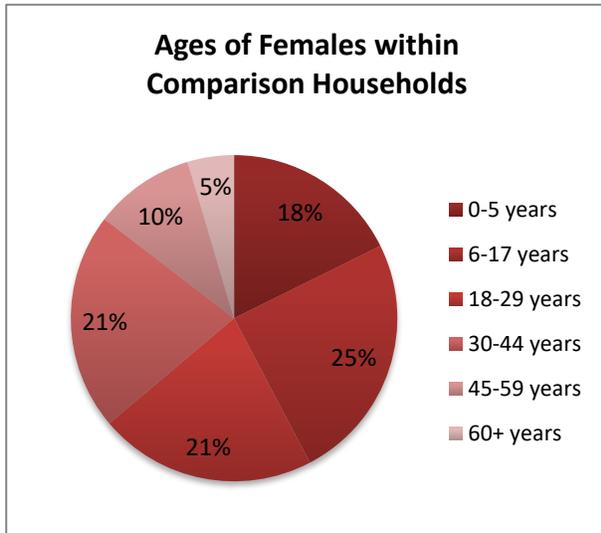
**Figure 4**



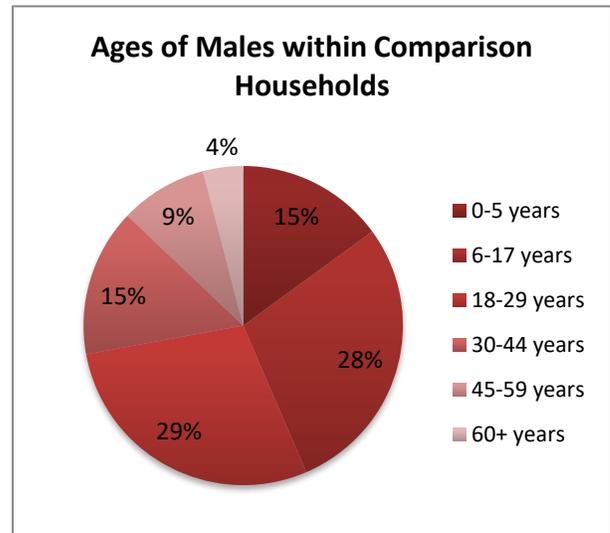
**Figure 5**



**Figure 6**

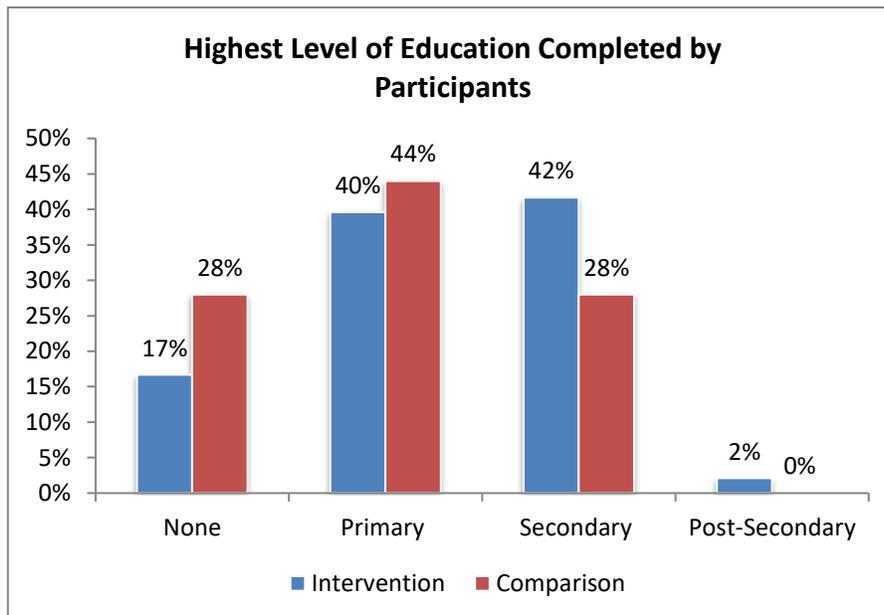


**Figure 7**



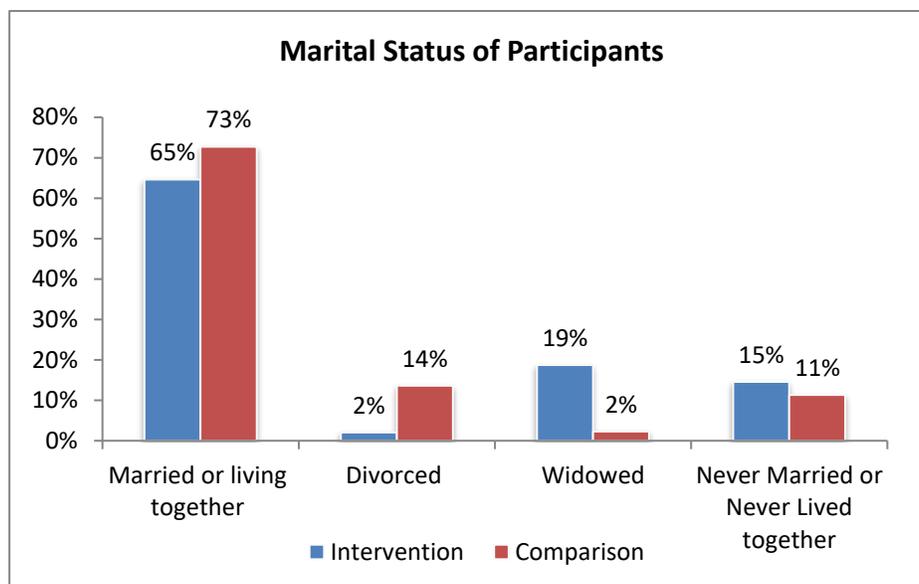
The majority of respondents' highest level of education was either primary or secondary school. As Figure 8 shows, the intervention respondents had slightly higher levels of education, with 44% having completed secondary school or higher, compared to 28% for the comparison group.

**Figure 8**



As shown in Figure 9, the majority of both intervention and comparison participants were “married or living together.”

**Figure 9**



## Household Economic Stability

In order to assess the economic stability of households in the study, ICRW measured:

- 1) The value of the goods and money that households receive from various sources;<sup>5</sup>
- 2) The value of their earnings; and
- 3) Their expenditures and assets.

Taken together, these three data points provide an overall picture of the households’ level of economic stability, which enabled ICRW to compare intervention and comparison households and assess changes in economic stability between the baseline and endline periods.

Several of the data points below demonstrate that the **intervention households were slightly economically better off than the comparison households**. Intervention households received a slightly higher value of goods and/or money (Figures 10-12), and a greater percentage of them were engaged in work (Figures 13-16). Among the households that were engaged in work, both the respondents and other household members within intervention households were more likely

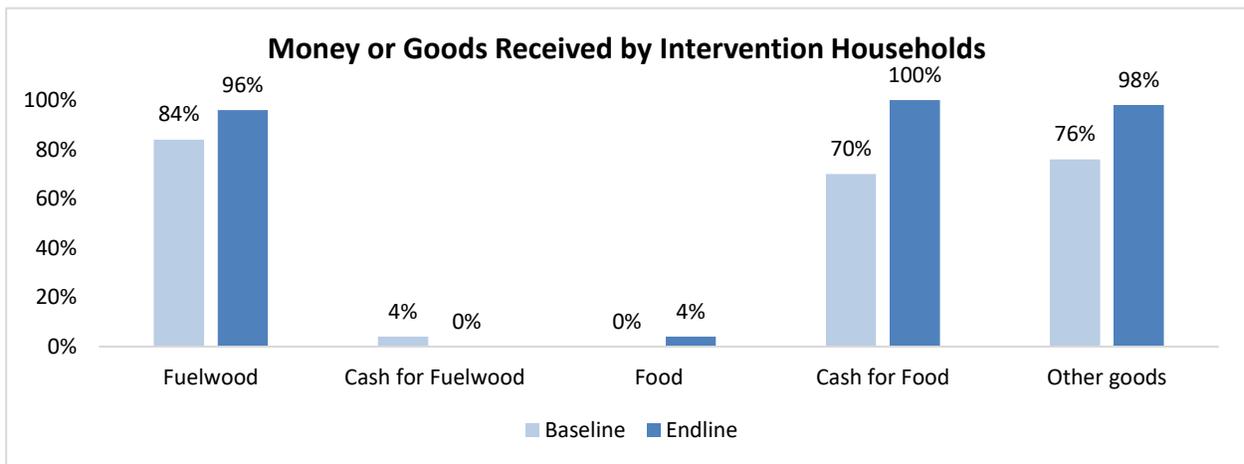
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<sup>5</sup> In Kigeme camp, households receive goods and cash for goods from UNHCR, WFP, and other NGOs

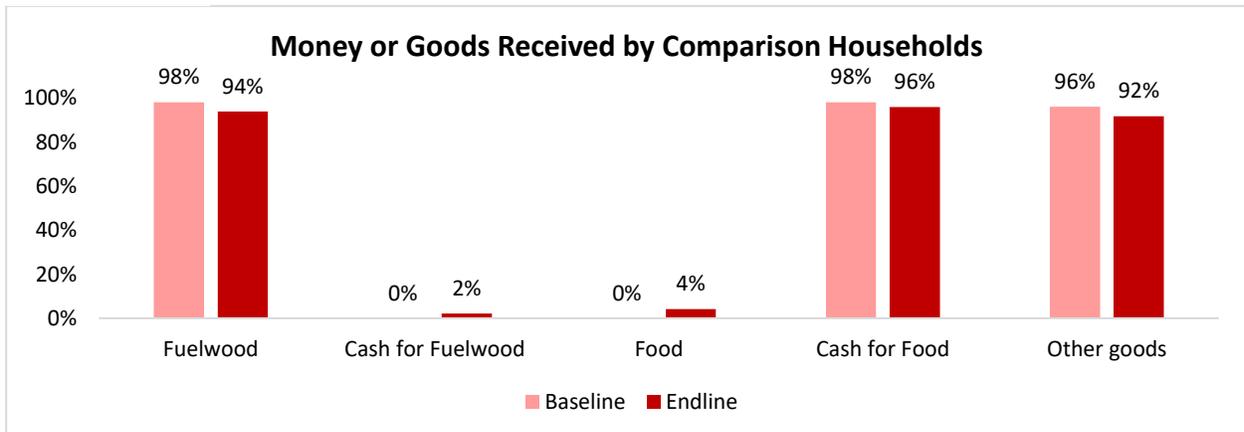
to be engaged in higher-skilled work (e.g. camp administration) than those in comparison households (Figures 17-20).

One possible reason for this is the way that Inyenyeri recruited customers for the pilot project. Inyenyeri offered the opportunity to participate in the pellet stove initiative to a randomly selected group of households, after which the households decided whether to opt in. As the pellets cost money, it is likely that the households who opted in were those with the financial ability to do so – i.e. households that were slightly better off economically. However, while the intervention and comparison groups were at slightly different socio-economic levels, measuring changes within each group from baseline to endline and comparing them with each other still helps to gauge what changes have resulted from use of Inyenyeri.

**Figure 10**



**Figure 11**



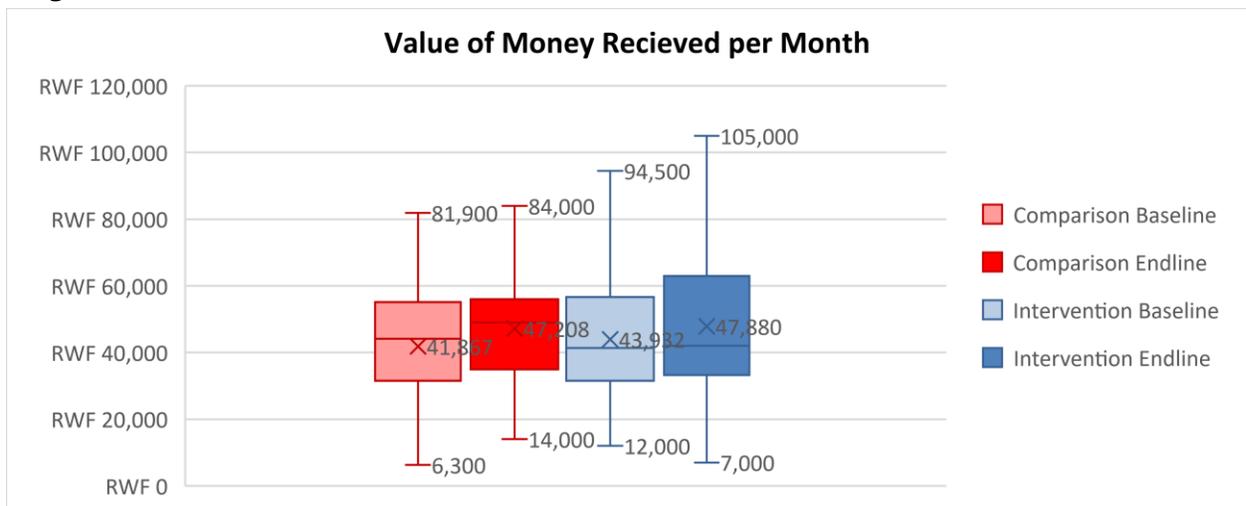
As is clear from Figures 10 and 11, both intervention and comparison households received fuelwood, cash for food, and other goods, and a few households also received food at the endline. While the percentage of households reporting having received goods and money slightly increased for intervention households and slightly decreased for comparison households between the baseline and endline, these changes were minimal and likely due to slight reporting errors as the percentage of houses receiving goods and money was the same at baseline and endline. The reported value of the cash received increased for both intervention and comparison households.

- Intervention households were receiving an average of \$53.51 (43,932 RWF) per month at baseline, compared to \$58.32 (47,880 RWF) at the endline
- Comparison households were receiving an average of \$51.00 (41,867 RWF) at baseline, compared to \$57.50 (47,208 RWF) at the endline

These reported values reflect an actual change in the amount of cash distributed by aid organizations to all households in the camp, which increased between the baseline and endline surveys. At the baseline, households were receiving 6,300 RWF per person per month and at the endline they were receiving 7,000 RWF per person per month. The difference between this and the reported amounts among the intervention and comparison groups is due to the fact that there are different numbers of people per household and also slight errors in recall.

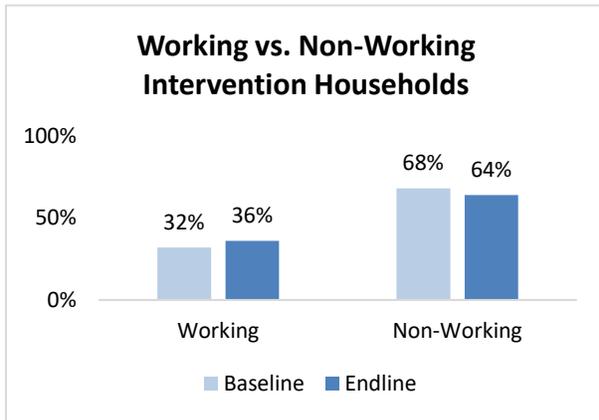
Figure 12 shows the change in value of money received by intervention and comparison households from baseline to endline. While there are a few outliers that pull the averages, the range of responses is quite similar from baseline to endline among both intervention and comparison households. The fact that the differences are so small supports the idea that the overall economic situations of the comparison and intervention households were very comparable.

**Figure 12**

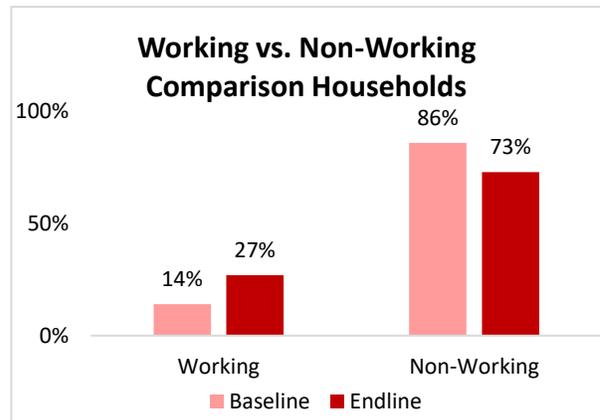


In terms of employment, more intervention households than comparison households were involved in some sort of work at the baseline – 32% compared to 14%, respectively – as shown in Figures 13 and 14. The gap between the two groups decreased at the endline, with 36% of intervention households engaged in work versus 27% of comparison households. Since there were increases in both the percentage of intervention and comparison households that work, it is unlikely that the Mimi Moto and fuel pellets had a direct impact on household employment.

**Figure 13**

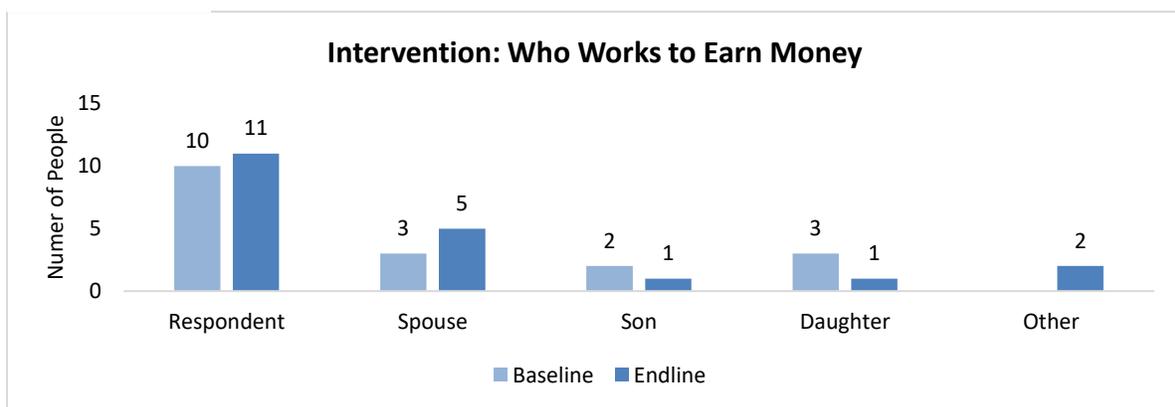


**Figure 14**



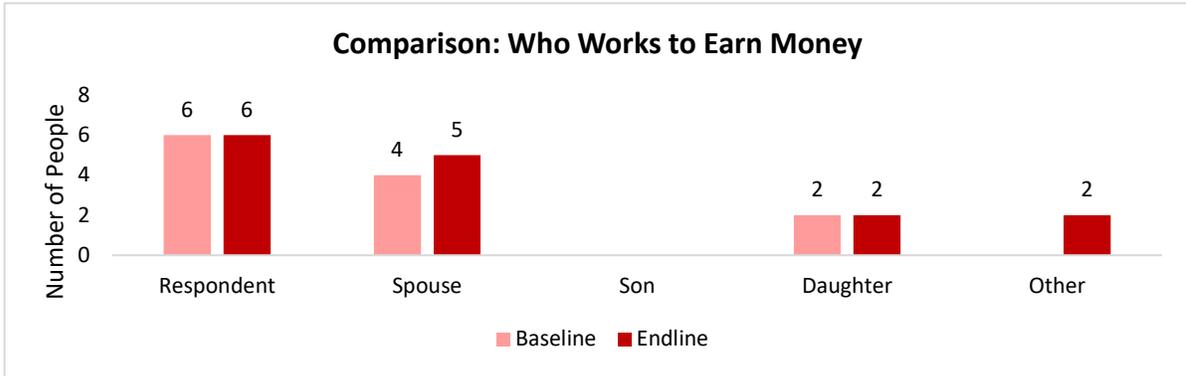
Figures 15 and 16 show that among households that worked, in both groups it was the survey respondent that most frequently worked for money, followed by the spouse, and then the daughter.<sup>6</sup>

**Figure 15**



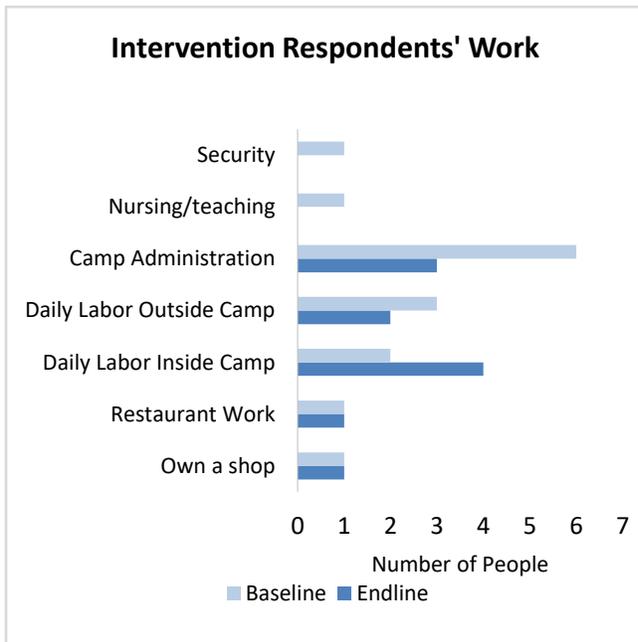
<sup>6</sup> Note: "Other" refers to extended family, such as grandchildren, cousins, nieces and nephews, etc.

**Figure 16**

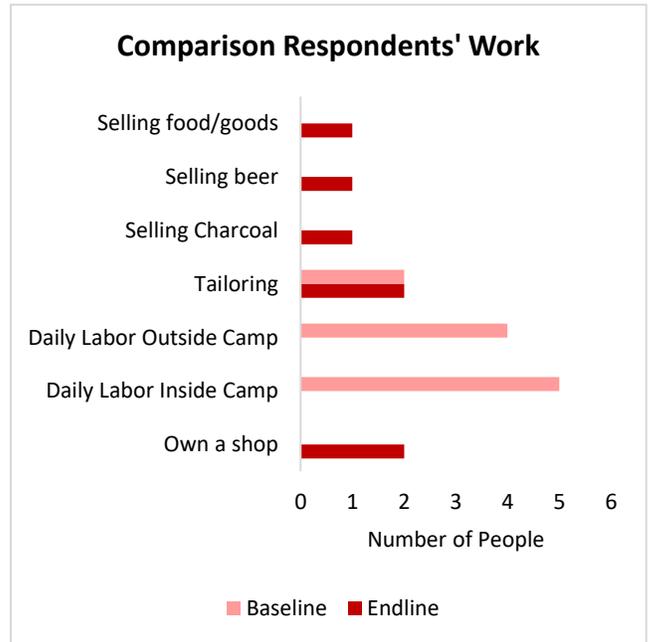


As noted earlier, Figures 17-20 show that survey respondents and other household members in intervention households were engaged in more professional types of work, such as security, nursing, camp administration, and restaurant work. By contrast, respondents and household members in comparison households were engaged in less skilled jobs, such as selling food/goods, beer, and charcoal. This aligns with the previous observation that the intervention households seem to be slightly better off economically relative to the comparison households, though still comparable. There also appears to be a slight difference in the types of jobs that comparison households engaged in at baseline (daily labor within and outside the camp) versus endline (selling food/goods, selling beer, and selling charcoal). ICRW was unable to determine the reason for this shift. It may be due to seasonal shifts, changes in the availability of jobs, or the fact that

**Figure 17**

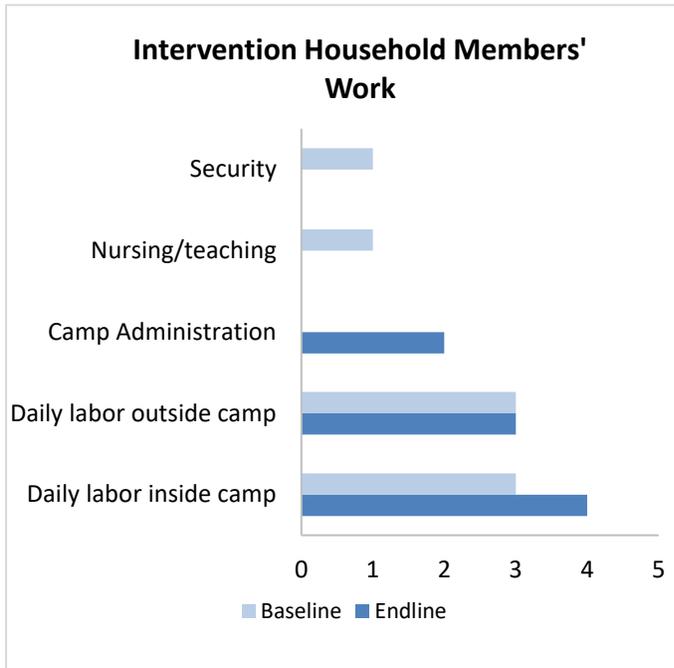


**Figure 18**

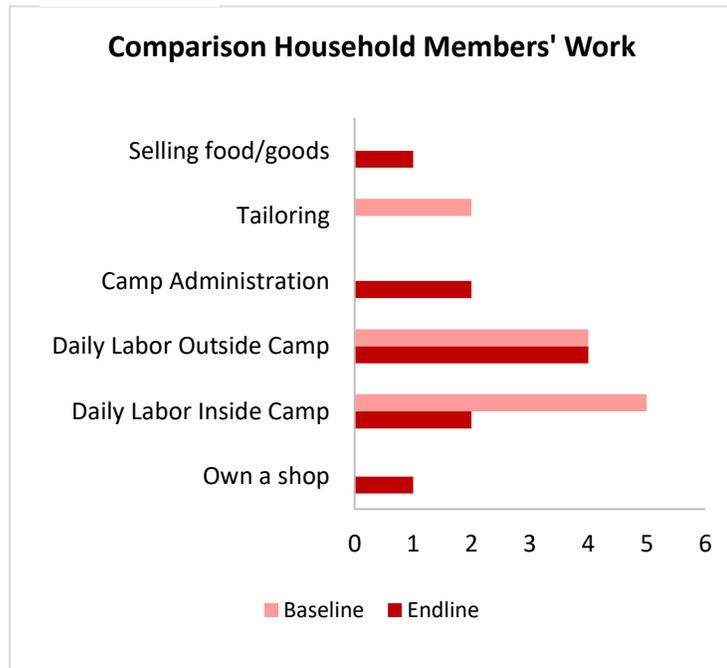


families were given slightly more cash assistance at the endline and thus felt that they could try engaging in their own businesses.

