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CHARCOAL VALUE CHAIN AS A COMPLIMENTARY LIVELIHOOD ACTIVITY FOR PASTORALISTS IN THE RANGELANDS

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Abstract

Global charcoal production has more than tripled over the past 50 years from 17.3 million tons in 1964 to 53.1 million tons in 2014. 61% of the present global charcoal production occurs in Africa, mostly to satisfy demand for cooking fuel from urban and peri-urban households. Despite the adverse environmental impacts associated with charcoal production, a significant global population relies on it for energy needs, while many producers depend on it as a livelihood source. Whereas this calls for efforts to promote sustainable charcoal production practices, this has to be informed by in-depth understanding of the charcoal value chain to guide interventions aimed at making it a sustainable economic activity. This study used household interviews, key informant interviews, and focus group discussions to gather data on the practices, actors, prices, and quantities of charcoal traded at different nodes of the value chain in Pokot Central, Kenya. The results revealed over 13 categories of actors who were directly and indirectly involved in the charcoal production and trade. These included tree owners, producers, bulking agents, transporters, brokers, retailers, wholesalers, and law enforcers (police and Kenya Forest Service guards). The findings showed that the producers mainly used traditional kilns. Charcoal trade was mainly dominated by middle traders who determined prices along the value chain, and charcoal prices varied widely from US\$ 4 per 100kg of charcoal at point of production to US\$ 20 per 1 kg in urban centres. The higher prices at the urban centres were partly attributed to extra marketing costs associated with illegal fees paid to the law enforcers at road blocks during transportation. These findings point at the need to improve the production efficiency by use of improved kilns, and formalize charcoal trade to ensure standardization of prices and minimize exploitation of producers by brokers as well as corrupt law enforcers.

Introduction

Global charcoal production has more than tripled over the last 50 years from 17.3 million tons in 1964 to 53.1 million tons in 2014 (Malimbwi & Zahabu, 2009; FAO,2016). About 60% of this increasing volume is obtained in Africa (FAO, 2016), where it is primarily used to fulfil demands for cooking fuel from urban and peri-urban households (Ghilardi et al., 2013; Mwampamba et al., 2013). Current projections indicate that the total population of Africa is likely to double between 2015 and 2050 (UN, 2015), which is anticipated to further increase the demand for charcoal due to rural-urban migration. Urban centres in Kenya have already recorded an increase in charcoal consumption by 64% over the last two decades (KIPPRA, 2010). In Kenya the charcoal industry provides direct employment to approximately 700,000 people that include wood producers/ tree owners (land owners who cultivate multipurpose trees to meet different commercial needs), charcoal producers, transporters, and vendors (Njenga et al., 2013). Annual revenue of approximately US\$ 427 million has been collected by the county and national governments from charcoal licenses and business permits. This figure is projected to increase to well over US\$ 12 billion by 2030 (Iiyama et al., 2014). However, this can only be achieved for as long as charcoal remains inexpensive and readily available in comparison to alternative energy sources like liquified petroleum gas (LPG), kerosene, and electricity (Schure et al., 2013).

As in many other parts of SSA, the production and marketing of charcoal in Kenya largely evade the legal and fiscal instruments of the state. Most of producers are positioned somewhere along the spectrum of 'legal-informal' (for instance, when resource ownership and access are regulated through non-codified customary practices) and 'illegal-informal' (such as when state authorities tolerate the unwarranted extraction of resources against petty bribes) (Bergmann et al., 2019). In order to improve this situation, the Kenyan government passed the Forestry (2005) and Energy (2006) Acts, which specify a number of legal requirements and rules regarding the production, transportation and marketing of charcoal. This process of regulation of the charcoal value chain received further impetus with the adoption of the Forest (Charcoal) Rules in 2009. The policy provided for the

introduction of a licensing scheme, investments in efficient production technologies, and the establishment of officially approved and institutionally arranged charcoal production systems (RoK, 2009).

The widespread implementation of such policies has been curtailed by a number of misconceptions about the charcoal sector (Mwampamba et al., 2013) and numerous impediments resulting from highly bureaucratic procedures (Ghilardi et al., 2013) and informality, including customary tenure regimes (Bergmann et al., 2019). The Kenyan government has attempted to control informal production by means of bans, most recently in 2018. However, as experiences gained in other sub-Saharan countries show, neither formalization of existing practices (Kammen et al., 2005), nor a complete ban of informal production (Jones et al., 2016) warrants enhanced sustainability of the charcoal sector. Charcoal value-added potential (including options for taxation) is not fully tapped, available resources are often not used efficiently, and gross proceeds are far from being distributed equitably along the value chain. This study analysed charcoal production practices, actors and their roles, and prices at various stages of the charcoal value chain. The empirical case study focuses on Pokot Central sub-County, a rural dry land in north-western Kenya.

