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ALTERNATIVES TO CHARCOAL

2023 Charcoal Producer Survey

Submitted: October 16, 2023

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Activity Start Date and End Date: January 5, 2021 – January 4, 2026

COVER PHOTO: A charcoal producer being interviewed by an enumerator with his young child during the 2023 Charcoal Producer Survey. Credit: USAID A2C

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ALTERNATIVES TO CHARCOAL

Charcoal Producers Monitoring Survey, 2023

SUBMITTED October 16, 2023

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ACRONYMS

USAID A2C	USAID Alternatives to Charcoal Activity
ATF	Alternative Technologies and Fuels
CEO	Camp Extension Officer (of the Ministry of Agriculture)
CFMG	Community Forestry Management Group
CPS	Consumer Preferences Survey
CSV	Comma Separated Values (in Excel)
DDL	Data Development Library
FD	Forestry Department (of the Ministry of Green Economy and Environment)
FTE	Full-Time Equivalent
FY	Fiscal Year
GRZ	Government of the Republic of Zambia
HH	Household
KG	Kilograms
MCFA	USAID Modern Cooking For Healthy Forests
MGEE	Ministry of Green Economy and Environment
MOA	Ministry of Agriculture
NGO	Non-Governmental Organization
PEA	Political Economy Analysis
QA	Quality Assurance
SOW	Scope of Work
USAID	United States Agency for International Development
USG	United States Government
ZEMA	Zambia Environmental Management Agency

1.0 ACTIVITY OVERVIEW

1.1. ACTIVITY OVERVIEW

Project Name	USAID Alternatives to Charcoal
Program Start & End Date	January 5, 2021 – January 4, 2026
Name of Prime Implementing Partner	Tetra Tech ARD
Contract Number	72061121C00001
Subcontractors	Tetra Tech ESI, PMTC Zambia, and Shared Value Africa Services Int'l (SVAS)

1.2. ACTIVITY DESCRIPTION

The USAID Zambia Alternatives to Charcoal (USAID A2C) Activity works to reduce dependence on charcoal as an energy source in Zambia and catalyze the increased use of low emissions alternative technologies and fuels (ATFs) through innovation and increased private sector engagement to reduce charcoal production-driven deforestation and greenhouse gas emissions. USAID A2C works with the private sector, the Government of the Republic of Zambia (GRZ), civil society, community-based organizations and communities to remove barriers and create opportunities to advance consumer adoption of ATFs; strengthen monitoring and enforcement of charcoal regulatory frameworks; and work alongside consumers to shift preferences and reduce demand away from charcoal while supporting sustainable livelihoods for former charcoal-producing households. The Activity is guided by an understanding of local market systems, strong private sector engagement and a commitment to engaging youth and empowering women.

Activity Goal: The USAID A2C activity will reduce charcoal energy consumption by 25% in Lusaka and by 5% in urban areas outside of Lusaka and catalyze a 38% increase in the use of low emission charcoal alternative technologies and/or fuels to reduce deforestation directly attributable to charcoal production by 6.69%.

USAID A2C will achieve these goals by implementing five overarching objectives, as listed below.

- **Objective 1:** Identify and remove market barriers to enable a 38% increase in the household use of alternative technologies and fuels (ATFs)
- **Objective 2:** Support the Government of the Republic of Zambia (GRZ) to improve the business enabling environment for low emission charcoal ATFs
- **Objective 3:** I Implement social behavior change and communication interventions to increase consumer use of low emission ATFs.
- **Objective 4:** Support alternative livelihoods in charcoal producing communities and improve capacity to regulate and enforce charcoal supply chains.
- **Objective 5:** Integrate adaptive management including through Pause, Reflect and Pivot workshops.

2.0 EXECUTIVE SUMMARY

As part of USAID A2C's support for alternative livelihoods in charcoal producing communities, and establishing Community Forest Management Groups (CFMG), a charcoal producer survey is undertaken annually at selected sites in the following four (4) districts: Kalumbila, Lufwanyama, Solwezi and Mumbwa. The overarching objectives of the survey are to: (1) calculate the number of people and time spent engaged in the charcoal value chain in the selected sites; and (2) collect relevant information regarding charcoal producers and charcoal production to inform more targeted and effective livelihoods programming for this demographic. Additionally, the survey provides valuable contextual data, including the drivers that lead people to take up charcoal production, economic dynamics, when and where charcoal production takes place, as well as charcoal production dynamics.

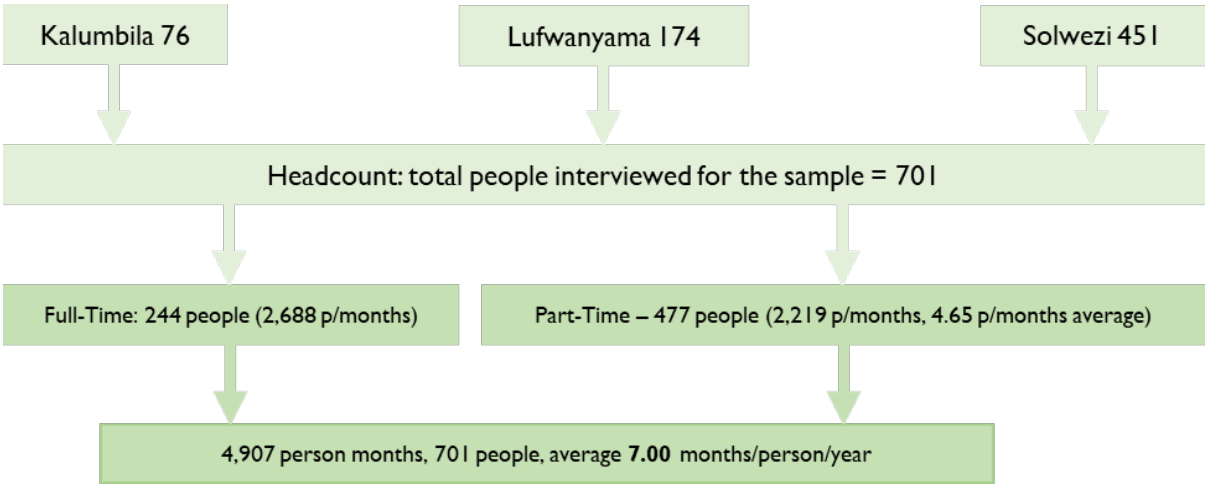
An initial pilot survey was carried out in March 2022 from which the project refined the index to capture the number of people engaged in the charcoal value chain based on their level of effort (number of production months). A baseline charcoal producers survey was then carried out in the dry season between 22 August and 16 September 2022 in Mumbwa, Solwezi, Lufwanyama, and Kalumbila districts. This report presents the results of the first repeat (round 2) survey carried out in September 2023.

The baseline survey was used to establish the basis for Performance Indicator 16 for the USAID Alternatives to Charcoal project. The indicator determines the number of people engaged in the charcoal value chain by dividing the total person months recorded by the number of people interviewed for the baseline survey. The baseline for Indicator 16 was calculated to be 7.38 person months – the average number of months out of the year that the producers manufacture charcoal; this represents 62% of their time.

The September 2023 survey could not be repeated in all four districts, and only three areas were sampled. These were Kalumbila, Lufwanyama and Solwezi. The survey team could not visit Mumbwa district for staff safety and security reasons which are described in more detail in the body of the report. The fact that one of the four districts could not be sampled means that the survey cannot fully report against the baseline in 2023. However given that Indicator 16 is cumulative, it can still be calculated and reported in September 2024 and again in September 2025.

The consolidated summary of the three areas, and the totals, are presented in Figure 1 below.

Figure 1: Level of effort (number of production months) per 2023 Charcoal Producers Survey



Results from the 2023 survey indicate the average number of people engaged in the charcoal value chain based on their level of effort (number of production months) has declined slightly (5.4%) as compared to the baseline. The % reduction, per district and overall, is summarized in Table 1 below.