**Figure 19**

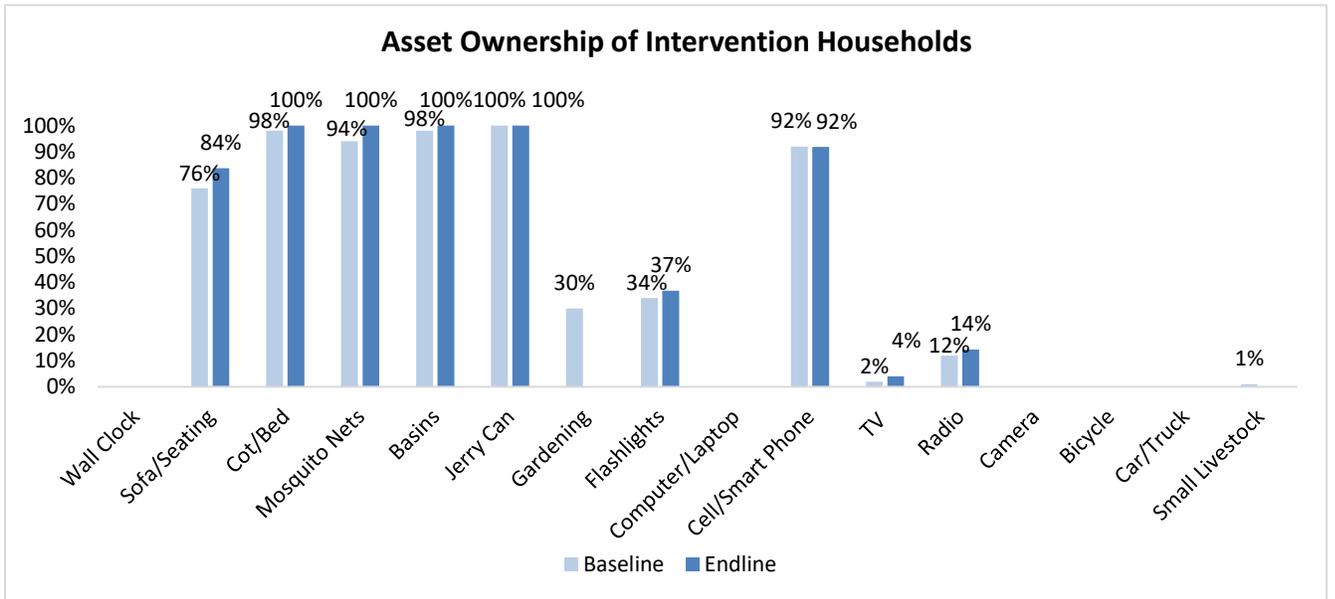


**Figure 20**

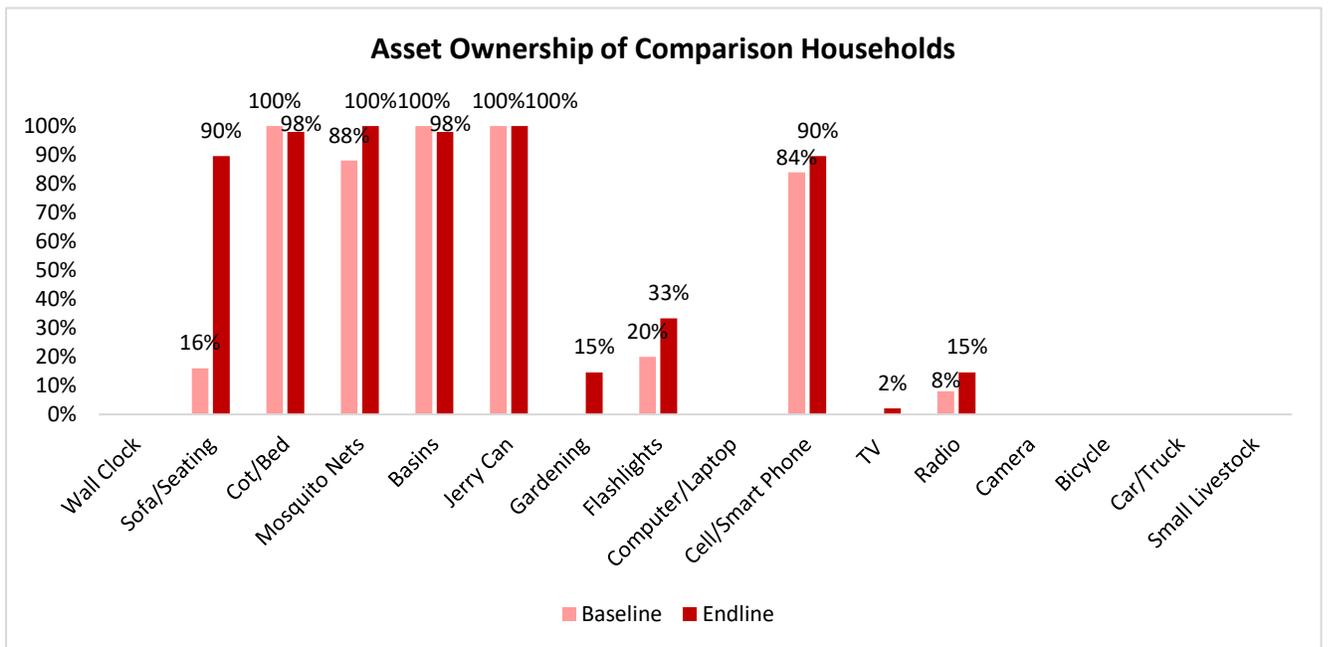


Asset ownership (Figures 21 and 22), another indicator of economic stability, was very similar between the intervention and comparison households at both baseline and endline, highlighting that the two groups were adequately matched. One potential reason for this is that all households within the camp are very limited in what they can possess, due to both space restrictions and camp regulations. Furthermore, some of the asset options provided in the survey (e.g. mosquito nets and/or jerry cans) are items that UNHCR, WFP, or other NGOs have provided for the refugees, so we would expect all households to have those items.

**Figure 21**



**Figure 22**



## FINDINGS

The following sections outline ICRW's assessment of how Inyenyeri's stove and fuel intervention impacted its refugee customers in Kigeme. Based on the quantitative survey data and qualitative FGDs and interviews, the analysis covers cookstove usage, time spent cooking and procuring fuel, financial expenditure on fuel, gender dynamics, and other social and economic indicators.

### Cookstove Usage

A variety of cooking devices were used for all the main cooking tasks in both intervention and comparison households in Kigeme (see images below).

1. **Mimi Moto** – Customers leased this stove from Inyenyeri for the cost of one sack of fuel pellets each month.
2. **Traditional** – In this context, "traditional" refers to a metal frame stove that can be used to cook with wood, charcoal, or agricultural waste.
3. **Three-stone fire** – A cooking method which balances a pot on top of three large stones, with the fire constructed in the center using wood, charcoal, agricultural waste, or other available fuel.
4. **Fixed mud stove** – A non-portable stove built of mud, which can be used with wood, charcoal, agricultural waste, or other biomass in some areas.
5. **Local improved wood stove** – A locally-produced wood-burning stove that outperforms a traditional stove on criteria which may include emission factors, fuel consumption, thermal efficiency, durability or safety.
6. **Local improved charcoal stove** – A locally produced charcoal-burning stove that outperforms a traditional stove on criteria which may include emission factors, fuel consumption, thermal efficiency, durability or safety.
7. **High-efficiency improved wood stove** – A wood stove that significantly outperforms a traditional stove on criteria which may include emission factors, fuel consumption, thermal efficiency, durability or safety.
8. **LPG** – a stove that uses liquid petroleum gas. (No image available)

**Image 1: Mimi Moto**



**Image 2: Traditional Stoves**



**Image 3: Three Stone Fire**



**Image 4: Fixed Mud Stove**



**Image 5: Local Improved Wood Stove**



*Images courtesy of Inyenyeri*

**Image 6: Local Improved Charcoal Stove**

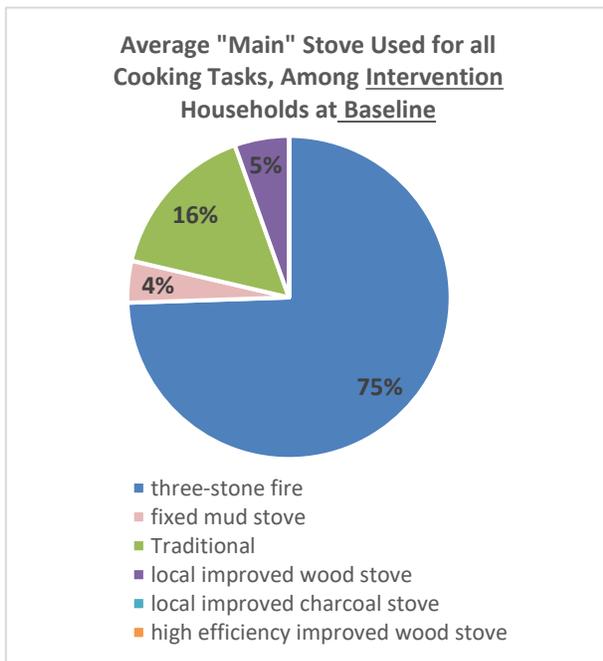


**Image 7: High-efficiency Improved Wood Stove**

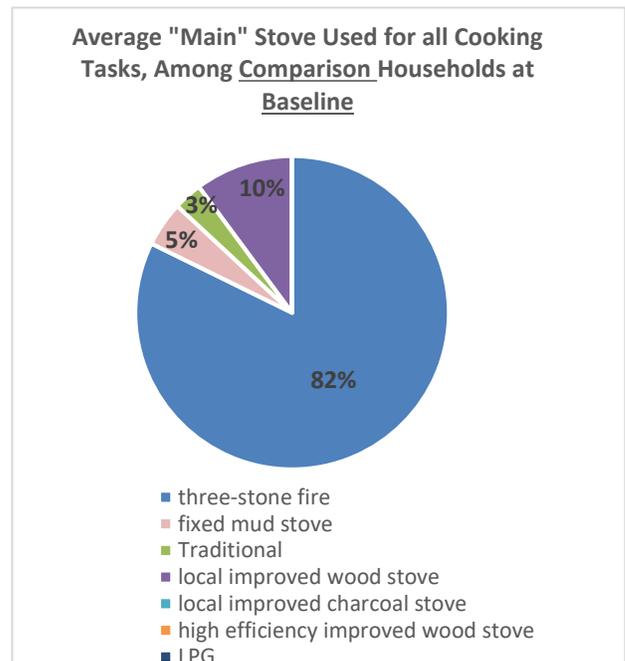


It should be noted that many households were using more than one type of stove – a practice commonly referred to as “stove stacking.” The fact that households were stove stacking to meet their diverse cooking needs, even to perform the same cooking task throughout the week, shows that no one device was adequately meeting their needs. The pie charts below show, on average, which stoves were used as the “main” cooking device for five main cooking tasks – namely, cooking porridge, rice, beans, ugali, and potatoes. Figures 23 & 24 display baseline data from the intervention and comparison groups, respectively, while Figures 25 & 26 show data from the endline.

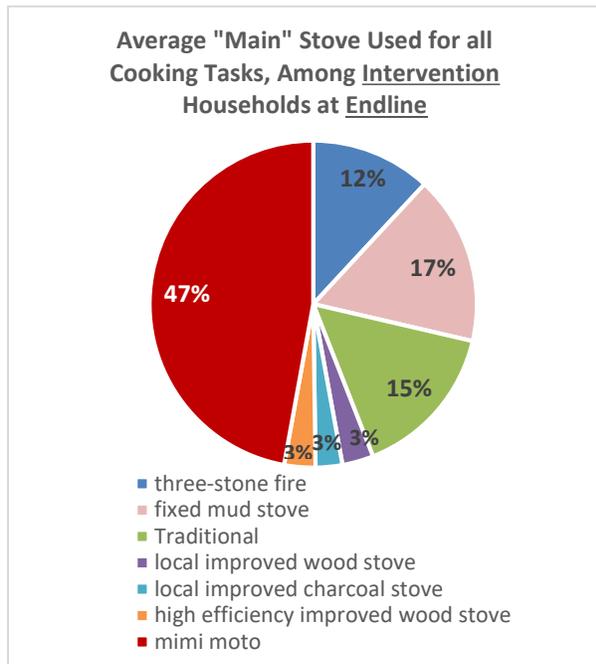
**Figure 23**



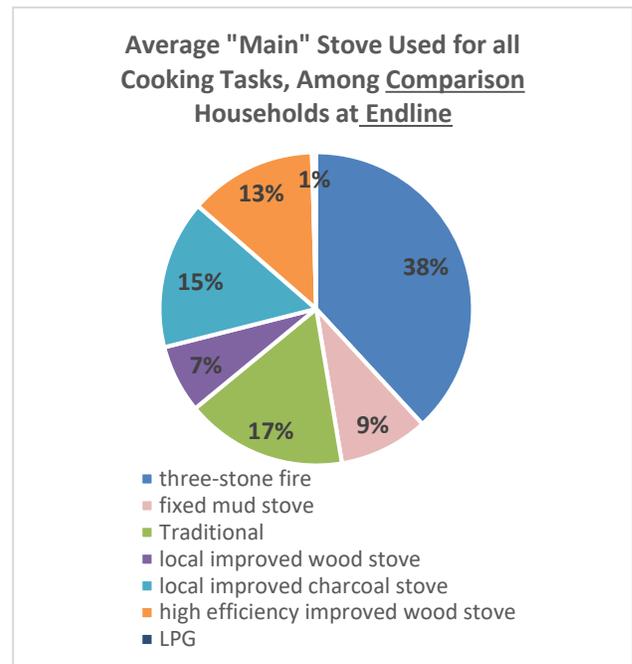
**Figure 24**



**Figure 25**



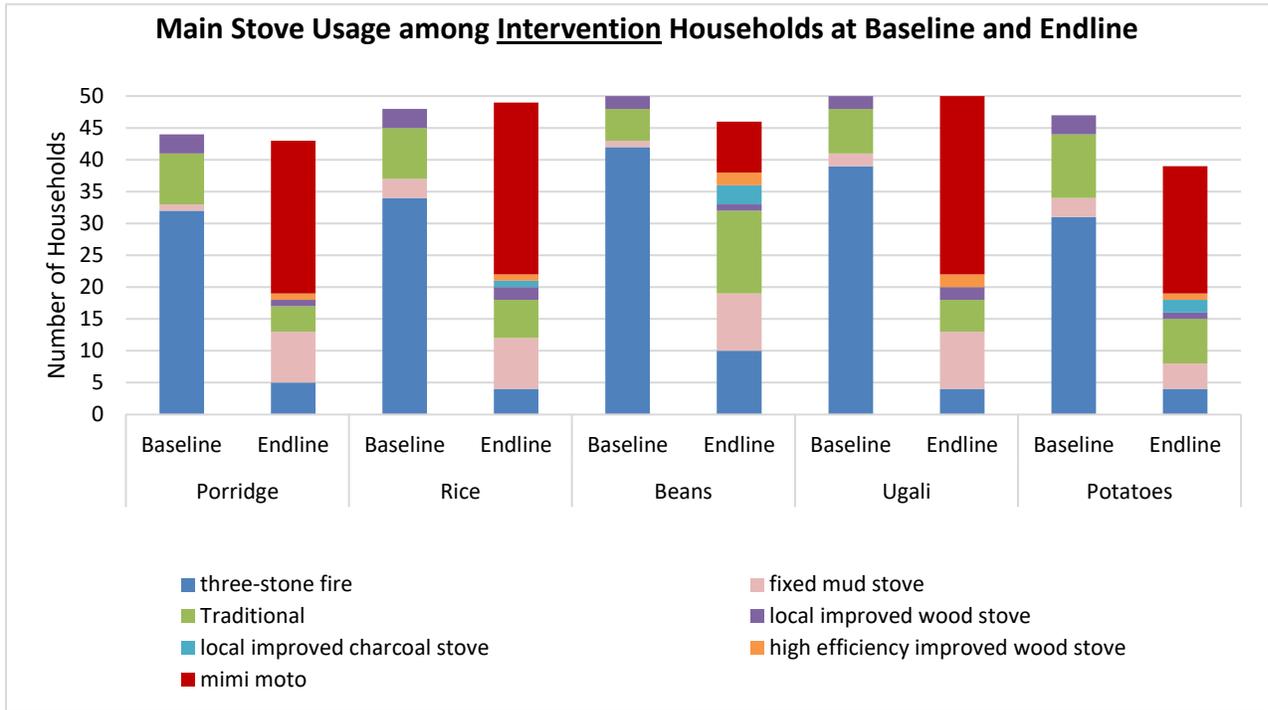
**Figure 26**



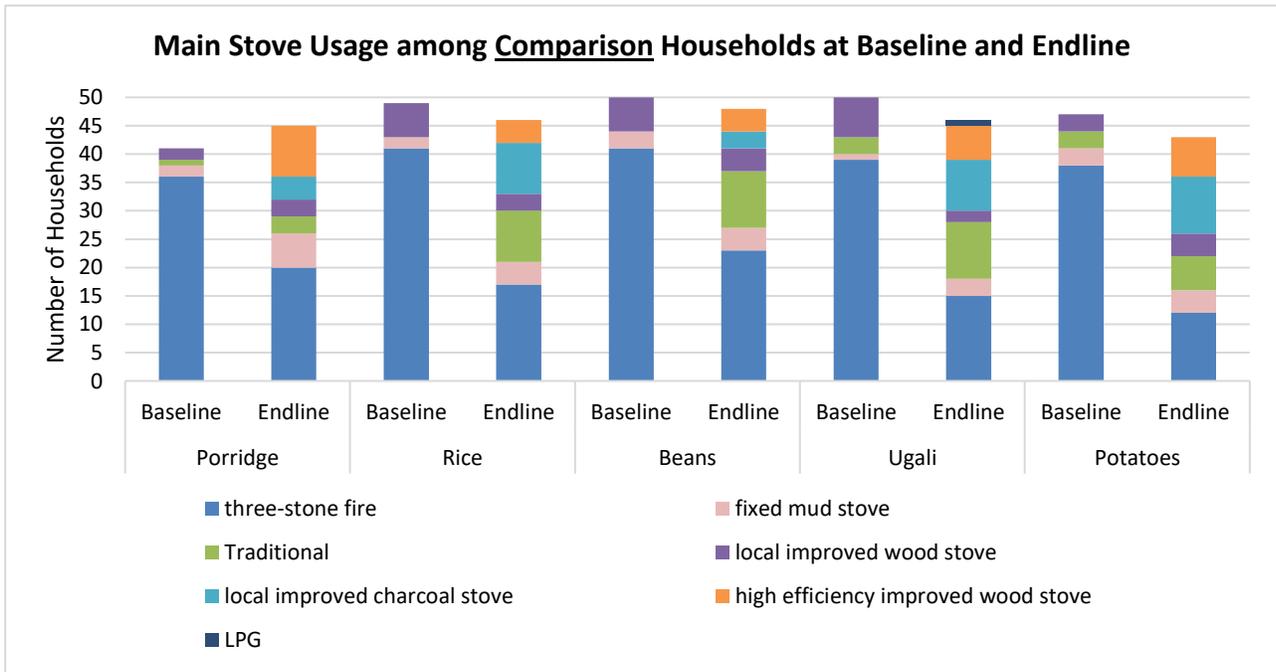
While there appears to be a greater variety of stove types reported at the endline among both intervention and comparison groups, this is likely due to increased sophistication in probing on questions by interviewers, rather than a change in actual stoves used. After collection of the baseline data, ICRW encouraged its enumerator to be as specific as possible when collecting information on the different stove types used. It is for this reason that there is a more granular breakdown at the endline, compared to the baseline.

Figures 27 and 28 disaggregate the usage of the various cooking devices across different cooking tasks at baseline compared to endline. As mentioned in the *Limitations* section, while respondents were asked to recall stove usage in both the current season (which would have been dry season at the baseline and rainy season at the endline) as well as the opposite season, it seems that people were skewed to provide responses that reflected usage patterns in the current season and then to say that these usage patterns were the same in the other season. This accounts for the reported difference in usage patterns from baseline to endline even among the comparison households. At the baseline, the usage patterns were similar between the intervention and comparison households; however, at the endline they were different because the intervention households were frequently using the Mimi Moto.

**Figure 27**



**Figure 28**



As shown in Figure 27, intervention households used the Mimi Moto as the primary cooking device for all cooking tasks except for beans; however, they also frequently used other stoves – chiefly the three-stone fire, fixed mud stove, and the traditional stove. Figure 28 shows that in comparison households, the most frequently used devices included: the three-stone fire, the local improved charcoal stove, and the high efficiency wood stove.

The above data provides some useful insights about the overall adoption of the Mimi Moto stove and Inyenyeri’s fuel pellets among the intervention households. Although we see a large degree of stove stacking among both intervention and comparison groups, Figure 25 shows that **the Mimi Moto became the primary device for cooking in almost half of intervention households**. This is borne out by Figure 27, showing that **intervention households used the Mimi Moto as the primary device for all cooking tasks except for beans**.

Since ICRW did not have the opportunity to conduct follow-up surveys in both rainy and dry seasons, it was difficult to assess whether seasonal variations affected usage of the Mimi Moto. To address this, in the endline survey intervention respondents were asked to recall how frequently they used the Mimi Moto as the primary cooking device in both the rainy and dry seasons for each dish. Below are the percentage of times for which the Mimi Moto was used as the primary cooking device for the following dishes:

- Porridge: 69% in rainy season and 67% in dry season
- Rice: 66% in rainy season and 65% in dry season
- Beans: 22% in rainy season and 19% in dry season
- Ugali: 68% in both rainy and dry seasons
- Potatoes: 50% in rainy season and 69% in dry season

As noted above, despite the Mimi Moto being widely adopted, intervention households still frequently used other stoves in addition to the Mimi Moto. Through observation and anecdotal conversations with Inyenyeri users, ICRW found that **intervention households were often only purchasing one sack of pellets per month – the minimum purchase amount under their agreements with Inyenyeri**. They would use the Mimi Moto as their primary cooking device for most cooking tasks while they had pellets to cook with but **when the pellets ran out, they would resort to other, cheaper cooking methods rather than purchase more pellets**. This observation was crucial to identifying the cost of pellets as a barrier to the full adoption of Inyenyeri’s model among refugee households.

The focus group discussions (FGDs) with Inyenyeri customers provided some insight and context on the disaggregated cooking task data. For example, although many intervention respondents listed the Mimi Moto as their primary or secondary stove of choice for cooking ugali, participants in the FGDs described some specific challenges with cooking this dish. Users explained that the legs of the stove were not strong enough to support a heavy dish like ugali. Some said they had to enlist another household member to help – one person cooked the dish while the other held the stove. For large families, users said it was just not possible to cook ugali on a Mimi Moto due to the large volume and weight.

