



## **Transforming Tanzania's Charcoal Sector Project**

### **Technical Report 4**

# **Charcoal market conditions in 2016 in Dar es Salaam and Morogoro, Tanzania**

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## EXECUTIVE SUMMARY

### Introduction and Objective of the Assignment

The TTCS partners successfully modelled a sustainable charcoal value chain that provides more security to charcoal producers; generates significant village level revenue from fees; and establishes an environmentally sustainable harvesting approach. Central and Local Government have been supportive of the model. Despite its success in the area where the model is implemented prevalence of charcoal in the market that has evaded payment of royalties has undermined the competitiveness of the sustainable charcoal. This study is one of the approaches to assess compliances. In 2013, Camco implemented a study entitled 'Market Research for Sustainably-Produced Charcoal'. The objective of the Camco study was to make as strong and sound a determination as possible as to whether sustainably-produced charcoal can be successfully marketed in a "profitable", "commercially viable" way in major urban areas in Tanzania, focusing initially on the urban areas of Morogoro and Dar es Salaam. The current study builds on the market study conducted by Camco in 2013 with the view to generate information for charcoal value chains in Dar and Morogoro. As such the sampling design and questionnaires were based on those used in the 2013 Camco study.

### Objectives of the assignment

The overall objective of this assignment was to document current charcoal market conditions including price and compliance trends. Specific objectives were:

1. To collect data on current charcoal prices along the charcoal value chain for Morogoro and Dar es Salaam.
2. To document stakeholders' perspectives on compliance trends in the charcoal trade.

### Methodology

The sample sizes were:

- 30 charcoal producers in villages outside the TTCS project areas
- 30 charcoal traders/transporters, 15 were charcoal transporters by lorry
- 25 wholesalers, 20 from Dar es Salaam
- 25 retailers, 20 from Dar es Salaam
- Customers 31
- 5 Government representatives from local and central government.

The questionnaire (with addition to questions compliances) used by Camco in 2013 was used in this study, and Camco research work was a yardstick to provide descriptions of differences and similarities on charcoal prices, charcoal trade along the charcoal value chain and perceptions of stakeholders on compliance. The sampling frame was charcoal producers, transporters/traders, wholesalers, retailers, consumers and Government representatives. All questionnaire data were coded, entered, cleaned and analyzed using Statistical Package for Social Science (SPSS) program. The results were summarized to identify current situation, perceptions of stakeholders on compliances, trend of compliances, charcoal trade trend, actors and their experiences along the value chain, transportations and costs incurred.

## **Results and Discussion**

### **Characteristics of actors along charcoal value chain**

The charcoal value chain includes producers, transporters, wholesalers, large consumers and retailers. The Government institutions TFS, DFOs and village authorities are regulators of the value chain.

#### ***Charcoal Producers***

Charcoal production was male dominated with no new entrants into charcoal production in those villages in the last three years. Also reported by Camco (2013) study there were no full time charcoal producers; they do not produce during the rainy season, during planting or harvesting times as there is a shortage of labour during those periods. The experience of producers was about 6 years in the production. Producers reported that there was a shortage, and it was therefore more difficult to get wood for charcoal production compared to one year ago. Education on sustainable charcoal production and tree planting activities/afforestation were the most cited measures by producers to improve availability of wood for charcoal production. Productions per kiln were very little as the technology used was traditional earth kiln. In 2016, all respondents agree that the price of charcoal varies throughout the year. During the study (September 2016) the price of charcoal in villages ranged between TZS 8000 and 10,000 per bag reflecting that taxes were not included. With low productivity and low prices per bag, obviously earnings per kilns for the producers were also very small. Generally, this shows that the price of charcoal at producer level has not increased substantially since 2013. The most frequently-cited reasons for charcoal production being “bad” for the environment were disorganized felling of trees without replanting. Charcoal producers were aware that environmental conservation is important and improvements on charcoal production were required. The current study shows that planting trees, charcoal certification/labelling, formalization of producers/ groups and local government support (in that order) were cited by the producers as important factors for consideration to improve charcoal production. Respondents reported the need for formalization of charcoal business as earlier documented by Camco (2013) that almost all would like to see the charcoal business “regularised” or “formalised”. In the current study respondents still felt that formalization of charcoal business producers can improve charcoal production.

#### ***Transporters***

The transportation of charcoal from the production sites to urban areas uses lorries, motorcycles and bicycles. Motorcycles and bicycles usually transport charcoal from production point primarily to roadside, but in some cases they transport charcoal to urban wholesalers, retailers and even to final consumers (home delivery). As observed in Camco (2013) a wide range of transportation modes were used, implying diverse number of regulation applications. In addition, there were a wide number of overlapping jurisdictions (i.e. village authorities, district authorities, Tanzania Forest Service/MNRT, Tanzania Revenue Authority, traffic police) and the varying abilities of different transporters to negotiate leads to wide differences in costs incurred by transporter. Most drivers or operators were also owners of the means of transportation. In most cases charcoal transportation was a primary economic activity of the owner of the means of transportation. Apart from transporting their own charcoal, most transporters also transport charcoal owned by others. Contrary to the Camco report, the current study shows that the numbers of charcoal transporters in the period between September 2015 and September 2016 have increased.

### **Wholesalers**

Charcoal wholesale business dominated by male with some new entrants in the business. This implies that wholesaling was more attractive than charcoal production which had no new entrants for the last three years. They have been in the business longer (13 years) than any other group in the charcoal supply chain, much as one would expect implying that the business is paying. Also, most of the wholesalers were residing in the study wards, entailing that it is easier to organize, monitor or conduct training at this node of the value chain. They were selling to a relatively wide number of buyers (both retailers and final consumers). The average earning per month from charcoal at this node ranged from TZS 1,142,000 for Ilala to 6,922,857 for Kinondoni with the opinion that monthly earnings from charcoal has increased between TZS 146,000 and 437,500 in one year period. Wholesalers' charcoal is over packed bags (popularly known as *lumbesa*). As charcoal arrives in Temeke, Ilala, Kinondoni and Morogoro Urban *lumbesa* bags are often unpacked and repacked to smaller units for selling to retailers or customers.

### **Retailers**

Most charcoal retailers are also owners of the business, and the node was female dominated. Similar to Camco study the capital for the trade was small ranging from TZS 46,250 to 56,000 mainly acquired through own sources very few acquired capital from financial institutions. Retailers buy in bags and sell in smaller units. Majority of the retailers buy charcoal from more than one source. The main sources were Kilosa/Gairo, Kisarawe, Mkuranga, Rufiji, Handeni and Morogoro Rural. Charcoal reaches retailers by various means such as bicycles, private cars, small trucks, large trucks/lorries and motorcycles. About 65% of the charcoal retailers sampled had opinion that current charcoal production was not sustainable.

### **Consumers (Households)**

All customers indicated to use charcoal for domestic cooking, some using charcoal in combination with other energy sources. There were about five combinations of sources of energy (energy mix) used by households for cooking. The combinations were: Charcoal only; charcoal and LPG; Charcoal and kerosene; charcoal and firewood; and charcoal, kerosene and firewood. In Camco study of 2013, LPG was not recorded in any households outside Dar es Salaam. Most (51.6%) of the households did not know where charcoal came from. Majority (74.2%) had no idea on how charcoal is produced. Majority (71%) of households never heard of sustainable charcoal before. This result confirms the Camco (2013) report that lack of knowledge of how charcoal was produced was fairly evenly distributed amongst respondents.

## **Charcoal Prices along the Charcoal Value Chain**

### **Wholesalers**

There were price differences between Kilosa villages, Morogoro Urban and Dar es Salaam. The average price in villages was TZS 8,828 while in Morogoro Urban was between 45,000 to 65,000 depending on the weight of the bag and location. In Dar es Salaam the unit of measurement varies between 10kg and 70kg. In Dar es Salaam there were no charcoal bags observed to weight 100kg as reported in Morogoro Urban. Generally, prices per bag were higher in Temeke, Ilala and Kinondoni across all units of measurement compared to Morogoro Urban. Additionally, all respondents in Morogoro Urban and Ilala districts, and most of the respondents in Temeke and Kinondoni reported that charcoal prices per bag have increased if compared to prices in September 2015. This observation is similar to the one made by Camco (2013), who observed at that time, that the prices of charcoal had risen over the past 12 months by an average of some TZS 5,000 per bag.

### ***Retailers***

Retailers were requested to compare current charcoal prices per units with prices offered by retailers in September 2015. Results show that there are significant price increases across all units. The magnitude of price increase varied between districts. This is contrary to Camco study that reported charcoal prices were increasing very little over the past several years.

### ***Customers***

When one looks at consumer charcoal prices today compared to those offered in September 2015, most of the households were of the opinion that charcoal prices have changed since this time last year. According to Camco, charcoal customers' prices; were increasing relatively little over the past several years.

### **Stakeholders' Perspectives on Compliance**

#### ***Producers: Charcoal production and trade compliances***

Generally, producers responses show that compliances at this node was very low ranging between 17% (those paid for harvesting trees for charcoal at the villages) and 57% (for those paid cess to municipal for charcoal trade). Majority paid transit pass for those transporting charcoal to outside Kilosa District. Most wood for charcoal production were harvested as a free good from forests. That means majority of producers do not contribute to the costs of protecting and managing the forests where wood for charcoal production is harvested.

#### ***Other actors along the chain***

Other actors along the chain were transporters, wholesaler's retailers and costumers. Majority of these actors in Morogoro and Dar es Salaam were not aware that they require license/permit to sale their charcoal, and those selling charcoal to them also requires licenses and permits. Majority of transporters, wholesalers, retailers and consumers were of the opinion that the required taxes/fees were not duly paid.

### **Conclusion and Recommendations**

- Sources of wood for charcoal production were non-reserved natural forests and from forest reserves. Introduction of sustainable charcoal production and value chain development in villages would provide more security to charcoal producers; generates significant village level revenue from fees; and establishes an environmentally sustainable harvesting approach.
- In some villages enforcement of Forest Act and by-laws and restrain economic activities that degrade forest and conservation activities were perceived by some producers to be a bottleneck to wood availability for charcoal production. Activities that consider environment and incomes in symmetry would enhance compliances.
- Investment on education on sustainable charcoal production is important because majority of producers cited this as measures to improve availability of wood for charcoal production.
- Contrary to Camco report, in this study some producers claimed to pay money to get permission from village leadership to cut wood from forest for charcoal production. Proper recording of incomes of this nature could assist feedback on the money collected to the villagers.

- Charcoal producers were aware that environmental conservation is important and improvements on charcoal production were required and many appreciated that charcoal need to be produced sustainably.
- Charcoal certification/labelling, formalization of producers/ groups and local government support (in that order) were cited by the producers as important factors for consideration to improve charcoal production. Also, majority of the transporters always buy charcoal in same places. Therefore it is easier to mobilize them. Formalization of charcoal business producers and transporters can improve charcoal production.
- There were a wide number of overlapping jurisdictions (i.e. village authorities, district authorities, Tanzania Forest Service/MNRT, Tanzania Revenue Authority, traffic police) and the varying abilities of different transporters to negotiate leads to wide differences in costs incurred by transporter. An intervention to improve negotiations and rule of law is crucial.
- The earnings of the wholesalers were high probably because of their strongest negotiating position. Over packed bags (popularly known as *lumbesa*) are dominant in the wholesaler node along the charcoal value chain. Also, there were price differences between Kilosa villages, Morogoro Urban and Dar es Salam. Mechanisms that would reduce earning differences need to be instituted.
- Majority of households never heard of sustainable charcoal, increasing awareness on sustainable charcoal is important.
- Similar to Camco (2013), that the prices of charcoal had risen over the past 12 months. This could partly be attributed to inflation rate and not the real price of charcoal.
- Responses show that compliances at all nodes was very low. Wood used for charcoal production was not paid for. This means that most wood for charcoal production were collected as a free good from forests. In most nodes actors were not aware that they require license/permit to sale their charcoal, and those selling charcoal to them also requires licenses and permits. Awareness raising on the regulations is important

## **ACRONYMS**

NAFORMA	National Forest Monitoring and Assessment
PFM	Participatory Forest Management
MAI	Mean Annual Increment
MEWN	Ministry of Environment, Water and Natural Resources
TFCG	Tanzania Forest Conservation Group
TaTEDO	Tanzania Traditional Energy and Development Organisation
TTCS	Transforming Tanzania's Charcoal Sector
TFS	Tanzania Forest Service
D&D	Deforestation and forest degradation
SDC	Swiss Agency for Development and Cooperation
SPSS	Statistical Package for Social Science Program

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## 1. INTRODUCTION

### 1.1 Forest Resources and Woodfuel in Tanzania

Tanzania is rich in forest resources; the National Forest Monitoring and Assessment (NAFORMA) established the forested area in the country to be about 48 million hectares, equivalent to 54.6% of the land area. About 27 million hectares of forests falls under conservation (i.e. wildlife reserves and water catchment protection forests) that are legally not allowed for wood extraction. It is estimated that production forests where harvesting can be conducted legally cover an area of approximately 21 million hectares. Most of the forest area (90%) is occupied by woodland. Other forest types include montane, mangrove and acacia forests and coastal woodlands. About 18 million hectares of this total forest area have been gazetted as forest reserves and 4.1 million hectares of this are managed under Participatory Forest Management (PFM). Over 17.3 million hectares, a third of total forests, are in village lands, most with no properly defined management regimes (NAFORMA Report, 2014).

The forests are a primary source of wood energy and other forest products and services. Household consumption comprises the largest category of woodfuel consumption. Other large consumers of wood energy are small-scale enterprises which include food vending/processing, brewing, fish frying/smoking, salt production, baking, restaurants, schools, prisons, hospitals, agro-processing (e.g. tobacco/tea curing, beehives making; and bricks burning (Monela and Abdallah, 2007; Lusambo, 2016). Woodfuel utilization in terms of charcoal and firewood threatens most of the forests including those under district and central government reserves. This comes from the fact that the primary energy consumed in Tanzania is woodfuel (account more than 90%) and wood harvesting for woodfuel is done unsustainably. Therefore, interventions targeting sustainable and efficient production and use of woodfuel deserve special attention.