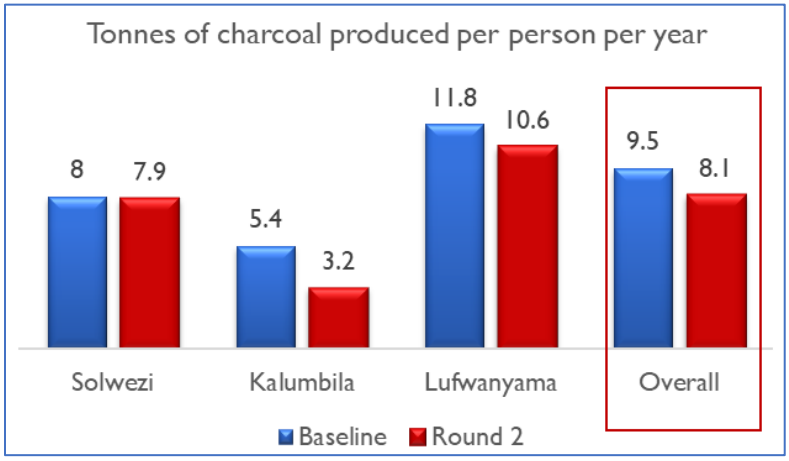
Table 1: Level of Effort (person months) per District and Reduction (%) per District

District	Baseline: Level of Effort (2022)	Baseline: Level of Effort (2023)	% Reduction
Solwezi	7.8	7.6	2.6%
Kalumbila	5.9	5.5	6.8%
Lufwanyama	7.1	6.1	14.1%
Overall	**7.4**	**7.0**	**5.4%**

All districts show a reduction in the level of effort, with Solwezi showing the least (-2.6%) and Lufwanyama the most (-14.1%). The significant drop in Lufwanyama is attributable to a recent enforcement campaign which disrupted supply to the large commercial charcoal consumers in the area. The enforcement activities were undertaken by the Zambia Environmental Management Agency (ZEMA) in April and May 2023. The impacts and opportunities related to this action are discussed in detail in the appropriate sections below.

Charcoal production is a function of level of effort (input months) and production efficiency. As in the Baseline, USAID A2C collected data on production estimates, as reported by respondents, and calculated the total production per respondent using the following formula: number of bags per kiln * the size of bags * the number of kilns used per year. **Results indicate that charcoal production is declining in all three districts surveyed, with an overall decrease of 1.4 million tons as compared to the baseline (see Figure 2).**

Figure 2: Average Tons/Person/year by District, 2022 Baseline vs 2023 Survey



Charcoal production (i.e., the average number of tons reported, per person, per year) is a useful triangulation to confirm the primary producer 'level of effort' index. If the level of effort is reported as changing, then the production per person should also change in the same direction as the level of effort. As shown in Table 2 below, the reduction in level of effort roughly matches the reduction in change for production. While the percent reductions in level-of-effort do not match exactly, in the two districts that have large samples (Lufwanyama and Solwezi) they are very close which provides extra confidence in the data and analysis.

Table 2: Tons per person per year by district – 2022 Baseline vs 2023 Survey

District	Baseline: Tons produced per person per year (2022)	Baseline: Tons produced per person per year (2023)	% Reduction
Kalumbila	5.4	3.2	40.7%
Lufwanyama	11.8	10.6	10.2
Solwezi	8	7.9	1.3
Subtotal	**9.5**	**8.1**	**14.7%**

The data and analysis for this survey comes with two caveats. First, caution should be taken when making direct comparisons between the baseline and this survey because one entire district (Mumbwa), representing 23% of the original sample (266 out of 1,167) has been left out. Second, the number of repeat respondents (from the baseline) was low at 53%. And in one district, the number of all respondents (repeat and new) was significantly below the baseline (174 respondents in this survey as compared to the baseline of 395).

3.0 INTRODUCTION

3.1. OBJECTIVE

This survey, conducted in September 2023, is the first annual repeat survey of charcoal producers in USAID A2C's rural impact areas. It follows on from the baseline which was conducted in September 2022. The baseline and 'round 2' (this survey) are conducted at the same time each year - during the dry season - to measure the percentage change in the number of people engaged in the charcoal value chain. This includes an assessment of the number of people directly engaged in the charcoal value chain (expressed as the total number of production months divided by the total sample size) in the selected sites. USAID A2C has a target of reducing the number of people engaged, or level of effort spent, in the charcoal value chain by 33% over the life of the project (Performance Indicator 16).

This year, the survey only reached three out of four of target districts, which were Kalumbila, Solwezi, and Lufwanyama. Unfortunately, the team were not able to survey Mumbwa as the Forest Department had been carrying out a series of enforcement activities in July, some of which were close to, or involving, communities where the USAID A2C project is working. The enforcement activities followed a suspension of all 'cordwood' and 'conveyance' permits in the entire Mumbwa district two months prior. Cord permits allow for felling trees and manufacturing charcoal; conveyance permits allow for the transport of that charcoal to markets. It also followed the issuance of eviction orders to producers and (illegal) settlers in the Mumba National Forest. The enforcement activities targeted producers by conducting a number of 'charcoal sweeps'. These sweeps are carried out with armed support from the Zambia National Service and Zambia Police Service because they often result in unrest, conflict, and violence. Sweeps entail i) seizing and impounding of any bagged charcoal found, ii) seizing and impounding any trucks transporting charcoal, iii) destruction of any charcoal kilns (or of wood in kilns, ready for production of charcoal) by burning the kilns, iv) arresting any producers that can be found and are linked to charcoal production. Fines and prosecutions are issued for impounded trucks and arrested producers, the impounded charcoal is sold by the Department at one-off auctions to the public.

This created two challenges to successful deployment of the survey. Firstly, the enforcement activities created a safety and security concern for the survey team who might be mistaken for government officials or accused of bringing government attention to their area. Secondly, it was highly likely that any data collected would be influenced by the ongoing enforcement activities, with respondents unlikely to be truthful with their answers.

Even though it was clear from the start that it was not possible to fully report against Indicator 16 this year, the survey proceeded in the other three districts. The gathering of data, and the focus of the analysis, therefore changed from reporting aggregated data from all four sites against Indicator 16, to disaggregated data (per site), as well as general lessons learned from this disaggregated data at individual site level - this is therefore the focus of this report.

Data on charcoal production, in the three sites sampled, was gathered using the same methodology as the baseline to validate and contextualize the average level of effort of producers. This survey also provides important contextual analysis on both i) the demand for charcoal and ii) the state of productivity (and associate technology choices for charcoal production) amongst respondents.

Gender data was also collected and analyzed during this survey. The gender information produced from this data is useful in the design and delivery of alternative livelihoods for female charcoal producers. For example, activities that are traditionally male dominated, such as beekeeping, will require deliberate efforts in, among other things, capacity building, provision of modern hives, accessories and equipment,

and enhanced market linkages, if active participation by female community members is be to recognized and actively promoted.

3.1.1 DRY SEASON BASELINE VS DRY SEASON ANNUAL MONITORING SURVEY

To reduce seasonality bias, the baseline and subsequent annual surveys are conducted at the same time every year, in the dry season. The advantages of the dry season over the wet season are as follows:

- Charcoal producers are actively involved in production as charcoal production peaks during this period as producer / farmers are less engaged in farming activities. Recall accuracy is likely to be maximized during this time when producers are actively involved in production.
- Charcoal producers who may be involved in agricultural activities side by side during the wet season are less likely to be available for a survey during that time. Producers are, therefore, more likely to attend the survey during the dry season when they have fewer activities alongside charcoal production.
- Different market forces and value chain players are more active in the project sites during the dry season as the access roads are passable; some parts of the sites are not accessible during the rainy season due to flooding. Thus, the survey is better suited at the time that most players are active. Access is required not only for the market forces and value chain players but for the survey team as well.

3.2 METHODOLOGY

This (round 2) survey was conducted from Friday August 18th to Wednesday, September the 13th, 2023. The survey included 701 interviews in three of the four project sites namely Solwezi (Kapijimpanga), Lufwanyama (Mukumbo) and Kalumbila (Kyangozhi). The fourth site, namely Mumbwa (Kaindu), was excluded from this year's survey due to safety and security concerns. Whereas the Baseline Survey comprised 899 interviews, this survey had 701 respondents: or a 22% reduction in the overall number of respondents for the three sampled sites.

The number of repeat respondents in 2023 survey differed considerably among sites, with an average of 41.49% (373 repeats from the baseline sample of 899). Solwezi returned the highest number of repeat respondents (58.14%), Lufwanyama the lowest (at 24.3%) with Kalumbila in between (at 32.26%). A summary of the overall numbers, per district, is as per Table 3 below.