The FGDs also explored why households were not using the Mimi Moto to cook beans. Participants noted they would have to use up three batches of pellets to make beans, and they felt this was using up too much of the pellets. An alternative method, taught to them by Inyenyeri staff, was to soak the beans overnight in order for them to soften so that they would require fewer pellets to cook. However, participants commented that the beans lose their flavor when they are soaked, so other cooking methods were preferable.

## Cooking Time

To gain an understanding of how Inyenyeri’s intervention impacted cooking time, ICRW asked both comparison and intervention respondents how many times they engaged in each cooking task (i.e. cooking beans, ugali, etc.) in an average week and how many minutes each task took. As shown in Table 1 below, the overall time required for all cooking tasks each week decreased for both intervention *and* comparison households between the baseline and endline surveys. However, closer examination of the data shows that the cooking time required for beans is significantly higher than other cooking tasks and distorts the overall averages.

**Table 1: Change in Cooking Time (*With Beans*)**

	Baseline	Endline	Change
<b>Intervention Households</b>	1155 minutes per week (2.7 hours per day)	599 minutes per week (1.4 hours per day)	-48%
<b>Comparison Households</b>	1581 minutes per week (13.8 hours per day)	939 minutes per week (2.2 hours per day)	-41%

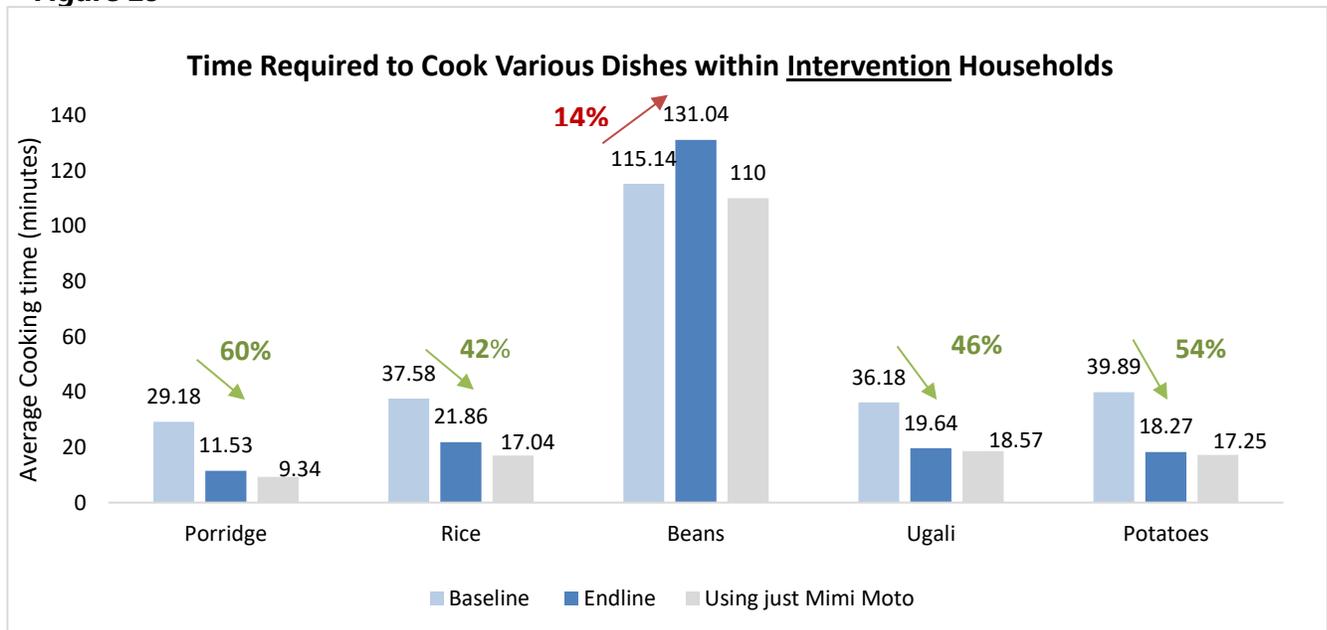
**Table 2: Change in Cooking Time (*Without Beans*)**

	Baseline	Endline	Change
<b>Intervention Households</b>	638 minutes per week (1.5 hours per day)	353 minutes per week (0.8 hours per day)	-45%
<b>Comparison Households</b>	661 minutes per week (1.6 hours per day)	611 minutes per week (1.5 hours per day)	-7%

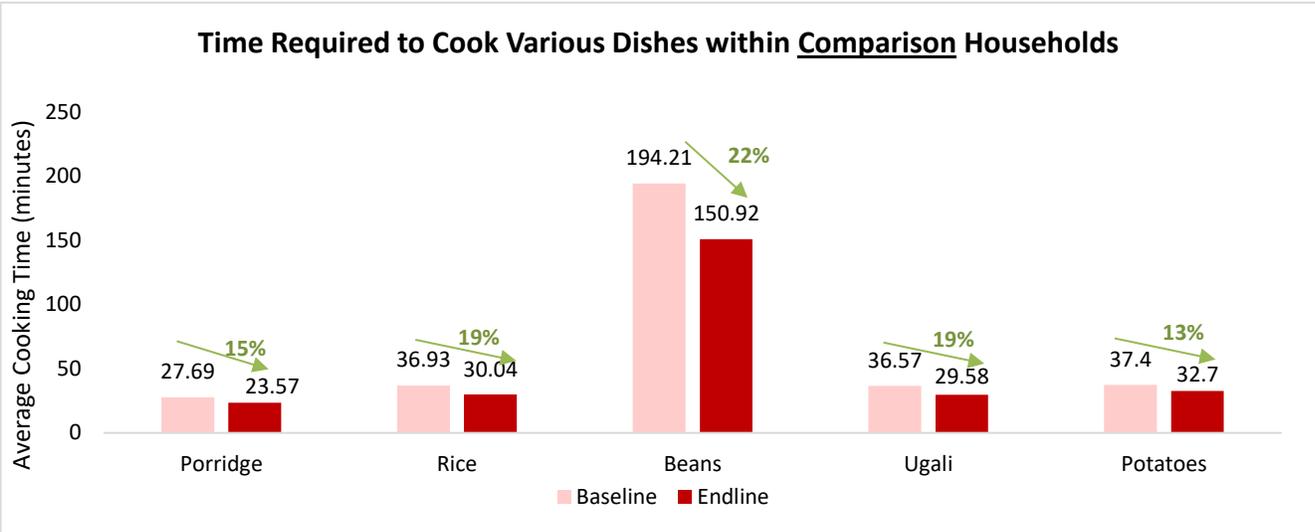
Both intervention and comparison households reported cooking beans approximately half as frequently at the endline as they did at the baseline (in both rainy and dry seasons), thus greatly reducing the overall average amount of time required to conduct the five main cooking tasks. Since beans appeared to be an anomaly, as described above, ICRW also calculated the average time required for cooking excluding the time required for cooking beans. When beans are removed from the calculation, the reduction in the overall amount of time required for cooking per week is much greater for intervention households (45%) than comparison households (8%).

Breaking down cooking time by specific tasks (i.e. dishes) bears out this trend. Figures 29 and 30 show that intervention households experienced much greater reductions in cooking time than comparison households across all tasks except for cooking beans, for which intervention households actually experienced an increase in the amount of time required. These cooking times include time spent using all cooking devices that the household reported, which enabled ICRW to capture stove stacking practices and reach a realistic estimation of how much time households were really spending on cooking each day. Isolating the amount of time required for each cooking task using only the Mimi Moto versus other cooking devices, as shown in Figure 29, shows even greater reductions in cooking time.

**Figure 29**



**Figure 30**

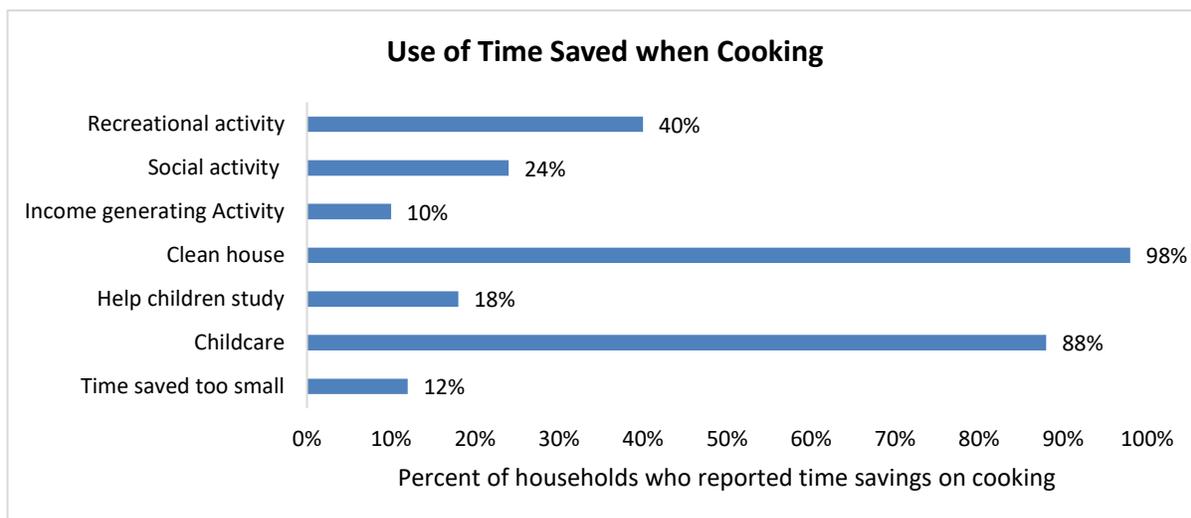


While there are likely several reasons for the increase in cooking time for beans in intervention households, it is interesting to note that the Mimi Moto was only used as the primary device to cook beans in 22% of these households. In fact, when we look at the amount of time required to cook beans using only the Mimi Moto, we see that there is a slight decrease in the amount of time required. Upon further exploration on this topic through the FGDs, it was clear that it takes a long time to cook beans regardless of what cooking device is used. Therefore, the majority of households opted not to use the Mimi Moto to cook beans because it would still take a long time, thus requiring an expensive amount of pellets. Rather, they chose to use a local stove, which might take longer, but would be much cheaper in terms of fuel.

However, when households did use the Mimi Moto as their primary device for cooking beans, they saw reductions in cooking time. In addition to measuring actual changes in time required for cooking, ICRW also measured respondents' perceptions of changes in time required for cooking. These perceptions can play an important role in individuals' sense of well-being and contribute to an understanding of how saved time was spent. **100%** of intervention households reported that it took **less time to cook** now that they have the Mimi Moto. Though not captured in the quantitative data, participants in the focus group discussions noted that using the Mimi Moto and pellet system saved them time both before and after cooking. Unlike wood, the pellets require no preparation, and they keep pots clean, which cuts down on time spent cleaning dishes after the meal.

Intervention respondents who reported saving time on cooking were subsequently asked what they spent that time on rather than cooking. The most common answers by far were cleaning the house and caring for children (Figure 31).

**Figure 31**



Among the 10% of respondents who reported using saved time on income-generating activities, the below table depicts what activities these households are engaged in and on average how much they are earning per month through this endeavor. These may include both existing income-generating activities, and also pursuits that only began after the advent of the Mimi Moto. Some of these activities may account for the 4% increase in households that work (see Figure 13).

**Table 3: Income-generating activities and earnings among those who reported saving time on cooking**

Income-generating activity	Average income earned per month
<b>Selling traditional beer</b>	\$36.54 (30,000 RWF)
<b>Daily activity inside the camp</b>	\$30.45 (25,000 RWF)
<b>Community health worker</b>	\$21.92 (18,000 RWF)
<b>Work of an NGO in the camp</b>	\$21.92 (18,000 RWF)
<b>Cleaner in the camp/office of UNHCR</b>	\$21.92 (18,000 RWF)
<b>Hairdressing</b>	\$18.27 (15,000 RWF)
<b>Boutique, a family business</b>	\$6.09 (5,000 RWF)

In order to facilitate a discussion about possible time savings using the Mimi Moto, ICRW conducted four focus group discussions at the endline with Inyenyeri customers. The two groups had a total of five and four respondents, respectively. In two of these FGDs, a series of photographs/drawings depicting various everyday activities – including a woman cooking, cleaning the house, taking care of the kids, helping the kids study, doing some sort of income-generating activity, and spending time on social/leisure activities – were distributed and participants were instructed to choose the picture showing which activity they spent most of their time doing *before* receiving the Mimi Moto, and then had a discussion about why they chose this activity. Then they were asked to choose the picture showing which activity they spent most of their time doing *after* receiving the Mimi Moto, and again there was a facilitated discussion about why they chose this activity and what this meant for their lives.

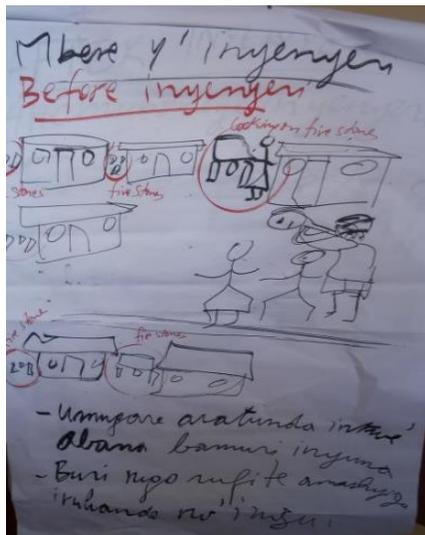
Many participants picked pictures indicating cooking as the main activity they did before receiving the Mimi Moto. One respondent said that she chose the cooking photograph “because time for fuel and preparing food is too much.” The second most popular activity among participants pre-Mimi Moto was taking care of children” “No one else can do it in my family,” said one respondent. Few people (only one respondent in each discussion group) were involved in income-generating activities prior to receiving the Mimi Moto.

When asked how they spend their time now that they use the Mimi Moto, instead of picking pictures of cooking or childcare, they chose the photographs depicting social/leisure activities or cleaning activities. A few respondents also said that they spent most of their time after receiving the Mimi Moto on taking care of children or making money. No one ranked cooking as their top choice, explaining that, cooking activities can no longer be described as an activity that takes too much of their time. These findings are fairly consistent with the quantitative findings, which showed that childcare and cleaning the house were by far the two most reported activities that respondents engaged in with their saved time. However, while FGD participants discussed engaging in social and leisure activities, these did not come out prominently in the survey data. This may be because women find it difficult to categorize certain activities as “leisure.”

When FGD participants were asked what they would do with their time if they had an unlimited amount of Mimi Moto pellets, younger refugees said they would be involved in income-generating activities; middle-aged refugees reported they would spend their time helping children to study; while older refugees said they would spend time on leisure activities, like visiting friends. The young women who participated in the discussions noted that contributing to the family income is considered very important because it would increase their value as a woman and as a mother. The middle-aged women said that helping their children study is important because they

want to see their children progress well at school. Older women said they rarely have time to visit their married children and friends, but with enough pellets they would have time for socializing. Through a broader discussion on the overall benefits experienced by Mimi Moto users, FGD participants continued to frequently cite time savings as one of the main benefits. Across groups, participants noted that they now have some time for other household chores, such as cleaning and doing dishes, as well as time to spend on social/leisure activities. One respondent described this change saying: “I used to spend much time and energy on cooking but now I have time to breathe. I also have time to visit friends.” Respondents also explained that with the Mimi Moto, food is now ready on time. Children always have food before they go to school and “they always eat before sleeping.” Furthermore, when asked about the main benefits experienced from using Mimi Moto, 68% of intervention respondents reported speed of cooking.

## Gender Dynamics



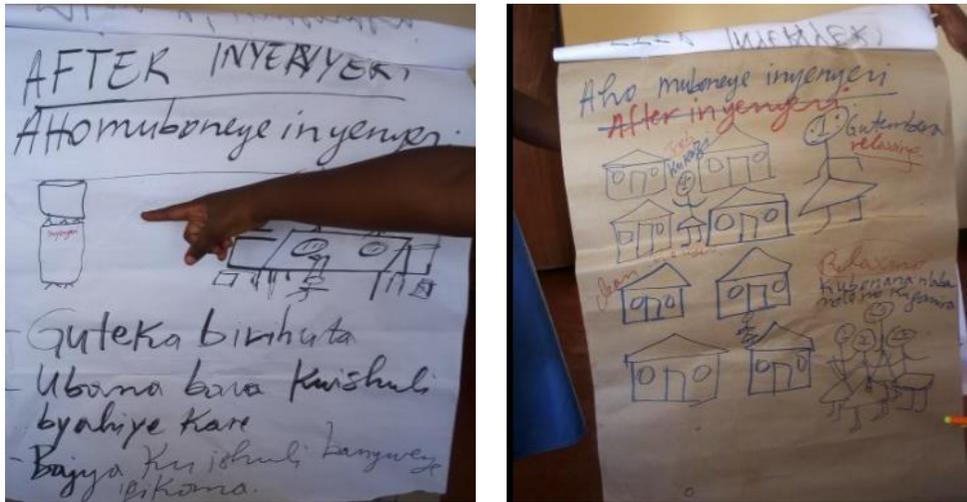
**Image 8: Focus Group Discussion “Before” Drawing**

For the other two focus group discussions, participants were asked instead to draw their lives both before and after receiving Inyenyeri to elucidate some of the nuanced, gendered impacts that have occurred. In the “before” drawings (Image 8), the groups drew a woman carrying wood on her back with children around her. Participants explained that women are often carrying children on their backs while cooking, and at the same time taking care of other children. Pictures also included young girls involved in cooking. Every house had a three-stone fire cooking place next to the house. While not captured in their drawings, participants also discussed how traditional cooking methods create a lot of smoke, causing women to have to spend a lot of time cleaning soot. They also explained that due to this smoke, household members were often rubbing their eyes and had headaches and runny noses. Women also mentioned that before having the Mimi Moto they felt sad because cooking is energy and time consuming. Cooking activities make them very exhausted, and some even mentioned losing their appetite because they were so tired.

For the “after” drawings, groups drew a Mimi Moto stove standing nearby while a family sits around the same table eating. They explained that cooking is very quick, the whole family can eat together, and in the morning kids take porridge and go to school without being late. Women mentioned that cooking is easier, quicker, and cleaner. Many participants emphasized that they

no longer experience health-related symptoms such as coughing, eye irritation, and runny noses like they did before. One group of participants drew people “relaxing, enjoying a clean premises and life.”

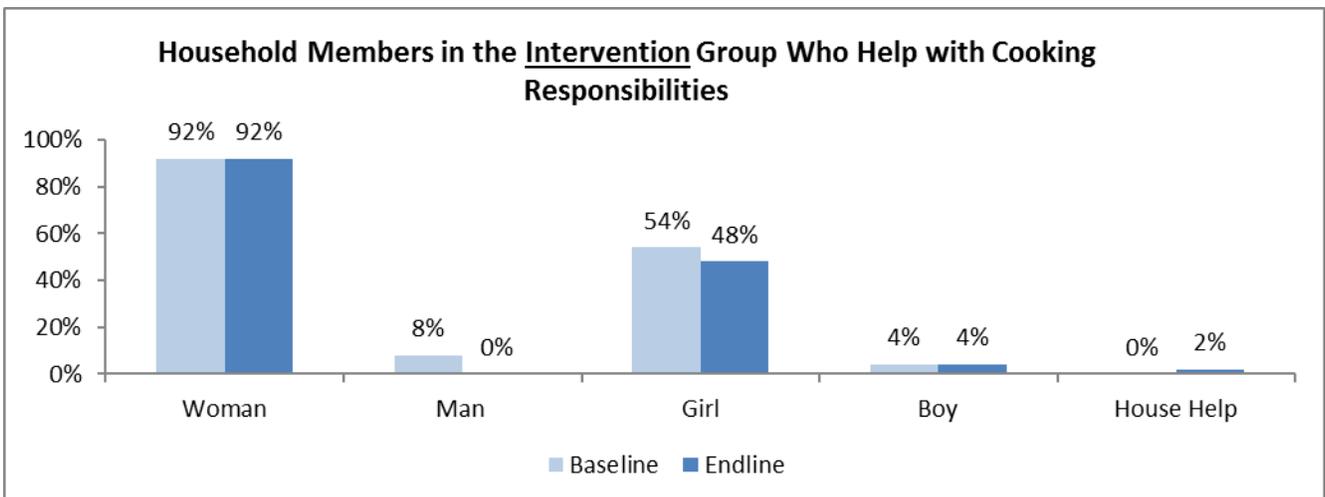
**Image 9: Focus Group Discussion “After” Drawings**



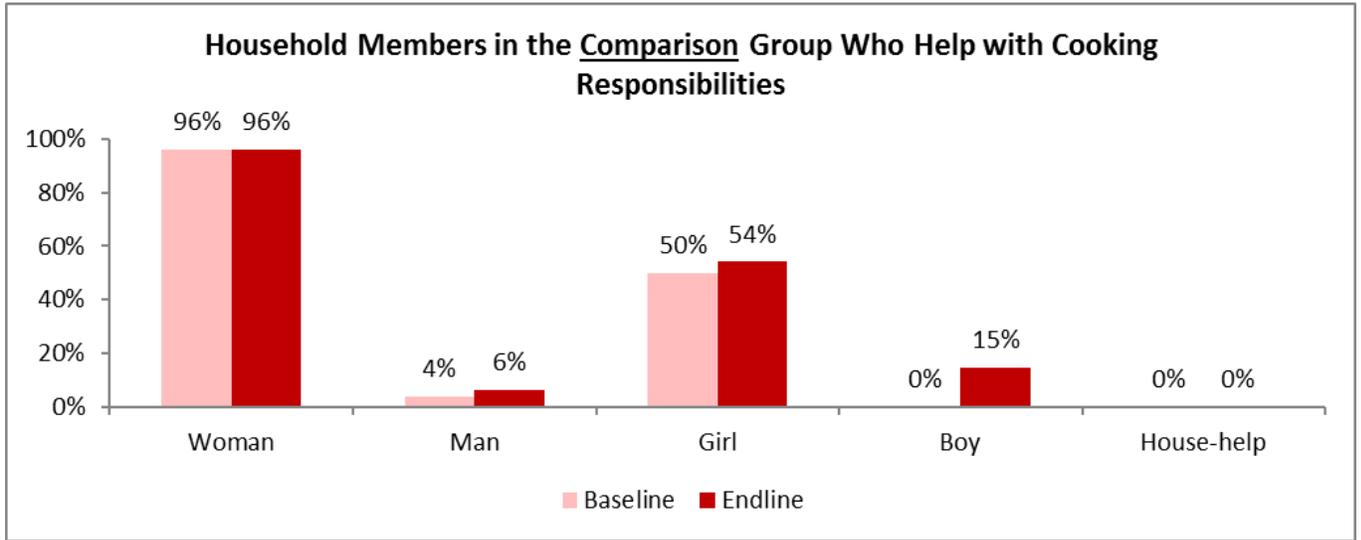
*Who is Involved in Cooking*

ICRW hypothesized that because the Mimi Moto is much easier to cook with, additional family members, and in particular male family members, might contribute to cooking. However, as Figures 32 and 33 show, there was little change in who was involved in cooking from the baseline to the endline among the intervention group. There was an increase in the percentage of boys involved in cooking among comparison households, but the reason for this shift is unknown.

**Figure 32**

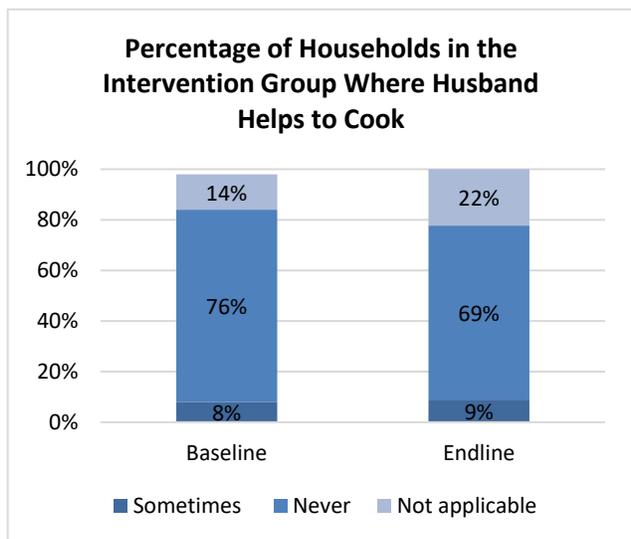


**Figure 33**

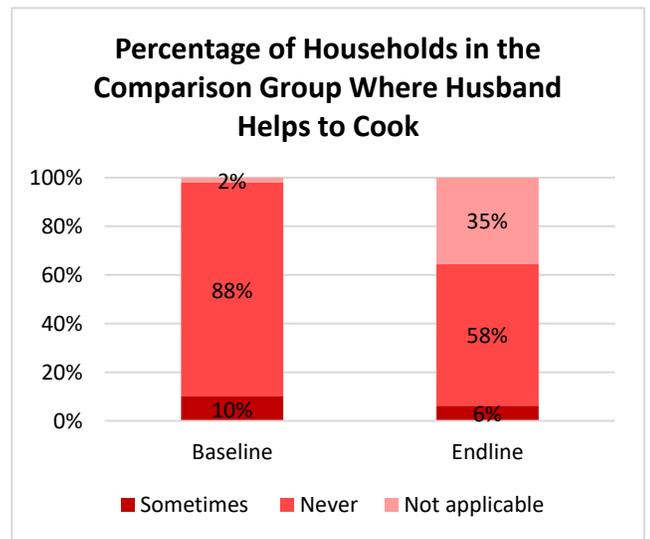


Similarly, as is clear from Figures 34 and 35, we did not see significant changes in the frequency of which husbands help with cooking.