High population contributes to the increased demand on woodfuel. In 1961 Tanzania had a population of 7 million people with total annual wood consumption of 14 million m<sup>3</sup> while allowable wood harvesting (total annual supply based on MAI) were 105 million m<sup>3</sup> giving a surplus of 91 million m<sup>3</sup>. Deforestation is largely driven by two major factors: land clearing for agriculture, and wood extraction for energy. A number of studies (Abbot and Homewood 1999; Chidumayo, 2005; Dewees, 1995; Fisher and Shively, 2007; Luoga *et al.*, 2000; Mwampamba 2007; Sprague and Oyama, 1999) showed that in many cases these factors work in tandem, wood extraction is followed by use of the land for agriculture. On the other hand, Mwampamba *et al.*, 2013 reported that forest degradation associated to charcoal production is largely independent from deforestation driven by agricultural expansion. The contribution of charcoal production to deforestation in tropical countries with the highest rates of deforestation is estimated at less than 7% (Chidumayo and Gumbo, 2013).from unsustainable consumption of woodfuel. Recent results from NAFORMA indicate that both the protection and production forests are degraded with average standing wood volume of 50 m<sup>3</sup> per ha. The total average standing volume per ha had declined from 180m<sup>3</sup>/ha in 1961 to 50m<sup>3</sup>/ha in 2012 and the MAI declined to around 2m<sup>3</sup>/ha. In many various places what used to be forests has been degraded to bushlands and grasslands. In 2012, Tanzania mainland had a population of 43,625,354 people (an increase of more than 6 times when compared to 1961) creating a wood deficit (in that year) of 7.8 million m<sup>3</sup> from the production forests. To meet the wood demand deficit, harvesting is taking place in villages and in protected forests that are legally not allowed for wood harvesting. Although, the volume of charcoal produced in Tanzania is very high, but its contribution to government revenues is little because of low compliances. This affects revenue

collection by the Local and the Central Governments. In addition, the unsustainable charcoal in the market may compete unfairly with charcoal produced sustainably. Regarding charcoal produced sustainably, royalties, fees and all the required taxes are paid while in most cases, charcoals produced unsustainably may evade the taxes.

Charcoal and fuelwood demand for domestic and industrial use is listed as one of the major direct causes of deforestation and forest degradation. Other drivers of deforestation and forest degradation includes illegal and unsustainable harvesting of forest products, forest fires, agricultural expansion, overgrazing and nomadic pastoral practices, infrastructure development, settlement and resettlement, and introduction of alien and invasive species. These causes of deforestation and forest degradation (D&D) are indirectly driven by market and policy failures, population growth including rapid urbanization and rural settlement expansion, poverty and the poor state of the economy. If charcoal production and its use are to contribute to sustainable development and poverty alleviation, the entire charcoal value chain needs to be understood and addressed in a holistic manner (MEWN, 2013).

## **1.2 Background and Rationale to the Assignment**

### **1.1.1 Background Information of the Project**

The Tanzanian Community Forest Conservation Network (MJUMITA) in partnership with the Tanzania Forest Conservation Group (TFCG) and the Tanzania Traditional Energy and Development Organisation (TaTEDO) are implementing a project entitled 'Transforming Tanzania's Charcoal Sector' (TTCS). The Project is supported by the Swiss Agency for Development and Cooperation (SDC). The first phase of the Project was implemented from March 2012 to October 2015. The Project is now in the second phase which is running from November 2015 and October 2019. The project goal is a pro-poor and climate resilient transformation of the economics and governance of charcoal and other forest product value chains. The project has two major outcomes:

- **Outcome 1.** Sustainable and well-governed value chains for charcoal and other forest products improve rural livelihoods, climate change resilience and social services in three Districts.
- **Outcome 2.** An enabling and supportive policy and institutional framework exists for well-governed, environmentally sustainable and pro-poor charcoal and other forest product value chains.

Currently, the Project activities focused on 30 villages in Morogoro Region with advocacy and communication work at national level. This Assignment is expected to contribute to **Outcome No. 2** of the Project and specifically to **Output 2.2** Policies, laws and regulations relation to tree-based biomass energy contribution to pro-poor charcoal and other forest product value chains, sustainable management of woodlands and enhanced climate change resilience.

During Phase 1 of the project an advocacy strategy was developed with four objectives:

1. To advocate for energy, forest and environment policies, laws, regulations, guidelines and sectoral plans that support sustainable, pro-poor charcoal and other forest product value chains in ways that also generate climate change adaptation and mitigation benefits,

2. To advocate for market conditions that favour charcoal and other forest products that have been produced legally and in accordance with approved management plans,
3. To advocate for accurate and relevant information to be made publicly available about the charcoal trade and other forest products,
4. To advocate for community rights to their land and natural resources to be upheld by local and central government and for the resolution of land-related conflicts.

In order to realize the desired achievements, the Project is implementing advocacy strategy through four interconnected strategies which are research, meetings/dialogue, and media coverage and stakeholder empowerment. The Project's research strategy provides the foundation for its evidence-based advocacy. This Assignment is part and parcel of the Project's research strategy with a purpose of contributing to **Research Objective 2** on charcoal market conditions particularly issues related to compliance with regulations requiring royalty payments. Therefore, the assignment assessed compliance rates with a view to highlight prevalence of evasion of charcoal royalty payments.

### **1.2.2 Rationale of the study**

During phase 1 of the TTCS, the project partners successfully modelled a sustainable charcoal value chain that provides more security to charcoal producers; generates significant village level revenue from fees; and establishes an environmentally sustainable harvesting approach. The key change was to establish a mechanism whereby verifiably sustainable charcoal was exempted from Central Government royalties and communities charged and retained fees. Central and Local Government have been supportive of the model. Despite its success in the area where the model is implemented the prevalence of charcoal in the market that has evaded payment of royalties to Tanzania Forest Service (TFS) has undermined the competitiveness of the sustainable charcoal. This study is one of the approaches to assess compliances.

In 2013, Camco implemented a study entitled 'Market Research for Sustainably-Produced Charcoal'. The objective of the Camco study was to make as strong and sound a determination as possible as to whether sustainably-produced charcoal can be successfully marketed in a "profitable", "commercially viable" way in major urban areas and high-end/value operations (e.g., lodges, oil and gas and mining camps, tourist "safari camps", etc.) in Tanzania, focusing initially on the urban areas of Morogoro and Dar es Salaam. The key findings of the Camco (2013) study were:

- There was no strong "willingness to pay" a substantial premium for the sustainable charcoal by the end-users.
- There was little willingness to pay more than a marginal premium by end-users, apply to all users both household and commercial, "high end" and "low-income/medium-income".
- There was limited willingness to specifically trade in sustainable charcoal.

This study builds on the market study conducted by Camco in 2013 with the view to generate trends for charcoal value chains in Dar and Morogoro. As such the sampling design and questionnaires were based on those used in the 2013 Camco study.

### **1.3. Objectives of the consultancy**

The overall objective of this assignment was to document current charcoal market conditions including price and compliance trends.

### **1.3.1 Specific objectives were:**

1. To collect data on current charcoal prices along the charcoal value chain for Morogoro and Dar es Salaam.
2. To document stakeholders' perspectives on compliance trends in the charcoal trade.

## **2. METHODOLOGY**

This research was a follow up study of the Camco (2013) that focused on 'Market Research for Sustainably-Produced Charcoal' financed by SDC through TFCG. Therefore, the methodology used by Camco in 2013 was used in this study. The Camco research work was a yardstick to provide descriptions of differences and similarities on charcoal prices, charcoal trade along the charcoal value chain and perceptions of stakeholders on compliance. Dynamics of the sector, the transitioning of the sector over the past several years, and changing dynamics between each group along the value chain are provided in this study.

### **2.1 Sampling and Sample Size**

The sampling frame of this study included charcoal producers, transporters/traders, wholesalers, retailers, and Government representatives. The sample size was in accordance with the ToR and these were:

- 30 charcoal producers in villages outside the TTCS project areas
- 30 charcoal traders/transporters, 15 were charcoal transporters by lorry
- 25 wholesalers, 20 from Dar es Salaam
- 25 retailers, 20 from Dar es Salaam
- 5 Government representatives from local and central government.

The charcoal producers and transporters were selected from villages namely Kwambe, Makwambe and Mkobwe) in Kilosa District in Morogoro. The villages were outside TTCS project area in accordance with ToR. In Morogoro Urban data was collected from transporters/traders, wholesalers, retailers, and Government representatives in Kichangani, Mafiga, Mbuyuni and Mji Mpya Wards.

In 2013, Dar es Salaam Region (Dar es Salaam City Council) had Kinondoni, Ilala, and Temeke districts with three Municipal councils namely:, Kinondoni Municipal Council, Ilala Municipal Council, and Temeke Municipal Council. This research targeted Kinondoni, Ilala, and Temeke Municipal Councils as used by Camco in 2013. By then the population size of Temeke and Kinondoni Municipal Councils were 1,368,881 and 1,775,049 respectively, while that of Ilala was 1,220,611 people (National Population Census, 2012). The district boundaries were also the municipal council's boundaries. The sample size in Dar es Salaam were four wholesalers and four retailers randomly selected from a list of registration in each municipality. Regarding retailers five were randomly selected from Morogoro and 5 from each municipality in Dar es Salaam also from lists of registrations. District Forest Officer in Kilosa provided the consultants a list of 30 registered traders of whom 6 were transporting charcoal by lorry.

Twelve Government staff representatives were selected for stakeholder perception assessment. The representatives were: District Forest Manager (TFS), District Forest Officer and one Assistant

Beekeeping Officer in Kilosa District. In Morogoro Urban, four Ward Executive Officers and four Street Executive Officers were also selected and interviewed. In Dar es Salaam, the District Land and Natural Resource Officer in Ilala District, one District Forest Officers and one District Forest Manager in Temeke District, and One District Forest Officer in Kinondoni District were interviewed.

In addition to the sample required by the ToR, households being the most important end-consumers along charcoal value chain were also selected and used to collect data for this study. A total of 31 households were randomly sampled and interviewed as follows: Morogoro Urban (11), Temeke (8), Ilala (6) and Kinondoni (6) districts. Table 1 summarises the sample that was used for this study. Generally, 178 interviews were conducted within the categories in Table 1.

**Table 1: Summary of the samples used for the study**

Sample category	Kilosa	Morogoro Urban	Temeke	Kinondoni	Ilala	Total sample
Producers	30	-	-	-	-	30
Transporters	30	-	-	-	-	30
Wholesalers/supermarkets	-	5	7	7	6	25
Retailers	-	5	8	6	6	25
Households	-	11	8	6	6	31
Hotel, restaurant, cafe, take away	-	5	7	6	7	25
Government	3	4	2	1	1	12
Total	63	30	32	26	26	178

## 2.2 Data Collection Methods

### 2.2.1 Marketing Survey

A market survey was conducted in Dar es Salaam and Morogoro to come up with the information regarding trading procedures, compliances and market prices of charcoal. The questionnaires used by Camco in 2013 were modified to improve the relevance of the questions, and some more questions on compliances were added to collect data from:

- Producers: sustainably-produced charcoal, compliance trends, taxation system, improvement on charcoal markets, how to make the sector to work better, situational and livelihood of the economic actors along the supply chain, awareness on environmental consequences, importance of charcoal to the producers, contribution of charcoal to livelihood issue, organization of production, source of wood used to produce charcoal, investments in charcoal production, wood availability for charcoal, willingness to pay for wood that was “sustainably-produced”, willingness to pay taxation, understanding of the workings of the market place and positions of actors along the chain, quantification of regulatory and tax costs, any overlapping jurisdictions.
- Transporters: how various transportations (e.g. bicycles, motor cycles, lorry) used and costs per bag along the value chain. Extent of engagement of large transporters in the transport business, barriers to entry, investment and operating costs, extent of engagement of small-scale transporters from bicycles to motorbikes in the business, how the wholesalers have been affected by the transformation of the sector, do the transportations pay any fees or taxes, how long are they in the business, where do they transport the charcoal, and if they pay all village dues.

- Wholesalers: do they keep records, are they homogenous, where do they buy, where do they sell, their knowledge on charcoal business as compared to other stakeholders.
- Retailers: their characteristics, retailers margins (increasing/decreased), the “competitors” and likely competitors to sustainably-produced charcoal, both in the charcoal field, as well as charcoal substitutes (particularly electricity, LPG and kerosene).
- Consumers: Overview of household, energy sources used for cooking, energy source used primarily for cooking, number of bags of charcoal purchased, charcoal suppliers, charcoal prices, sources of charcoal supply, perceptions on compliance and sustainability of charcoal production.

Questionnaires in **Appendix 1** (for charcoal producers), **Appendix 2** (for Transporters), **Appendix 3** (for hotel, restaurant, cafe, take away), **Appendix 4** (for wholesalers/supermarkets etc), **Appendix 5** (for Retailers), **Appendix 6** (for Households) and **Appendix 7** (for Government Representatives) were used to guide data collection along the charcoal value chain.

### **2.2.2 Stakeholders Consultation through In-depth Interviews**

This was done through discussions with Government officials. The officials included: Forest and Beekeeping Division, Tanzania Forest Service (TFS) headquarter, District Forest Manager, and District Forest Officers. Questionnaire in **Appendix 6** (for Government Representatives) was used to guide the in-depth discussion. The discussions aimed to solicit information on: perceptions and aspirations of the stakeholders on the charcoal sector compliances, taxation system, and competition of the sustainable charcoal. Responsibility of the actor in the charcoal business, key policies, regulations, laws that govern charcoal production, number of people in charcoal business, trend of charcoal business, importance of charcoal to economy, its contribution to the national economy, charcoal production and source, heard about sustainable charcoal, key policy and legislative gaps that prevent charcoal from being produced sustainably, main government initiatives to promote sustainable charcoal production and markets etc

### **2.3 Data Analysis**

All questionnaire data were coded, entered, cleaned and analyzed using Statistical Package for Social Science (SPSS) program. The results were summarized to identify current situation, perceptions of stakeholders on compliances, trend of compliances, charcoal trade trend, actors and their experiences along the value chain, transportations and costs incurred.

## **3. RESULTS AND DISCUSSION**

### **3.1 Charcoal Value Chain Current Status and Issues**

The charcoal value chain includes producers, transporters, wholesalers, large consumers and retailers. The Government institutions TFS, DFOs and village authorities are regulators of the value chain. The results from the surveys are presented in sub-sections below:

#### **3.1.1 Producers**

##### **3.1.1.1 Characteristics of charcoal producers**

Table 2 presents the characteristics of the charcoal producers in the surveyed villages in Kilosa District (as analyzed from responses to Part 1 of questionnaire to charcoal producers). The table shows that charcoal production is male dominated. The results also show that respondents were in

the production for a period between 3 to 12 years indicating that there were no new entrants in charcoal production in those villages in the last three years. Usually charcoal production is not a full time job and some of the producers do so as a safety net. Camco (2013) study reported that there were no full time charcoal producers; they do not produce during the rainy season, during planting or harvesting times as there is a shortage of labour during those periods. Most producers have experiences averaging to about 6 years in the production.

**Table 2: Characteristics of the charcoal producers**

Village	Years in production	Years of residence	Total labour	% of respondents	
				Male	Female
Kwambe	5	14	16	10	6
Makwambe	3	7	2	2	-
Mkobwe	12	20	7	5	2
Overall average	6	14	9	6	3

### 3.1.1.2 Availability of wood for charcoal production

Responses to Part 2 of questionnaire to charcoal producers showed that wood is the main inputs for charcoal production. Most of the producers indicated that the sources of wood for charcoal production were non-reserved natural forests and few obtained wood from forest reserves (Table 3). This concurs with Camco study of 2013 that also reported that most of the wood for charcoal production was obtained from the natural forests.