Methods and Study Site

The study was conducted in Pokot Central, a sub-county of West Pokot County, located in the Rift Valley region of Kenya. Pokot Central has undergone intensive environmental and socio-economic changes over the past 30 years (Petersen et al., 2021a), which led to an increased relevance of charcoal production as a livelihood, especially since the 1990s (Bergmann et al., 2019). The study site was purposively selected because of the predominance of commercialized charcoal production in the area. Data was collected through household interviews using a semi-structured questionnaire and was complemented by 42 KIIs, 6 FGDs and direct observations. The sample population for the study involved charcoal producers, traders, County Government officials, middlemen, as well as households that were not participating in local charcoal production. Information from KIIs and FGDs were collected and summarised to characterise the charcoal value chain, illustrating key players at various levels, their roles as well as marketing channels, and estimated prices.

Results

Value chain actors and their roles

The results revealed various actors who are directly or indirectly involved in the charcoal value chain, their roles and interactions (Figure 1). Whereas the direct actors are commercially involved in charcoal market channels at different levels, indirect actors influence the functioning of the value chain, by providing specific support services or implementing legal provisions. Charcoal producers are the main stakeholders at the production stage and, therefore, key for the entire industry. Bulking agents play an integral role of providing the market. Transporters who bring the charcoal from Pokot Central to the urban markets are hired by wholesalers from the respective towns. Numerous other actors who claim their stake in the charcoal value chain at different levels (production, transportation, marketing, and consumption) are differentiated by the main activities that take place at the different levels.

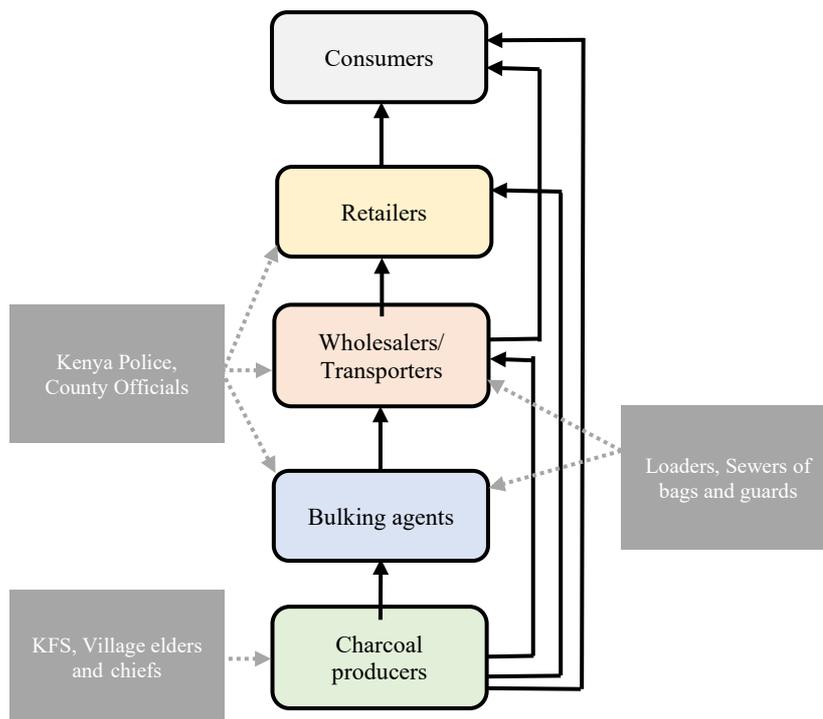


Figure 1: Charcoal flow among different actors in the value chain. Source: Key informant interviews (N=42) and FGD (N=72)

Charcoal production as a livelihood

Commercial small-scale charcoal production emerged as an important livelihood activity at Orwa Location, Pokot Central, during the 1990s. Today charcoal production is one of the key sources of regular and reliable income for a majority of households in the study area. As narrated by KIIs, the process of charcoal production

(Figure 2) using traditional kilns involves preparing the wood, which can either be freshly cut or fallen trees. Then the kiln site is selected close to the source of the wood and possibly in the vicinity of rivers to provide sand for sealing the kiln and water for cooling the charcoal once the carbonization is complete. The kilns are regularly inspected to monitor the progress and to ensure the stack is evenly covered and no openings emerge. Whereas emission of a dense white smoke from the ventilations indicates moisture escaping from the wood, grey or black smoke indicates that carbonization is in progress. Emission of a light blue smoke indicates complete carbonization, which calls for complete sealing of ventilations to allow the coal to cool.