**Figure 34**



**Figure 35**



Note: "Not applicable" refers to family situations in which there was no husband (e.g. widowed women), or the husband was not around at the time.

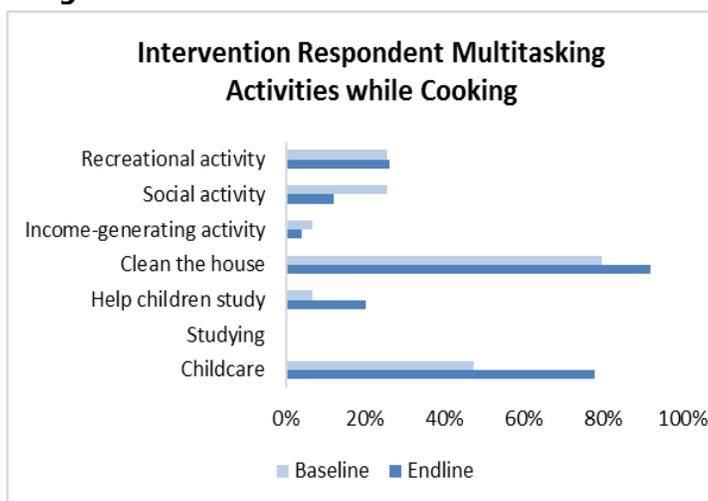
The qualitative data also shows that little has changed in the way of encouraging men and boys to cook. During FGDs, participants noted that it is cultural practice for women and girls to cook because they know how and because they are available at home. One Inyenyeri staff member who was interviewed reiterated this claim, saying “in our culture, when the woman is there, the man cannot cook.”

In half of the group discussions, participants expressed that if men were to help, it should be done indoors because it is either embarrassing or shameful for a man to be caught cooking. An Inyenyeri staff member explained: “Even those [men who are] cooking, they do it in a big privacy. [People think] that their wives have bewitched them.” According to Inyenyeri staff, the intense social stigma around men’s involvement with cooking is reinforced strongly at the family level. “I have a brother,” said one respondent. “When my father finds him cooking, he insults him that he should not be doing so when his sisters are there.” However, in alignment with this logic, one focus group thought Inyenyeri could be beneficial because it allows the user to cook indoors, though no such phenomenon of men cooking indoors was seen in practice.

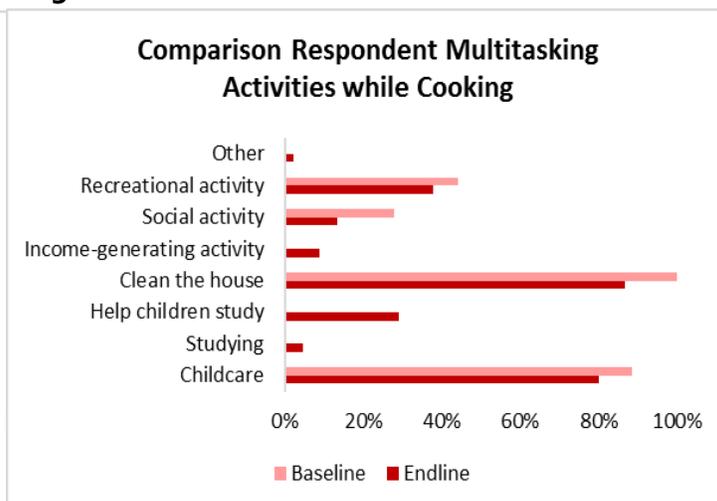
### Multi-tasking

The majority of respondents in intervention and comparison households reported doing something else while cooking (i.e., multi-tasking), and there was a slight increase in this practice among both intervention and comparison groups from baseline to endline – from 86% to 100% among intervention household respondents, and 88% to 90% among respondents from comparison households. Of those who reported multi-tasking in both groups, the most frequent activities they reported doing included cleaning the house and child care (see Figures 36 and 37).

**Figure 36**



**Figure 37**

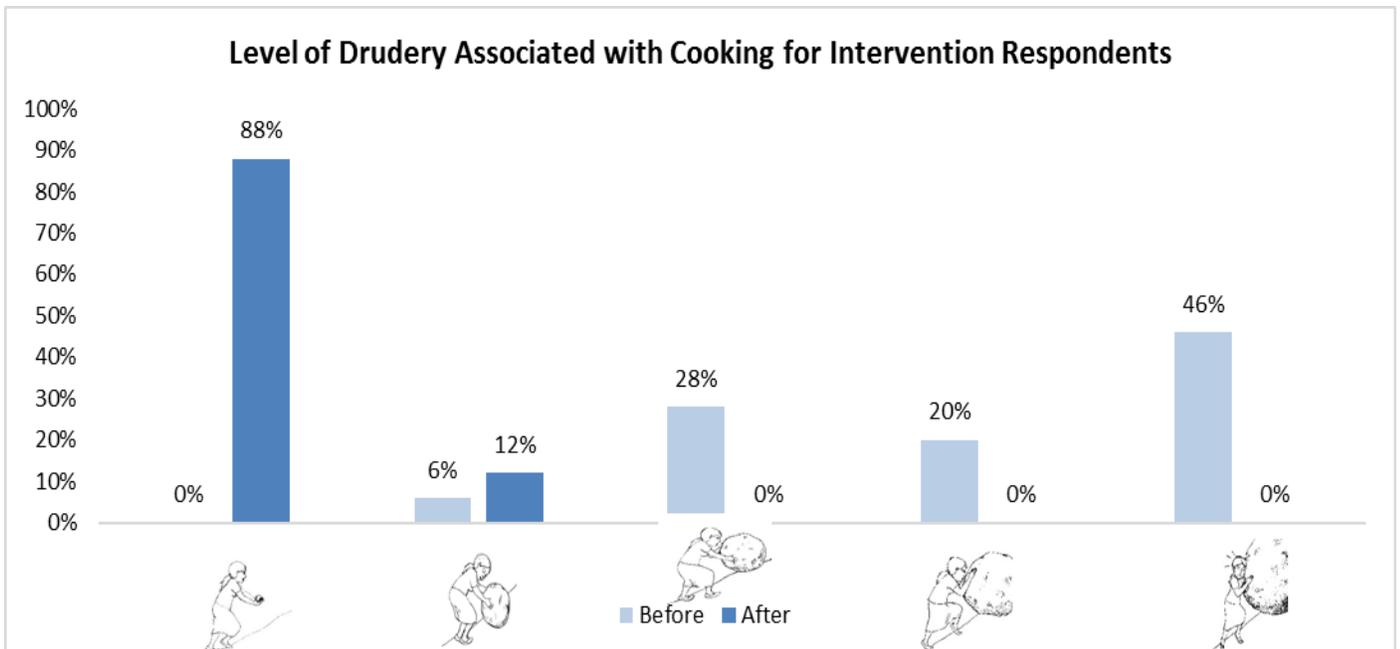


Some of the Inyenyeri staff who were interviewed noted that the Mimi Moto’s portability, efficiency, and ease of use allow customers to multi-task while cooking and to choose where they want to prepare food. One staff member said: “They [customers] can do anything and at the same time cook. They gained time and eat without forgetting to do anything...They can cook from their workplace.” However, given that similar percentages of respondents in both intervention and comparison households reported multitasking while cooking, and that many households in both groups were stove stacking, ICRW’s findings suggest that the Mimi Moto did not contribute significantly to users’ ability to multitask while cooking.

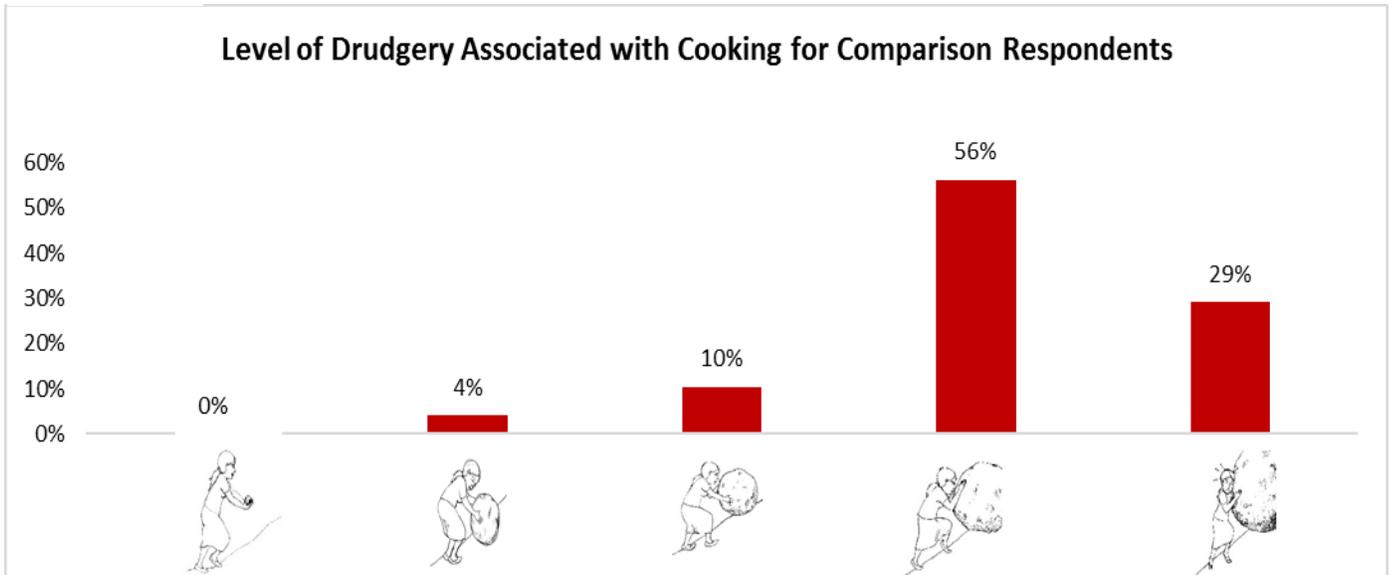
## Drudgery

Drudgery refers to the amount/level of effort needed to complete a task. For cooking, drudgery consists of the effort or workload associated with collecting and preparing/processing fuel, as well as cooking, such as lighting and managing the fire. During the endline surveys, ICRW asked households to rate the level of effort associated with cooking, based on a series of images that depicted a task that requires very little effort up to a task that requires a great deal of effort – in this case, a woman pushing a stone up a hill. Respondents from intervention households were asked to mark which picture represented the level of effort required before they had the Mimi Moto and after they had the Mimi Moto. Respondents from comparison households were asked to mark the picture that represented the current level of effort associated with cooking. Figures 34 and 35 show the level of effort that respondents associated with cooking.

**Figure 38**



**Figure 39**



On average, intervention households reported a **72%** decrease in the level of **drudgery associated with cooking**. Numerically, on a scale from 1 to 5, intervention households reported a decrease in cooking drudgery from 4.06 to 1.12. In reflecting on current levels of effort, comparison households reported a drudgery level of 4.1.<sup>7</sup>

Participants in all of the FGDs agreed that cooking with Inyenyeri is easier than with wood or other stoves. They commented that after completing the training, both lighting the stove and cooking were very easy. As noted above, users said that Inyenyeri saves them effort before and after cooking since there is no need to prepare the pellets as one needs to prepare wood, and the Mimi Moto keeps pots clean, so there is less clean-up afterwards. Users also appreciated the convenience of being able to cook inside the home. Participants who were previously using charcoal said they no longer had to wash their hands after handling the fuel, thus saving them water as well as time. However, some participants in FGDs noted that it can be frustrating to have to completely remove the used pellets before adding another batch to relight the stove.

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<sup>7</sup> Data on drudgery was not collected during the baseline surveys. In piloting the surveys, ICRW found that it was very difficult for people to report on levels of drudgery associated with everyday tasks. They didn't consider tasks to be hard or easy – more something that they simply had to do every day. It was not until they had experienced something different that they could reflect back and report the change in the level of drudgery.

## Health & Safety

Health and safety was one of the areas where we saw the most drastic changes after the use of the Mimi Moto. As a Tier 4-ranked stove in indoor emissions, the Mimi Moto emits much lower levels of carbon monoxide and particulate matter than any traditional cooking method. Consequently, ICRW expected to see decreases in some of the health-related and quality of life (HRQoL) indicators associated with cooking smoke in the intervention households.<sup>8</sup>

As depicted in Figures 40 and 42, reported incidents of burns and HRQoL indicators such as eye irritation, coughing and sneezing, and shortness of breath decreased dramatically in intervention households – both for survey respondents and other household members (as reported by respondents). By contrast, the percentage of respondents and household members in comparison households experiencing these same HRQoL indicators (Figures 41 and 43) remained approximately the same.

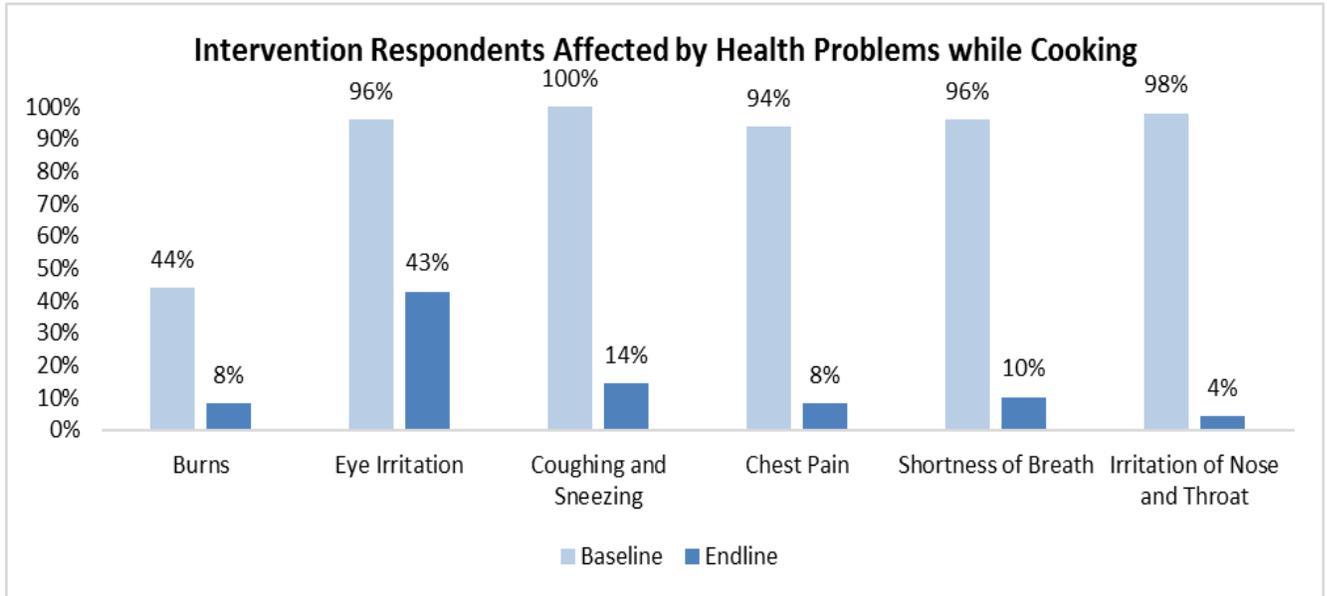
Overall, there was an average 83% decrease in experience of burns and various HRQoL issues in intervention households, among both the participants themselves (Figure 40) and their other household members (Figure 42). The symptoms that saw the greatest decrease among intervention respondents were irritation of nose and throat (96% decrease), chest pain (91% decrease), and shortness of breath (89% decrease).

Figures 44 and 45 show the change in frequency with which respondents from intervention and comparison households experienced eye irritation, and Figures 46 and 47 show the frequency with which respondents experienced coughing and sneezing. While there are slight increases in the frequency with which comparison respondents experienced these HRQoL indicators, there are large decreases in the frequency among intervention respondents. Intervention respondents are much less likely to have reported “frequently” experiencing either of these symptoms. In comparison households, there was actually a 25% increase in the percentage of respondents who experienced these indicators (Figure 41) and only a decrease of 28% in the experience of such symptoms among their other household members (Figure 43).

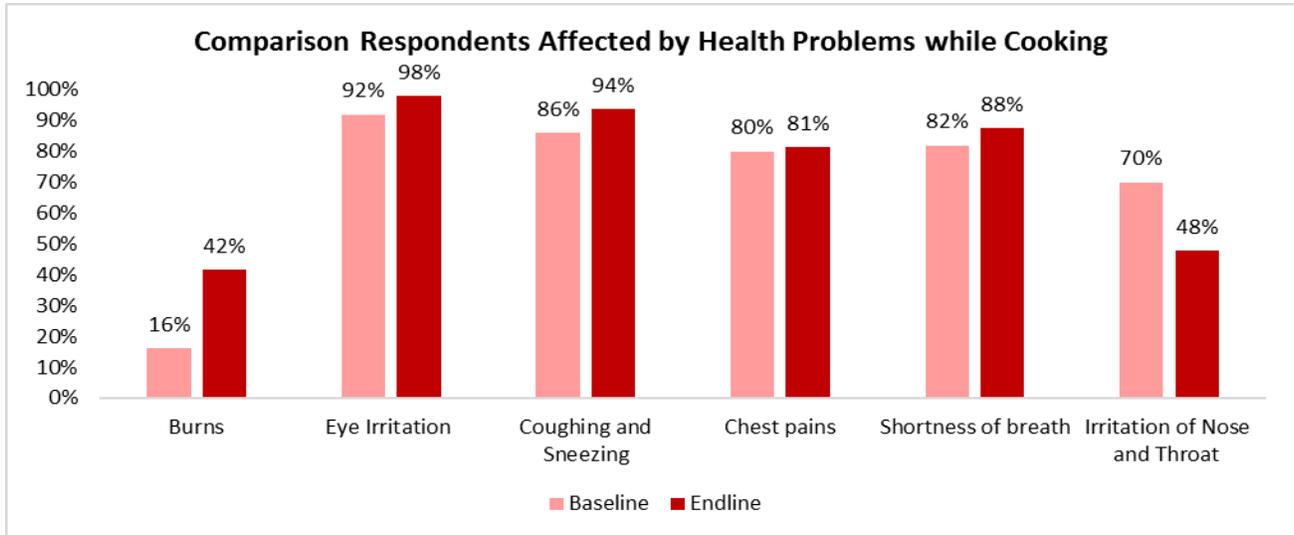
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<sup>8</sup> For more information on stove tier ratings, visit <http://cleancookstoves.org/technology-and-fuels/standards/iwa-tiers-of-performance.html>