Table 3: Sites, Numbers of Respondents (Baseline and 1st Monitoring Survey) including repeat respondents

District	Baseline respondents in 2022	1st Monitoring (Round 2) Survey respondents in 2023	Variance no.	Variance %	Repeat respondents	Repeat %
Solwezi	442	451	9	2.03	257	58.14
Lufwanyama	395	174	-221	-55.95	96	24.3
Kalumbila	62	76	14	22.58	20	32.26
Total	**899**	**701**	**-198**	**-31.34**	**373**	**41.49**

3.3. SAMPLING PROTOCOL

3.3.1. DEPLOYMENT OF THE SURVEY INSTRUMENT

The survey instrument used in the 2022 Baseline Survey was edited and automated on Kobo Collect software. The instrument was in two parts (repeat and new), and included questions related to: demographics, the number of people (full and part time) and level of effort in charcoal production and

charcoal values (see Appendix A for a paper copy of the full electronic survey instrument). The survey instrument was then re-loaded onto five tablets and pre-tested by five enumerators before going to the field. As in the Baseline Survey, data from each day's collection was uploaded to the Kobo Collect cloud, and the data analyzed and cleaned during and immediately after fieldwork. Backup copies were also made each day, and full data was retained on the individual tablets as a secondary backup.

The data was then downloaded from the Kobo Collect platform as Comma Separated Values (CSV) files and imported into Excel for data cleaning and analysis. Excel was also used for some customized tables and graphs. For documentation, full data sets (in Kobo Collect and downloaded as CSV files into Excel) will be uploaded to the USAID's Data Development Library (DDL) to provide a permanent record of the raw data and for future use.

3.3.2. SURVEY TEAM PREPARATION, TRAINING AND EFFICIENCY

The survey team was comprised of five experienced enumerators, all of whom participated in previous USAID A2C surveys including the Pilot Survey in March and Baseline Survey in September 2022. Prior to field work, enumerator re-orientation was undertaken in Lusaka to pre-test the questionnaire, practice with the tablets and use the Kobo Collect application.

As was in the Pilot Survey, a one-day team debrief and lessons learned session was held in Lusaka after return from field work. This meeting provided an opportunity for reflection on the process in general and discussion on the way forward as regards to conducting the survey in the remaining site, namely Kaindu, Mumbwa District. The conclusion concerning Mumbwa was that the survey was cancelled until further notice.

Figure 3: Survey Team present at community feedback session, Mwidishi village, Solwezi District

3.4 GEOGRAPHICAL COVERAGE

There has been expansion / extension of the project sites in all the four districts since the Baseline was conducted in 2022. This is for the purposes of including areas where project partners are already active

with livelihood activities and Community Forest Management. Maps showing this extension across the three districts are provided in Figures 4 through 6 below.

Figure 4: Old and New Areas in Lufwanyama, Mukumbo Site

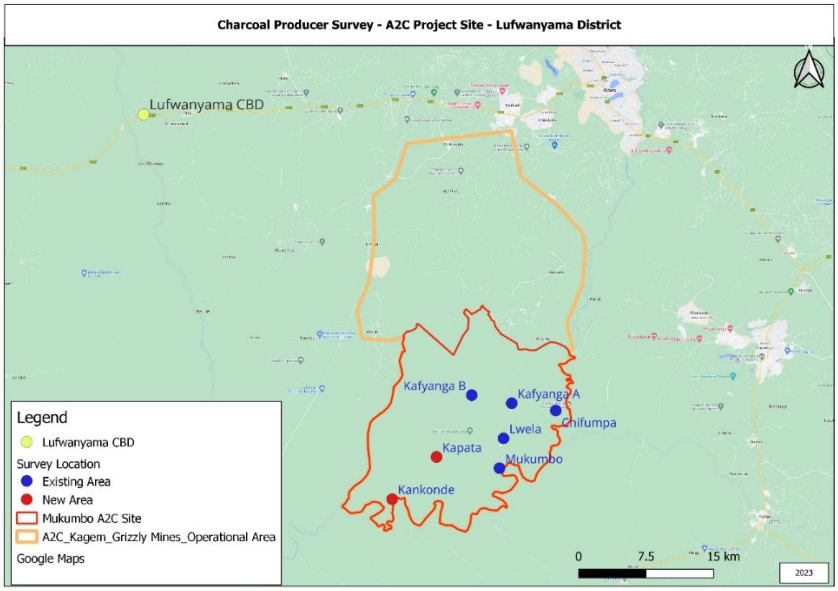


Figure 5: Old and New Areas in Solwezi, Kapijimpanga Site

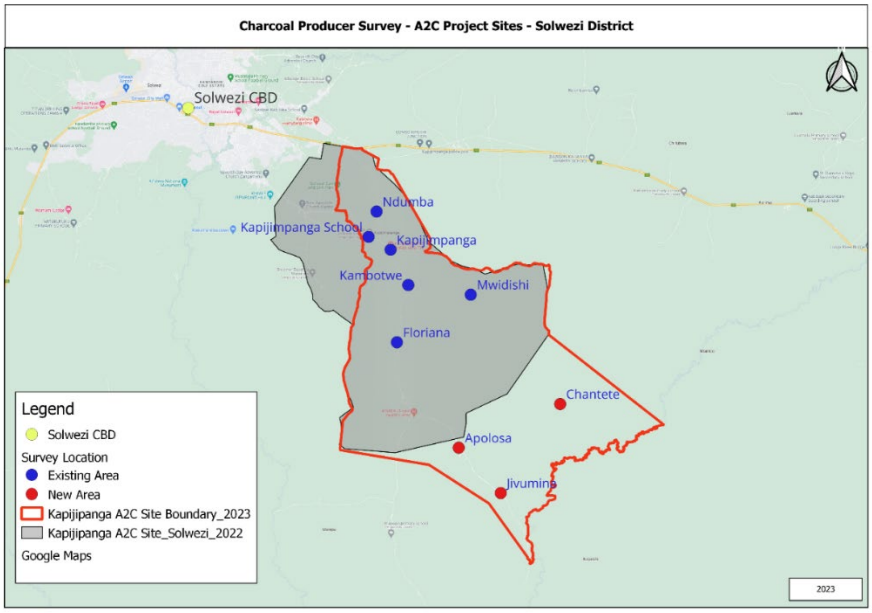
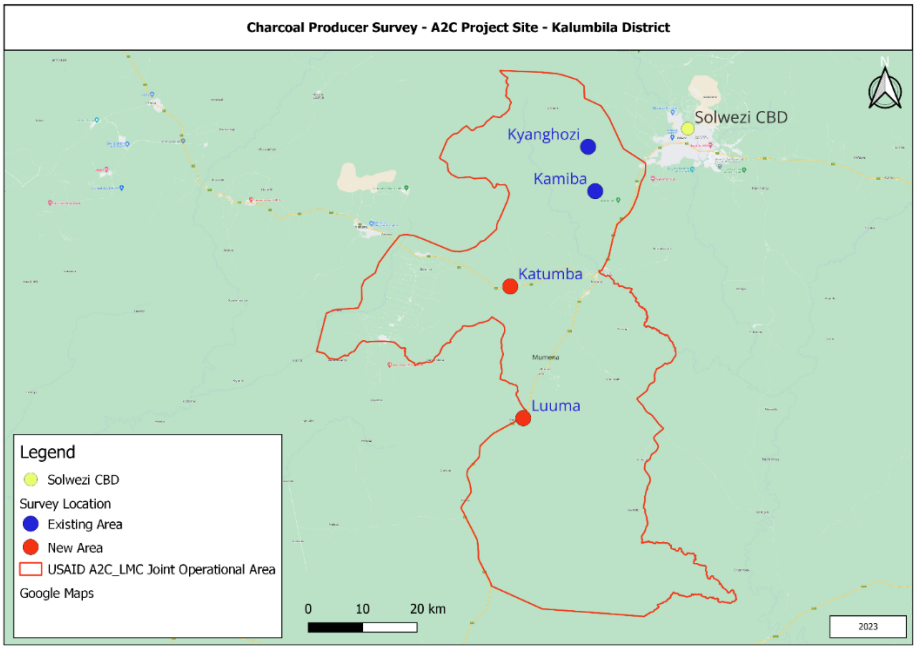


Figure 6: Old and New Areas in Kalumbila, Kyangozhi and Kamiba Sites



4.0 SURVEY RESULTS

4.1. NUMBER OF PEOPLE ENGAGED IN THE PRODUCTION OF CHARCOAL

To capture the number of people engaged in the production of charcoal more accurately, the survey calculates the average number of production months (level of effort) expressed as the total production months reported divided by the total sample size. Figure 7 below summarizes the number of people interviewed for this survey, per district and per category (full and part time) and the resulting average number of production months. In summary, producers spend 7.00 months out of their year engaged in the charcoal trade, or 58.3% of their time. This is 5.1% less than the baseline, which was 7.38 (for all four districts).