**Table 3: Source of wood for charcoal production**

Village	% of respondents collecting wood from non-reserved and reserved forests	
	Non-reserved natural forests	Forest reserves
Kwambe	100	-
Makwambe	89.9	11.1
Mkobwe	100	-

Responses to Part 4 of questionnaire to charcoal producers showed that producers reported that there was a shortage of wood, and it was therefore more difficult to get wood for charcoal production compared to one year ago (Table 4). Unfortunately, rules (enforcement of Forest Act and by-laws and that in some places restrain economic activities that degrade forest) and conservation activities (by communities that aim to enhance forest sustainability) were perceived negatively, considered being a bottleneck to wood availability for charcoal production. On the other hand, charcoal producers are aware of the rules and regulations governing production. In Camco (2013) study, all producers interviewed said trees are getting more scarce (fewer trees, distances to places where charcoal kilns are made was increasing, etc.) and that was increasingly difficult to obtain wood for charcoal production. In 2013, the scarcity of wood was associated with among other things with weak forest management. TTCS project that modelled a sustainable charcoal value chain that provides more security to charcoal producers; generates significant village level revenue from fees; and establishes an environmentally sustainable harvesting approach still have a



big role on introducing sustainable charcoal production and value chain development in villages outside the project.

**Table 4: Views and reasons (% of respondents) on availability of wood for charcoal production in the sample villages**

Village	Change in wood availability		Reasons for the difficult availability		
	Easier	More difficult	Strict rules	Conservation activities	Shortage of trees
Kwambe	9.1	90.9	60.0	50.0	40.0
Makwambe	22.2	77.8	71.4	28.6	14.3
Mkobwe	11.1	88.9	37.5	62.5	62.5
Overall	13.8	86.2	56.0	48.0	40.0

During the study, education on sustainable charcoal production and tree planting activities/afforestation were the most cited measures by producers to improve availability of wood for charcoal production. Other measures reported were increased government support and frequent monitoring and evaluation as appear in Table 5.

**Table 5: Views on how to improve wood supply for charcoal production**

Village	Education on sustainable charcoal production	Increase tree planting activities/afforestation	Government support on environmental conservation activities	Frequent monitoring and Evaluation
Kwambe	80.0	70.0	30.0	50.0
Makwambe	42.9	85.7	28.6	28.6
Mkobwe	87.5	50.0	50.0	25.0
Overall	72.0	68.0	36.0	36.0

### 3.1.1.3 Current charcoal production status

Responses to Part 7 of questionnaire to charcoal producers showed that in addition to family labour, charcoal production costs included limited hired labour, costs on wood and transportation to the road side and villages. Hired labour costs ranged between TZS 22,000 to TZS 59,071 per kiln (Table 6). Hired labour costs were for tree felling, billeting, and arranging the billet into the kiln, supervision of the kiln to ensure proper carbonization, downloading and loading charcoal to bags. In most of these elements family labour was involved but usually not accounted as one of the cost elements. Regarding costs on wood, some producers claimed to pay between TZS 50,000 and 75,000 to get permission from village leadership to cut wood from forest for charcoal production. It was claimed that Village chairmen, VEO or village natural resource committees were ones being paid for the permit to harvest wood but with no proper recoding and consequently feedback on the money collected was limited. On the contrary, none of the producers interviewed in 2013 by Camco (which focused in the TTCS project) reported purchasing wood or involved hired labourers.

In order to make and operate one kiln about two men working for seven hours in a day for 18 days is a requirement. Most of charcoal makers claim that the work is labour intensive and tedious (RAS Tabora, 2015). Most charcoal producers use simple and inefficient tools such as axes to fell trees, hand hoe and spade to dig-out soil to cover the kiln.

Productions per kiln were very little as the technology used was traditional earth kiln. In 2016, all respondents agree that the price of charcoal varies throughout the year. During the study (September 2016) the price of charcoal in villages ranged between TZS 8000 and 10,000 per bag reflecting that taxes were not included. With low productivity and low prices per bag, obviously earnings per kilns for the producers were also very small (Table 6). Camco (2013) reported selling prices of bags at between TZS 7,000 to TZS 14,000 per bag. Generally, this shows that the price of charcoal at producer level has not increased substantially since 2013. Actually, the data suggests that those higher prices reported by Camco (2013) of up to TZS 14,000 per bag are currently not paid to producers.

All kilns used by the charcoal producers were Basic Earth Mound Kilns (traditional earth kilns). Improved Basic Earth Mound Kilns were not observed in the study areas. Traditional earth kiln was one of the major drivers of unsustainable charcoal production as it is inefficient on wood use for production. In most villages visited the billets used in the earth kilns were not properly seasoned before carbonization starts. Also, observations showed that attention of operators to the kiln during carbonization was very inconsistent. Traditional charcoal production in many cases does not take into consideration the impact the activities might cause to the undercover such as tree seedlings and shrubs. Camco (2013) reported a similar situation in villages outside TTCS Project, as of today the situation has not changed.

**Table 6: Charcoal production costs and earnings per kiln in sample villages, Kilosa District**

Village	Labour cost (TZS)	Cost on wood (TZS)	Transport costs (TZS)	Production per kiln in bags	Average weight of bag (kg)	Price per bag at village	Gross revenue per kiln (TZS)	Total cost per kiln (TZS)	Net earnings per kiln (TZS)
Kwambe	22,000	50,000	74,000	17	71	10,000	170,000	96,000	74,000
Makwambe	10,000	75,000		23	77	8,222	189,106	85,000	104,106
Mkobwe	59,071	66,667	20,000	31	68	8,000	248,000	145,738	102,262
Average	36,900	60,714	65,000	23	72	8,828	203,044	162,614	40,430

Charcoal producers were aware that environmental conservation is important and improvements on charcoal production were required. Camco (2013) reported that almost all Dar es Salaam households interviewed were concerned on how charcoal was produced and thought it should be produced sustainably. Further, it was reported that, almost all households said that current charcoal production was bad for the environment. The most frequently-cited reasons for charcoal production being “bad” for the environment were disorganized felling of trees without replanting.

The current study shows that planting trees, charcoal certification/labelling, formalization of producers/ groups and local government support (in that order) were cited by the producers as

important factors for consideration to improve charcoal production (Table 7). The opinion (44% to 71.4%) of the charcoal producers were that charcoal production can be improved by increasing efforts on tree planting. Camco (2013) study reported that most stakeholders' recommendation for improving the environmental impact of charcoal production (i.e. of making it more "sustainable") was to replant and plant more trees. However, various efforts are in place to ensure tree seedlings produced, distributed, planted and tended to reach maturity (25 years in the context of charcoal production). But, there are some challenges that need to be worked out for tree planting activities to make significant impacts on the ground. The biggest challenge is low survival of planted seedlings. TTCS model is based on enhancing natural regeneration which is already proven in Kilosa District.

Charcoal labelling was cited (by about 28.6% to 33.3% of the sample producers) to be a good idea. Therefore labelling charcoal could be considered in the future".

Respondents reported the need for formalization of charcoal business as earlier documented by Camco (2013) that almost all would like to see the charcoal business "regularised" or "formalised". In the current study respondents still felt that formalization of charcoal business producers can improve charcoal production.

**Table 7: Views by the charcoal producers on improvement of charcoal production**

Village	% of charcoal producers recommending different solutions			
	Planting trees for charcoal production	Charcoal labelling/certification	Formalization of the producers	Local government support
Kwambe	44.4	33.3	11.1	11.1
Makwambe	71.4	28.6	-	-
Mkobwe	60	40	-	-

### 3.1.2 Transporters

#### 3.1.2.1 Characteristics of charcoal transporters

The transportation of charcoal from the production sites to urban areas uses various means of transportation including lorries, motorcycles and bicycles. Motorcycles and bicycles usually transport charcoal from production point primarily to roadside, but in some cases they transport charcoal to urban wholesalers, retailers and even to final consumers (home delivery). As observed in Camco (2013) a wide range of transportation modes were used, implying diverse number of regulation applications. In addition, there were a wide number of overlapping jurisdictions (i.e. village authorities, district authorities, Tanzania Forest Service/MNRT, Tanzania Revenue Authority, traffic police) and the varying abilities of different transporters to negotiate leads to wide differences in costs incurred by transporter. Most drivers or operators were also owners of the means of transportation. In most cases charcoal transportation was a primary economic activity of the owner of the means of transportation (Table 8). Apart from transporting their own charcoal, most transporters also transport charcoal owned by others (54% of transporters in Makwambe, 75% in Mkombwe and 33% in Kwambe).

**Table 8: Characteristics of charcoal transporters**

Village	Bicycles	Small lorries	Large lorries	Motorcycles	Transporters who are also drivers	Transporters who are also owners of	Charcoal transportation is a primary

							means of transport		economic activity	
					Yes	No	Yes	No	Yes	No
Makwambe	-	54	46	-	100	-	54	46	-	100
Mkombwe	-	-	71	29	57	43	14	86	88	12
Kwambe	10	20	60	10	30	70	10	90	89	11

### 3.1.2.2 Number and cost structure of transporters

Most respondents were of the opinion that the number of charcoal transporters in the period between September 2015 and September 2016 have increased. This is contrary to observations in the Camco (2013) study that only one of the ten transporters interviewed said there were more transporters today than previously. Additionally the majority of the transporters always buy charcoal in same places (Table 9). Some transporters living in the sample villages (qualifying as local transporters), but don't buy charcoal from their villages instead they buy charcoal from other villages.

**Table 9: Views of the charcoal transporters**

Village	Responses (%) of number of charcoal transporters since Sept 2015 to Sept 2016		Responses (%) on charcoal purchasing frequency in this place			
	Increased	Reduced	Always	Most times	Rarely	Not buy here
Makwambe	85	15	46	8	46	
Mkombwe	63	37	37	38	-	25
Kwambe	67	33	11	22	22	44

### 3.1.3 Wholesalers

#### 3.1.3.1 Characteristics of charcoal wholesalers

Like producers, the charcoal wholesale business is male dominated with about 11% female employees. About 25% of the respondents were new entrants in the business. This implies that wholesaling was more attractive than charcoal production which had no new entrants for the last three years. The number of years in the business ranged from one to 13 implying that the business is paying (Table 10). Also, most of the wholesalers were residing in the study wards, entailing that it is easier to organize, monitor or conduct training at this node of the value chain. Camco (2013) revealed that wholesalers were well established and are very similar. They kept information related to price. They sell to a relatively wide number of buyers (both retailers and final consumers). They tend to have been in the business longer than any other group in the charcoal supply chain, much as one would expect.

**Table 10: Characteristics of the charcoal wholesalers**

District	Ward	Years in business	Years in residence	Employees	Female employees	Male employees
Morogoro urban	Kichangani	1	8	1	-	1
	Mafiga	2	3	12	-	12
	Mbuyuni	4	2	1	-	1
	Mji Mpya	2	18	1	1	-
Temeke	Azizi Ally	13	20	2	1	1
	Buyaga	1	1	1	-	1
	Mtongani	4	3	1	-	1
	Sabasaba	1	2	1	-	1
	Sokoni	6	8	2	-	2
Ilala	Buguruni	2	15	1	0	1
	Madenge	1	2	-	-	-
	Manzese	9	20	2	1	1
Kinondoni	Manzese	6	5	1	1	-
	Msisiri A	2	2	1	-	1
	Mwananyala	1	1	-	-	-
	Mwananyamala	5	5	8	-	8

### 3.1.3.1 Average earnings for charcoal wholesalers

The quantity of charcoal sold by the wholesalers is presented in Table 11.

**Table 11: Average quantity of charcoal sold by wholesalers in Dar es Salaam and Morogoro (monthly)**

District	Quantity of charcoal sold by wholesalers per month			
	10 kg bags	50 kg bags	70 kg bags	90/100 kg bags
Morogoro Urban	-	48	25	15
Temeke	32	35	43	-
Ilala	100	13	40	-
Kinondoni	500	63	175	-

Respondents reported that the average earning per month from charcoal ranged from TZS 1,142,000 for Ilala to 6,922,857 for Kinondoni. On the overall, they were on the opinion that monthly earnings from charcoal has increased between TZS 146,000 and 437,500 in one year period. The increment in Temeke was highest compared to the rest of the districts sampled (Table 12). The earnings of the wholesalers were high probably because of their strongest negotiating

position and low vulnerability to regulators such as TFS and policy (see also Camco, 2013) compared to transporters and producers who encounter them on the road.

**Table 12: Estimated Average earnings for charcoal wholesalers (on monthly basis)**

District	Price / bag that wholesalers buy at				Price / bag that wholesalers sell at				Changes (+ve) in monthly earnings from Sept. 2015 to Sept. 2016 (TZS)	Earnings per month as of Sept 2016 (TZS)
	10kg bags	50kg bags	70kg bags	90/100kg bags	10kg bags	50kg bags	70kg bags	90/100kg bags		
Morogoro urban		39,000	40,000	57,000		45,000	50,000	65,000	150,000	1,650,000
Temeke	10,000	33,750	42,000		15,000	55,000	54,500		437,500	1,275,000
Ilala	18,000	37,000	41,500		30,000	45,000	55,000		146,000	1,142,000
Kinondoni	21,000	40,250	47,000		30,000	50,000	57,500		212,857	6,922,857

Charcoal is packed and transported in bags (defined by the Government to be 75kg). However, over packed bags (popularly known as *lumbesa*) are dominant along the charcoal value chain. As reported by Camco (2013) some bicycles were reported to carry more than two 90kg bags per trip (some carry more, some carry only one). As charcoal arrives in Temeke, Ilala, Kinondoni and Morogoro Urban *lumbesa* bags are often unpacked and repacked to smaller units. Table 13 summarizes units used and number bags of charcoal sold in those units in the sample districts.

**Table 13: Units used and number of charcoal bags sold in Dar es Salaam and Morogoro**

District	Unit sold			
	10kg	50kg	70kg	100kg
Morogoro Urban	0	30	65	15
Temeke	80	85	70	0
Ilala	100	48	80	0
Kinondoni	500	150	40	0

### 3.1.4 Retailers

Most charcoal retail sellers are also owners of the business, and a considerable percentage (100% in Morogoro, 50% Temeke and 33% in Ilala District) of owners were female. Similar to Camco study the capital for the trade was small ranging from TZS 46,250 to 56,000 mainly acquired through own sources. Capital here means the amount of money that the retailers used to run the business. In the current study, it was only in Ilala where about 16.7% of the retailers acquired capital from financial institutions. Also, the majority of the retailers buy charcoal from more than one source (Table 14).