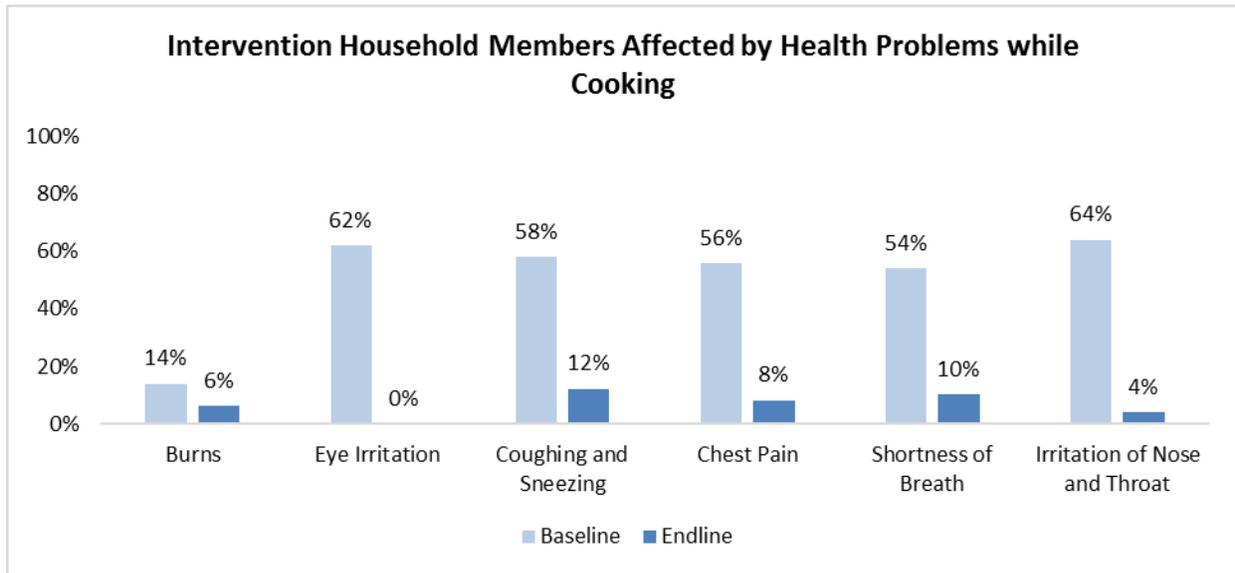
**Figure 40**



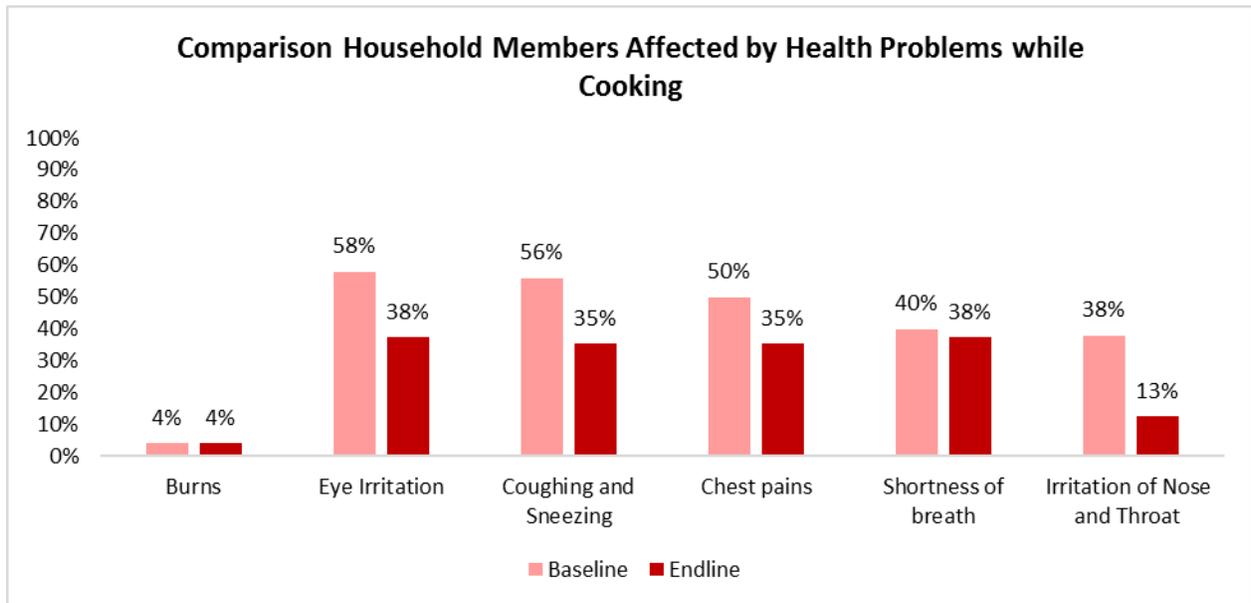
**Figure 41**



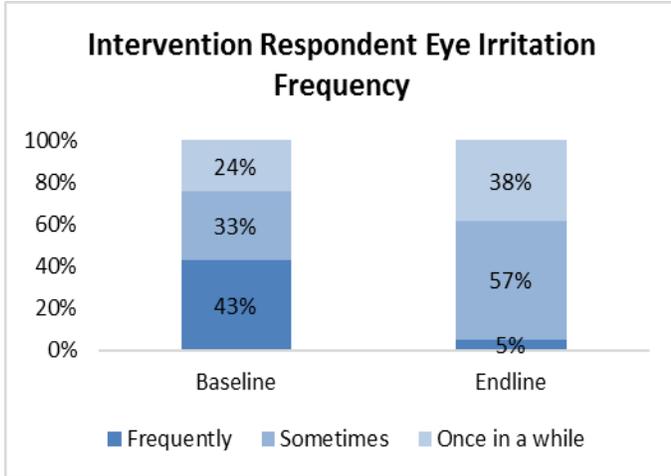
**Figure 42**



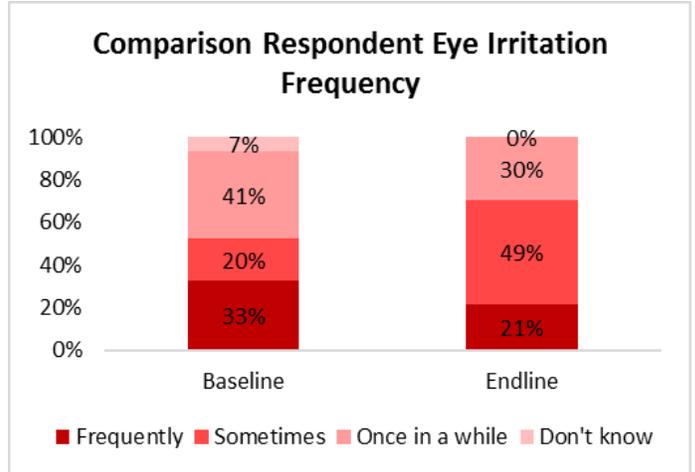
**Figure 43**



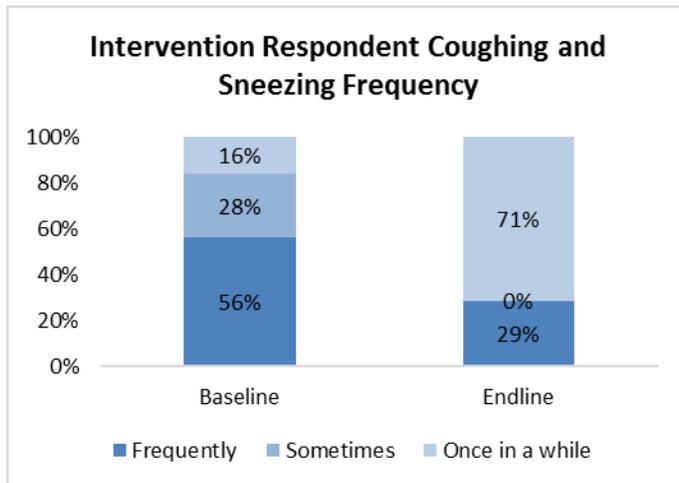
**Figure 44**



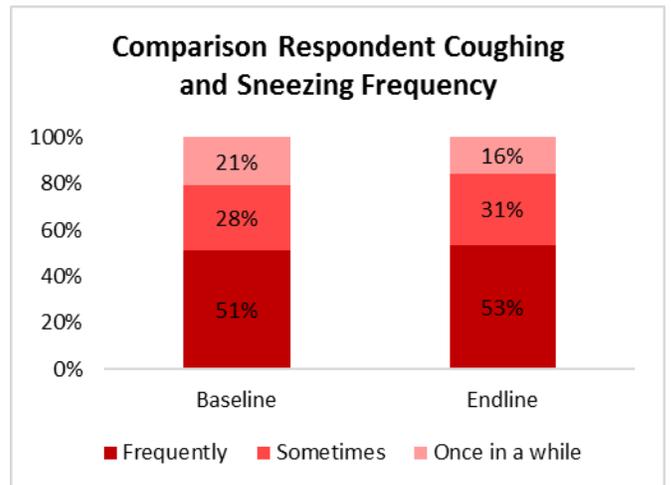
**Figure 45**



**Figure 46**



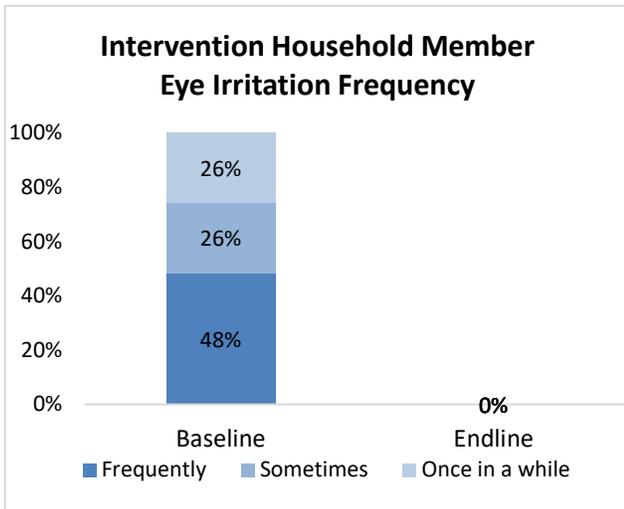
**Figure 47**



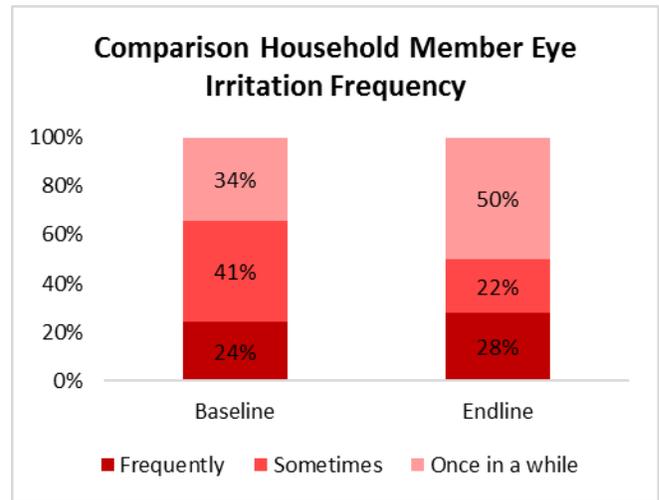
HQRoL indicators experienced by other household members (Figures 42 and 43) show that the percentage of other household members who experience various health-related issues decreased among both intervention and comparison households, but to a much greater extent among intervention households. As these other household members are not the primary ones doing the cooking, they experience these health issues in lower percentages than the respondents. The HQRoL issues with the greatest decreases among other household members in intervention households include eye irritation (100% decrease) and irritation of the nose and throat (94% decrease).

Similar to the patterns of the frequency of health issues experienced by respondents, in Figures 48-51, we see that there are large decreases in the frequency with which other household members from intervention households experienced HRQoL issues, while the experience of these issues among other household members from comparison households remains largely unchanged.

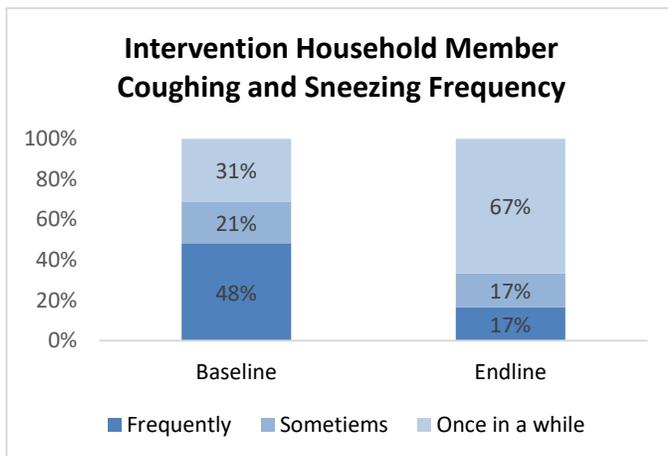
**Figure 48**



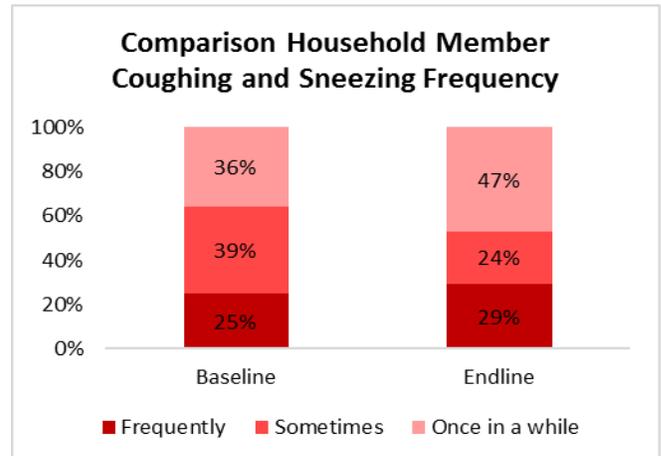
**Figure 49**



**Figure 50**



**Figure 51**



In addition to asking about the frequency of various health-related issues and safety risks, we also asked intervention respondents about their perception of change in safety. Similar to perception of changes in time use, this perception is important for understanding how Inyenyeri potentially contributes to changes in well-being. Since having the Mimi Moto, **100% of intervention respondents reported feeling safer while cooking.**

The large decrease in burns among intervention respondents – 44% to 8% between baseline and endline – was expanded upon during the FGDs. Participants told the team that they felt they could safely cook with their children around because the outside of the stove does not get hot. Users felt that they could not be burned easily with the Mimi Moto and even were comfortable using the stove inside their homes. One participant in the focus group said, “by using Inyenyeri, we feel very safe because the risks of having house burn or any other burns are very minimal.” Another explained that the pellets lose heat immediately after they are removed from the stove, so they cannot burn surrounding materials. When living in close proximity to other houses, one participant commented, it is even more important to reduce the risk of housefires. The only safety concern mentioned in the discussion was that some users were hesitant to add more pellets while cooking, for fear of being burned. One group suggested that additional trainings be held on this specific topic.

Inyenyeri customers interviewed were able to attribute a number of different health-related benefits to the use of the Mimi Moto. A reduction in eye irritation was consistently cited by respondents as a key health benefit experienced by Inyenyeri users. Participants also cited a reduction in coughing, though other health-related benefits that were seen in the survey data – including reductions in sneezing, chest pain, shortness of breath, or reduced irritation of the nose and throat – were not explicitly mentioned by FGD participants.

To provide some context on the quantitative data, ICRW conducted a key informant interview with a health worker, the chief nurse in the camp’s health clinic, who noted that the three most common health problems within the camp were:

- 1) Burns; for which the health center receives approximately three cases per week. Among these, more than 80% were children under the age of five.
- 2) Asthma; the center estimated the number of people in the camp experiencing asthma to be about 50; and,
- 3) Asphyxia; particularly at night.

The health worker noted that since Inyenyeri was introduced in November 2016, the number of serious burn cases reported had reduced. Cases of asphyxia had similarly reduced in the past six

months. While interesting, it is impossible to know whether these reductions directly resulted from Inyenyeri because the clinic does not track Inyenyeri patients vs. non-Inyenyeri patients.

## Fuel Use

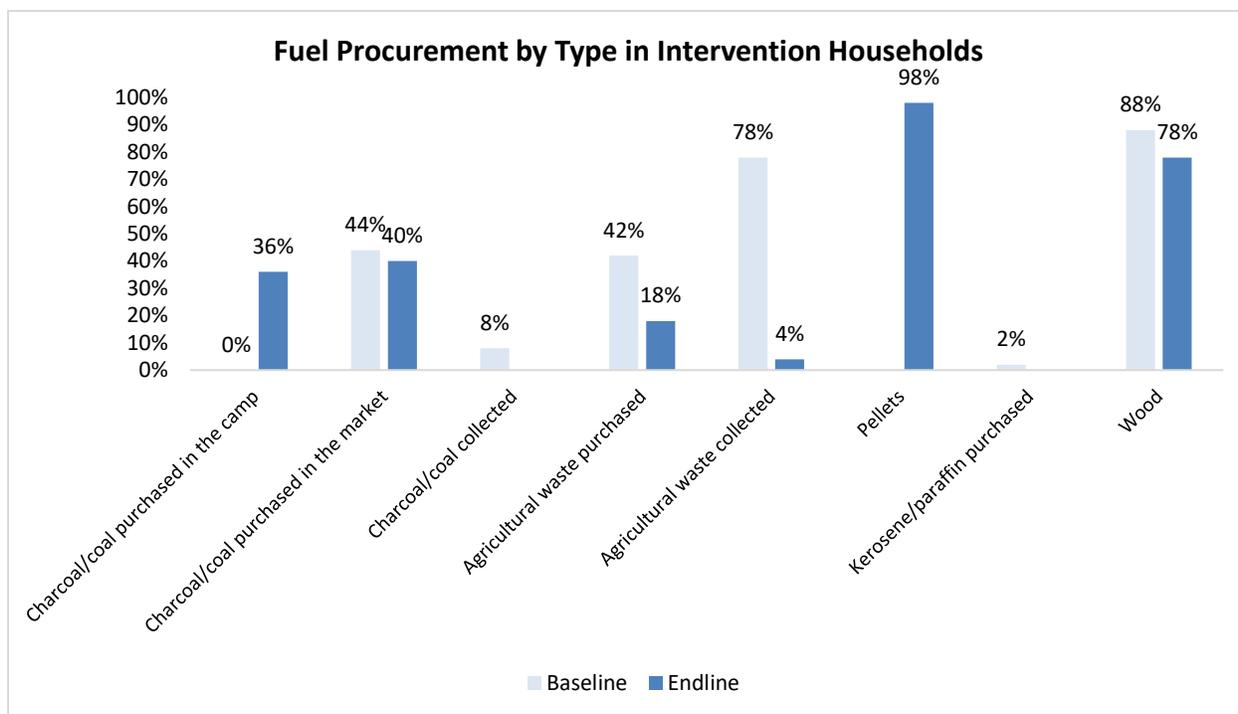
The quantitative survey also sought to capture several measures related to fuel procurement, including the type of fuel used, in what quantities, and with what frequency, as well as the amount of time and money spent on procuring the fuel. While the design of the stove can impact the amount of time a user spends cooking, it can also impact the amount of time spent on gathering fuel. Reducing the time, energy, and money needed to collect and/or purchase fuel can have a significant social and economic impact on refugees.

Based on the surveys, ICRW identified five fuel types in use – wood, charcoal/coal, agricultural waste, kerosene/paraffin, and Inyenyeri pellets. These were then divided into eight distinct groups based on how the fuel was procured:

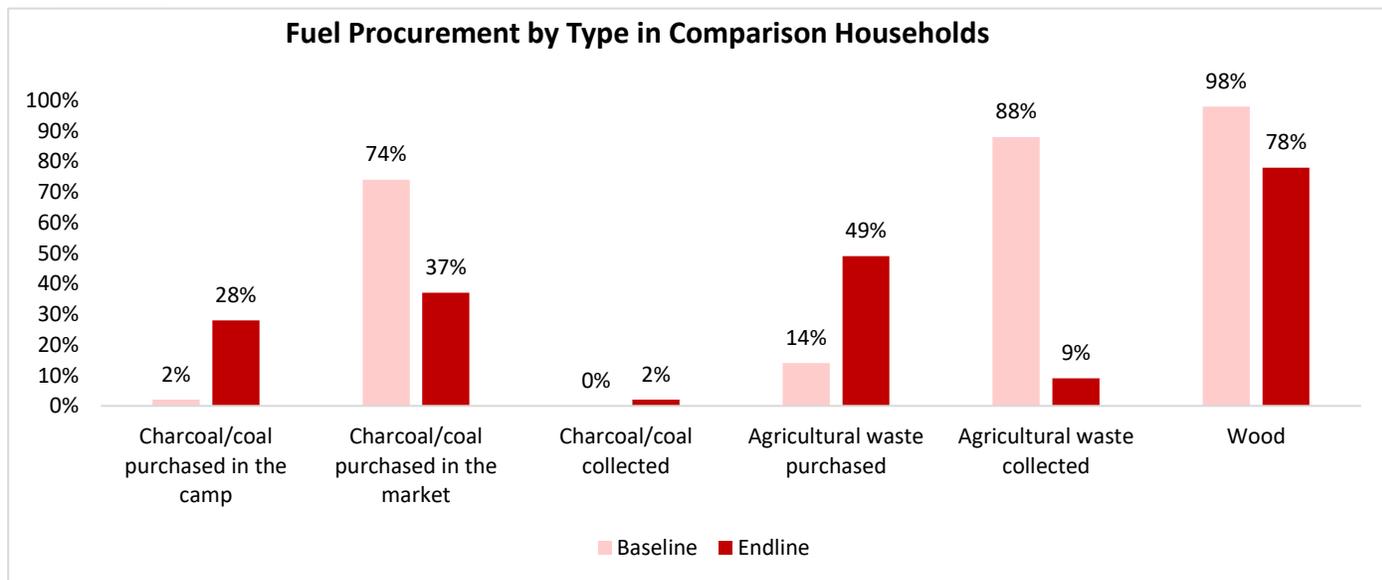
- **Wood** – At the time of the baseline and endline survey, UNHCR was distributing firewood to all households in Kigeme for cooking. Given that firewood collection by refugees is illegal in Rwanda, ICRW could not ask if, where, or how households procured firewood outside of UNHCR’s distributions without putting the refugees at risk.
- **Kerosene/Paraffin** – purchased by only a few intervention households at the baseline.
- **Agricultural waste – collected** by household members of both groups.
- **Agricultural waste – purchased** in the camp by household members in both groups.
- **Charcoal – purchased in the camp** by household members in both groups.
- Charcoal – purchased in the market outside the camp by members of both groups.
- **Charcoal “collected”** – This refers to a few cases where refugees were making or gathering their own charcoal.
- **Pellets** – purchased monthly from Inyenyeri only by intervention households. As the program had not yet started at the time of the baseline, pellets only appear at the endline.

Figures 52 and 53 below show fuel types and means of procurement in both groups at baseline and endline. While the preferred fuel types among survey respondents were slightly different between intervention and comparison households, the highest percentage of households in both groups used wood, collected agricultural waste, and purchased charcoal in the market at the baseline. Preferences shift somewhat at the endline.

**Figure 52**



**Figure 53**



Notably, Figure 52 shows that despite a high (98%) preference for pellets, **intervention households continued to use other fuels besides Inyenyeri’s pellets**. This aligns with the above data on cookstove usage, which shows that many households were stove stacking, supplementing the Mimi Moto with other devices. **Findings from the FGDs show that cost is the main barrier**

**to using Inyenyeri more frequently.** All four focus groups noted that they buy pellets when they can, but when money runs out they must supplement with charcoal or other fuels. One group emphasized the importance of price, saying, “as refugees, we prefer price than paying attention to consequences or time.” When asked how to improve the program, participants across groups agreed, “if the price would go down to 100 RWF per kilo and the subscription fee go down to 20kg per 2,000 RWF, people would be using pellets exclusively.”

Along with the addition of purchasing pellets, both intervention and comparison households saw slight decreases in the use of wood, which may be due to the fact that the baseline survey was conducted during dry season, and the endline survey was conducted during rainy season. During rainy season, households are less likely to use wood, as it is wet and heavy. Figures 52 and 53 also depict a shift from collecting to purchasing agricultural waste in both groups. Similar to the use of wood, this may be due to the seasonal shift wherein it was easier to collect agricultural waste during the dry season, but more difficult during the rainy season, leading households to purchase it instead.

There was a significant increase in the purchase of charcoal within the camp among both intervention and comparison households. Among comparison households (Figure 53), it appears that this may have been part of a shift from purchasing charcoal in the market outside of the camp to purchasing in the camp. We do not know the reason for this shift, and can only assume that more charcoal became available at an affordable price within the camp. Among intervention households, one potential reason for the increase of charcoal purchasing inside the camp may be the existence of roadside charcoal sellers in Kigeme (Image 10). While traveling to purchase the pellets from the Inyenyeri shop, Inyenyeri customers may have passed these sellers chosen to purchase charcoal out of convenience. As households purchased these fuels, there would be less of a need to collect other fuel types. In the customer satisfaction portion of the survey, a low proportion of intervention households reported “uses less charcoal” as one of their experienced benefits from using the Mimi Moto, despite the fact that 36% of households reported this as a motivation for using Inyenyeri. This further emphasizes that, due to stove stacking to meet household needs, households continued to purchase and use charcoal even after having the Mimi Moto.

**Image 10: Roadside charcoal sellers in Kigeme Camp**



## Procurement

Table 4 summarizes the percentage of households that were purchasing and collecting fuel at the baseline and endline, as well as the average amount of money and time expended and distance they were traveling to procure fuel each month. The time and distance statistics below include the time required to both purchase and collect various types of fuels, as well as the distance traveled to both purchase and collect fuel. It is worth noting that a majority of households in both groups were both purchasing *and* collecting fuel at the baseline, again highlighting that the refugees were using a mix of strategies to meet their cooking needs.

**Table 4: Fuel Procurement (Excluding Wood)**

Intervention Households		Comparison Households	
Baseline	Endline	Baseline	Endline
<b>78% of households purchased fuel</b>	<b>100%</b> of households <b>purchase</b> fuel <sup>9</sup>	<b>86%</b> of households <b>purchased</b> fuel	<b>82%</b> of comparison households <b>purchase</b> fuel
<b>86% of households collected fuel</b>	<b>4%</b> of households <b>collect</b> fuel	<b>88%</b> of households <b>collected</b> fuel	<b>12%</b> of comparison households <b>collect</b> fuel
<b>On average, intervention households spent an average total of \$3.67*, traveled 1.46km* and spent 53.11 minutes on fuel procurement each month.</b>	On average, intervention households are spending <b>\$7.05</b> , traveling <b>1.53km*</b> and spending <b>52.92 minutes</b> on fuel procurement each month.  (After removing time spent on agricultural waste collection, a monthly average of <b>48.92 min</b> is spent on fuel procurement)	On average, comparison households spent an average total of <b>\$3.52*</b> , traveled <b>2.16km*</b> and spent <b>57.31 minutes*</b> on fuel procurement each month.	On average, comparison households are spending <b>\$4.02</b> , traveling <b>1.88km*</b> , and spending <b>95.58 minutes</b> on fuel procurement each month.  (After removing time spent on agricultural waste collection, a monthly average of <b>79.05 min</b> is spent on fuel procurement)
On average, households made <b>1.97 fuel procurement trips/month</b>	On average, households made 3.11 fuel procurement trips/month	On average, households made 2.36 fuel procurement trips/month	On average, households made 2.42 fuel procurement trips/month

\* = Outliers have been removed<sup>10</sup>

There was an increase in the percentage of intervention households that purchase fuel, likely directly due to their participation in Inyenyeri, while the percentage of comparison households who purchase fuel remained approximately the same. There was a large decrease in the percentage of both intervention and comparison households who were collecting fuel at endline. While there might have been a slight decrease among intervention households due to

<sup>9</sup> The 100% is to be expected, as all intervention households were Inyenyeri customers.

<sup>10</sup> ICRW removed entries that were statistical outliers in the data set. Outliers are calculated by first dividing data into quartiles, where  $Q1$  (the 1<sup>st</sup> quartile) is the point for which 25% of the data are *less than* or equal to this value and  $Q3$  (the 3<sup>rd</sup> quartile) is the point for which 25% of the data are *greater than* or equal to this value. The IQR (the interquartile range) is the distance between  $Q3 - Q1$ , it contains the middle 50% of the data. Outliers are then defined as any values that fall outside of:  $Q1 - (1.5 * IQR)$  or  $Q3 + (1.5 * IQR)$ .

participation with Inyenyeri, it is likely that much of the decrease in fuel collection was due to the fact that the baseline was conducted during dry season and the endline during rainy season, when collection of fuel is more difficult.

When we look at the average expenditure, distance, and time spent on fuel procurement, it is clear that **among intervention households expenditure has increased**, distance traveled has slightly increased, and the amount of time spent remained relatively similar. Expenditure has increased due to spending on pellets, and the distance has likely increased due to the distance that respondents have to travel to the Inyenyeri shop (see Annex 1) and/or the additional distance some of them had to travel to collect fuel during the rainy season, when it is necessary to walk farther to find dry fuel. While intervention households appear to be spending large amounts of time on fuel procurement at the endline, this average is skewed by two intervention households who were traveling greater distances to collect agricultural waste. When these households are excluded from the average, we see a slight reduction in the average overall amount of time required for fuel procurement among intervention households – from 52.92 minutes per month to 48.92 minutes per month.