Figure 7: First Annual Monitoring (Round 2) Charcoal Producers' Survey Summary (September 2023)

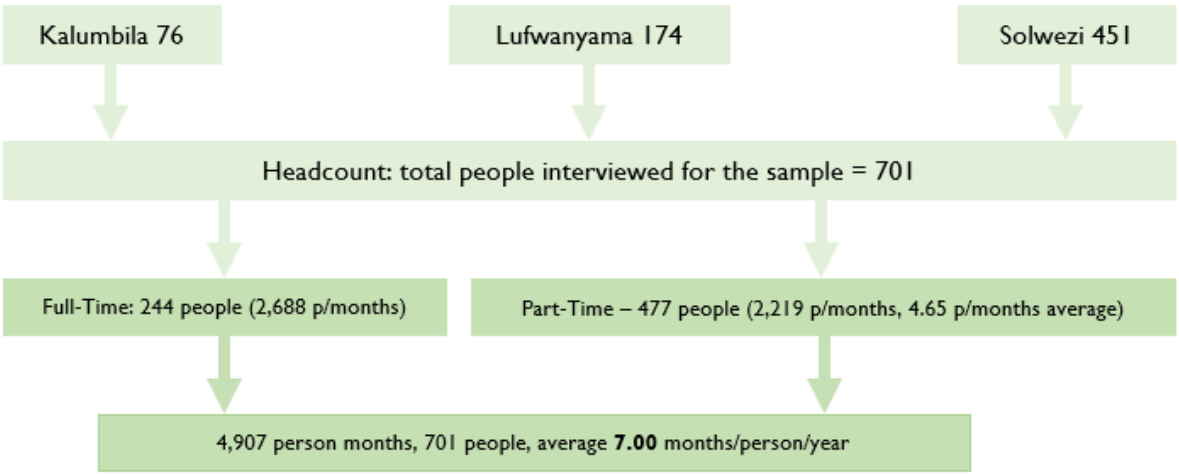
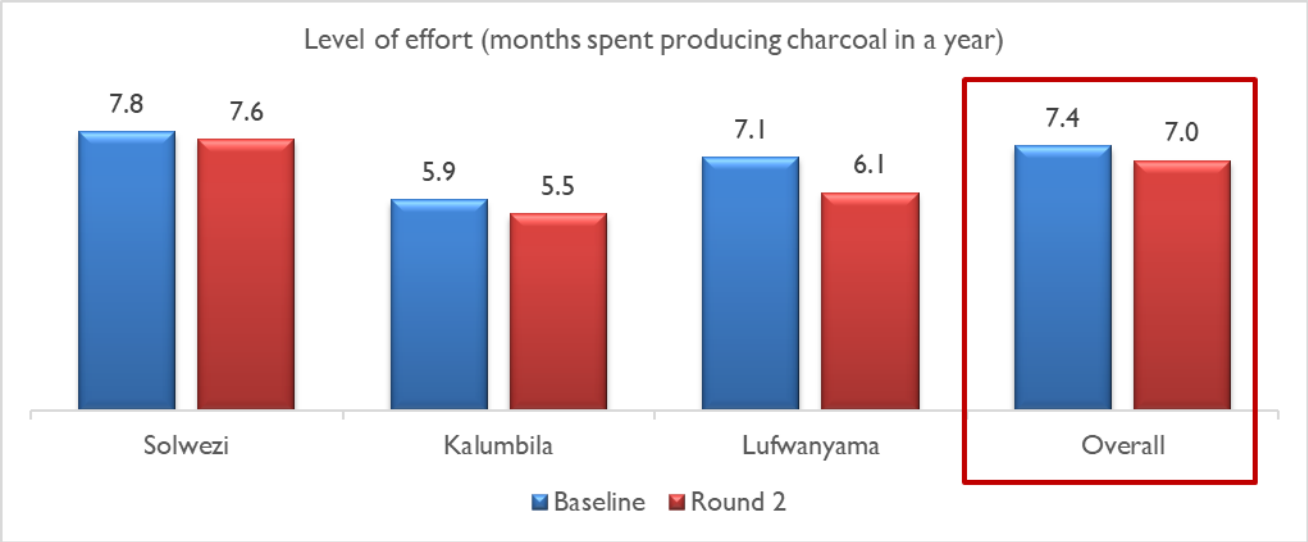


Figure 8 below shows the summary – per district and overall – of the average level of effort (months per person per year) for charcoal producers. The data and analysis for this survey comes with two caveats, related to both the reduced number of districts and to the reduced number of 'repeat' respondents:

i. Direct comparisons cannot be made between the baseline and this survey because one entire district, Mumbwa, representing 23% of the original sample (266 out of 1,167) has been left out.
ii. The number of repeat respondents (from the baseline) was low at 53% (373 repeats from a sample of 701 respondents). And in one district, Lufwanyama, the number of all respondents (repeat and new) was significantly below the baseline (44%, so 174 respondents in this survey compared to the baseline of 395).

One probable reason for the low respondent rate is attributable to the frustration felt by respondents that USAID A2C's alternative livelihoods activities are only in the initial phases, with many former respondents electing not to participate in the survey until livelihood activities are fully underway.

Figure 8: Level of Effort (months) spent on charcoal production (person/year), Baseline vs Round 2



Notwithstanding the caveats mentioned above, several observations can be drawn from the survey data and analysis. **From the 2023 survey of 701 producers in three surveyed districts, the level of effort is 7.0 person months**. **This is 5.4% less than the baseline** (for all four districts). All the three sampled districts namely Solwezi, Kalumbila and Lufwanyama recorded a decrease in the Level of Effort from 7.8 to 7.6, 5.9 to 5.5 and 7.1 to 7 months per person per year, respectively. This is shown in Table 4 below:

Table 4: Percentage Reduction in Level of Effort per District 2022 vs 2023

District	Baseline - 2022	Round 2 - 2023	% reduction
Solwezi	***7.8***	***7.6***	2.6%
Kalumbila	***5.9***	***5.5***	6.8%
Lufwanyama	***7.1***	***6.1***	14.1%
Overall	***7.4***	***7.0***	5.4%

The numbers above are consistent with observations about the characteristics of the value chains in each district. All districts have a reduction in the level of effort, with Solwezi showing the least (2.6% reduction) and Lufwanyama the most (14.1% reduction). The Solwezi production is a classic 'traditional small-scale family value chain' area. It manifests itself in a stable and established production and marketing environment – primarily supplying domestic markets. Lufwanyama is at the opposite end of the scale, commercial and industrial value chains supplying industrial users in Luyanshya. The significant reduction in level of effort in Lufwanyama is due to the disruption to the industrial value chain by ZEMA enforcement activities.

The percentage of full-time charcoal producers was reduced in two sites, namely Kyangozhi (Kalumbila District) and Mukumbo (Lufwanyama District) from 24% to 18% and 29% to 18%, respectively. The percentage of full-time in Kapijimpanga (Solwezi District) remained the same (see Table 5 below).

Table 5: Percentage of Full-time vs Part-time changes between 2022 and 2023

District	Baseline - 2022		Round 2 - 2023	
	Full-time	*Part-time*	*Full-time*	*Part-time*
Kalumbila	24%	76%	18% ⬇	82%
Lufwanyama	29%	71%	18% ⬇	82%
Solwezi	40%	60%	40%	60%

4.2. GENDER BALANCE AND DISCUSSION

Gender analysis in charcoal production is important not only for understanding current livelihoods dependent on charcoal, but also for the design of alternative livelihood options currently underway. The changes in the gender balance since the baseline are minimal, with 60% Male and 40% Female versus 59% Male and 41% Female in the Baseline (see Table 6 below).