**Table 14: Characteristics of the charcoal retailers (in %)**

District	Sellers is the owner	Female Sellers	Female ownership	Source of capital		Seller knows source of charcoal	Capital in TZS	Buy from one seller
				Financial institution	self			
Morogoro Urban	100	100	100	0	100	100	56,000	50
Temeke	62.5	16.7	50	0	100	87.5	46,250	12.5
Ilala	50	50	33	16.7	83.3	50	71,333	16.7
Kinondoni	50	0	0	0	100	100	50,000	0

Table 15 summarized retailers' prices at this stage along the value chain i.e. price that they buy for and the price that they sell.

**Table 15: Retailers prices along the chain**

District	Buying price per bag		Selling price per unit			
	Minimum	Maximum	1kg	2kg	5kg	1bag
Morogoro Urban	35,000	40,000	500-1,000	1,000-2,000	2,000-3,000	40,000-45,000
Temeke	30,000	60,000	500-2,000	1,000-3,000	3,000-7,500	35,000-74,000
Ilala	35,000	60,000	500-1,500	1,000-3,000	3,000-7,500	55,000-70,000
Kinondoni	40,000	50,000	500-2,000	1,000-4,000	3,000-8,000	50,000-55,000

The main sources of charcoal for the retailers in Morogoro Urban and Dar es Salaam were Kilosa/Gairo, Kisarawe, Mkuranga, Rufiji, Handeni and Morogoro Rural (Table 16). Charcoal reaches retailers by various means such as bicycles (15%), private cars (5%), small trucks (50%), large trucks/lorries (15%) and motorcycles (15%). About 65% of the charcoal retailers sampled had opinion that current charcoal production was not sustainable.

**Table 16: Source of charcoal**

District	Charcoal source					
	Kilosa/Gairo	Kisarawe	Mkuranga	Rufiji	Handeni	Morogoro rural
Temeke	42.9	14.3	28.6	14.3	0	0
Ilala	33.3	66.7	0	0	0	0
Kinondoni	50	25	0	0	25	0
Morogoro urban	50	0	0	0	0	50

### 3.1.5 Consumers (Households)

Out of 31 consumers (households), 11 (35.5%) owned houses they were living in, and 20 (64.5%) were renting. Majority of the sample households were resident in the area for more than 12 years. The houses had rooms between five and seven with about 11 to 15 people living in the same house (Table 17).

**Table 17: Characteristics of the households**

District	Years in residence	Number of rooms in a house	Number of people live in a house
Morogoro urban	16	7	15
Temeke	12	6	15
Ilala	16	5	11
Kinondoni	13	7	14

All 31 households (100%) indicated to use charcoal for domestic cooking, some using charcoal in combination with other energy sources. It is observed from results that there were five combinations of sources of energy (energy mix) used by households for cooking. The combinations were: Charcoal only; charcoal and LPG; Charcoal and kerosene; charcoal and firewood; and charcoal, kerosene and firewood (Table 18).

**Table 18: Consumer (Household) response in % on energy mix for cooking**

	Combination of energy sources for cooking				
	Kerosene, charcoal & firewood	Charcoal & firewood	Charcoal	Kerosene & charcoal	LPG & charcoal
Morogoro urban	27.3	36.4	36.4	.0	.0
Temeke	.0	12.5	50.0	37.5	.0
Ilala	16.7	.0	16.7	66.7	.0
Kinondoni	.0	16.7	50.0	16.7	16.7
% of Total	12.9	19.4	38.7	25.8	3.2

When households were requested to list the primary energy for domestic cooking, 87.1% listed charcoal and the rest mentioned LPG (Table 19). However, none listed electricity as a source of energy for cooking.



**Table 19: Responses in % on sources of energy used primarily for cooking**

District	What source of energy do you use primarily for cooking?	
	LPG	Charcoal
Morogoro urban	18.2	81.8
Temeke	25.0	75.0
Ilala	0	100
Kinondoni	0	100
% of Total	12.9	87.1

Camco (2013) reported that over 90% of the respondents use charcoal as their primary source for cooking, demonstrating that consumers and suppliers recognize just how important charcoal is to their livelihoods and to the economy. In Camco study of 2013, LPG was not recorded in any households outside Dar es Salaam as compared to the current study which showed that at a small percentage (18.2%) of households use LPG in Morogoro Urban. Results of the efforts to introduce LPG as an alternative energy source for cooking are slowly becoming visible in towns.

Majority of the households purchase charcoal daily and few every few days to one week. Most of the households purchase small quantities at a time (Table 20). As also reported by Camco (2013), majority of households perceived that charcoal supplies are reliable.

**Table 20: Charcoal purchase frequency and quantity**

District	Charcoal purchase frequency				Quantity purchase at a time			
	Every day	Every few days	Once a week	Once more than a week	Small debe (5litre)	Medium debe (10 litres)	Large debe (20 litres)	Bag
Morogoro urban	81.8	18.2	-	-	1	1	1	-
Temeke	50	37.5	12.5	-	1	1	-	1
Ilala	80	-	20	-	1		-	1
Kinondoni	66.7	16.7	16.7	-	1	1	-	1

Most (51.6%) of the households did not know where charcoal came from (Table 21).

**Table 21: Knowledge on where charcoal comes from**

District	Do you know where your charcoal comes from?	
	Yes	No

Morogoro urban	54.5%	45.5%
Temeke	50.0%	50.0%
Ilala	33.3%	66.7%
Kinondoni	50.0%	50.0%
Overall	48.4%	51.6%

Those who knew where charcoal was coming from listed Bagamoyo/Mkuranga, Morogoro, Handeni and Iringa (Table 22).

**Table 22: Responses on where charcoal came from**

District	Source of charcoal				
	Bagamoyo/Mkuranga	Morogoro	Iringa urban	Morogoro urban	Handeni
Morogoro urban	33	50	0	17	0
Temeke	75	25	0	0	0
Ilala	50	50.0%	.0%	.0%	.0%
Kinondoni	0	33	33	0	33

Majority (74.2%) had no idea on how charcoal is produced. This result confirms the Camco (2013) report that lack of knowledge of how charcoal was produced was fairly evenly distributed amongst respondents. Most of the households, including most of those who said they did not know where charcoal came from believed it came from “natural forest” followed closely by “hard wood” sources. Most (93.5%) households purchase charcoal from street sellers and buy charcoal from one (61.3%) or two charcoal retailers. Also, the majority (77.4%) were of the opinion that charcoal supply was reliable. Camco (2013) observed that about two-thirds (33) of the households interviewed did not know what geographic location their charcoal came from.

Majority (71%) of households never heard of sustainable charcoal before. Those few (29%) who knew something on sustainable charcoal, it was through radio/ television (55%), word of mouth (33%) and brochures/ posters (11%). All respondents didn’t know whether charcoal they were currently buying in the market was sustainably produced or not, and didn’t know if they have ever bought sustainably produced charcoal in the past.

### 3.2 Charcoal Trade Requirements/Procedures

Generally, charcoal is produced from unreserved forests on village land or local authority forest reserve. Procedures to follow in order to get permits to harvest charcoal in the two types of forests vary and are detailed in the Kilosa District Harvesting Plan (Ishengoma *et al.*, 2015). Application procedures, permits and licensing requirements are summarized below:

#### 3.2.1 Application procedures, permits and licensing

##### • *Unreserved Forests on Village Land*

According to the National Harvesting Guidelines 2015 application for charcoal harvesting in **Unreserved Forests on Village Land** requires the following procedures:

- The forest dealers should be registered for specific forest produces in this case charcoal,
- The forest dealer identifies the forest in the village to be harvested,

- Forest dealer applies by submitting an application letter to the village,
- The application letter is discussed by the Village Government,
- The applicant (Forest Dealer) to fill a special application form named TFS 1,
- Relevant section in TFS.1 will be filled by the Village Government,
- Application for permits should comply with Section 49 of the Forest Act which provides the legal basis for issuing permits for the harvesting of forest produce from un-reserved forests on village land,
- Application approved by respective village in accordance with Section 49(6) of the Forest Act
- A copy of the TFS 1 form shall be retained by the Village,
- The DFO will submit the registered application forms (TFS.1) together with the District Harvesting Plan to the District Harvesting Committee for decision making,
- The applications are discussed by the District Harvesting Committee on quarterly basis,
- Application approved by District Harvesting Committee
- Based on the Committee's recommendations, DFO will issue license to the applicant, after paying relevant fees.
- Possession of a valid license to harvest in the unreserved forests on village land granted by the DFO.

- **Local Authority Forest Reserves**

According to Section 49 of the Forest Act of 2002, application for charcoal harvesting in Local Authority Forest Reserves requires the following procedures:

- DFO submits proposal for harvesting District Authority Forest Reserves to relevant committees,
- Tender for harvesting District Authority Forest Reserve is announced/advertised by DED,
- District Council Tender Board receives applications submitted on a prescribed form; accompanied by the prescribed fee and signed by the applicant or a duly authorized representative or agent of the applicant,
- District Council Tender Board processes the applications and award,
- District Council is informed of the District Tender Board decisions,
- The District Harvesting Committee is informed for final decision making.
- Tax payer Identification Number
- Four passport size photo
- To note that registration for the charcoal trade start 1<sup>st</sup> July to 30<sup>th</sup> June

### 3.2.2 Relevant fees for charcoal production and trade

The following fees and taxes are supposed to be paid to the central government, district council and village levels:

#### *Fees and taxes paid to the Central Government through TFS*

- **Registration fee:** A fee of TZS 261,000/= supposed to be paid to TFS for registration of forest produce dealers including charcoal per year,
- **Royalty fee:** A fee of TZS 16,500 supposed to be paid per a bag of charcoal (75 kg per bag) or TZS 240 per kg,
- **Contribution to tree planting:** Five percent of the royalty paid as a contribution to tree planting,

- **Contribution to Tanzania Forest Fund:** Three percent of the royalty paid as a contribution to the trust fund.
- **Transit Pass:** an amount of TZS 7,500 for a vehicle of 7 tonnes and below and TZS 15,000 for a vehicle above 7 tonnes is paid to the TFS District Forest Manager office for transportation of charcoal outside the district. This pass indicates the amount to be transported and is valid for a specified number of days.
- **Income tax:** Paid for business

#### *Fees and taxes paid to the District Councils*

- **Cess:** District Councils have power to formulate own by-laws within their area of jurisdiction. For example, a cess of 30% of the registration fee charged by the central government (currently equal to TZS 78,000/) charged by Kinondoni District Council,
- A fee of TZS 1500 per bag is paid to the District Council in the area where charcoal is harvested.
- **Business license:** Amount of TZS 80,000/= is paid to the District Business Office for business license,

#### *Fees and taxes paid to the Village Councils*

- A fee of TZS 500/= per bag is paid to the village council. This fee varies between villages depending on by-laws approved by the village assembly.

It must further be observed that charcoal should not be transported beyond the period between 6am and 6pm, and should be transported in open tracks. Failure to abide to the procedures, paying fees and taxes attract penalties.

### **3.3 Charcoal Prices along the Charcoal Value Chain**

#### **Wholesalers**

Dar es Salaam is supplied with charcoal from various sources including Rufiji, Kisarawe, Mkuranga and Bagamoyo. Also, bicycles, motor cycles, hired trucks/lorries and those returning from up-country transport charcoal from upcountry including Morogoro, Tabora, Singida, Iringa etc are used to supply charcoal to Morogoro Urban and Dar es Salaam. In addition, a limited amount of charcoal is produced in Kigamboni and sold in Dar es Salaam. Consequently, charcoal prices in Dar es Salaam are influenced by many factors.

There were price differences between Kilosa villages, Morogoro Urban and Dar es Salam. The average price in villages was TZS 8,828 (Shown in Table 6), while in Morogoro Urban was between 45,000 to 65,000 depending on the weight of the bag and location. In Dar es Salaam the unit of measurement varies between 10kg and 70kg. In Dar es Salaam there were no charcoal bags observed to weight 100kg as reported in Morogoro Urban. Generally, prices per bag were higher in Temeke, Ilala and Kinondoni across all units of measurement compared to Morogoro Urban (Table 23).

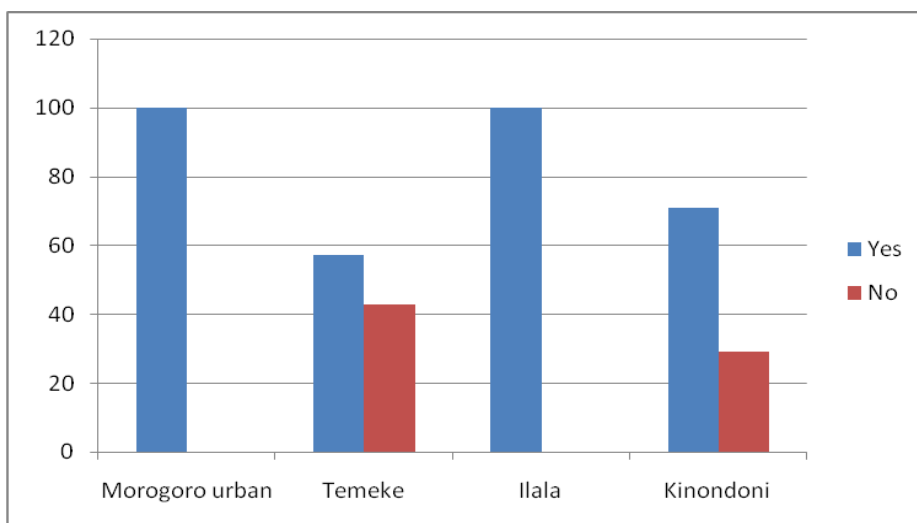
**Table 23: Average quantity and prices per unit of charcoal sold by wholesalers in Dar es Salaam and Morogoro monthly**

District	Quantity				Prices			
	10kg	50kg	70kg	90/100kg	10kg	50kg	70kg	90/100kg
Morogoro	-	48	25	15	-	45,000	50,000	65,000

Urban								
Temeke	32	35	43	-	15,000	55,000	54,500	
Ilala	100	13	40	-	30,000	45,000	55,000	
Kinondoni	500	63	175	-	30,000	50,000	57,500	

The results for the prices of charcoal in Temeke district are confusing and cannot be easily explained. For example the price for a 70kg bag is lower than the price for a 50kg bag. Also, the price for a 10 kg bag in Temeke is half the price for the same bag in Ilala and Kinondoni. This calls for more data collection.

Additionally, all respondents in Morogoro Urban and Ilala districts, and most of the respondents in Temeke and Kinondoni reported that charcoal prices per bag have increased if compared to prices in September 2015 (Figure 1). This observation is similar to the one made by Camco (2013), who observed at that time, that the prices of charcoal had risen over the past 12 months by an average of some TZS 5,000 per bag. However, at that time the inflation rate was about 7.9%. It was also observed by Camco (2013) that there was a perception that charcoal prices were rising – but, it was not a major concern, although the degree to which this was felt depended upon individual consumers. Information on price changes collected in this study are provided in Appendix 8. These changes vary from TZS 3000 to 20,000 with an average of TZS 10,000.