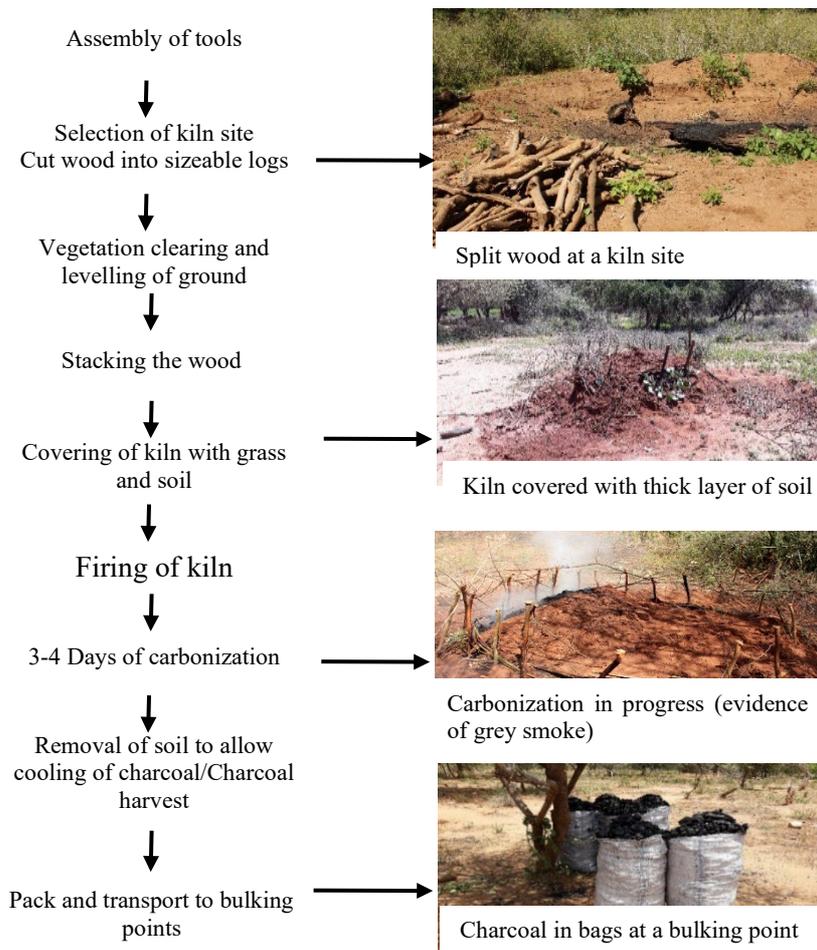


Figure 2: Process of Charcoal production. Source: Key informant interviews (N=42) and FGD (N=72)

Estimated costs, charcoal prices, and profits for actors along the value chain

Key informant interviews and FGDs revealed that a producer earns an estimate of US\$ 4-4.5 (Ksh 400-450) per 100 kg bag or an equivalent of US\$ 120 (Ksh 12,000) per month during the wet season when the weather is conducive. Interviews with officials from the Kenya forestry service (KFS) officials show that between 5 and 10 lorries with a capacity of 150-180 bags of charcoal are granted permit weekly to transport charcoal from Masol, Lomut, Wei Wei locations to urban centers of Eldoret, Kitale, and Kapenguria, and sometimes to Kakamega town and Kisumu city. Small scale traders in between the major towns also buy small quantities. Not included are the illegal trade volumes that go uncaptured. Figure 3 presents estimates of costs incurred, traded volume, and prices at different levels of the value chain, from production level to end-user.

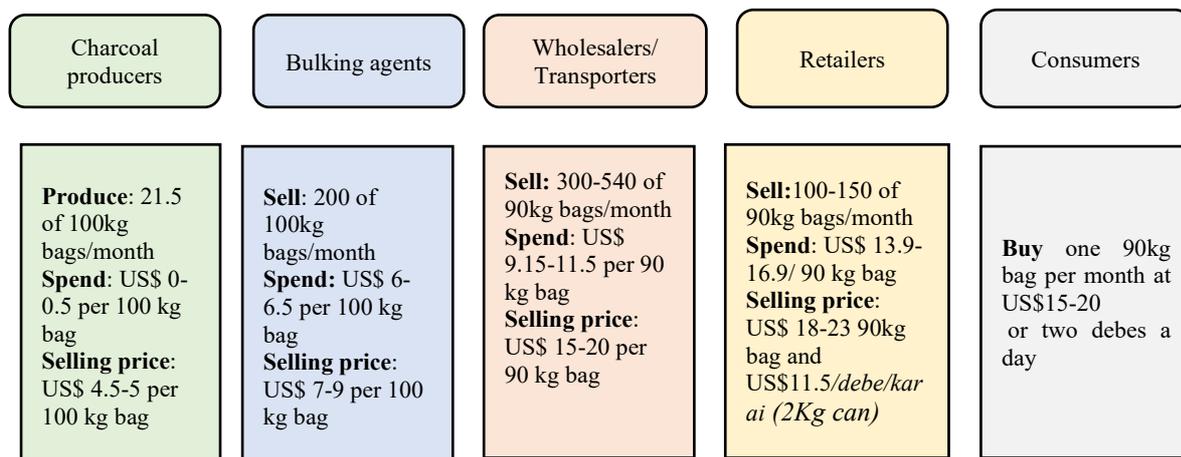


Figure 3: Average charcoal prices and traded volumes per actor at various nodes of the chain as reported by KIIs and FGD participants¹. Source: KII (N=42) and FGD (N=72)