Among comparison households, we also see an increase in fuel expenditure and time spent on fuel procurement, again likely due to the fact that households were more likely to purchase fuel during the rainy season, and those who did collect fuel spent more time searching for dry fuel during rainy season. There is actually a slight decrease in the distance traveled to procure fuel among comparison households. This may be due to the fact that there was a shift (evident in both groups) from purchasing charcoal in the market to purchasing it within the camp.

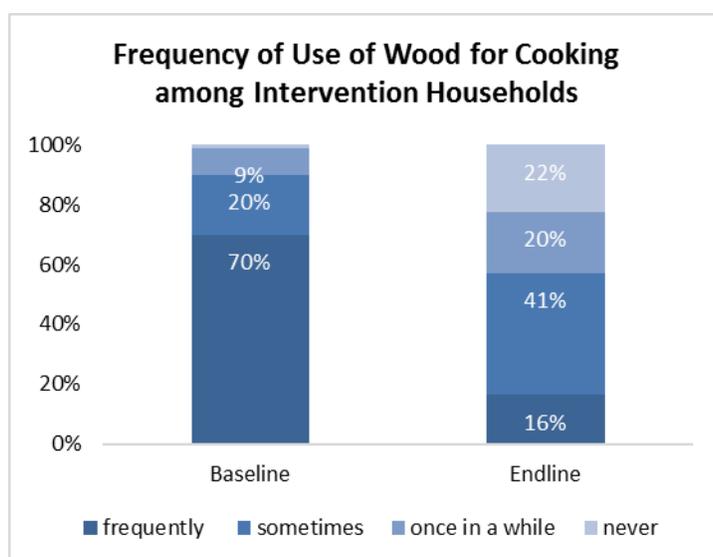
The fact that there was such a large increase in time spent on fuel procurement among comparison households, while it remained nearly constant among intervention households suggests that while the time required for fuel procurement generally increases during rainy season, participation with Inyenyeri enabled intervention households to balance this challenge and come out spending approximately the same amount of time on fuel procurement as they were during dry season.

The following sections break down some of the above data for the most commonly used fuels among intervention and comparison households at baseline versus endline.

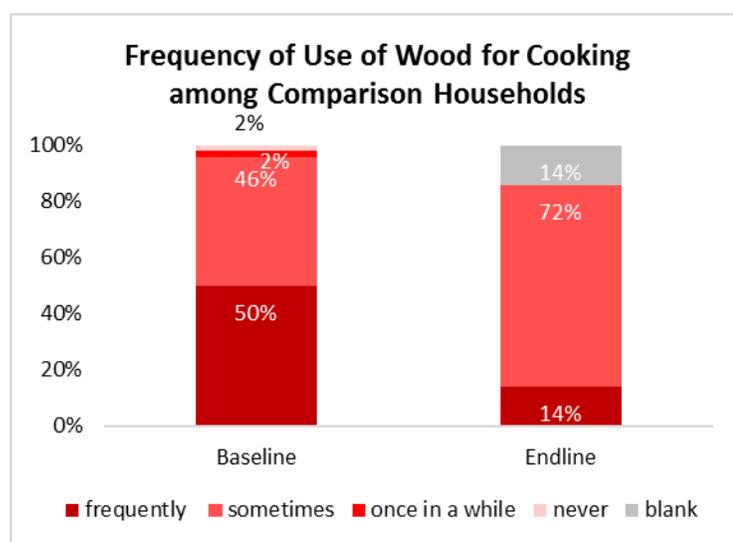
## Wood

As noted above, UNHCR was distributing wood bundles for cooking to families in Kigeme. Given that wood was distributed instead of procured, ICRW asked respondents how often they used wood for cooking, instead of how often they collected or purchased it. Table 5 and Figures 54 and 55 below depict how wood use changed among both groups between the baseline and endline. While some families were collecting firewood outside of the camp, this is technically illegal; therefore, we did not ask households to provide any details on this activity to avoid revealing illegal activity and placing them at risk with camp authorities.

**Figure 54**



**Figure 55**



**Table 5: Change in Wood Use Per Week**

	Intervention Households			Comparison Households		
	Baseline	Endline	Change	Baseline	Endline	Change
Amount used (kg)	54.75	28.16	-26.59 kg	52.14	43.19	-8.95 kg

As depicted in figures 52 and 53 above, that there was a reduction in the percentage of both intervention and comparison households that used wood for fuel. Figures 54 and 55 show that among households that did use wood, there was a shift to using wood less frequently at the endline compared to the baseline. As explained above, this is likely due to the fact that the endline was conducted during the rainy season and dry wood is more difficult to find and store. Furthermore, intervention households used wood even less frequently at the endline, likely due to their use of Inyenyeri pellets instead. Table 5 depicts the amount of wood used at baseline and

endline among intervention and comparison households. It follows the same pattern of small decreases among comparison households and large decreases among intervention households.

### *Charcoal Purchased in the Market*

**Table 6: Changes in Charcoal Procurement Per Month**

Intervention Households				Comparison Households		
	Baseline	Endline	Change	Baseline	Endline	Change
Number of trips	1.29	1.6	0.31 trips	1.59	1.66	0.07 trips
Money spent	\$4.29	\$3.11	-\$1.18	\$4.52	\$4.18	-\$0.34
Distance traveled (km)	0.93	0.78	-0.15 km	2.02	1.37	-0.65 km
Minutes spent	28.6	22.63	-5.97 min	54.53	60.71	6.18 min

As seen in Figures 52 and 53, while there were overall decreases in the percentage of households that purchased charcoal in the market outside the camp (especially among comparison households), there were slight increases in the number of trips among both intervention and comparison households that did purchase charcoal in the market. Expenditure decreased among both intervention and comparison households, suggesting that the price was lowered in the market. While the distance traveled was slightly reduced for both intervention and comparison households, this is likely due to a recall bias, as the location of the market has not moved.

Interestingly, the amount of time required to purchase charcoal in the market decreased among intervention households and increased for comparison households. This may be due to intervention households needing to buy less charcoal because they were primarily using pellets. Consequently, they could purchase the smaller amounts of charcoal sold on the roads within the camp. By contrast, charcoal remained a popular fuel for comparison households and they would have needed to buy it in larger quantities, which can only be purchased outside of the camp.

### *Agricultural Waste - Purchased*

**Table 7: Changes in Agricultural Waste Purchased Per Month**

Intervention Households				Comparison Households		
	Baseline	Endline	Change	Baseline	Endline	Change
Number of trips	1.12	2.11	0.99 trips	1.43	1.56	0.13 trips
Money spent	\$2.92	\$4.43	\$1.51	\$3.65	\$3.14	-\$0.51
Distance traveled (km)	0.92	1.5	0.58 km	1.39	1.2	-0.19 km
Minutes spent	33.81	32.78	-1.03 min	56.43	49.9	-6.53 min

Among intervention households, there was an overall decrease in percentage of respondents who purchased agricultural waste from baseline to endline, likely because they were now purchasing pellets instead (see Figure 52). There was an increase in the percentage of comparison households who purchased agricultural waste, likely due to the fact that the endline was conducted during rainy season, so it would be easier to purchase agricultural waste rather than collect it (Figure 53).

Among both intervention and comparison households who purchased agricultural waste at the endline, there were more purchasing trips than then were at baseline. This is likely also due to the difficulty in finding good, dry agricultural waste to buy during the rainy season. Households were making more frequent trips to purchase agricultural waste but were purchasing less fuel per trip at the endline, or they may have needed to pay more, as dry agricultural waste is rare during the rainy season. While the amount of time spent on purchasing agricultural waste decreased among both intervention and comparison households, intervention households saw slight increases in expenditure and distance traveled, while comparison households experienced slight decreases in expenditure and distance traveled. This could be due to the combination of sometimes having to travel farther or pay more for agricultural waste during rainy season (as seen in the intervention group) and the need to purchase smaller amounts of agricultural waste since not as much is available (as seen in the comparison group). In general, it seems that during the rainy season, households are buying smaller quantities of agricultural waste from sellers to fill fuel gaps, as opposed to purchasing larger amounts of agricultural waste to serve a larger role in meeting their energy needs during dry season.

#### *Agricultural Waste - Collected*

**Table 8: Changes in Agricultural Waste Collected Per Month**

	Intervention Households			Comparison Households		
	Baseline	Endline	Change	Baseline	Endline	Change
Number of trips	1.06	3	1.94 trips	1.09	2.2	1.11 trips
Distance traveled (km)	0.82	2.4	1.58 km	1.99	7.08	5.09 km
Minutes spent	29.83	100	70.17 min	48.48	212	163.52 min

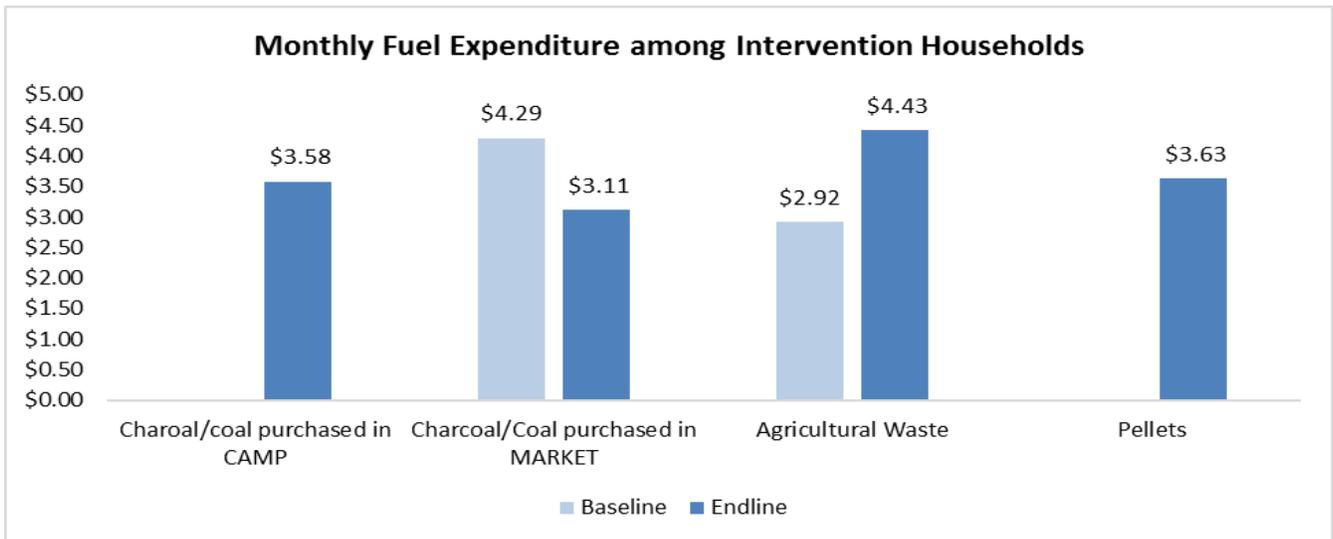
Overall, the percentage of households who were collecting agricultural waste greatly decreased among both intervention and comparison households, as can be seen in Figures 52 and 53. Again, this is likely due to the fact that the endline survey took place during rainy season, when it is much more difficult to collect dry agricultural waste. However, within the two intervention households and five comparison households who did continue to collect agricultural waste at the endline,

there were increases in the number of trips, the distance traveled, and the amount of time spent on agricultural waste collection. Households likely had to take more trips, spend more time, and travel further to find dry agricultural waste that they could use for fuel.

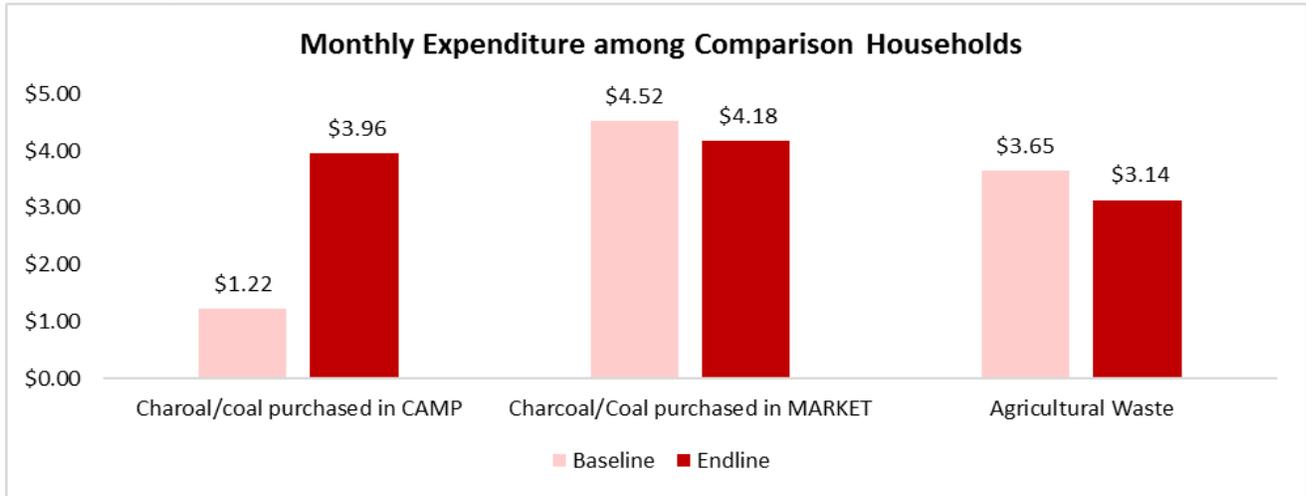
## Expenditure

As Figure 56 shows, among intervention households who purchased each type of fuel, expenditure on pellets and charcoal purchased in the camp were new at endline. It is important to note that households were choosing to spend money given to them to purchase food (by WFP) to instead purchase pellets. This demonstrates that they saw value in using the Mimi Moto. There was also an increase in expenditure on agricultural waste and a decrease on expenditure on charcoal purchased in the market. Among comparison households, as shown in Figure 57, there was an increase in expenditure on charcoal purchased in the camp and slight decreases in expenditure on charcoal purchased in the market as well as agricultural waste.

**Figure 56**

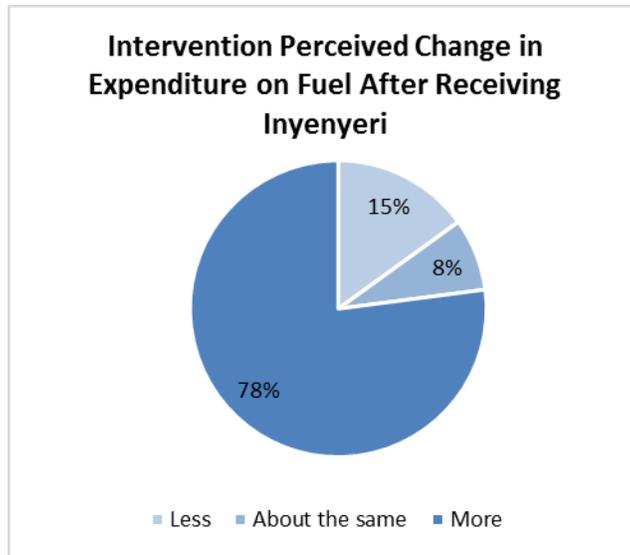


**Figure 57**



In addition to measuring the actual change in expenditure associated with various fuel types, ICRW asked respondents about their perception of change in fuel expenditure since signing up with Inyenyeri. As would be expected, Figure 58 shows that **a majority of respondents felt that they were spending more money on fuel since using Inyenyeri.**

**Figure 58**



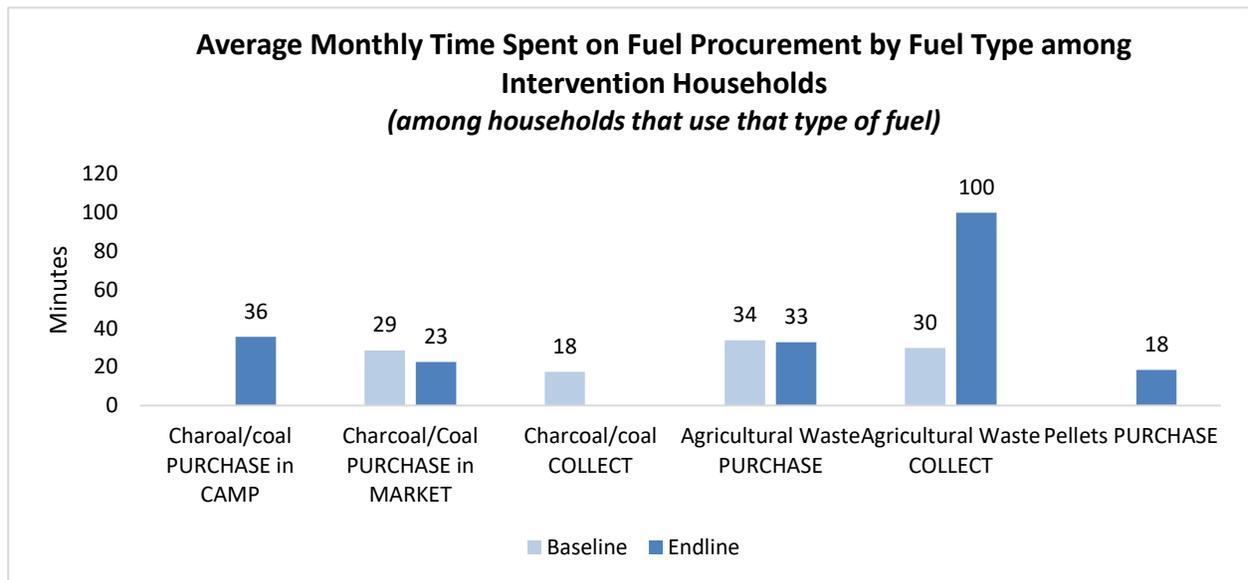
**Time**

Figures 59 and 60 depict the time that households spent procuring each type of fuel between baseline and endline. Both intervention and comparison households experienced a large increase in time spent on collection of agricultural waste. As previously noted, this is likely due to the fact that the endline was conducted during the rainy season and thus households had to spend a lot

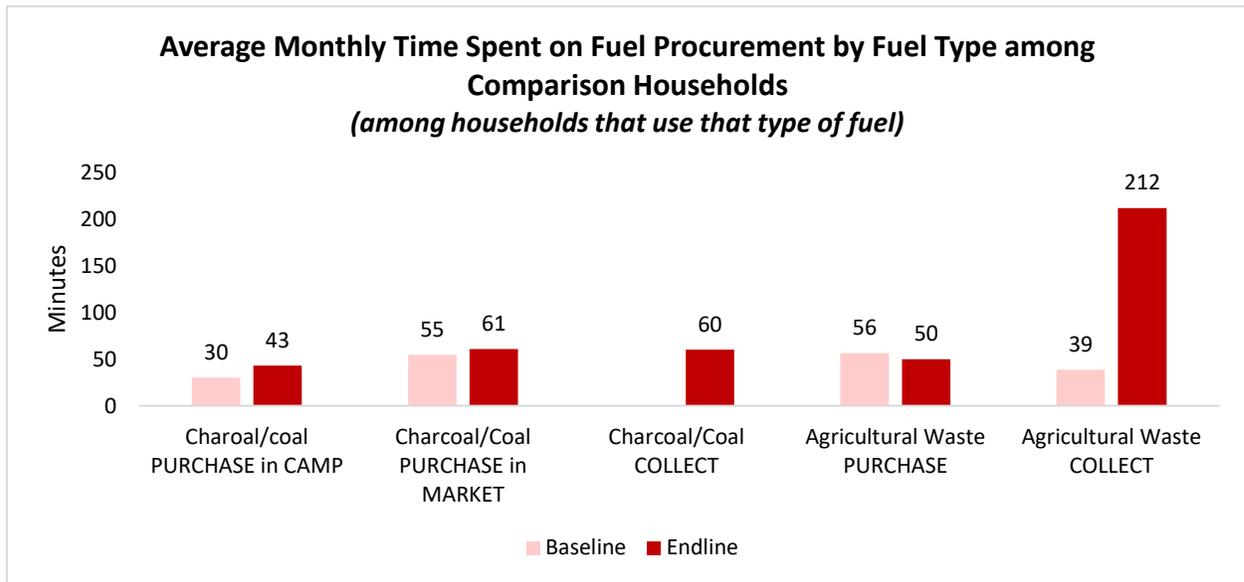
of time searching for dry, plentiful agricultural waste to use as fuel. Intervention households went from spending an average of 30 minutes per month collecting agricultural waste at baseline to 100 minutes at endline, and the shift among comparison households was from 39 minutes at baseline to 212 minutes at endline.

However, it is important to note that only seven households (two intervention and five comparison) were collecting agricultural waste at the endline (see Figures 52 and 53). Despite this, the amount of time those respondents spent collecting agricultural waste was so high that it distorted the overall average changes in time spent on fuel procurement among all households. This being the case, ICRW excluded the collection of agricultural waste when calculating the overall average (Table 9).

**Figure 59**



**Figure 60**



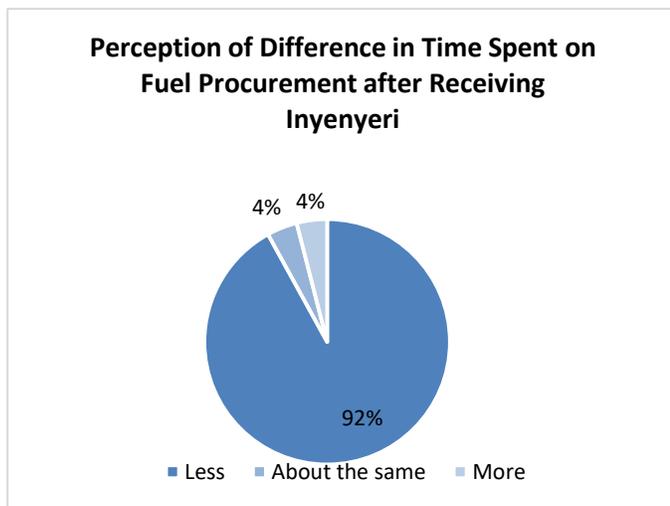
Overall, there was a minimal shift in the amount time spent on fuel procurement among intervention households (8% decrease) and a large increase (38%) in the amount of time required for comparison households, excluding the amount of time required for collection of agricultural waste. This leads ICRW to conclude **that participation with Inyenyeri enabled intervention households to balance seasonal changes and spend approximately the same amount of time on fuel procurement in the rainy season as they did during dry season.**

**Table 9: Average Change in Fuel Procurement Time (Excluding Collected Agricultural Waste)**

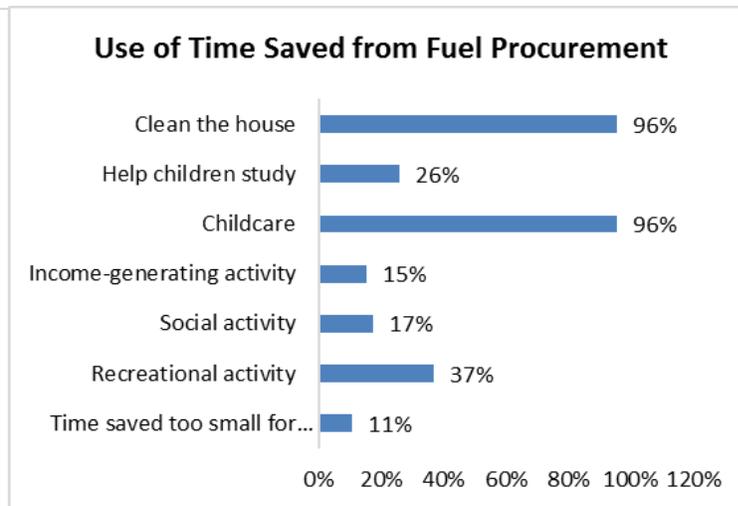
	Baseline	Endline	Time Difference	Change
<b>Intervention Households</b>	53.11 min	48.92 min	-4.19 min	-8%
<b>Comparison Households</b>	57.31 min	79.05 min	+ 21.74 min	+38%

In addition to measuring the actual amount of time spent on fuel procurement, ICRW also measured respondents' perception of the change in time spent on fuel procurement. Interestingly, while there was very little difference in the measured time associated with fuel procurement from baseline to endline for intervention households, the vast majority (92%) of intervention respondents *percieved* the amount of time spent on fuel procurement to be less after using Inyenyeri's system, compared to before (Figure 61).

**Figure 61**



**Figure 62**



Among those who felt that fuel procurement required less time now that they were Inyenyeri customers, households most frequently reported using this time for cleaning the house and childcare (Figure 62). Among the small percentage of households who used this time for income-generation, Table 10 shows the average monthly income earned by these particular endeavors.