**Figure 1: Response on whether there are changes in charcoal price since September 2015**

### Retailers

Retailers were requested to compare current charcoal prices per units with prices offered by retailers in September 2015. Results show that there are significant price increases across all units. The magnitude of price increase varied between districts (Table 24). This is contrary to Camco study that reported charcoal prices were increasing very little over the past several years.

**Table 24: Price change of charcoal sold by retailers per bag in Dar es Salaam and Morogoro**

Village	Price change between Sept. 2015 and Sept. 2016								
	25kg	50kg	60kg	65kg	70kg	80kg	5 kg debe	2 kg debe	1 kg debe

Temeke	5,000	20,000	12,500		10,000	5,000	5875	2425	1212
Ilala					5,500	10,000	5166	2000	1000
Kinondoni			20,000		20,000		6083	2666	1333
Morogoro urban	1,000			2,000			2400	1400	700

### Households

When one looks at consumer charcoal prices today compared to those offered in September 2015, most of the households were of the opinion that charcoal prices have changed since this time last year (Table 25). According to Camco, charcoal household prices; were increasing relatively little over the past several years. Inflation (escalation of consumer prices) in September 2015 was 6.1% and in September 2016 dropped to 4.5%. That means the consumer prices were expected to be reduced therefore inflation alone cannot explain the observed increase in charcoal prices in this study.

**Table 25: Charcoal price change as reported by households in Dar es Salaam and Morogoro**

District	Yes	No	Average price change between Sept 2015 to Sept. 2016
Morogoro urban	81.2	18.8	3,922
Temeke	87.5	12.5	1,128
Ilala	80	20	8,600
Kinondoni	83.3	16.7	2,500

## 3.4 Stakeholders' Perspectives on Compliance

### 3.4.1 Charcoal production and trade compliances

#### Producers

At this node of the value chain, compliance was measured by asking the charcoal producers if they pay fees/taxes or cess for wood harvesting and charcoal trade. Generally, responses show that compliances at producer node was very low ranging between 17% (those paid for harvesting trees for charcoal at the villages) and 57% (for those paid cess to municipal for charcoal trade). Majority in Kwambe and Makwambe paid transit pass for those transporting charcoal to outside Kilosa District (Table 26).

**Table 26: Responses on extent of charcoal producers compliances to license/permits**

Village	% of those paying various fees/permits			
	Village wood harvesting permits/fee	Transit pass fee	Municipal cess	Central Government fee
Kwambe	17	50	57	-
Makwambe	50	50	-	-
Mkobwe	33	-	43	100

When charcoal producers were asked as to whether they pay for wood used for charcoal production, majority (72.7% in Kwambe, 89.9% in Makwambe and 66.6% in Mkobwe) indicated that

wood was not paid for (Table 27). This means that most wood for charcoal production were collected as a free good from forests.

**Table 27: Responses (in %) of producers on payment for wood for charcoal production in selected villages in Kilosa District**

Village	Buy wood	
	Yes	No
Kwambe	27.3	72.7
Makwambe	11.1	89.9
Mkobwe	33.3	66.6

That means majority of producers do not contribute to the costs of protecting and managing the forests where wood for charcoal production is harvested. Therefore, sustainability of charcoal production in villages outside TTCS project is uncertain. On the other hand, TTCS project is working with 10 villages in Kilosa and has put in place a model whereby trees are harvested for charcoal on a 24 year rotational cycle, such that the woodlands have enough time to regenerate, with improved forest management, after 24 years, trees can be harvested again on a sustainable basis. The revenues from selling trees to producers on a 24 year sustainable basis more than cover the costs of protecting and managing their village forests (Camco, 2013).

### 3.4.2 Other actors along the chain

Other actors along the chain were transporters, wholesaler's retailers and households. Majority of these actors in Morogoro and Dar es Salaam were not aware that they require license/permit to sale their charcoal, and those selling charcoal to them also requires licenses and permits. It is clear that the majority of transporters, wholesalers, retailers and consumers were of the opinion that the required taxes/fees were not duly paid (Table 28). Camco (2013) reported that producers and transporters paid village taxes but these were mainly in villages under TTCS project.

**Table 28: Perception of other actors along the charcoal value chain on compliances**

	District	*Positive responses on Questions asked (in %)			
		1	2	3	4
Wholesalers	Morogoro Urban	100	40	100	40
	Temeke	35	35	37	41
	Ilala	30	28	26	24
	Kinondoni	35	40	37	35
Retailers	Morogoro urban	100	40	80	60
	Temeke	47	33	50	33
	Ilala	40	50	31	41
	Kinondoni	13	17	18	25
Households	Morogoro urban			86	67
	Temeke			40	57
	Ilala			33	14
	Kinondoni			27	29
Transporter	Makwambe	0	0		
	Mkombwe	62.5	37.5		

	Kwambe	77.8	33.3		

**\*Key:**

<sup>1</sup>Do you require license/permit to sale/transport charcoal

<sup>2</sup>Have you paid for all taxes?

<sup>3</sup>Do you know that licenses/permits are require for those selling charcoal to you?

<sup>4</sup>Do think they pay all required taxes?

#### 4. CONCLUSION AND RECOMMENDATIONS

- Sources of wood for charcoal production were non-reserved natural forests and from forest reserves. Introduction of sustainable charcoal production and value chain development in villages would provide more security to charcoal producers; generates significant village level revenue from fees; and establishes an environmentally sustainable harvesting approach.
- In some villages enforcement of Forest Act and by-laws and restrain economic activities that degrade forest and conservation activities were perceived by some producers to be a bottleneck to wood availability for charcoal production. Activities that consider environment and incomes in symmetry would enhance compliances.
- Investment on education on sustainable charcoal production is important because majority of producers cited this as measures to improve availability of wood for charcoal production.
- Contrary to Camco report, in this study some producers claimed to pay money to get permission from village leadership to cut wood from forest for charcoal production. Proper recording of incomes of this nature could assist feedback on the money collected to the villagers.
- Price of charcoal at producer level has not increased substantially since 2013.
- Charcoal producers were aware that environmental conservation is important and improvements on charcoal production were required and were appreciated that charcoal need to be produced sustainably.
- Charcoal certification/labelling, formalization of producers/ groups and local government support (in that order) were cited by the producers as important factors for consideration to improve charcoal production. Also, majority of the transporters always buy charcoal in same places. Therefore it is easier to mobilize them. Formalization of charcoal business producers and transporters can improve charcoal production.
- There were a wide number of overlapping jurisdictions (i.e. village authorities, district authorities, Tanzania Forest Service/MNRT, Tanzania Revenue Authority, traffic police) and the varying abilities of different transporters to negotiate leads to wide differences in costs incurred by transporter. An intervention to improve negotiations and rule of law is crucial.
- The earnings of the wholesalers were high probably because of their strongest negotiating position. Over packed bags (popularly known as *lumbesa*) are dominant in the wholesaler node along the charcoal value chain. Also, there were price differences between Kilosa villages, Morogoro Urban and Dar es Salam Mechanisms that would reduce earning differences need to be instituted.
- Majority of households never heard of sustainable charcoal, increasing awareness on sustainable charcoal is important.
- Similar to Camco (2013), that the prices of charcoal had risen over the past 12 months. This could partly be attributed to inflation rate and not the real price of charcoal.



- Responses show that compliances at all nodes was very low. Wood used for charcoal production was not paid for. This means that most wood for charcoal production were collected as a free good from forests. In most nodes actors were not aware that they require license/permit to sale their charcoal, and those selling charcoal to them also requires licenses and permits. Awareness raising on the regulations is important.
- .

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## APPENDICES

### Appendix 1: Charcoal Producers Questionnaire

#### QUESTIONNAIRE: CHARCOAL PRODUCERS/PROJECTS

	Name of Enumerator		Contacts:
	<b>Completed by the enumerator</b>	Questionnaire No:	
	Village:		District:
<b>Details of the respondent</b>	Name:		
	Telephone:		
	Email:		
	Resident:		

#### PART1: OVERVIEW OF THE PRODUCER/GROUP

i.	(a) Name of the Group/Producer:	(c) Date
	(b) Is the Producer Woman or Man? Yes ( ) or No ( )	commenced production (mm/yy):
ii.	(a) Is Person interviewed the only producer of this charcoal? Yes ( ) or no ( )	(b) If no, how many other producers are producing with her/him?
iii.	How many producers are (list number):	(a) Men
		(b) Women:

iv.	a) How long in business?	b) How long in this place?  c) Is this the only place that you make charcoal? Yes ( ) Or No( )	
v.	Total investment cost in your production (TSHS):		
vi.	Source of Finance	a) Self: Yes( ) or No( )	b) If other (specify)
<b>PART2: WoodSupply</b>			
i.	a) Does seller know source of charcoal: Yes ( ) or No( )		
ii.	From what source does charcoal come from(put a tick)  a) Soft wood b) Hardwood  c) Natural forest d) Planted forest e) Forest reserve  f) Non-reserve forest		
<b>Part3: Wood Supply Organisation</b>			
i	a) Do you buy this wood? Yes( ) No( )		
ii	Where does the bought wood come from? <i>Put a tick to the appropriate answer</i>		

	<p>a) Respondent's own land</p> <p>b) From village forest land</p> <p>c) From village other land</p> <p>d) From "general" land</p> <p><del>e) From forest reserve land</del></p>
iii	<p>a) If producer does not buy wood, does producer cut wood for charcoal herself/himself? Yes( )no( )</p> <p>b) If she/he buys,where does the wood come from?<i>Put a tick</i></p> <p>1. Respondent's own land</p> <p>2. From village forest land</p>

#### Part4: Wood Supply Sustainability

i.	Does the wood that you use fo charcoal production ever come from land where trees are replant (sustainable tree harvesting)? Yes ( ) or No( )
ii.	If Yes, who supplies that wood?
iii.	If Yes,where does that sustainable wood come from?
iv.	If Yes, how much of wood that producer uses for charcoal come from Sustainable sources(estimate%)
v.	If Yes (sustainable wood supply) is this wood easier or more difficult to get than Wood from non-sustainably produced supplies? Easier/More difficult
vi.	If Yes(sustainable wood), does producer prefer using sustainable wood for Charcoal production? Yes/no
vii.	If producer prefers sustainable wood,why (short answer)?

viii.	Does the producer know other charcoal producers using sustainable wood? Yes ( ) or No( )
ix.	If respondent knows others who use sustainable wood, how many does she/he know?(give number)
x.	Is wood getting easier or more difficult to obtain this year than two years ago? Easier/more difficult
xi.	If more difficult,why?(short answer)
xii.	If more difficult,does the respondent have any suggestions on how to make it less difficult? (short answers, listing how to make it less difficult)  a. b.
xiii.	If the respondent buys wood for charcoal, would she/he pay more for the wood if it was sustainably produced? Yes( )or No( )
xiv.	If yes, how much more (percentage of what is paid now)
xv	If no, why would she/he not pay more? (short answers on why not pay more)  a. b. c. d.
<b>Part5: Charcoal Sales</b>	

.	<p>a) Does the respondent sell charcoal to (tick all appropriate)</p> <p>1. Bicycle</p> <p>2. Private car</p> <p>3. Government car</p> <p>4. Non-charcoal lorry</p>
ii.	<p>a) Do you know where the charcoal they buy is going? Yes ( ) or ( )</p> <p>b) If yes, where do you think it is going? Most frequent place</p>
iii.	<p>What do charcoal buyers look for most (e.g., quantity, quality, etc.)? Fill in the blank</p>
iv.	<p>Have you ever had a charcoal buyer ask you for "sustainably-produced charcoal"? Yes/no</p>
v.	<p>If yes, are you asked for sustainably produced charcoal often? Yes( ) or No( )</p>
vi.	<p>If yes, who asks for sustainably produced charcoal? Short answer</p>
vii	<p>Why do you think they ask for sustainably produced charcoal?</p> <p>a.</p> <p>b.</p> <p>c.</p>
<p><b>PART6: CharcoalProduction</b></p>	

i.	Briefly describe how you prepare the wood for charcoal production?  a. b. c.
ii.	Do you ever dry the wood before charcoal production? Yes ( ) or No ( )
iii.	If you do dry it, how long do you dry it? Days
iv.	Do you ever cut the wood into smaller sizes before you burn it? Yes ( ) or no ( )
v.	If yes, why do you cut it?
vi.	How do you make the charcoal (tick appropriate)  a. Basic Earth-mound Kiln (BEK)  b. Improved Basic Earth-mound Kiln (IBEK)  c. Adam Gas Retort
vii	Do you bag your charcoal?
viii	Do you know how much each bag weighs? Yes ( ) or No ( )
ix	If yes, what is the average weight?
x	How many bags do you sell per month?
xi	Do you ever "package" the charcoal in any thing other than a bag (gunia)?
xii	If yes, what do you package it in (short answer)
Xiii	Does the number of bags you sell every month change over the year? Yes/No
Xiv	If yes, why does the number of bags change? (short answer)

xv	Any other comments on production  a. b. c. d.
<b>Part7: Production Cost</b>	
i.	How many kg or bags of charcoal do you produce per month:
ii.	How much is a kg or bag of charcoal( <i>in TSHS</i> ):
iii.	Does the price of charcoal change during the year? Yes/ No
iv.	If yes, by about how much percent above compared to today's prices?
v.	If yes, by about how much percent lower compared to today's prices?
vi.	Do you produce throughout the year?Yes/no
vii.	a) How much do you spend on the following expenses per month(in local currency):  1. Labour:  2. Wood:
<b>PART8: CHARCOAL SALES&amp;REVENUESS</b>	
i.	What do you think your net earnings from charcoal are per day per:  a) 1kgdebe
ii.	How much do you estimate you make a day from selling charcoal?



iii.	Has the amount you make from charcoal sales changed since this time last year (yes, no)?
iv.	If yes, how much has charcoal earning changed since this time last year (estimate)?
v.	Where is charcoal purchased
vi.	From whom is charcoal purchased
vii.	Is charcoal purchased from same person all the time
viii.	How much is charcoal old today per:  a) 1 kg debe b) 2 kg debe c) 5kg debe d) bag (give weight)
ix	How do you think your charcoal earnings could be improved?  a. b. c.
x	Please list three things that you would want to change to make the charcoal production sector work better for you?  a. b. c.
xi	List three things that would make the charcoal production sector work better overall?  a.

xii	The charcoal sector, from charcoal production to charcoal transport to charcoal selling is very "informal" (not organized). What do you think should be done or