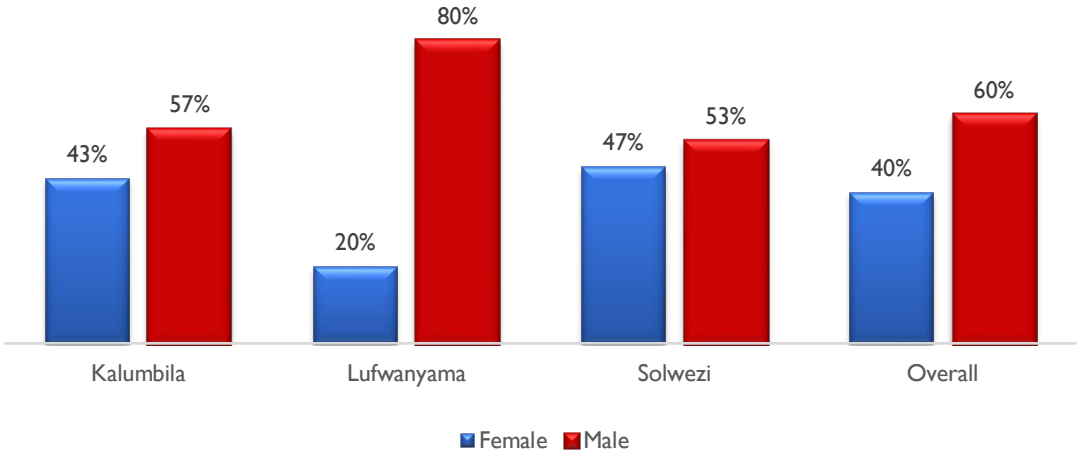
Table 6: Gender balance changes between 2022 and 2023

District	Baseline - 2022				Round 2 - 2023			
	Female		*Male*		*Female*		*Male*	
	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent
Kalumbila	16	25%	47	75%	33	43% ⬆	43	57%
Lufwanyama	155	39%	240	61%	35	20% ⬇	139	80%
Solwezi	200	45%	243	55%	210	47%	241	53%
Total	***371***	***41%***	***530***	***59%***	***278***	***40%***	***423***	***60%***

The notable change was that female participation in charcoal production in Kyangozhi (Kalumbila) increased to 43% in this survey from 25% in the Baseline. This could be attributed to the fact that all aspects of the value chain are more vertically integrated, and they are on a small scale as opposed to being commercial. Meanwhile, there was a reduction in female participation in Mukumbo site (Lufwanyama) from 39% to 20% during the same period as all aspects of the value chain are becoming less vertically integrated and more commercial. The gender balance (overall) by district is shown in Figure 9.

The implication is that when small-scale/livelihoods areas are overrun by commercial/industrial operations, it impacts all small-scale producers, but it affects women even harder. It appears that men can jump from small scale production and get piecework from commercial operators, but women are unable to make this jump and are excluded and/or marginalized. Therefore, in the design of alternative livelihood activities currently underway, it should be considered that a lot more women are disadvantaged and/or disempowered (when traditional small scale charcoal production is crowded out by commercial operators) than men.

Figure 9: Gender balance by District



Further disaggregation of the gender balance across full and part time work (see Figure 10) reveals:

i) Equal balance between Male and Female (at 50%: 50%, respectively) in the Full-Time category
ii) Imbalance between Male and Female (at 65%: 35%, respectively) in the Part-Time category

Figure 10: Gender balances between full- and part-time (%) categories

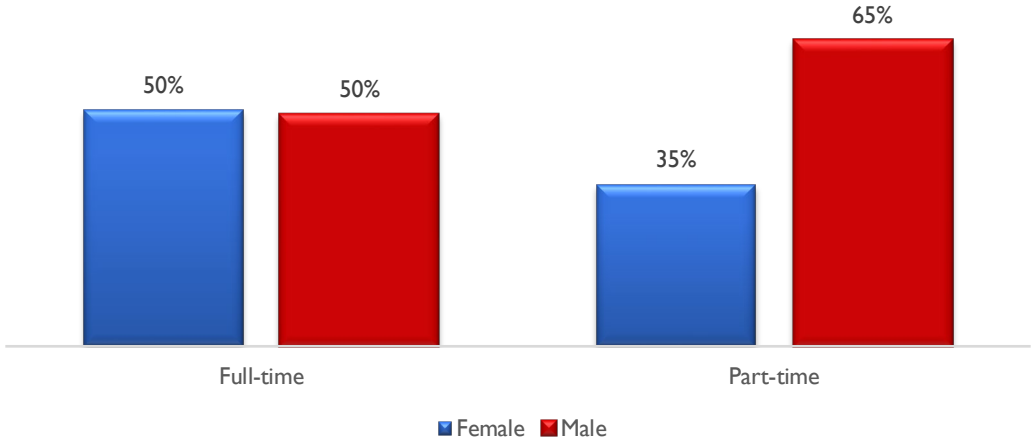
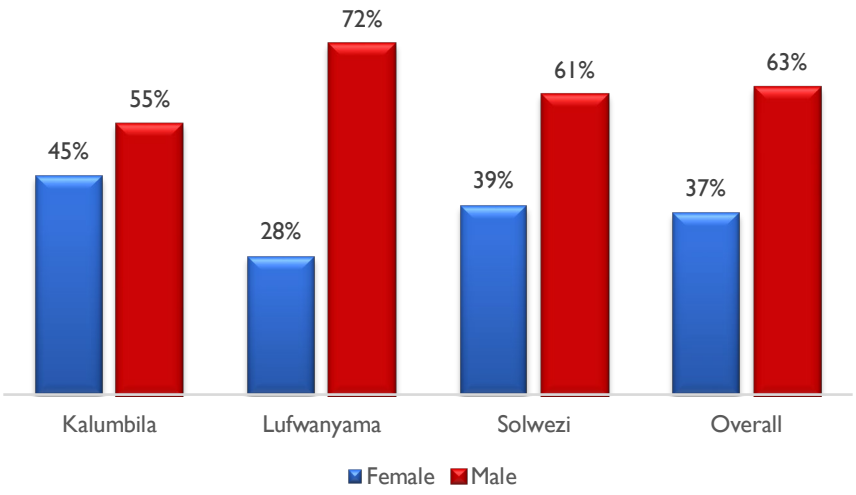
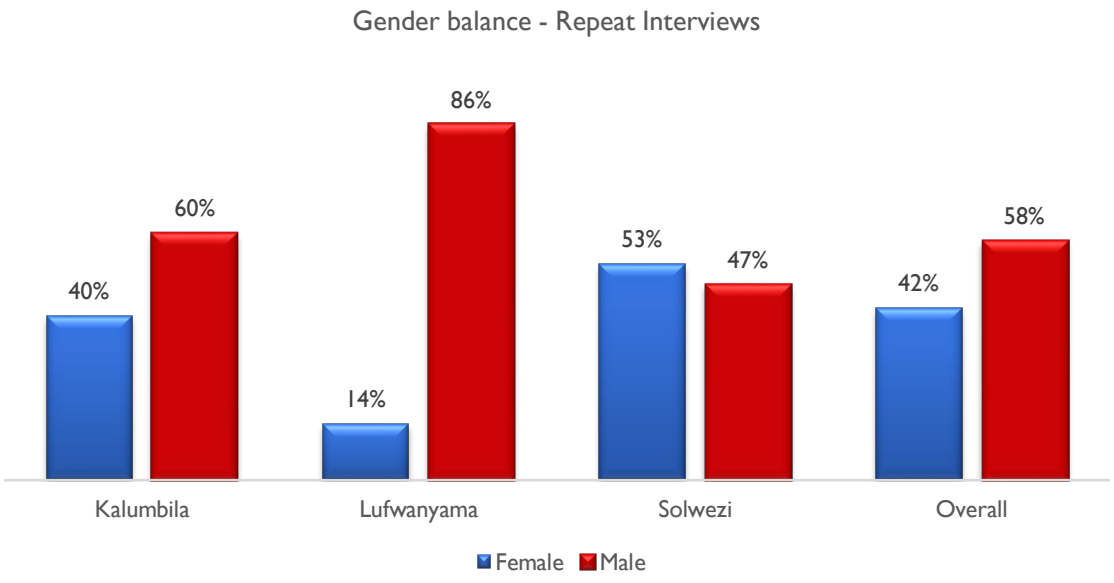


Figure 11: Gender balances by District – New Interviews



In the 'New Interviews' category (i.e., those that were not interviewed in the baseline), the ratio of Male to Female charcoal producers for all sites (Male 63%: Female 37%) depicts less Female participation. This is skewed towards more commercial / large scale production that is typical in Lufwanyama; Lufwanyama having the widest imbalance of Male 72%: Female 28%. Kalumbila is the most balanced with Male 55%: Female 45% with Solwezi being in between the other two sites with Male 61%: Female 39%.