**Table 10: Income-generating Activities of Those Who Perceived Time Saved on Fuel Procurement**

Income-generating activity	Average monthly income earned
Community health worker	\$21.92 (18,000 RWF)
Work with an NGO	\$21.92 (18,000 RWF)
Boutique	\$6.09 (5,000 RWF)
Selling traditional beer	\$23.14 (19,000 RWF)
Hairdressing	\$18.27 (15,000 RWF)
Daily activity inside the camp	\$36.54 (30,000 RWF)

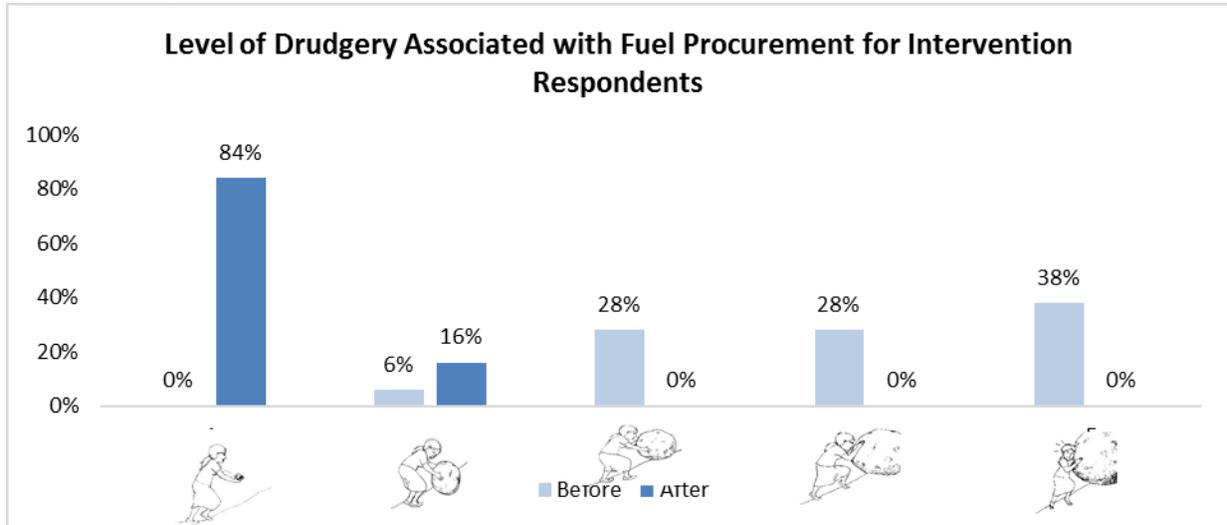
However, **limited emphasis should be placed on these findings of how “saved” time is used**, since in the actual measured amount of time required for fuel procurement among intervention households (Figure 59) changed very little from baseline to endline.

### Drudgery

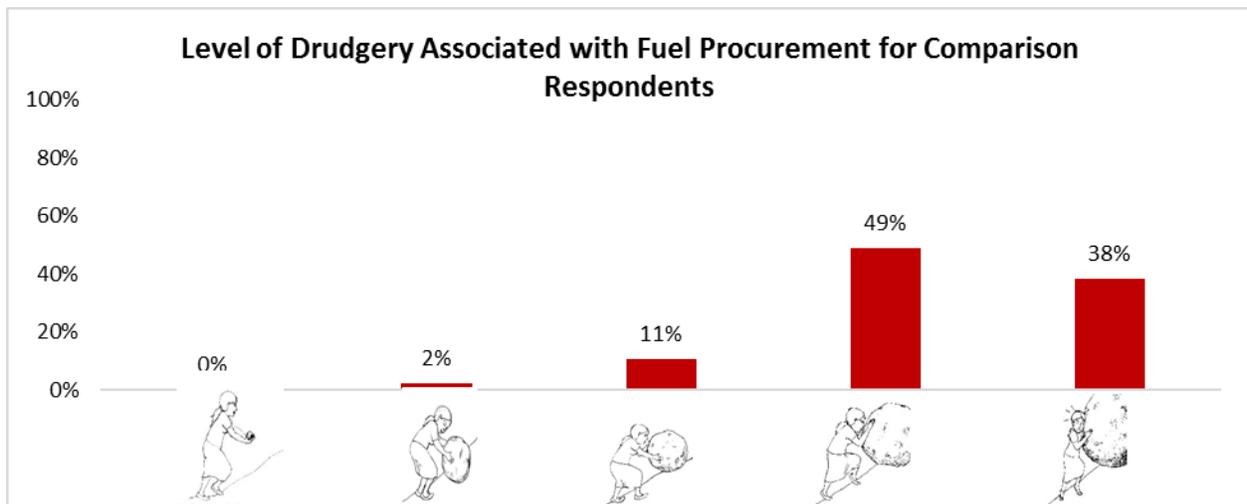
Similar to drudgery associated with cooking, ICRW asked households at the endline to rate the level of effort associated with fuel procurement on a visual scale that depicted a task that requires very little effort up to a task that requires a great deal of effort. We asked intervention households to mark which picture represented the level of effort required before they used the Mimi Moto stove and Inyenyeri pellets and after. Comparison households were asked to mark the picture that

represented the current level of effort associated with fuel procurement. Figures 63 and 64 show the level of effort respondents associated with fuel procurement.

**Figure 63**



**Figure 64**



On average, **intervention households reported a 71% decrease in the level of drudgery associated with fuel procurement.** Numerically, on a scale from 1 to 5, intervention households reported a decrease in drudgery with fuel procurement from 3.98 to 1.16, and comparison households reported an average drudgery level of 4.23.<sup>11</sup>

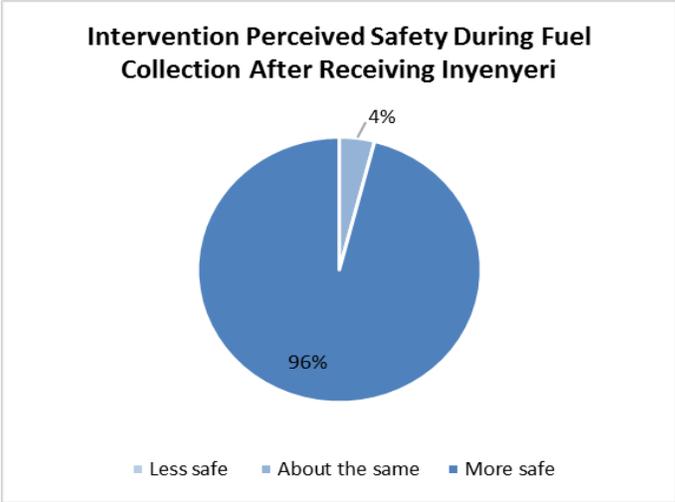
<sup>11</sup> As noted in the cooking section above, data on drudgery was not collected during the baseline surveys, only during the endline.

Participants in the FGDs noted several ways in which Inyenyeri had reduced the drudgery associated with fuel procurement. One group noted that a family could send their child to pick up the pellets, as there was a set price– no negotiation necessary, and they knew their child would not be in danger, but getting wood from the camp would require the head of household. One respondent explained that when she was pregnant, “when I felt exhausted, I called at the store and one of the staff even brought pellets to my house.” Another group commented that sometimes they would come back empty handed from trips to purchase charcoal because the supply is inconsistent. For those who receive wood from camp administration, participants noted waiting in line for five hours before their name was called. Two groups appreciated that pellets are available at any time, and the price always remains fixed.

**Safety**

As Figure 65 depicts, in response to the question of whether respondents felt more, about the same, or less safe during fuel procurement since having Inyenyeri, **96% of intervention households reported feeling safer**. This increased sense of safety is likely due to the fact that households are no longer required to venture out of the camp, or even to remote locations within the camp, to collect and purchase fuel, but rather know exactly where they can purchase the pellets.

**Figure 65**



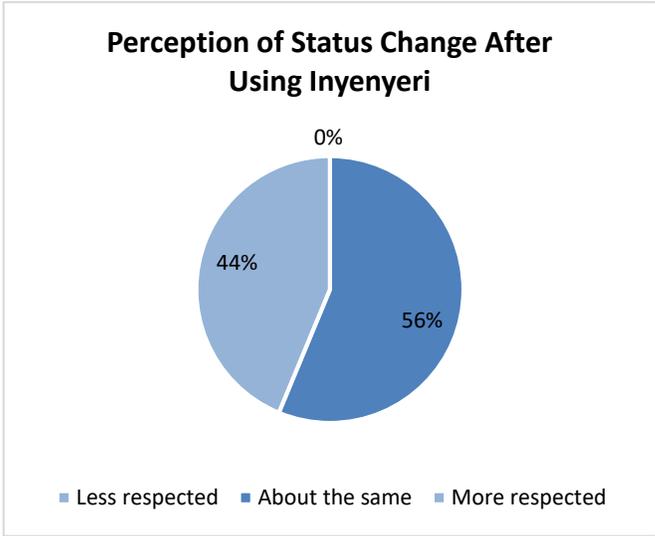
Many FGD respondents mentioned that exposure to risk during fuel collection has also reduced because of Inyenyeri. Before Inyenyeri, some respondents noted facing risk of having their axes stolen, injuring themselves while chopping wood, or being beaten. Others said that they faced potential robbery to their houses while they left to stand in long lines to receive wood in the camps. As one respondent explained, "I had to have somebody to stay at home while I [stood in] line for wood. This person can steal [from] me, but now I use a few minutes to get pellets, so [there is] no need for anybody to stay at home." Other Inyenyeri customers mentioned feeling safer because they no longer had to leave the camp to look for fuel. "We stay in the camp, [so there is] no risk of being beaten looking [for] fuel out of the camp," one female respondent said. One participant had a particularly negative experience after being caught collecting fuel outside the camp and got into trouble with authorities.

Customers were careful to note, however, that risks have not diminished altogether, since they still are forced to use wood because of the high price associated with Inyenyeri. They also reported that backaches and headaches, which are often associated with queuing to receive wood, have also reduced.

### Social Status and Relationships

Since having Inyenyeri, about half of the intervention respondents (44%) reported that they felt more respected by others, and about half (56%) felt about the same. Among respondents who felt more respected, 89% believed their increased social status is because community members think they are rich since they have the Mimi Moto stove, and 11% believed their increased status was because community members think they are smart for having the Mimi Moto stove.

**Figure 66**



Although ICRW did not explicitly collect data on this topic, one notable benefit of Inyenyeri that emerged in the FGDs was that the intervention contributed to reducing risks for conflicts within and between families. In the majority of the FGDs, female participants indicated that quarrels with husbands over delayed food have reduced. For example, when a husband has an emergency and needs to leave the house immediately, or if children need to eat breakfast expeditiously before they go to school, the wife/mother is able to use the Mimi Moto to cook food for the family more quickly. Husbands also appreciate that with the Mimi Moto, food is always warm.

FGD participants also reported that neighbors appreciate that the Mimi Moto produces less smoke, particularly given the cramped living quarters in Kigeme Camp. Before Inyenyeri's intervention, if one family had washed their clothes and smoke from a neighboring kitchen dirtied them, a quarrel might result. With Inyenyeri, however, this issue of conflicts between neighbors has decreased significantly. One respondent explained, "smoke [from my old cooking devices] introduced quarrels with neighbors before, but now we have peace with them." More robust data would be needed to determine the extent of this phenomenon, and future research on this topic is encouraged.

## Customer Satisfaction

In addition to all of the above questions about social and economic impacts, ICRW also asked intervention households about their satisfaction with Inyenyeri's products and services. Responses to these questions can be used by Inyenyeri to better understand the benefits and challenges experienced by users. It can also be used to improve product design, marketing messages, product demonstrations and training, pricing, and product dissemination.

Figure 67 depicts respondents' level of agreement or disagreement with various statements about Inyenyeri. The darker color represents "strongly agree," showing that most respondents strongly agreed with various positive statements about Inyenyeri. However, one statement that respondents were most likely to "strongly disagree" or "somewhat disagree" with was "Inyenyeri is a good price," again highlighting that **price is one of the main challenges respondents find with participating with Inyenyeri.**

**Figure 67**

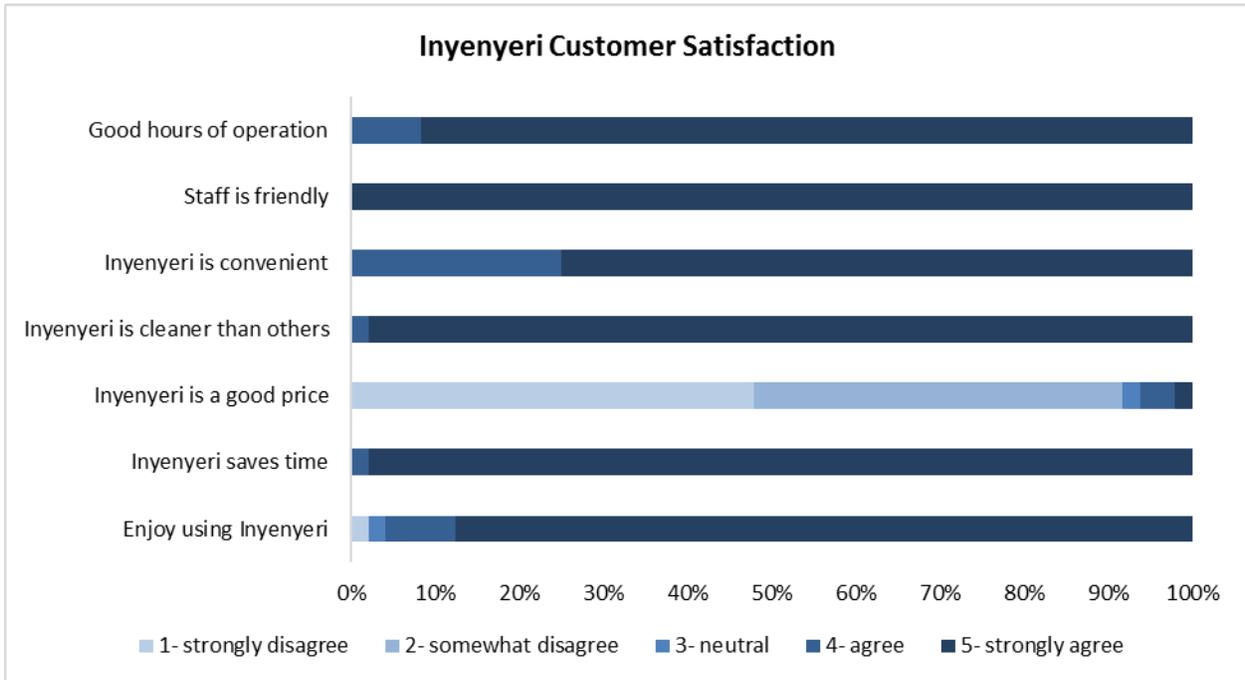
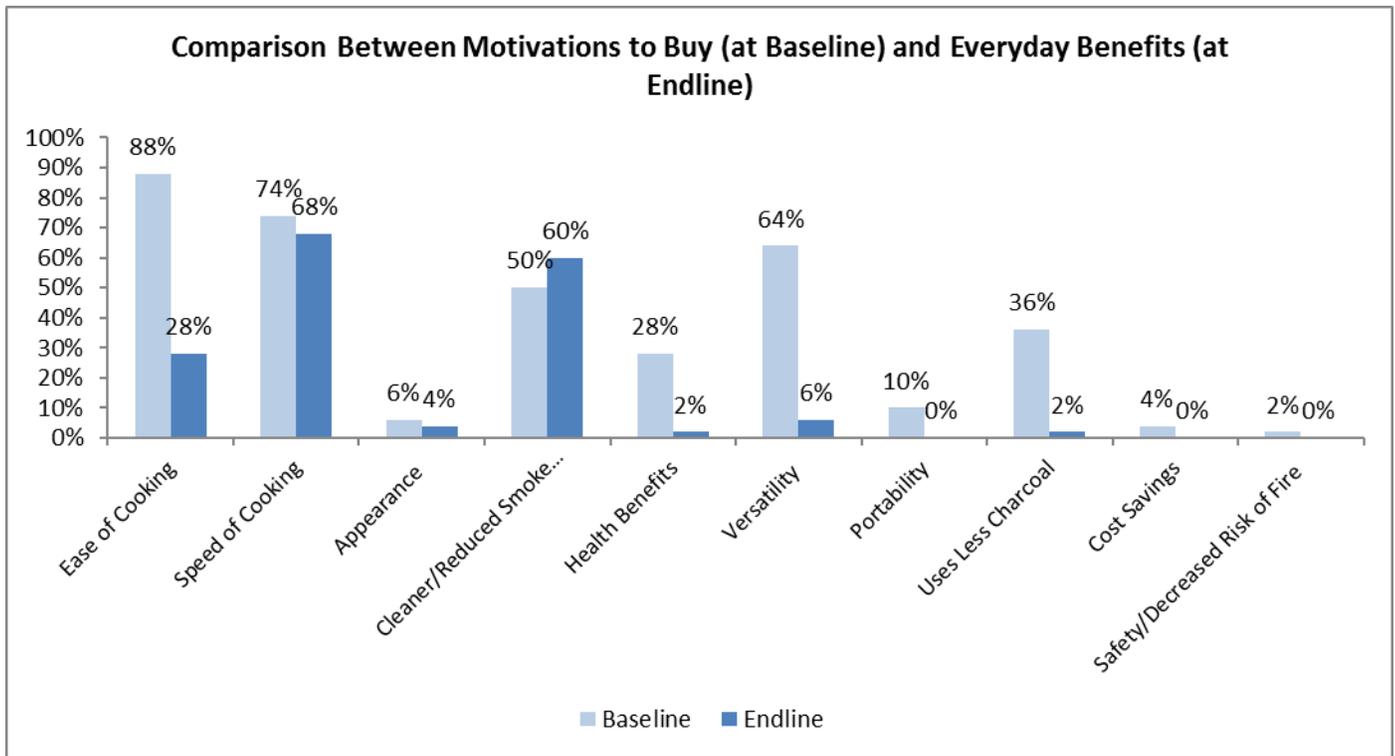


Figure 68 below shows the reasons respondents said motivated them to sign up with Inyenyeri at the baseline, as well as and the chief benefits they actually experienced at the endline. While “speed of cooking” and “cleaner/reduced smoke” were both motivators for participating and experienced benefits, it is interesting to note that larger percentages of respondents cited “ease of cooking” and “versatility” as motivators for participating, compared to the percent of respondents that reported these as some of the main benefits. Inyenyeri may want to explore this further to understand whether respondents do not actually feel that the Mimi Moto is easy to use and/or versatile. If this is the case, Inyenyeri may want to conduct further training with sales agents on how to demonstrate and train customers to use the Mimi Moto to ensure that customers are experiencing the full range of potential benefits.

As previously discussed, it is also interesting to see the difference between the expected and experienced benefit Inyenyeri customers using less charcoal, since the Mimi Moto uses pellets. This is something Inyenyeri might want to explore in looking at how households continue to practice stove and fuel stacking while using the Mimi Moto, and thus may not be experiencing as much of a reduction in charcoal usage as expected.

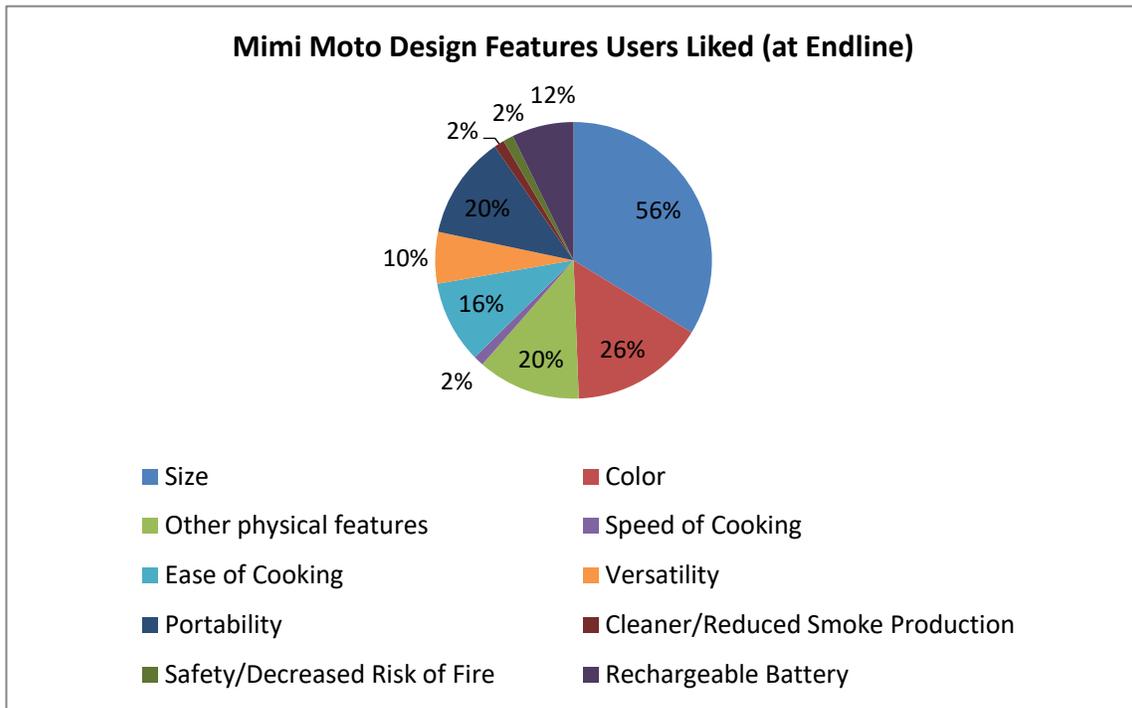
Figure 68



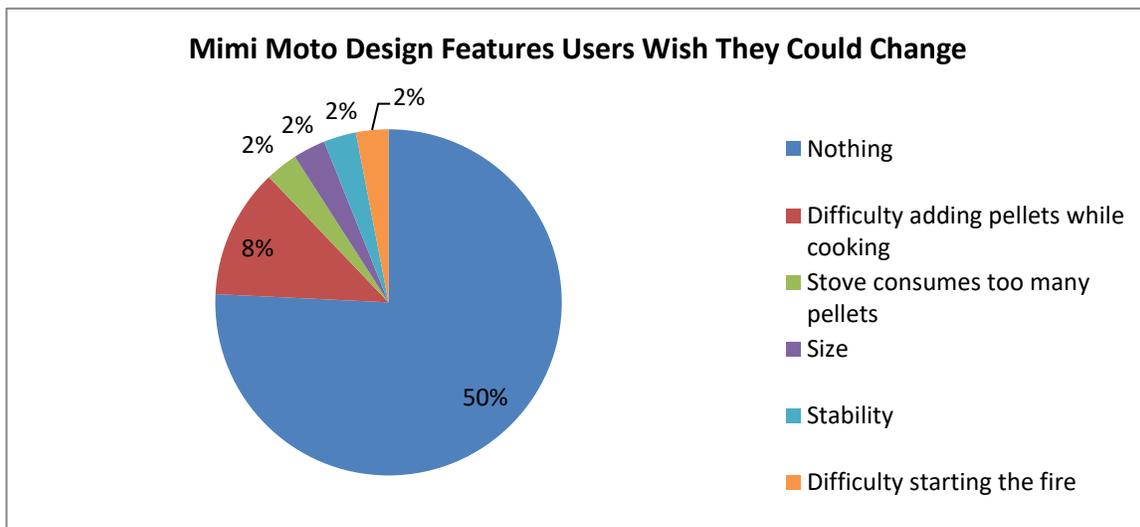
ICRW also interviewed Inyenyeri staff about customer satisfaction. They reported that customers experience a variety of different impacts from using the Mimi Moto, although **the most frequently mentioned benefit was the speed of cooking and subsequent time saved**. As one staff member explained, “cooking is no longer an issue...They use Mimi Moto– a very quick [stove].” Another said that customers “gained time for other activities.” Other employees noted that the stove itself is cleaner (produces less smoke) and is “more comfortable.”

Figure 69 shows which design features of the Mimi Moto stove respondents liked most (size, color, and other physical features), while Figure 70 shows which design features respondents would like to change. While the majority of respondents said that there is nothing they would change about the Mimi Moto design, 8% reported difficulty adding pellets while cooking.