**PART9: Livelihoods**

i.	How important is charcoal income to you & your family (please tick somewhat Or very, below)?  a) Somewhat important b) Very important
ii.	a) Is it easier or more difficult to produce charcoal than two years ago?  Easier/more difficult  b) If more difficult, do you know why?(short answer)  1.
iii.	Is charcoal your main source of income? Yes/no
iv.	If yes, what proportion of your income does charcoal provide?
v.	What other activities do you engage in:  a) Agriculture b) Livestock c) Fishing
vi	What do you use the income from charcoal for (most important thing by a, next Important by b,etc.)?  a) Food b) Health c) School fees
vii	What other source of cash income do you have(please specify)?  a. b. c.
<b>PART10:CHARCOAL BUSINESS</b>	

i	(a) Have you ever tried to apply for a business loan for the charcoal business?	Yes?	No?
	(b) If YES,did you get the loan?	Yes?	No?
	(c) If NO, what reason was given?		
ii	State three of your <b>MAIN</b> challenges with the charcoal business		
	a.		
	b.		
	c.		
iii	List all the licences and fees required to operate this business		
	(a)		
	(b)		
	(c)		
	(d)		
<b>PART11:EXTERNAL SUPPORT</b>			
i.	What programmes, policies,incentives by government or development partners or NGOs or others if put in place would enable growth in the charcoal business?		
ii.	Any other comments (focusing on the contribution of charcoal resources to the Broader total income to see if charcoal is making a significant contribution to the total welfare of rural households):		
<b>PART12: OTHER QUESTIONS</b>			
i.	Do you care whether charcoal is sustainably-produced or not?Yes/no		
ii.	If you care,why do you care? (short answer)		
	a.		
	b.		
iii.	Do you think current charcoal production is good for the environment?		
	Yes/no		

iv.	<p>If no, why do you think it is not good for the environment?</p> <p>a. b. c.</p>
v.	<p>If no, how would you suggest making charcoal better for the environment?</p> <p>a. b. c. d.</p>
ix.	<p>Other –Please feel free to add any comments or questions</p> <p>a. b. c. d. e.</p>

## Appendix 2 – Transporter Questionnaire

<b>QUESTIONNAIRE C: TRANSPORTERS</b> <i>(The questions below are to be used only to guide the discussion)</i>		
<b>Completed by the enumerator:</b>	Questionnaire No: Enumerator's Name:	Date: Time:
	Village/Municipality/Location:	District:
<b>Details of the respondent</b>	Name	
	Location	
	Town	
	District	
	Telephone	
	Email	
Part 1: General		
i.	What type of transport is this? (tick appropriate) a) Bicycle b) Private car c) Government car d) Non-charcoal lorry e) Small charcoal lorry f) Large charcoal lorry g) Other (specify)	
ii.	Are you the driver of this vehicle? Yes/no	
iii.	If no, what are you (vehicle owner, charcoal loader, other, specify)	
iv.	Is this transport vehicle/mode owned by you? Yes/no	
v.	Is the Owner Woman or Man (indicate)	
vi.	Is transporter/interviewee man/woman (indicate)	
Part 2: Charcoal Transport Business		
i.	How long in business (fill in years)	
ii.	Is this your primary economic activity? Yes/no	

iii.	How often do you transport charcoal (times/month)?
iv.	Does it seem like there are more, less or the same amount of charcoal transporters now (competition btw traders)
v.	Do you always purchase/sell charcoal at this place? (tick appropriate) a) Always b) Most times c) Rarely d) Not buying or purchasing charcoal here
vi.	If no, where else do you purchase charcoal? (list up to 3 places) a) Place 1 b) Place 2 c) Place 3
vii.	Do you transport charcoal for others? Yes/no If yes, how often do you transport for others? (tick appropriate) a) Always b) Most times c) Rarely
viii.	If you transport charcoal for others, is it always for the same person/company? (tick appropriate) a) Always b) Most times c) Rarely
ix.	Is charcoal the only thing you transport? Yes/ No
x.	If no, what else do you transport? (short answer) 1. 2. 3.
xi.	Do you ever transport charcoal one way (e.g., to urban areas) and transport other products the other way (e.g., to rural areas)? Yes/no
xii.	If yes, what do you transport to rural areas? (short answer) 1. 2. 3.

xiii.	Where is the final destination for the charcoal you are transporting now (name town/city, and, if possible, place in town/city): _____
xiv.	<p>a) Is your destination for your charcoal you are transporting now the same destination you always transport charcoal? Yes/no</p> <p>b) If the answer to is no, please name other place(s) you transport charcoal? (fill in up to 3 additional places)</p> <ul style="list-style-type: none"> <li>• Destination 1</li> <li>• Destination 2</li> <li>• Destination 3</li> </ul>
xv.	How many bags can you carry at once and how much does each bag cost? (fill in): <p>a) No of bags at once:</p> <p>b) Cost per bag:</p>
xvi.	How much charcoal do you transport per trip (average number of bags per trip)
xvii.	How much do you estimate you make each trip you transport charcoal? Tshs per trip
xviii.	<p>a) Has the amount you make from charcoal transport changed since this time last year (yes, no)?</p> <p>b) If yes, how much has charcoal earning changed since this time last year (estimate)?</p>
<b>Part 3: Charcoal Transport Regulation &amp; Control</b>	
i.	What challenges do you encounter in transporting charcoal? (list 3 in order of most important) <p>1:</p> <p>2:</p> <p>3:</p>
ii.	How do you deal with these challenges? (short answer) <p>1:</p> <p>2:</p> <p>3:</p>
iii.	What are expenses incurred in transporting charcoal? (list ALL costs & expenses starting with most important) <p>1:</p> <p>2:</p>

	<p>3:</p> <p>4:</p> <p>5:</p>
iv.	Do you require any special licenses or permits to transport charcoal? Yes/No
v.	<p>If yes, list all the kinds of licenses/permits you require &amp; from which authority (e.g., local government, policy, forest officers, etc.)</p> <p>1:</p> <p>2:</p> <p>3:</p>
vi.	<p>Do you pay any taxes or other fees to transport charcoal? Yes/no</p> <p>If yes, please list ALL (official and unofficial) taxes/fees &amp; who you pay these fees to:</p> <p>Tax/Fee 1:</p> <p>Tax/Fee 2:</p> <p>Tax/Fee 3:</p>
vii.	<p>Please list three things that you would want to change to make the charcoal transport sector work better for you?</p> <p>1.</p> <p>2.</p> <p>3.</p>
viii.	<p>List three things that would make the charcoal transport sector work better overall?</p> <p>1.</p> <p>2.</p> <p>3.</p>
ix.	<p>The charcoal sector, from charcoal production to charcoal transport to charcoal selling is very “informal” (not organised). What do you think should be done or could be done to organise the entire charcoal sector?</p> <p>1.</p> <p>2.</p> <p>3.</p>
<b>Part 4: Charcoal Source Information</b>	
i.	Do you know the source of the charcoal you are transporting? (yes, no)
ii.	If yes, where does the charcoal come from (district)
iii.	<p>From what source does charcoal come from:</p> <p>a) Soft wood</p>



	<ul style="list-style-type: none"> <li>b) Hard wood</li> <li>c) Natural forest</li> <li>d) Planted forest</li> <li>e) Forest reserve</li> <li>f) Non-reserve forest</li> <li>g) Do not know</li> </ul>
iv.	Do you only buy from one seller (yes, no)
v.	If you buy from more than one, how many (number)
vi.	Where is charcoal purchased (location)
vii.	<p>From whom is charcoal purchased (tick ALL appropriate)</p> <ul style="list-style-type: none"> <li>a) Charcoal Producer</li> <li>b) Road side Seller?</li> <li>c) Charcoal Seller in Village/Town?</li> <li>d) Other (specify)</li> </ul>
viii.	From which of these sources do you purchase most of your charcoal? (list one)
ix.	Is charcoal purchased from same source all the time (yes, no)
<b>Part 5: Charcoal Production</b>	
i.	Do you have any idea of how charcoal produced (yes, no)
ii.	Has charcoal price changed since this time last year?
iii.	If yes, how much have charcoal price changes since this time last year (estimate)?
<b>Part 6: Other</b>	
i.	Do you care whether charcoal is sustainably-produced or not? Yes/no
ii.	If you care, why do you care? (short answer)
iii.	Do you think current charcoal production is good for the environment? Yes/no
iv.	<p>If no, why do you think it is not good for the environment?</p> <ul style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> <li>4.</li> </ul>
v.	<p>If no, how would you suggest making charcoal better for the environment?</p> <ul style="list-style-type: none"> <li>1.</li> </ul>

	<p>2.</p> <p>3.</p>
vi.	<p>a) Do you think that “certifying” charcoal (e.g., where it is produced, from what sources it is produced, whether it is sustainably produced, etc would be a good thing? Yes/No</p> <p>b) If yes, why do you think charcoal certification would be a good thing? (short answer)</p> <p>c) What would convince you that “certified” charcoal was sustainably-produced? (tick each relevant box)</p> <p>1. Tanzania Bureau of Standards (TBS) label saying charcoal was sustainably-produced</p> <p>2. Label showing district authorities had certified charcoal as sustainable</p> <p>3. Label from a non-government organisation (name the organisation) that the charcoal was sustainably-produced</p> <p>4. Label from central government ministry or agency (name the agency) that the charcoal was sustainably-produced?</p> <p>5. Other (please state):</p> <p>6. Nothing would convince me on a label that charcoal was sustainably produced?</p> <p>7. If nothing, why would no label would convince you that charcoal was sustainably produced?</p>
vii.	Other – Please feel free to add any comments or questions

**Appendix 3: Questionnaire to Commercial and Institutional Consumers/ hotel, restaurant, cafe, take away**

Name of Enumerator		Contacts :	Telephone:
			Email:

<b>Completed by the enumerator</b>	Questionnaire No:	Date:
	Town:	Time:
		District:

<b>Details of the respondent</b>	Name of Hotel, Restaurant, Cafe, Take Away (tick appropriate)	
	Respondent Name:	
	Telephone:	
	Email:	
	Resident:	

**Part 1: Overview of Hotel/Restaurant/Cafe/Take Away/Boarding School/Canteen/Prison**

<b>i.</b>	When was establishment opened?
<b>ii.</b>	How many full-time employees does establishment have?
<b>iii.</b>	Number of Rooms (hotel, boarding school, prison)
<b>iv.</b>	How many restaurants, cafes does establishment have?
<b>v.</b>	Seating capacity of restaurant(s)/cafe(s)
<b>vi.</b>	What energy sources do you use for cooking? (tick all appropriate) a) Electricity b) LPG c) Kerosene d) Charcoal e) Firewood f) Other (specify)
<b>vii.</b>	Does establishment use charcoal for general cooking? Yes/no

**Part 2: Charcoal Demand**

<b>i.</b>	How many bags of charcoal do you purchase per month?
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ii.	How much do you pay per bag?
iii.	Where do you purchase your charcoal?
iv.	How many charcoal suppliers do you have? (tick appropriate) a) One b) Two c) More (specify)

### Part 3: Charcoal Supply

i.	Has charcoal price changed since this time last year? Yes/no
ii.	If yes, how much has charcoal price changed since this time last year (estimate)?
iii.	Is charcoal supply reliable? Yes/no
iv.	Do charcoal suppliers deliver to you? Yes/no
v.	If no, where do you buy your charcoal?

### Part 4: Sources of Charcoal Supply

i.	Do you know where your charcoal comes from? Yes/no
ii.	If yes, where does the charcoal come from (district)
iii.	From what source does charcoal come from: a) Soft wood b) Hard wood c) Natural forest d) Planted forest e) Forest reserve f) Non-reserve forest g) Don't know
iv.	Do you have any idea how charcoal is produced (yes, no)

### Part 5. Sustainable Charcoal (*Enumerator: Explain in more detail what sustainable charcoal is, what makes it "sustainable"*)

i.	Have you ever heard of sustainable charcoal? Yes/No
ii.	If yes, how did you learn about sustainable charcoal? (Tick one) a) Radio/TV adverts b) Workshop/seminar c) Word of mouth d) Brochures/posters e) During a market visit f) Other (please state)

iii.	<ul style="list-style-type: none"> <li>a) Do you know whether the charcoal you currently buy is sustainably produced or not? Yes/no</li> <li>b) If yes, from whom do you buy it? (name, company)</li> <li>c) If yes, for how long have you been buying it?</li> <li>d) If yes, how much do you pay per bag (equivalent) for the sustainable charcoal? Tsh/bag</li> <li>e) If yes, are you happy with the sustainable charcoal? Yes/no</li> </ul>
iv.	Why are you are you not happy with sustainable charcoal (short answer)?
v.	<ul style="list-style-type: none"> <li>a) Have you ever bought sustainably produced charcoal in the past? Yes/no</li> <li>b) If yes, from whom did you buy it? (Name, company, etc.)</li> <li>c) If yes, when did you buy it? (year)</li> <li>d) If yes, were you satisfied with it?</li> <li>e) If you were not satisfied with the charcoal, why were you not satisfied? (short answer) <ul style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> <li>4.</li> <li>5.</li> </ul> </li> </ul>
vi.	<ul style="list-style-type: none"> <li>a) Do you know anyone who is using sustainably produced charcoal?</li> <li>b) If yes, please tell us who. (name)</li> </ul>

**Part 6: Marketing Questions**

i.	<p>List using 1 to 8 (8 highest), what is most to least important to you about charcoal (use number only once)?</p> <ul style="list-style-type: none"> <li>1. Reliability of supply?</li> <li>2. Charcoal delivered to your establishment?</li> <li>3. Consistent good quality of charcoal?</li> <li>4. Packaging of charcoal</li> <li>5. Consistent quantity that conforms to what you order?</li> <li>6. Price of charcoal</li> <li>7. Quality of charcoal</li> </ul>
ii.	If Quality, what do you mean by quality? (open answer)

iii.	<p>a) Are you willing to pay a higher price (premium for sustainable charcoal):</p> <ol style="list-style-type: none"> <li>1. Delivered to you? Yes/no</li> </ol> <p>If yes, how much more (percent) would you pay for delivery to you?</p> <ol style="list-style-type: none"> <li>2. Consistent good quality of charcoal? Yes/no</li> </ol> <p>If yes, how much more would you pay (in percent) for consistent quality of charcoal?</p> <ol style="list-style-type: none"> <li>3. Sustainably-produced charcoal? Yes/no</li> </ol> <p>If yes, how much more would you be willing to pay for sustainable charcoal?</p> <ol style="list-style-type: none"> <li>4. Reliability of delivery/supply of your charcoal? Yes/no</li> </ol> <p>b) If yes, how much more (percent) would you pay for reliability of delivery?</p> <p>c) If you are willing to pay extra for sustainably-produced charcoal, why would you pay that premium? (simple answer)</p>
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### Part 7: Other Questions

i.	<p>Please list three things that you would want to change to make the charcoal sector work better for you?</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> </ol>
ii.	<p>List three things that would make the charcoal sector work better overall?</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> </ol>
iii.	<p>The charcoal sector, from charcoal production to charcoal transport to charcoal selling is very “informal” (not organised). What do you think should be done or could be done to organise the entire charcoal sector?</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> <li>4.</li> </ol>
iv.	<p>Do you care whether charcoal is sustainably-produced or not? Yes/no</p>

v.	<p>If you care, why do you care? (short answer)</p> <ol style="list-style-type: none"> <li>1.</li> <li>2.</li> <li>3.</li> </ol>
vi.	<p>Do you think current charcoal production is good for the environment? Yes/no</p> <p>If no, why do you think it is not good for the environment?</p> <ol style="list-style-type: none"> <li>1</li> <li>2.</li> <li>3.</li> </ol>
vii.	<p>If no, how would you suggest making charcoal better for the environment?</p>
viii.	<p>a) What would convince you that charcoal was sustainably-produced? (tick each relevant box)</p> <ul style="list-style-type: none"> <li>• Label showing district authorities the sustainable charcoal came</li> <li>• Label from a non-government organisation (name the organisation) that the charcoal was sustainably-produced</li> <li>• Label from central government ministry or agency (name the agency) that the charcoal was sustainably-produced?</li> <li>• Other (please state):</li> <li>• Nothing would convince me on a label that charcoal was sustainably produced?</li> <li>• If nothing, why would no label convince you that charcoal was sustainably produced?</li> </ul>
ix.	<p>Other – Please feel free to add any comments or questions</p>