Figure 12: Gender balances by District – Repeat Interviews



In the 'Repeat Interviews' category, the ratio of Male to Female charcoal producers for all sites (Male 58%: Female 42%) depicts more Female participation than in the New Interviews category. This is skewed towards more livelihoods / small scale production that is typical in Solwezi and Kalumbila

districts; Solwezi having the highest Female participation (with Male 47%: Female 53%) in this category. Lufwanyama is the least balanced with Male 86%: Female 14% with Kalumbila being in between the other two sites with Male 60%: Female 40%.

4.3. CHARCOAL PRODUCTION

4.3.1. PRODUCTIVITY: TONS OF CHARCOAL PER PERSON PER YEAR

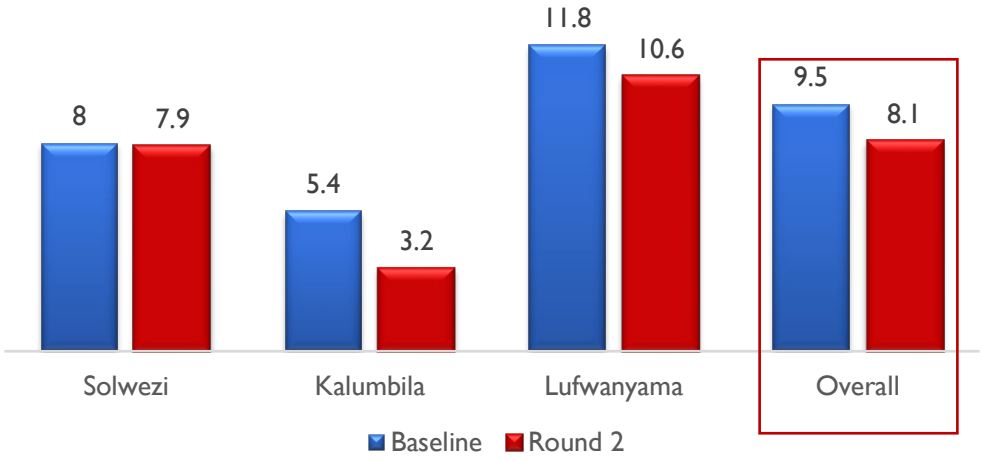
Charcoal production is a function of level of effort (input months) and production efficiency. As in the Baseline, USAID A2C collected data on production estimates, as reported by all respondents, and calculated the total production per respondent using the formula below:

Total production for each respondent = number of bags per kiln * the size of bags * the number of kilns per year.

The overall productivity figure (i.e. tons of charcoal produced per person per year) continues to be an important validity check against the level of effort reported above (average full-time equivalent level of effort of producers). It is also an important measure of trends in technology used for production (axes vs chainsaws), and trends in small-scale vs commercial production across the survey population.

The average annual production per person (in tons) by district is summarized in Figure 13 below.

Figure 13: Average amount (tons) of charcoal produced (person/year)



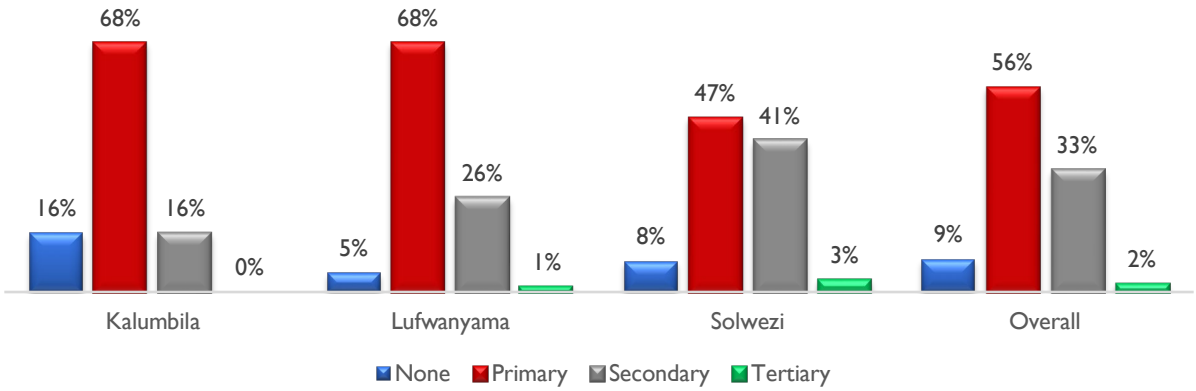
There is a 14.7% reduction in the overall charcoal production per person, per year as compared to the baseline. This, however, masks considerable differences in the reductions per district – as shown in Table 7 below.

Table 7: Percentage Change in Charcoal Production (tons) per District 2022 vs 2023

District	Baseline - 2022	Round 2 - 2023	% reduction
Kalumbila	***5.4***	***3.2***	40.7%
Lufwanyam	***11.8***	***10.6***	10.2%
Solwezi	***8***	***7.9***	1.3%
Subtotal	***9.5***	***8.1***	14.7%

The sample for Kalumbila is small, and the number of repeats is low, so the large percentage reduction should be treated with caution. Lufwanyama and Solwezi reduction numbers shadow the results of the level of effort reduction. A further observation relates to the level of numeracy and the limitations that the 'one year recall' has on the data. Some respondents have a rough estimation of their total charcoal production due to limited levels of education, literacy, and numeracy; with the highest level of education for 56% of the respondents being primary school as shown in Figure 14 below:

Figure 14: Highest level of education attained by charcoal producers



However, data on number of bags per kiln, bag size and number of kilns (per year) do provide an approximate understanding of production per person. As data builds up over a series of years, it becomes more reliable notwithstanding the limitations mentioned above.

Small scale, part-time livelihoods charcoal producers are still deploying labor intensive (low capital cost) technologies for felling, stacking, and producing kilns and for packaging the charcoal ready for consumers in the urban markets. The productivity for this category is therefore lower than their counterparts who use, for example, chainsaws for felling trees. However, these continue to obtain high financial returns because they tend to produce, transport, and sell their own charcoal, thereby eliminating predatory middlemen. A good example is producers in Kapijimpanga, who are close to the urban Solwezi market.

Commercial charcoal businesses tend to deploy more capital intensive (but higher productivity) methods, including mechanization (e.g., chainsaws for felling and cross-cutting). In many cases, these producers have more time to spend on the actual production since they do not spend any extra time and effort in preparing the charcoal packaging for sale to consumers in urban markets. For these businesses, charcoal is a 'bulk' commodity, so they fill bags without either i) the elaborate 'heads' that make the product attractive to consumers or ii) sealing the bags (which also adds time and effort to offloading at delivery). Lufwanyama is a good example of this model.

4.3.2. ESTABLISHED VERSUS FRONTIER

As was observed in the Baseline Survey, the overall production per person per year, for both full-time and part-time producers, is still significantly higher in Lufwanyama (at 10.6 tons) than in the other 2 districts namely Solwezi and Kalumbila (at 7.9 and 3.2 tons, respectively). This is explained by the nature of the production area and the producers, that is 'established' vs 'frontier'. To recap, the characteristics of each type of production area and producer are as follows:

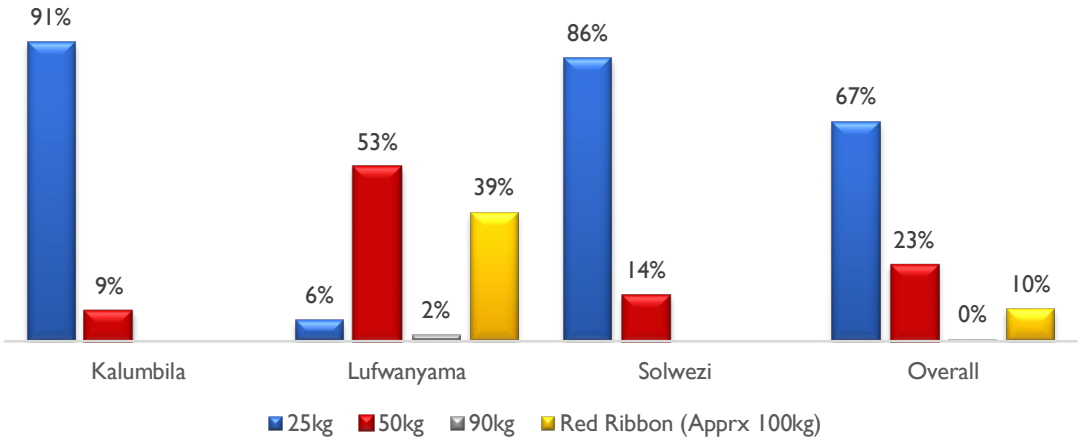
Established - Solwezi and Kalumbila. These are still traditional producing areas, with producers mainly marketing 25 kg market-ready bags (91% and 86% of bags produced being 25 Kg, in Solwezi and Kalumbila, respectively) in family-based vertically integrated small scale livelihoods value chains.