**Figure 69**

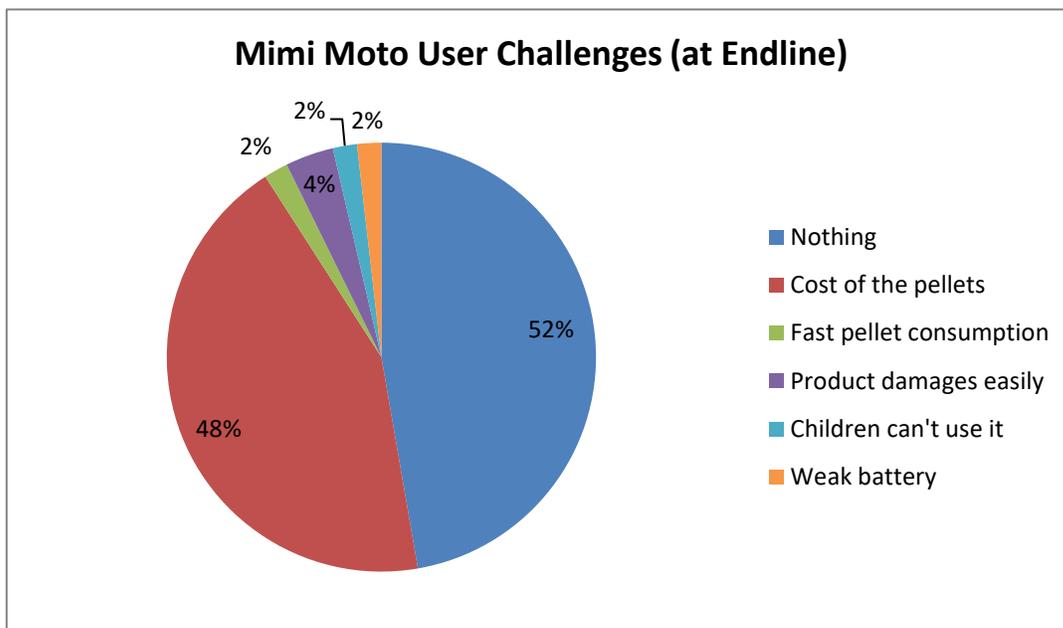


**Figure 70**



When asked what other challenges people experienced with Inyenyeri, about half (52%) reported nothing, and about half (48%) reported the cost of the pellets (Figure 71). Other challenges included that the product damages easily, fast pellet consumption, children being unable use it, and weak battery.<sup>12</sup>

**Figure 71**



### Challenges with the Inyenyeri Model

One challenge that the majority of users have noted with Inyenyeri's model is that **household fuel expenditure has increased**. This is because most Inyenyeri customers in Kigeme were still using charcoal and/or wood in addition to buying the regular supply of Inyenyeri pellets. One customer said that the amount of money she spends on fuel has doubled. Another explained that the The amount of money their family spends has increased "because I still have to buy charcoal and add pellets." According to respondents, the incremental cost of fuel for refugee families using the Mimi Moto has increased anywhere from 500 RWF- 3,000 RWF per month, which aligns with the findings from the quantitative data. Larger families were most affected by this change. For small families (those with less than five members), fuel expenditure did not change significantly

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<sup>12</sup> The Mimi Moto employs a built-in battery pack to power the internal fan. The pack can be recharged using electricity or solar energy from a separate solar panel. More information is available at <http://catalog.cleancookstoves.org/stoves/434>

since receiving the Mimi Moto; however, for medium and large families (those with five or more family members), fuel expenditure increased by up to 3,000 RWF/month.

While it was clear that customers appreciate the many benefits of the Mimi Moto, the cost for them remains a challenge. "As poor as we are," one respondent explained, "what is important is the price rather than benefits." When asked how much they would ideally want to pay for pellets, one respondent said: "150 RWF would be good, or 100 if possible. We would be very happy." Others agreed that approximately 100 RWF/kg would be reasonable, as this would make the pellets comparable in price to other forms of fuel used within the camp. For example, 100 RWF/kg is approximately what the smallest bundle of charcoal costs for refugees in Kigeme.

Another financial challenge noted by Inyenyeri participants was that due to a lack of household economic stability, **many families had difficulty paying for the pellets** on a regular basis. As one focus group member explained, "at the start, some of the families were very unstable. Some did not pay the March subscription. The good thing is we are allowed to suspend our subscription." Another group member said that everybody has suspended their subscription with Inyenyeri at least once. In one focus group, three out of six respondents said they had problems paying and had stopped using Inyenyeri. Financial instability was experienced even among those who did not suspend their subscription, especially in the first or second month of subscription.

Despite the perceived high cost of the pellets, the current system of purchasing pellets was appreciated amongst Mimi Moto users. When asked about the possibility of buying the stove on credit (paying for it in installments) and having the price of the individual pellets be reduced, users were on the whole unsupportive, citing a number of benefits of the current model. In particular, users like that if their stove becomes damaged or gets stolen, Inyenyeri either replaces the stove or helps them to locate it.<sup>13</sup> Some respondents also explained that if they owned the stove outright, the temptation to sell it for money would be too great, saying "we fear we cannot afford its cost."

A few challenges about the use of the stove and/or pellets also emerged during the focus group discussions. Participants in two different FGDs mentioned that with the Mimi Moto, only adults can be involved with the cooking, with minimal support from children under the age of ten. This is because if not enough attention is paid to the cooking, **food can easily get burnt**. One respondent explained, "you have to sit next to it [the stove] because just one minute [and the] food is burn[ed]." Others noted that sometimes the food cooked on the Mimi Moto does not taste

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<sup>13</sup> Within Inyenyeri's model, the Mimi Moto remains Inyenyeri's property and is leased to the user (rather than owned by them) in exchange for buying a set amount of pellets per month.

good, but that perhaps this is because they did not yet fully understand how to regulate the stove. This issue could potentially be resolved through additional user trainings or support by Inyenyeri staff within the camps.

FGD participants also said that **pellets are very fragile** and can be destroyed by any contact with water or humidity. They suggested that Inyenyeri should design the pellets to resist water, or package them in a container to prevent them from coming in contact with liquids while they are sitting in the home waiting to be used. Inyenyeri staff members do educate customers about proper use of the pellets from the outset, explaining that pellets are made from tree flour that is solidified, and that because of this, it is important to protect pellets from contact with water and humidity, which will cause the pellets to smoke and need to be put in the sun to make them solid again before use. However, it is clear that additional education on this topic is needed for customers to be able to more effectively use (and thus, be satisfied with) the stove and fuel. To address this issue, Inyenyeri might also consider designing a small user guide or leaflet that users can post in their houses to remind family members about how Inyenyeri operates and how pellets should ideally be handled.

Additionally, while the Mimi Moto stove seemed to work well during the dry season, **users experienced challenges charging the fan battery** during the rainy season, when there is not enough sunlight to charge the solar panel—and therefore to power the stove. This has been identified as the main issue for people living in Kigeme A (see Annex 1 for a map of Kigeme camp). As Inyenyeri has a store in Kigeme B, people living in B have chance to charge their batteries very easily. It was suggested that Inyenyeri should also secure a room in Kigeme A, powered by electricity, where users living on that side of the camp can go to charge their stove batteries.

## Inyenyeri Operations

ICRW collected data for Inyenyeri to consider with reference to what was working well in their operations and what needed improvement. In addition to interviewing Inyenyeri customers, ICRW also interviewed four camp residents who were hired to work as Inyenyeri Customer Service Representatives (CSRs) during the project. Their insights resulted in some valuable feedback for Inyenyeri.

## Staff Demographics and Role

Four Inyenyeri staff (three women and one man) – who are also refugees within the camp – were interviewed during individual in-depth interviews (IDIs) in an effort to discern what impacts Inyenyeri is having at the employee level. There are two married female staff members, ages 40 and 43 years old; one 25-year-old, unmarried female; and one unmarried 25-year-old male staff member. All have been with Inyenyeri since September 2016.

Staff members work from approximately 8:00 AM – 5:00 PM each day, and their responsibilities include cleaning the workplace, selecting and measuring pellets, receiving clients, selling pellets, and distributing receipts. Periodically, staff members also make home visits to Inyenyeri customers to see how the stove is working and to help resolve any problems they may be experiencing.

Staff also occasionally train new Inyenyeri subscribers, though this was uncommon during the project period (only five times in the past six months) since Inyenyeri had yet to scale-up in the camp. During training, staff carefully review the contract with new subscribers to ensure that they understand each component. One staff member explained, “I meet people at their houses and read [the] contract for them. Even those who can read, we read for them. We choose to read for them because we need to insist on sections that are important for them to know [the] terms of our relations.” They also explain, in detail, how the pellets should ideally be used – for example how many pellets to use depending on the type of food being cooked, how to keep them dry, and to only put pellets into the stove once, as this is a concept that can be confusing for some new customers. One Inyenyeri staff member noted that customers particularly have trouble understanding why pellets can only be used once, since other forms of fuel like charcoal can be reused.

## Employee Recruitment

Two of the staff members first heard about the position from their friends in the camp who read the announcement that Inyenyeri had posted at the gate; the other two saw the announcement on their own and decided to apply. Many noted financial independence as a key driver for applying. Some were interested in the position because Inyenyeri is a private company and thus they thought that the salary would be better than that of other opportunities provided to them by NGOs within the camp. One said, “I thought it would be a good job because I wanted to be an independent worker, not being measured as a refugee.”

For staff who were previously unemployed, Inyenyeri provided them with a job. Those who were already employed noted wanting to work for a more business-oriented company. One female staff

member who had previously sold charcoal in the Democratic Republic of the Congo said that she was particularly interested in this industry and “wanted to know of the improved kind of charcoal they were advertising.” Only one staff member mentioned applying in hopes of increasing her status within the community.

## **Staff Trainings**

Inyenyeri staff receive training on a number of different topics, including stove usage, customer care, the paperwork that customers have to sign when they subscribe or cease their subscription with Inyenyeri, and reporting guidelines including how to issue receipts, how to complete the repair sheet, and how to stop an agreement. Trainings on product usage focused on how to light the stove, how to use the pellets properly so as not to spoil them or destroy the stove, how long it takes to cook each type of dish, and how to cook different foods, especially beans. One staff member explained that beans receive a special focus “because we need to know how often to add pellets for a dish of beans. Except [for] flesh beans, you add [the pellets] at least once. For dried beans you add [the pellets] up to three times.”

Staff members said that customer service was the most important thing they learned through these trainings, with at least one employee saying that this is a skill she feels she can use in the future. Another explained how the service provided by Inyenyeri differs from other industries within the camp: “I was always angry of the service I received from different organizations. I had always wished to make difference. Wherever I go, I will be able to give a good service.”

One employee said that the most important things she learned were product knowledge and how to be self-confident: “[I] learned new techniques for customer care, [which] built confidence in me as a woman...it is an added value to me as [a woman] because now I can deal with anybody, discuss and serve him or her.” Another respondent indicated that it is helpful to know how to prepare, and thus to understand, any contract or signed agreement. “I know that before signing any agreement, I have to pay attention,” they said.

Overall, the hired staff feel that, unless Inyenyeri introduces new products, they have received sufficient training to be able to effectively do their job. Two staff members who were interviewed said there is nothing more they would like to get trained on, though it was suggested that having a handout for staff would help them to remember key points. One staff member said that she would like to learn computer skills. “If I can know how to use a computer for me to be able to record information and send it through the computer it would be very good,” she explained. Another said that she would like more training on customer care, particularly additional training

on how to manage people who are interested in dropping their subscription. “How can I bring them back?” one asked.

## Marketing Strategies

While Inyenyeri had not yet scaled up in Kigeme at the time of the project, there is great potential to do so in the future according to the staff who were interviewed. Already, the four Inyenyeri staff members noted that there is a growing interest in and desire for Inyenyeri products within the camp. It seems that current customers were pleased with the Mimi Moto and were encouraging others in the camp to also invest. As a result, new client recruitment and education began – to a small degree – to be incorporated into Inyenyeri employees’ job responsibilities.

When asked how new potential customers learn about Inyenyeri, one staff member explained:

*At the first the selection was at random. Then we went to their [potential new customers’] houses, inviting them for the launching day of Inyenyeri. Then, Inyenyeri did demonstrations. Everybody who came got registered, and went home spreading the word. After we recruited the first cohort, people were learning from their neighbors. Whoever is interested comes (since we recruited the first cohort in October 2016), we register them, and when stoves are available we call them.*

In addition to spreading news of Inyenyeri by word of mouth, when employees conduct home visits to check on current customers, they have the opportunity to raise awareness among the customers’ neighbors. According to the employees, the Inyenyeri T-shirts and service cards also help to promote the products. When staff pass by while wearing the shirts and carrying the cards, people in the camp stop them to ask about Inyenyeri.

When introducing potential new customers to the stove, Inyenyeri staff found it useful to conduct demonstrations to show people how the stove works. One employee said:

*When arriving at the office, I explain how it [the Mimi Moto] works... We even light it to indicate how it works. On the day of training, we even go to the market, buy food, cook and share food, to make them test food cooked through Inyenyeri.*

The types of marketing messages Inyenyeri staff use focus on the cleanliness of the stove, that it produces no smoke, and that it is efficient, easy to use, and works well in the small houses in Kigeme Camp. One employee explains to customers: “It [the Mimi Moto] can be used even in our

small houses without any risk.” Employees also communicate that the stove protects people from health problems, like eye irritations, headaches, and respiratory infections.

Other selling points include that the stove controls heat (in particular that it is made as a thermos, so the outer layer is never hot, which reduces risk of burns), it saves time, it allows users to do other activities instead of only cooking, and its quick-cooking potential ensures that children do not have to go to school or to bed without eating. However, according to staff, it is the cleanliness and efficiency of the stove that drives most customers to subscribe.

During presentations, staff are careful to explain that the Mimi Moto stove is for rent, not for purchase, and that Inyenyeri is responsible for repairing the stoves if there are any problems. One staff member also educates potential customers about environmental impacts, saying that “Inyenyeri uses wastes of trees to make pellets. Inyenyeri reduces risks for deforestation and environment intoxication.”

Staff note that women are most interested in the Mimi Moto, because they are the ones responsible for cooking within the household. One female staff member also explained that women are interested in the clean energy products because they are the ones who receive the stipends from organizations working within the camp, like World Food Programme (WFP), and thus, are the ones who have decision-making power around how to use it. According to one Inyenyeri employee:

*Women [are the ones who are interested in buying the clean energy products] because they are the ones in charge of cooking. They know the stress of fuel procurement. They are the ones managing money received from WFP. Women are the ones receiving the money. Men ask from them if they need anything. Men don't have anything to say on money. Therefore, they cannot be involved on something involving money. This has not been a decision [made by] UNHCR or any NGO. It has been a decision by families because men can move at any time.*

### **Stove Demand & Scale-Up Potential**

All of the staff members who were interviewed noted a growing demand for clean and efficient cookstoves within Kigeme Camp. Several staff said that they cannot keep up with the demand for Inyenyeri, and one noted that “many people, even those coming from outside the camp, wish to be members but we don't have enough stoves.” Another said, “I sometimes go home in hiding because many people are stopping in my way asking for explanations.” This type of interest and excitement for the Mimi Moto bodes well for the potential scale-up of Inyenyeri.

At least part of this demand, according to staff, is a result of UNHCR's announcement that they were planning to switch from offering refugees money to purchase fuel instead of in-kind firewood. Staff have observed that the money that UNHCR is planning to give is worth more than the wood itself, so refugees would rather have a cookstove like the Mimi Moto, which uses pellets, so that they can take the money from UNHCR instead of having to use the distributed wood for cooking. One staff member elaborated, saying "the number [of people approaching me who are interested in Inyenyeri] increased recently, since they [UNHCR] [announced that they would be] giving money instead of wood. People have observed that the money will be more than the wood they give. They therefore want to have money rather than wood." Another staff member explained that "receiving money for pellets is preferable than receiving wood. Wood requires additional cost (waiting for them for a long time, their transport, axing, sometimes drying...) to be used."

## Impacts on Inyenyeri Employees

Inyenyeri staff experienced a number of economic, social, and empowerment impacts as a result of their employment with Inyenyeri, including increased financial stability, decision-making power, self-confidence, social status, access to new networks, and communication skills. While the group hired was quite small, the results below can inform future studies on how market-based cooking interventions may provide additional livelihood opportunities for crisis-affected people by incorporating them into the stove and fuel value chain.

### Employee Satisfaction

All four staff who were interviewed said that they would highly recommend working with Inyenyeri to other people within the camp. When asked, staff said that they did not have any challenges to report regarding their work with Inyenyeri. They appreciate having a contract with Inyenyeri and feel respected by the company. Other reasons for employee satisfaction included the cleanliness of the job/workplace, a positive work culture, a stress-free job, a good salary, particularly as compared to other jobs within the camp, the opportunity to engage with customers, and the ability to learn about new products and new skills through their job that they feel will be marketable in the future.

Of all of the activities that Inyenyeri staff are engaged in, sales and home visits are the two staff members reported enjoying the most. They said that selling pellets introduces them to new people in the camp. As one IDI respondent noted "to sell pellets is my favorite because when selling I meet new people. I get to talk to them, old mothers and kids. Then I don't appear in the camp as a foreign[er]." Staff also like being able to explain Inyenyeri to customers because "people are happy" when learning about Inyenyeri. Additionally, respondents reported enjoying that Inyenyeri

allows them to practice and to grow their own business skills, such as customer care. One staff member explained “I did not study business. Inyenyeri gave me a very good experience in business.” Another said, “I now know many techniques of customer care. I got training on customer care through Inyenyeri, so I can run my own business now.” Home-visits were another reported favorite part of the job because they provide staff with the opportunity to expand their networks and to meet people from various corners of the camp. “I meet new faces, I get new friends,” one staff member said.

Inyenyeri employees also receive more tangible benefits, such as early access to the stoves – so that they can understand how the pellets and stove work in order to explain to others – and a reduced subscription price. These perks were cited by interviewees as added benefits of their employment, along with the income generated through working with Inyenyeri. According to one staff member, “I get some money, which is sufficient to me. I was working with another project in the camp. The money I get with Inyenyeri helps to support my family, and I can get some extra money to visit my family members.”

### **Financial Stability**

For several staff members, increased financial stability was the first benefit they mentioned when asked how becoming an Inyenyeri employee has changed their life. At least two staff members said that now, because of Inyenyeri, they can “eat on time,” with one noting that they now also have more nutritious meals. Greater household economic stability was also mentioned as a key benefit of employment. “Before I could not provide basic needs for my family,” one employee said. Another explained that her increased financial status has impacts not only at the individual level, but also at the family and community levels. “The money I get benefit[s] both my family and friends,” she said. Another agreed, saying: “[Before], I was always begging my parents. Now I can provide for the family.”

Financial impacts were most notable for staff members who were previously unemployed, though changes were reported by all staff since Inyenyeri pays more than other positions within the camp. One staff member noted that, before joining Inyenyeri, she had been without a job for a significant amount of time. “I had spent four years without a job,” she said. “I had a job in the first year here in Kigeme, 2012. Then, [in] 2013, [I] lost my job. 2016 brought Inyenyeri to me.”

Staff commonly use the money they earn from Inyenyeri to supplement what they get from other donors like UNHCR to provide food and clothing for themselves and their children, and to assist relatives or provide other forms of support to their families. One employee said, “I bought beautiful cloths, eat well, and am a part of the family and participate in church activities.” Another

said that with her Inyenyeri income, “I add to the family needs. We do not get enough for the family of nine people. What we get from UNHCR is not enough, so I supply the remaining.” Another employee mentioned using earnings to pay school fees for her sister in Rwanda. She also said that because of Inyenyeri, she was able to participate in the funeral ceremony for her aunt in the distant town of Ngarama, Rwanda. Only the male staff member mentioned having not spent any of the earnings, but instead saving for the future.

All staff members reported feeling happy that they are now able to provide for themselves and their families. “I feel very happy and valuable for my family,” one said. Because of the increased income, one employee noted that she feels better integrated into society.

### **Decision-Making Power**

Three of the four staff members who were interviewed noted experiencing increases in their decision-making power, and noted that this was in part because they were now the ones providing for the needs of the family. One female employee explained: “I am the bread winner... all the eyes are turned on me.” Another said “yes, I now contribute to advising my father.”

While decision-making may have increased for staff, it was clear that employees were not independently making decisions. For the married women, their husbands remained the primary decision-maker, and for those still living with their parents, they consulted their fathers before making a decision.

### **Self-Efficacy**

Inyenyeri has also changed the way the staff members see themselves, increasing their belief in their own abilities. One said: “It [Inyenyeri] was an opportunity for me to indicate what I can. I managed to demonstrate my abilities.” As a result of this newfound confidence, all employees interviewed said that they now believe they can set and strive to achieve personal goals. One female staff member noted “I can set goals and together with my husband we try to achieve them.” The male staff member seemed especially sure in his ability to achieve these goals, saying “I am confident. As any young man, nothing is impossible.”

Inyenyeri also appeared to increase employees’ willingness to try new things. For three staff members, learning business skills through Inyenyeri encouraged them to pursue other business opportunities within the camp. As one explained, “Inyenyeri opened my mind for business. I can set up a small business here in camp.” Another employee explained that she uses the money she made through Inyenyeri to help her younger sister open her own business.

All staff members who were interviewed also reported increases in communication skills because of their exposure to new people and to public speaking through their work with Inyenyeri. One said: "Inyenyeri exposed me to many people and I am now able to speak to [important] people."

## **Social Status**

Employees noted feeling more respected as a result of their work with Inyenyeri. According to one staff member, at least some of this newfound status was a direct result of her increased income. People within the camp know Inyenyeri staff have money and now ask them for help. "I have respect from my neighbors since I have money. I can lend money to neighbors and friends," said one employee. "Now they [my family and other community members] know I can do something for them," another explained.

One staff member also mentioned gaining status because of the type of community service work he is doing with Inyenyeri. "My mom was happy seeing me giving service," he said. Another – who did not have a house before – said that she even received a house from the Street Chief because of her work with Inyenyeri.

Accessing new networks was another added benefit of employment with Inyenyeri. All employees who were interviewed said that they had formed new relationships as a result of Inyenyeri and that they discuss Inyenyeri with new people they meet. One employee said that she had "increased my social cohesion" as a result of Inyenyeri. "I even know the president of the camp [now]," she added.

## **Future Goals**

In the IDIs, ICRW asked the four Inyenyeri employees where they saw themselves in five years. While one staff member was unsure, most demonstrated a positive outlook for their future. "[Inyenyeri has] increased my view of the future opportunities," one said. Some expressed interest in continuing to work with Inyenyeri, feeling that this would continue to be a positive opportunity for them and their families. One noted hoping that he could continue to be promoted within the company, saying that if he is still "working for Inyenyeri within five years, I will have a strong foundation for life... When Inyenyeri started there [were] changes. As Inyenyeri gets improved, I am also getting improved. In five years with Inyenyeri, I may be having a good post, in the company; I may be able to head at least a post in the company." Another employee said that she hopes to take what she has learned from Inyenyeri to start her own business, explaining "in five years I see myself in business. I learnt how business is done and customers are cared for."

## CONCLUSIONS

As demonstrated in this report, Inyenyeri's cooking intervention in Kigeme camp has resulted in some significant social and health benefits for its refugee customers, including:

- Among intervention households, the Mimi Moto was used as the primary cooking device for all cooking tasks, besides cooking beans.
- Compared to non-participating households, Inyenyeri customers experienced nearly a five times greater reduction in cooking time across all cooking tasks except for cooking beans.
- Significant decreases (average of 83%) in burns and health-related and quality of life indicators experienced while cooking, such as eye irritation, coughing and sneezing, and shortness of breath.
- A 72% decrease in the level of drudgery (amount/level of effort needed to complete a task) associated with cooking and a 71% decrease in the level of drudgery associated with fuel procurement.
- All Inyenyeri customers reported feeling safer during cooking, and 96% noted feeling safer during fuel procurement, as they are no longer required to venture out of the camp or even to remote locations within the camp to collect and purchases fuel, but rather know exactly where they can purchase the pellets.

While Inyenyeri customers appreciated the many benefits of the Mimi Moto, the high cost of pellets remains a significant barrier to wider adoption of Inyenyeri's model. As demonstrated above, monthly household expenditure on fuel actually increased among the majority of Inyenyeri customers. This is largely because the single packet of pellets that households can afford to purchase are insufficient to meet all of families' monthly cooking needs. Similarly, a single cookstove is insufficient for most households, which have an average family size of six. Consequently, many families continue to use their traditional cooking methods and fuels to supplement the Mimi Moto and fuel pellets. Most families are still purchasing cheaper charcoal and/or using firewood in addition to purchasing pellets. Many families also have difficulty paying for pellets on a regular basis. These outcomes emphasize the need to identify measures to ensure affordability that are specific to refugee populations. These lessons can be applied to similar cooking projects operating in humanitarian settings.

# ANNEX 1: MAP OF KIGEME CAMP