#### Appendix 4: Wholesalers/supermarkets etc

Name of Enumerator		Contacts :	Telephone:
			Email:
<b>Completed by the enumerator</b>	Questionnaire No:	Date:	
		Time:	
	Town:	District:	
<b>Details of the respondent</b>	Name of Supermarket, Petrol Station, Other Up-Market Vendor (tick appropriate)		
	Respondent Name:		
	Telephone:		
	Email:		
	Resident:		
<b>Part 1: Overview of Seller</b>			
<b>i.</b>	Name of Seller		
<b>ii.</b>	Is Seller the Owner? Yes/no		
<b>iii.</b>	Is the Seller Woman or Man (specify)		
<b>iv.</b>	Is the Owner Woman or Man (specify)		
<b>v.</b>	How long in business		
<b>vi.</b>	How long in this place		
<b>vii.</b>	How many employees/workers at business site		
<b>viii.</b>	How many women employees (non-owner)		
<b>ix.</b>	How many men employees (non-owner)		
<b>x.</b>	What are the main products sold here (most important item first, then next second, etc.) 1. Product 1 2. Product 2: 3. Product 3: 4. Product 4: 5. Product 5:		



<b>xi.</b>	Do you sell charcoal? Yes/no
<b>xii.</b>	If yes, go to Part 2, Charcoal Supply Information, and complete the questionnaire from there
<b>xiii.</b>	If no, go to Part 6, Sustainable Charcoal, and complete the questionnaire from there.
<b>Part 2: Charcoal Supply Information</b>	
<b>i.</b>	<p>a) How long have you been selling charcoal?</p> <p>b) Have you ever sold charcoal before now (i.e. Did you sell charcoal before, stop and start selling again?) Yes/No</p> <p>c) If yes, who did you buy charcoal from before? (individual, company, importer name)</p> <p>d) If yes, why did you stop before? (short answer)</p> <p>e) If yes, why did you start selling charcoal again? (short answer)</p>
<b>ii.</b>	<p>a) Are our charcoal customers primarily:</p> <ol style="list-style-type: none"> <li>1. Households</li> <li>2. Businesses</li> </ol> <p>b) If businesses, what type of businesses (e.g., restaurants, hotels, etc.) please specify</p>
<b>iii.</b>	<p>Are your charcoal customers primarily:</p> <ol style="list-style-type: none"> <li>1. Local Tanzanians</li> <li>2. Expatriates</li> <li>3. Other (specify)</li> </ol>
<b>iv.</b>	<p>a) Do you know the main use for your charcoal by your customers? Yes/no</p> <p>b) If yes, is it for:</p> <ol style="list-style-type: none"> <li>1. Ordinary cooking</li> <li>2. Special cooking (e.g., barbeques, etc.)</li> <li>3. Special commercial cooking (e.g., tandoori, roast chicken, etc.)</li> <li>4. Other (please specify)</li> </ol>
<b>v.</b>	With so much "traditional" charcoal available in the markets, at retailers, etc why do you think your customers prefer to buy charcoal from you? (short answer)
<b>Part 3: Charcoal Income</b>	

i.	<p>a) Has charcoal price changed since this time last year?</p> <p>b) If yes, how much has a charcoal price change since this time last year (estimate)?</p>
ii.	<p>In what quantities do you sell charcoal:</p> <ol style="list-style-type: none"> <li>1. 5 kg bags</li> <li>2. 10 kg bags</li> <li>3. Other (specify)</li> </ol>
iii.	<p>How many of each do you estimate you sell each month?</p> <ol style="list-style-type: none"> <li>1. 5 kg bags</li> <li>2. 10 kg bags</li> <li>3. Other (specify)</li> </ol>
iv.	<p>a) Have your charcoal sales increased or decreased over the past year? Increased/Decreased</p> <p>b) If charcoal sales have increased, why do you think they have increased?</p>
v.	<p>a) How much do you estimate you make a month from selling charcoal?</p> <p>b) Has the amount you make from charcoal sales changed since this time last year (yes, no)?</p>
vi.	<p>If yes, how much has charcoal earning changed since this time last year (estimate)?</p>
vii.	<p>How do you think your charcoal earnings could be improved?</p>
<p><b>Part 4: Charcoal Source of Supply</b> (<i>Enumerator: Explain in more detail what sustainable charcoal is, what makes it "sustainable"</i>)</p>	
i.	<p>a) Do you know the source of your charcoal (yes, no)</p> <ol style="list-style-type: none"> <li>1. Local (specify district)</li> <li>2. Imported (specify country)</li> </ol> <p>b) If yes, where does the charcoal come from: (tick appropriate)</p> <p>c) Do you only buy from one seller (yes, no)</p>
ii.	<p>a) If you buy from more than one seller, how many (number)</p> <p>b) From whom is charcoal purchased (tick)</p> <ol style="list-style-type: none"> <li>1. Local producer (specify whether individual, company, etc.)</li> <li>2. Importer (if charcoal is imported)</li> <li>3. Local wholesaler (if charcoal is imported)</li> <li>4. Other retailer (if charcoal is imported)</li> <li>5. Other (please specify)</li> </ol>

<b>iii.</b>	Is charcoal purchased from same source all the time (yes, no)
<b>iv.</b>	How often do you purchase charcoal 1. Once a week 2. Once a month 3. Other (specify)
<b>v.</b>	Do you have any idea of how charcoal is produced (yes, no)
<b>vi.</b>	From what source do you think your charcoal come from a) Soft wood b) Hard wood c) Natural forest d) Planted forest e) Forest reserve f) Non-reserve forest g) Do not know h) Sustainably-Produced Charcoal

#### Part 5: Marketing Questions

<b>i.</b>	List using 1 to 8 (8 highest), what is most to least important to you about charcoal (use number only once)? 1. Reliability of supply? of charcoal
<b>ii.</b>	If quality, what do you mean by quality?
<b>iii.</b>	Are you willing to pay a higher price (premium for charcoal): 1. Delivered to you? Yes/no If yes, how much more (percent) would you pay for delivery to you? 2. Consistent good quality of charcoal? Yes/no If yes, how much more would you pay (in percent) for consistent quality of charcoal? 3. Sustainably-produced charcoal? Yes/no If yes, how much more would you be willing to pay for sustainable charcoal? 4. Reliability of delivery/supply of your charcoal? Yes/no If yes, how much more (percent) would you pay for reliability of delivery? If you are willing to pay extra for sustainably-produced charcoal, why would you pay that premium? (simple answer)

### Part 6: Sustainable Charcoal

<b>i.</b>	Have you ever heard of sustainable charcoal? Yes/No
<b>ii.</b>	<p>If yes, how did you learn about sustainable charcoal? (Tick one)</p> <ul style="list-style-type: none"> <li>a) Radio/TV adverts</li> <li>b) Workshop/seminar</li> <li>c) Word of mouth</li> <li>d) Brochures/posters</li> <li>e) During a market visit</li> <li>f) Other (please state)</li> </ul>
<b>iii.</b>	<ul style="list-style-type: none"> <li>a) Do you know whether the charcoal you currently buy is sustainably produced or not? Yes/no</li> <li>b) If yes, are you happy with the sustainable charcoal? Yes/no</li> <li>c) If no, why are you/are you not happy with sustainable charcoal (short answer)?</li> </ul>
<b>iv.</b>	<ul style="list-style-type: none"> <li>a) Have you ever bought sustainably produced charcoal in the past? Yes/no</li> <li>b) If yes, from whom did you buy it? (Name, company, etc.)</li> <li>c) If yes, when did you buy it? (year)</li> </ul>
<b>v.</b>	<ul style="list-style-type: none"> <li>a) Do you know anyone who is using sustainably produced charcoal?</li> <li>b) If yes, please tell us who (name)</li> </ul>
<b>vi.</b>	<ul style="list-style-type: none"> <li>a) Do you think there is a market for sustainably-produced charcoal? Yes/no</li> <li>b) If yes (and you are not already selling it), would you be willing to sell sustainably-produced charcoal? Yes/No</li> <li>c) If yes, why would you be willing to sell it? (short answer)</li> </ul>
<b>vii.</b>	If you think there is a market for sustainably-produced charcoal, who would buy it? (list all who you think might buy it)
<b>viii.</b>	If you think there is a market for sustainably-produced charcoal, how big is the market (estimate number of type of bags you are currently selling that you think you could sell for sustainable charcoal)?
<b>ix.</b>	Do you think those who would buy sustainably-produced charcoal would pay more than the charcoal you are currently selling? Yes/No
<b>x.</b>	If yes, how much more (percentage on current price) do you think they would be willing to pay?

<b>xi.</b>	<p>What kind of things would those who would buy sustainably-produced charcoal, want to see:</p> <ol style="list-style-type: none"> <li>1. Strong certification that charcoal is sustainable? Yes/no</li> <li>2. Good packaging? Yes/No</li> <li>3. Good labelling and branding? Yes/No</li> <li>4. Other (please list other factors)</li> </ol>
<b>xii.</b>	<p>In addition to sustainability, what other factors do you think would be important for selling sustainably-produced charcoal?</p> <ol style="list-style-type: none"> <li>1. Quantity available</li> <li>2. Reliability of supply</li> <li>3. Consistent quality</li> <li>4. Testimonials/endorsements (if yes, what kind and from whom?)</li> <li>5. Other (please specify)</li> </ol>
<b>xiii.</b>	<p>Other comments on sustainably-produced charcoal? (list)</p>
<b>Part 7: Other Questions</b>	
<b>i.</b>	<p>Please list three things that you would want to change to make the charcoal sector work better for you?</p> <ol style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ol>
<b>ii.</b>	<p>List three things that would make the charcoal sector work better overall?</p> <ol style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ol>
<b>iii.</b>	<p>The charcoal sector, from charcoal production to charcoal transport to charcoal selling is very “informal” (not organised). What do you think should be done or could be done to organise the entire charcoal sector?</p>
<b>iv.</b>	<ol style="list-style-type: none"> <li>a) Do you care whether charcoal is sustainably-produced or not? Yes/no</li> <li>b) If you care, why do you care? (short answer)</li> </ol>
<b>v.</b>	<ol style="list-style-type: none"> <li>a) Do you think current charcoal production is good for the environment? Yes/no</li> <li>b) If no, why do you think it is not good for the environment?</li> <li>c) If no, how would you suggest making charcoal better for the environment?</li> </ol>

<p><b>vi.</b></p>	<p>Do you think that “certifying” charcoal (e.g., where it is produced, from what sources it is produced, whether it is sustainably produced, etc would be a good thing? Yes/No</p> <p>If yes, why do you think charcoal certification would be a good thing? (short answer)</p>
<p><b>vii.</b></p>	<p>What would convince you that “certified” charcoal was sustainably-produced? (tick each relevant box)</p> <ol style="list-style-type: none"> <li>1. Tanzania Bureau of Standards (TBS) label saying charcoal was sustainably-produced</li> <li>2. Label showing district authorities had certified charcoal as sustainable</li> <li>3. Label from a non-government organisation (name the organisation) that the charcoal was sustainably-produced</li> <li>4. Label from central government ministry or agency (name the agency) that the charcoal was sustainably-produced?</li> <li>5. Other (please state):</li> <li>6. Nothing would convince me on a label that charcoal was sustainably produced?</li> <li>7. If nothing, why would no label would convince you that charcoal was sustainably produced?</li> </ol>
<p><b>viii.</b></p>	<p>Other – Please feel free to add any comments or questions</p>

## Appendix 5: Retailers

QUESTIONNAIRE E: Charcoal Sellers			
Name of Enumerator		Contacts :	Telephone:
			Email:
<b>Completed by the enumerator</b>	Questionnaire No:		Date:
	Village:		Time:
<b>Details of the respondent</b>	Name:		
	Telephone:		
	Email:		
	Resident:		
PART 1: Overview of Seller			
i.	Name of Seller:		
ii.	Is Seller the Owner?		
iii.	Is the Seller Woman or Man?		
iv.	Is the Owner Woman or Man?		
v.	How long in this place		
vi.	Is place of business in fixed building (yes, no)		
vii.	How many employees/workers at business site		
viii.	How many women employees (non-owner)		
ix.	How much investment in place of business (TSHS): a) Source of Finance b) Self (Yes, No) c) Other (specify) d) Other (specify amount)		
Part 2: Charcoal Supply Info			
i.	Does seller know source of charcoal (yes, no)		
ii.	If yes, where does the charcoal come from (district)		
iii.	From what source does charcoal come from a) Soft wood		