Discussion

The results of this study reveal that charcoal production in the rural Central Pokot County is entirely done using traditional earth kilns without any improved technologies. This may be attributed to relatively high investment and maintenance costs associated with these improvements. However, other charcoal producing areas in Kenya and Tanzania have already adapted more efficient ways by employing simple improvements or Casamance kilns (Malimbwi et al., 2009; Giathi et al., 2013). This shows that by proper intervention, the traditional production system can be improved though it calls for targeted programs to train producers. The communally owned land and consequently freely available wood resources, furthermore lead to lower, or almost non-existing production costs in Pokot Central. In contrast to this, producers in other areas such as Kitui or Baringo County have to pay for wood, sourced from privately owned land (Mewnr et al., 2013).

While charcoal value chains from other areas include wood owners (Giathi et al., 2013), Pokot Central does not include them. This is most likely due to the lack of privately owned land in the study area and the ongoing land demarcation in West Pokot County could thus alter the included actors (West Pokot County Integrated Development Plan -CIDP). Apart from wood or land owners, other studies reported additional groups of people who also contribute to and benefit from the charcoal trade. These could be wood cutters (Vasco et al., 2018, Jolien et al., 2014) who are most likely a group for larger production sites, where single steps of the production process are outsourced. In contrast to Kambewa et al., 2007, who reported that most charcoal transporters owned the charcoal they moved, most of the transporters involved in the trade from Pokot Central were hired by wholesalers to transport charcoal to certain destinations. Thus, wholesalers involved in the value chain from Pokot Central, not only incur costs for transportation permits or fuels, but also the wages of hired truck drivers.

Unlike in other production areas, bulking agents or brokers play a central role in Pokot Central. The remoteness of many production sites that are further away from the main road and the good connections of the agents makes them an important actor group. Producers and the bulking agents in Central Pokot have a relationship that go beyond business and marketing, making it easier for them to trust each other with charcoal and cash. Nevertheless, the agents are the ones who determine the price per bag and control the market access, which results in a clear power disparity between the two groups. These hidden power relations and price negotiations are yet unclear and could be of interest for the future, when trying to increase the agency and bargaining power of local producers. In other places like Kajiado and Baringo, middlemen usually have no such importance to the value chain and price development (Mewnr et al., 2013), which can be attributed to the readily available market, better accessibility, and bulk production. The remoteness of Pokot Central also plays a role with regards to external shocks which affect the market access. A recent study from the same area showed, that producers suffered severe losses and subsequently faced existential crises, when their market access was cut off by the COVID-19 travel restrictions (Petersen et al. 2021b). This means, that value chains and their vulnerability towards certain shocks should be considered in national policies in the future.

Most of the costs incurred by transporters, wholesalers, and retailers were passed on to the consumers in form of higher charcoal prices. This finding is similar to those of other studies carried out in Kitui and Baringo Counties (Giathi et al., 2013). In contrast to a study from Ghana, which found that producers have very low

¹ Recorded average prices of charcoal and traded volumes per actor at various nodes of the charcoal value chain in Central Pokot County.

returns with a share of approximately 3% of the end price (Kwaku et al., 2018), producers from Pokot Central receive a comparatively large share of 20% of the overall revenues.

Conclusions

The current mode of charcoal production in Pokot Central is a highly basic procedure which requires a high amount of time and human energy. The producers prefer the traditional earth kiln technology to portable metal kilns.

In total, 13 different groups of actors are involved in the charcoal value chain from Pokot Central. These play different roles at different levels, including production, transportation, marketing, and consumption. Their interactions range from bi-directional, between two actors, to more complex interactions that involve several actors along the chain.

While middle traders, such as bulking agents and wholesalers, are key in linking the producers and consumers in the charcoal value chain, their involvement increases charcoal prices. The charcoal value chain is a rather complex system which combines traditional production methods, unregulated informal relationships and formal institutions along the chain. The study shows how local conditions such as land tenure or the remoteness of production sites can affect the whole value chain and consequently include or exclude certain actor groups. Future policies need to take these findings into considerations as all actors need formalized and secured circumstances to secure their livelihoods.

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