The process is not mechanized and is therefore labor intensive. This applies to production itself (smaller kilns, selective cutting and felling and cording using hand-axes) as well as transport, which is mainly using bicycles to get to market. Full time producers are still small-scale, labor-based livelihoods operators.

Frontier – Lufwanyama. Mukumbo is a commercial and industrial producing site, marketing, 'bulk industry' 50 kg bags for the Luanshya industrial market. The processes are increasingly mechanized and therefore the productivity (tons per producer per month) is still significantly higher. This applies to production itself (much larger kilns, and clear-felling without considering tree species). Increased use of chainsaws (owned or hired) continues to be observed in this frontier area with transport being by truck. However, it was learnt during the survey that MatchCo, a Luyanshya based match producing private firm was no longer buying charcoal from Mukumbo due to penalties slapped on the company by law enforcement agencies of the Government of the Republic of Zambia. This market disruption has resulted in the following:

i) Felled and cross-cut trees have not been piled.
ii) Piled logs have not been covered with soil.
iii) Already made kilns have not been 'fired.'
iv) Some cropped and bagged charcoal is left by the roadside and has not even been collected

Figure 15: Commonly produced charcoal bag per district



4.3.3 BAG SIZE

The size of a bag of charcoal (e.g., the weight) provide data about both the target market for the charcoal, and the type of charcoal producer. For example, the **90 kg** and **'red label' (120 kg)** bags are consumer products. They have elaborate 'heads', are well presented and are taken to urban markets where they are either i) sold directly to customers; ii) broken down by re-packers to sell to urban customers, or iii) sold to urban catering businesses. Due to their size and weight, they are transported exclusively in trucks. These bag sizes are still an important part of some seasonal trade from Lufwanyama.

The **25kg** bags are also consumer products. They too have elaborated 'heads' and are well presented for wholesale markets or retail (final customers). They are either sold in urban markets or from door-to-door. These bags are small enough to be transported by bicycle, and are always associated with small-scale, vertically integrated value chains that involve the bicycle as the primary means of transport to market. The 25kg bag size strongly dominates the trade from Solwezi and Kalumbila.

The **50kg** bags are an industrial/bulk product. They do not normally have 'heads' (they are packed level) and are seldom even sewn up. They are transported in bulk, stacked in a manner that accommodates 'open' bags. This bag size dominates the trade from Lufwanyama.

An analysis of bag sizes produced per district (the figure above) confirms the dominance of the 25 kg bag size in Solwezi and Kalumbila. Producers in Lufwanyama specialize in the 50 kg bag size due to demand by industrial operators including mines and smelters.

5.0 OBSERVATIONS

5.1 LUFWANYAMA OBSERVATIONS

Respondents in Lufwanyama (Mukumbo, Luela, Chifumpa, Kafyanga (A and B) were unsettled because of the market disruptions they had experienced when industrial users stopped coming to the area. The numbers of respondents that were willing to participate in the survey was significantly less compared to the baseline survey. The feedback sessions (held in advance of the survey) were relatively well attended, and discussions were open and lively. However, many former respondents (and potential new respondents) walked away after the feedback sessions and declined to later participate in the survey. When asked why they did not want to participate in the survey, several reasons were advanced. These included frustration at the slow pace of delivery for alternative livelihoods, and mistrust at the intentions of traditional (and official) leaders with respect to both livelihoods and CFM participation. There was also a consistent belief expressed that the information they supplied (in the baseline survey a year ago) had somehow precipitated the actions of ZEMA and the Forest Department in disrupting the value chain for industrial users.

Figure 16: Respondent in Lufwanyama explains how he fell into his kiln.

The disruption in the commercial/industrial market, and its dramatic effect on the USAID A2C Lufwanyama site producers, indicates the extent to which traditional producers were dependent upon organized, commercial value chain operators (primarily from Luyanshya). For instance, the 50 kg bag is still the packaging of choice for the bulk/industrial trade and producers interviewed expressed a strong desire for the industrial trade to resume. This in spite of the fact that bulk/industrial production disadvantages local producers by, for instance, driving prices down through limiting competition and monopoly tactics. Due to the poor condition of the roads, charcoal producers are entering the more lucrative consumer value chains, but primarily in the wet season when the commercial operators can't access the site due to the rains.

Several commercial operators that were observed during the Baseline Survey transporting loads of between 250 and 300 (50 kg) bags from Mukumbo to Luanshya were nowhere to be seen during the 2023 survey. The 50 kg bags, unsealed but loaded very precisely to ensure limited spillage, were lying by the roadside waiting to be collected. There was also no evidence of the stockpiling that usually takes place during the September – October period ahead of the wet season so that supplies to industrial users are not disrupted.

The expanded areas in Lufwanyama (namely Kapata and Kankonde) are more remote, have significant areas of intact forest, and are not producing significant amounts of charcoal. The survey team did observe two key dynamics in Kapata and Kankonde:

- Uncertainty with respect to the CFM processes, including inclusion and equity. There was a suspicion that the motives of traditional leaders (who allocate land and forests) are not always in the interests of community all members.
- Underlying tension with respect to 'internal migrants' i.e., settlers from outside the area (especially from the south of the country), their practices and impacts. Once again, the motives of traditional leaders, who are responsible for the allocation of land and forests, were not trusted. Community members are also concerned about an unfair alliance between newcomers and traditional leaders in decisions on land and forest allocation. This appears to be an emerging issue in all survey areas, but it was especially evident in Kapata.

5.2 SOLWEZI OBSERVATIONS

Charcoal demand from domestic users in the city of Solwezi is still almost entirely met from small-scale local production. For example, between 86 and 91 percent of the production is the 25 kg bag from Kapijimpanga and Kyangozhi / Kamiba, respectively. Almost all production is transported to Solwezi markets by bicycle (either the charcoal markets or door to door) with no evidence of transportation to larger cities. Producers are still mostly sedentary residents who produce, transport, and sell their produce in a fully integrated small-scale value chain. Like in the Baseline Survey, there was no evidence of any commercial charcoal transport (trucks) to Solwezi city from Kapijimpanga, Kyangozhi and Kamiba sites during this survey period.

Kapijimpanga still has several characteristics which are significantly different from other areas, as observed in the Baseline Study. For example:

- No evidence of commercial or industrial pressure from outsiders, in stark contrast to, for example, Lufwanyama.
- The highest 'repeat' respondent figures of all sites (at 58.14%), indicating a stable, sedentary producer population that is made up almost entirely of livelihoods producers as compared to Lufwanyama at 24.3% and Kalumbila 32.26%.
- The most nearly equal gender ratio of all sites, with the male to female ratio of 53%/47% (in contrast with Lufwanyama at 80%/20%).
- Dominance of the 25 kg 'market ready, bicycle transportable' bag size and a small-scale, vertically integrated value chain

Figure 17: Community Feedback Session, Kambotwe, Solwezi District

Several observations relate to the process of establishing CFM structures in Kapijimpanga. First, the CFM area was expanded specifically to bring increased forested areas under the CFM activity stream. The enumerators observed that reception to the survey was better, less controversial and divisive, in established project areas (Ndumba, Kapijimpanga, Kapijimpanga School, Floriana, Mwidishi and Kambotwe) as compared to new areas (Jivumina, Apolosa and Chantete).