	<ul style="list-style-type: none"> <li>b) Hard wood</li> <li>c) Natural forest</li> <li>d) Planted forest</li> <li>e) Forest reserve</li> <li>f) Non-reserve forest</li> <li>g) Do not know</li> </ul>
iv.	Does seller only buy from one seller (yes, no)
v.	If buy from more than one, how many (number)
vi.	Where is charcoal purchased (location)
vii.	<p>From whom is charcoal purchased (tick)</p> <ul style="list-style-type: none"> <li>a) Bicycle</li> <li>b) Private car</li> <li>c) Government car</li> <li>d) Non-charcoal lorry</li> <li>e) Small charcoal lorry</li> <li>f) Large charcoal lorry</li> <li>g) Other (specify)</li> </ul>
viii.	Is charcoal purchased from same source all the time (yes, no)
ix.	<p>How much is charcoal is bought each day (number per day)</p> <ul style="list-style-type: none"> <li>a) 1 kg debe</li> <li>b) 2 kg debe</li> <li>c) 5 kg debe</li> <li>d) Bag</li> </ul> <p>If bag, give weight of bag (kg)</p>
x.	Do you have any idea of how the charcoal you sell is produced (yes, no)
xi.	If you have idea of how charcoal is produced do you think from earthen kiln or from improved kiln (give one answer or other)
xii.	How much do you pay for charcoal per day?
xiii.	Has charcoal price changed since this time last year?
xiv.	If yes, how much has a charcoal price changed since this time last year (estimate)?
<b>Part 3: Charcoal Income</b>	



i.	How much charcoal do you sell per day (average number per day) a) 1 kg debe b) 2 kg debe c) 5 kg debe d) Bag
ii.	What do you think your net earnings from charcoal are per day per: a) 1 kg debe b) 2 kg debe c) 5 kg debe d) Bag
iii.	How much do you estimate you make a day from selling charcoal?
iv.	Has the amount you make from charcoal sales changed since this time last year (yes, no)?
v.	If yes, how much has charcoal earning changed since this time last year (estimate)?
vi.	Where is charcoal purchased?
vii.	From whom is charcoal purchased?
viii.	Is charcoal purchased from same person all the time?
ix.	How much is charcoal sold today per a) 1 kg debe b) 2 kg debe c) 5 kg debe d) bag (give weight)
x.	How do you think your charcoal earnings could be improved?
<b>Part 4: Other</b>	
	Please list three things that you would want to change to make the charcoal sector work better for you?  1  2  3

	<p>List three things that would make the charcoal sector work better overall?</p> <p>1</p> <p>2</p> <p>3</p>
	<p>The charcoal sector, from charcoal production to charcoal transport to charcoal selling is very “informal” (not organised). What do you think should be done or could be done to organise the entire charcoal sector?</p>
	<p>Do you care whether charcoal is sustainably-produced or not? Yes/no</p>
	<p>If you care, why do you care? (short answer)</p>
	<p>Do you think current charcoal production is good for the environment? Yes/no</p>
	<p>If no, why do you think it is not good for the environment?</p>
	<p>If no, how would you suggest making charcoal better for the environment?</p>
	<p>Do you think that “certifying” charcoal (e.g., where it is produced, from what sources it is produced, whether it is sustainably produced, etc would be a good thing? Yes/No</p>
	<p>If yes, why do you think charcoal certification would be a good thing? (short answer)</p>
	<p>What would convince you that “certified” charcoal was sustainably-produced? (tick each relevant box):</p> <ol style="list-style-type: none"> <li>1. Tanzania Bureau of Standards (TBS) label saying charcoal was sustainably-produced</li> <li>2. Label showing district authorities had certified charcoal as sustainable</li> <li>3. Label from a non-government organisation (name the organisation) that the charcoal was sustainably-produced</li> <li>4. Label from central government ministry or agency (name the agency) that the charcoal was sustainably-produced?</li> <li>5. Other (please state):</li> <li>6. Nothing would convince me on a label that charcoal was sustainably produced?</li> <li>7. If nothing, why would no label would convince you that charcoal was sustainably produced?</li> </ol>

	Other – Please feel free to add any comments or questions
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## Appendix 6: Household Questionnaire

CHARCOAL USERS/		Household Consumer	
			Telephone:
			Email:
<b>Completed by the enumerator</b>	Questionnaire No:	Date:	
	Town:	Time:	
<b>Details of the respondent</b>	District:		
	House No:		
	Respondent Name:		
	Telephone:		
	Email:		
Resident:			
<b>Part 1: Overview of Household</b>			
<b>i.</b>	How long have you lived here? (years)		
<b>ii.</b>	Do you own this house? Yes/No		
<b>iii.</b>	Do you rent this house? Yes/No		
<b>iv.</b>	How many rooms does this house have? (number)		
<b>v.</b>	How many people sleep in this house regularly? (number)		
<b>vi.</b>	What energy sources do you use for cooking? (tick all		

	<p>appropriate)</p> <p>a) Electricity</p> <p>b) LPG</p> <p>c) Kerosene</p> <p>d) Charcoal</p> <p>e) Firewood</p> <p>f) Other (specify)</p>
<b>vii.</b>	What source of energy do you use primarily for cooking? (specify)
<b>Part 2: Charcoal Demand</b>	
<b>i.</b>	<p>How many bags of charcoal do you purchase per month? How often do you purchase charcoal? (tick appropriate)</p> <p>1. Every day</p> <p>2. Every few days</p> <p>3. Once a week</p> <p>4. Once more than a week</p>
<b>ii.</b>	<p>How much charcoal do you buy each time you purchase charcoal (number)</p> <p>a) small debe</p> <p>b) medium debe</p> <p>c) large debe</p> <p>d) Bag (gunia/sisal bag)</p> <p>If bag, give estimated weight of bag: _____ kg</p>
<b>iii.</b>	<p>How much do you pay per bag? (Tshs)</p> <p>a) small debe</p> <p>b) medium debe</p> <p>c) large debe</p> <p>d) Bag (gunia/sisal bag)</p>
<b>iv.</b>	<p>Where do you purchase your charcoal?</p> <p>a) From door-to-door sellers</p> <p>b) From street sellers</p> <p>c) From small local shops (dukas)</p>

	<p>d) From large charcoal sellers</p> <p>e) Other (specify)</p>
<b>v.</b>	<p>How many charcoal suppliers do you buy from in any month? (tick appropriate)</p> <p>a) One</p> <p>b) Two</p> <p>c) More (specify)</p>
<b>Part 3: Charcoal Supply</b>	
<b>i.</b>	<p>a) Has charcoal price changed since this time last year? Yes/no</p> <p>b) If yes, how much has charcoal price changed since this time last year (estimate)?</p>
<b>ii.</b>	Is charcoal supply reliable? Yes/no
<b>Part 4: Sources of Charcoal Supply</b>	
<b>i.</b>	Do you know where your charcoal comes from? Yes/no
<b>ii.</b>	If yes, where does the charcoal come from (district)
<b>iii.</b>	<p>From what source does charcoal come from:</p> <p>a. Soft wood</p> <p>b. Hard wood</p> <p>c. Natural forest</p> <p>d. Planted forest</p> <p>e. Forest reserve</p> <p>f. Non-reserve forest</p> <p>g. Don't know</p>
<b>iv.</b>	Do you have any idea how charcoal is produced (yes, no)
<b>Part 5. Sustainable Charcoal</b> ( <i>Enumerator: Explain in more detail what sustainable charcoal is, what makes it "sustainable"</i> )	

<p><b>i.</b></p>	<p>a) Have you ever heard of sustainable charcoal? Yes/No</p> <p>b) If yes, how did you learn about sustainable charcoal? (Tick one)</p> <ul style="list-style-type: none"> <li>• Radio/TV adverts</li> <li>• Workshop/seminar</li> <li>• Word of mouth</li> <li>• Brochures/posters</li> <li>• During a market visit</li> <li>• Other (please state)</li> </ul>
<p><b>ii.</b></p>	<p>a) Do you know whether the charcoal you currently buy is sustainably produced or not? Yes/no</p> <p>b) If yes, from whom do you buy it? (name, company)</p> <p>c) If yes, for how long have you been buying it?</p> <p>d) If yes, how much do you pay per bag (equivalent) for the sustainable charcoal? Tsh/bag</p> <p>e) If yes, are you happy with the sustainable charcoal? Yes/no</p> <p>f) If no, why are you are you not happy with sustainable charcoal (short answer)?</p>
<p><b>iii.</b></p>	<p>a) Have you ever bought sustainably produced charcoal in the past? Yes/no</p> <p>b) If yes, from whom did you buy it? (Name, company, etc.)</p> <p>c) If yes, when did you buy it? (year)</p> <p>d) If yes, were you satisfied with it?</p> <p>e) If you were not satisfied with the charcoal, why were you not satisfied? (short answer)</p>
<p><b>iv.</b></p>	<p>a) Do you know anyone who is using sustainably produced charcoal?</p> <p>b) If yes, please tell us who. (name)</p>

**Part 6: Marketing Questions**



i.	<p>On a scale of 1 to 5 (5 highest), how important to you is:</p> <ol style="list-style-type: none"> <li>1. Reliability of supply?</li> <li>2. Certification that charcoal is sustainable?</li> <li>3. Consistent good quality of charcoal?</li> <li>4. Packaging of charcoal</li> </ol>
ii.	<p>Are you willing to pay a higher price (premium) for sustainably-produced charcoal? Yes/no</p> <p>If yes, how much more would you be willing to pay for sustainable charcoal? (x percent more, specify)</p> <p>If you are willing to pay extra for sustainably-produced charcoal, why would you pay that premium?</p> <p>(simple answer)</p>

**Part 7: Other Questions**

	<p>Please list three things that you would want to change to make the charcoal sector work better for you?</p> <ol style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ol>
ii.	<p>List three things that would make the charcoal sector work better overall?</p> <ol style="list-style-type: none"> <li>1</li> <li>2</li> <li>3</li> </ol>
iii.	<p>The charcoal sector, from charcoal production to charcoal transport to charcoal selling is very “informal” (not organised). What do you think should be done or could be done to organise the entire charcoal sector?</p>
	<ol style="list-style-type: none"> <li>a) Do you care whether charcoal is sustainably-produced or not? Yes/no</li> <li>b) If you care, why do you care? (short answer)</li> </ol>
	<ol style="list-style-type: none"> <li>a) Do you think current charcoal production is good for the environment? Yes/no</li> <li>b) If no, why do you think it is not good for the environment?</li> <li>c) If no, how would you suggest making charcoal better for the environment?</li> </ol>

	Do you think that “certifying” charcoal (e.g., where it is produced, from what sources it is produced, whether it is sustainably produced, etc) would be a good thing? Yes/No
	If yes, why do you think charcoal certification would be a good thing? (short answer)
	Other – Please feel free to add any comments or questions

## Appendix 7: Questionnaire to Government Representatives

<b>Biography</b>		
<b>Completed by the enumerator</b>	Questionnaire No:	Date:
	Name of Enumerator:	Time:
	Village:	District:
<b>Details of the respondent</b>	Name:	
	Organization:	
	Locations:	Village: Ward: District:
	Designation:	
	Telephone:	
	Email:	
	<b>Part 1: Background</b>	
i	How long have you been in this position? What are your primary responsibilities? 1. 2. 3.	
<b>Part 2: Charcoal</b>		
i	Please estimate the number of individuals/groups within your jurisdiction who are engaged	

	in charcoal production (number).
ii	Please list the key issues you face in your work with regard to charcoal producers? 1. 2. 3.
iii	What are the key policies, regulations, laws that govern charcoal production in your area of jurisdiction? 1. 2. 3.
iv	What are the key policies, regulations, laws that govern charcoal sales in your area of jurisdiction? 1. 2. 3.
v	What are the key policies, regulations, law that govern charcoal transport in your area of jurisdiction? 1. 2. 3.
vi	Where does the charcoal come from (village, ward, district):
vii	How many people (estimate) are active in producing charcoal in your area (village, ward, and district)?
viii	Are most, all of the charcoal producers in your area local in your area? Yes/no
ix	Do you think that charcoal production is an important economic activity in your area? Yes/no
x	If yes, please indicate how important you think it is (tick appropriate): 1. Very important 2. One of many economic activities 3. One of the most important economic activities

xi	<p>On a scale of 1 to 5 (5 being most important) please indicate how important charcoal production is in your area (rank the following from 1 to 5 and only give one number, e.g. 5 to each):</p> <ol style="list-style-type: none"> <li>1. Income generation</li> <li>2 Livelihoods</li> <li>3. Employment</li> <li>4.Paying school fees</li> <li>5. Helping people to buy food</li> <li>6 Other (specify)</li> </ol> <p>3. Charcoal Production &amp; Sources</p>
xii	Do you have any idea how charcoal is produced (Yes, No)
xiii	<p>If Yes, please answer the following questions:</p> <p>From what source does charcoal come from:</p> <ol style="list-style-type: none"> <li>1. Soft wood</li> <li>2. Hard wood</li> <li>3. Natural forest</li> <li>4. Planted forest</li> <li>5. Forest reserve</li> <li>6. Non-reserve forest</li> <li>7. Don't know</li> </ol>
xiv	<p>Is charcoal produced on village land following a forest management plan?</p> <ol style="list-style-type: none"> <li>a) Yes</li> <li>b) No</li> <li>c) Don't know</li> </ol>
<p><b>Part 3: Sustainable Charcoal</b> (<i>Enumerator: Explain in more detail what sustainable charcoal is, what makes it "sustainable"</i>)</p>	
i.	<p>Have you ever heard of sustainable charcoal? Yes/No, If Yes, how did you learn about sustainable charcoal? (Tick one)</p> <ol style="list-style-type: none"> <li>a) Radio/TV adverts</li> <li>b) Workshop/seminar</li> <li>c) Word of mouth</li> <li>d) Brochures/posters</li> <li>e) During a market visit</li> <li>f) Other (please state)</li> </ol>
ii.	Do you care whether charcoal is sustainably-produced or not? Yes/no
iii.	If you care, why do you care? (short answer)

iv.	Do you think current charcoal production is good for the environment? Yes/no
v.	If No, why do you think it is not good for the environment?
vi.	If No, how would you suggest making charcoal better for the environment?
vii.	What are the current policies and legislation affecting sustainable charcoal production?
viii.	What are the key policy and legislative gaps that prevent charcoal from being produced sustainably?
ix.	What the main government initiatives to promote sustainable charcoal production and markets?
x.	What are the main barriers and challenges of the current situation in the charcoal sector and what are the main barriers and challenges of scaling-up the sustainable charcoal production and markets?
<b>Part 4. Please give us your thoughts, observations and recommendations on the charcoal sector in your area and nationally?</b>	
i.	Please list three things that you would want to change to make the charcoal sector work better for you?
ii.	1
iii.	2
iv.	3
v.	List three things that would make the charcoal sector work better overall?
vi.	1
vii.	2
viii.	3
ix.	The charcoal sector, from charcoal production to charcoal transport to charcoal selling is very “informal” (not organized). What do you think should be done or could be done to organize the entire charcoal sector?
x.	Do you care whether charcoal is sustainably-produced or not? Yes/No
xi.	If you care, why do you care? (short answer)
xii.	Do you think current charcoal production is good for the environment? Yes/No
xiii.	If no, why do you think it is not good for the environment?
xiv.	If no, how would you suggest making charcoal better for the environment?
xv.	Other – Please feel free to add any comments or questions



**Appendix 8: Reported price changes per bag from September 2015 to September 2016**

	<b>District</b>	<b>Ward</b>	<b>Price changes</b>
Dar es Salaam	Ilala	Buguruni	12,666
		Madenge	20,000
	Kinondoni	Msisiri A	10,000
		Mwananyamala	7,000
		Mwananyamala	12,000
	Temeke	Mtongani	5,000
		Sabasaba	10,000
		Sokoni	13,000
	Morogoro	Morogoro Urban	Kichangani
Mafiga			3,000
Manzese			15,750
Mbuyuni			10,000
Mji Mpya			10,000