The seven steps that comprise the full suite of CFM establishment are well established in Zambia. The lessons learned from establishing over 200 CFMGs in all parts of the country, over a decade or more, are well documented. Two lessons are pertinent for CFM activities in Kapijimpanga:

- Processes that comprise the seven steps must be completed in sequence, and progress from one step to the other must only take place once each step is complete. This implies that the processes (especially in the introductory, foundation phases) cannot be rushed, must be inclusive and perceived as equitable, and therefore must take place at a pace that is determined by the community.
- The potential for elite capture is very high. This elite capture can take many forms, but manipulation of processes and structures, by traditional leaders' (for their vested interests) is the most common. This implies that the USAID A2C project cannot leave key foundation processes up to traditional leaders (or Government officials). Foundation steps (1 to 3) need significant, hands-on input from the Project. These are i) Community Forest Process Initiation and Awareness Raising, ii) boundary negotiation, mapping and iii) management group constitution and election.

Observations from group feedback sessions and individual interviews confirm the lessons above. Individuals in the new areas do not have all the information they need to proceed beyond step one. Because there is no consensus, there is still suspicion and division, and a common view is yet to emerge. Yet boundary mapping is advanced, as are elections and selection and vetting of Honorary Forest Officers. Going forward, it is recommended that CFM formation and processes take place in sequence, and at a pace that guarantees that each step is completed with the agreement of all stakeholders.

5.3. KALUMBILA OBSERVATIONS

Kalumbila (Kamiba) is the smallest of the USAID A2C sites and has the smallest sample size. The site is close to Solwezi, and the producer profile is very similar to that of Solwezi– small-scale, livelihoods production in vertically integrated family value chains serving the Solwezi domestic market. Due to the sample size, and low number of repeat interviews, the analysis of the data should be treated with caution. Notwithstanding this caveat, the survey team made several observations.

Production continues as before, with no evidence of commercial or industrial interests. The area is close to Solwezi town, and feedback sessions (and discussion) revolved around alternative livelihood options and agriculture. The Agriculture Block Officer was engaged and committed, as was the Forest Officer, and they both assisted in the feedback sessions and conducting of the survey.

One of the communities in Kalumbila that was not sampled in the Baseline (Kyangozhi) was covered in this year's survey. Of interest is the very high percentage of 25kg bags produced in Kyangozhi. This is the highest of all sites, with 91% of the sample falling into this category. For all the reasons advanced in the discussion on Solwezi above, Kyangozhi producers are mostly sedentary and small-scale; they transport charcoal directly themselves to markets, or door to door, as direct sales. USAID A2C did not see evidence of any commercial transport (trucks) from Kyangozhi / Kamiba during the survey period.

The team sampled a high number of respondents from the new, expanded, Kalumbila areas, which were brought into the USAID A2C project to expand the size of the CFM and align with the community forestry work being supported by Lumwana Mine. Reception to the survey was better in new, expanded areas (Luuma and Katumba) compared to old areas of Kamiba and Kyangozhi. This could be attributed to the fact that Lumwana Mine, through their CSR and Environmental Sustainability divisions, are already active in the area (and have been for some time) and their Community Forest Management and Alternative Livelihood promotion has had time to bear fruit. It could also be attributed to the considerable experience of the Kalumbila District Forest Office in matters related to CFM establishment. Kalumbila District has several well-established CFMGs, and the experience of the DFO in the processes appears to be a significant factor.

Figure 18: Respondent answers questions with his son in Kalumbila

6.0 DISCUSSION

The 2023 annual charcoal producer survey revealed some positive trends. Namely, the time (person months) that producers spend in the charcoal value chain has decreased as compared to the baseline by 5.4% from 7.4 to 7.0 months per year, and the amount of charcoal being produced declined by 14.7% from 9.5 to 8.1 tons per person. While these results are positive, caution should be taken when making direct comparisons between the 2022 baseline and the 2023 survey because one entire district (Mumbwa), representing 23% of the original sample was not included in the 2023 survey. Second, the number of repeat respondents from the 2022 baseline was low at 53%, and in one district, the number of all respondents (repeat and new) was significantly less than the baseline. In addition to this trend data, several important observations emerged from survey interviews, one-one-meetings and feedback sessions with charcoal producers which are discussed below.

6.1 GOVERNANCE AND TRUST

A recurring observation is the lack of trust that individuals in the community have for either i) customary traditional leaders and their agents at local level and ii) government officials at national and decentralized levels. This is not a new observation, and was discussed in the 2022 baseline report, but the 2023 survey found that lack of trust had further eroded. Lack of trust manifests itself in many forms and guises, several of which are highlighted below:

Information is power - asymmetry in information is a challenge. It was observed during feedback sessions, discussions, and interviews that information is either being withheld or distorted (or both) in the passage from the USAID A2C project to the individual beneficiary and back again. This is not uncommon in development projects, and USAID A2C should always consider how to balance the approach to counter some of the more egregious impacts of information-power-asymmetry dynamics. Government and traditional authorities need to be involved and informed at all points in the delivery of the project, but they should not control the flow of information between the project and the communities (and from the communities to the project). It is recommended that key messages be delivered directly to communities but in the presence of leaders. Project staff should also elicit feedback from communities, both directly and also in the presence of their leaders.

Elite capture takes many forms – benefits must be seen to be fair. In meetings and interviews, concerns (either real or perceived) were expressed by members in the community of elite capture. 'Community meetings' where the Headmen call meetings, influence who attends, and orchestrate proceedings, can be deliberately managed to their own advantage. As above, project staff should be alert to and guard against situations where asymmetry can be used unfairly to manipulate and create further inequity.

6.2 ALTERNATIVE LIVELIHOODS

Livelihood stacks are dynamic and opportunistic. This is especially clear from an area like Lufwanyama, where the livelihoods stack has been dramatically impacted by the rapid reduction in charcoal production due to enforcement activities. As such, alternative livelihoods for charcoal producers must therefore be dynamic and opportunistic too. The disruption of the charcoal supply chain in Lufwanyama is an opportunity but also a risk. If formal sector alternatives are not provided to quickly fill the gap, the opportunity will be lost and producers may either take their charcoal skills elsewhere or switch to other illicit livelihoods, such as illegal artisanal mining and illegal wildlife hunting.

Targeting is important – help should be for the poor and marginalised. Feedback from individual respondents indicates a general perception that livelihoods support is targeted at those who are already relatively well off and connected. Community members perceive that connected and more affluent individuals are more engaged in project activities while those who are already marginalized are overlooked. It will be important for USAID A2C grantees to address this perception through their programming and ensure an adequate social and gender inclusion strategy is put in place.

Figure 19: Women charcoal producers during a feedback session, Mwidishi, Solwezi District

6.3 COMMUNITY FORESTRY

Many issues mentioned above manifest themselves through the lens of the CFM processes. Critical cornerstones of CFM include: Equity (the perception by community members of what is fair and just) and Inclusion (making sure that everyone is invited and all voices are heard) . As discussed in earlier reports prepared by USAID A2C, the forest is a valuable and valued social safety net that underpins coping mechanisms that have evolved over centuries. The transition to contemporary and more formalized CFM systems can either reinforce and secure these (largely un-monetized) benefits, or fatally undermine them.

The CFM processes must be clearly understood, which takes time and resources. To ensure this, the CFM process must be patient, comprehensive, consultative, and inclusive. Observations by the survey team were that when it comes to the process itself many people still don't fully understand it or are misinformed. Furthermore, they feel left out of the process and many feel that the process is being rushed. This is not unique to USAID A2C, as CFM pace and process challenges are well known and documented. USAID A2C should balance expectations and the speed of outcomes, with the processes and resources that are required to achieve equity and inclusion. This includes identifying and mitigating the propensity for elite capture.

6.4 INTERNAL MIGRATION

A constant source of discussion among charcoal producers was the issue of internal migration. This is normally characterised with an entrenched belief that 'the south' of the country is dry, treeless, unproductive, and therefore vulnerable. This in turn is blamed for a steady stream of internal migrants from the south, who arrive with their cattle and fixed crop production methods. The perception is that this internal migration disrupts a situation where many people are already on the margins and vulnerable.

'Internal displacement' is a growing and destabilising dynamic. In an atmosphere where tension between communities and their traditional leaders is already high, new, and disruptive influences are unwelcome. As more people move from the south, and create more pressure for land, grazing and forest, there are heightened accusations that traditional leaders are selling out and cashing in. While this is difficult for USAID A2C to verify, the accusations themselves can erode an already thin trust even further. This is an issue beyond the control and mitigation capability of USAID A2C, but understanding its presence and influence is very important.

APPENDIX A: SURVEY QUESTIONNAIRE

(attached as a PDF file)

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