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IMPACT AND ASSESSMENT OF CHARCOAL MARKETING SYSTEM THROUGH COMMUNITY ASSOCIATIONS IN KITUI COUNTY, KENYA

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Abstract: A market survey was conducted among twelve Charcoal Producer Associations (CPAs) in three sub-counties of Kitui County namely Kitui East, Mwingi and Kitui South using a semi structured questionnaire. The objectives of this study were to: carry out a baseline survey among charcoal producers, transporters and whole-sellers/vendors within the study area; and analyze the socio-economic contribution of charcoal to the livelihood of local communities in the study area. The findings showed that charcoal was mainly produced using the traditional earth kiln. The results of a gross margin analysis demonstrated that the producers, vendors and wholesalers earned an average monthly income of KShs 11,000, 51,000 and 160,000 respectively in 2013. The average producer price was Ksh 400 while wholesalers/transporter received a price of KShs. 1,200 in Nairobi and Thika. The priority tree species preferred for charcoal production include *Acacia tortilis*, *Terminalia prunoides*, *Senna abbreviata* and *Balanites aegyptica*. The Kitui County government has enacted legislation to regulate the production, transportation and trade in charcoal. Charcoal is associated with improved livelihood of producers through employment creation and income generation. Adverse environmental concerns are also enormous though they can be mitigated through tree planting and use of efficient conversion technologies. This effort should be followed by sensitization of stakeholders and lifting of the current ban to pave way towards the operationalization of the Charcoal Regulations 2009.

Keywords: Charcoal; Marketing; Producer; Vendors; Wholesalers.

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INTRODUCTION

Of total 84% Kenya's land mass estimated at 57.6 million hectares is classified as arid and semi- arid (ASAL). Where 75% of approximately 2.6 million tons of charcoal is produced annually using unsustainable charcoal production technologies that possess great danger to the national socio-economic and bio-physical environment (Practical Action EA, 2010, Danida and RELMA, 2003). Fuelwood meets over 93% of rural household energy needs whilst charcoal is the dominant source of fuel in urban households (Ministry of Energy, 2002; Theuri, 2002; Kituyi, 2008). Besides being the standard cooking fuel for the majority of Kenyan households, woodfuel is an important energy

source for small-scale rural industries such as tobacco curing, tea drying, brick making, fish smoking and bakeries. The industry employs over 700,000 people who support more than two million dependents (GoK, 1999; Kibet 2014). Other sources estimated that in 2007 the charcoal industry supported over 2.5 million Kenyans by generating an annual income of over KShs 40 billion (USD \$ 481,927,711 at an exchange rate of 1USD\$ to KShs. 83), almost equivalent to the Tea industry (GTZ, 2007). The major charcoal producing counties in Kenya include; Kajiado, Makueni, Kitui, Kwale, Baringo, Elgeyo Marakwet and Tana River. Other counties where significant charcoal production takes place are Kilifi, Garissa, Laikipia, Machakos, Marsabit, Meru, Narok, Nithi and Turkana (Ministry of

Environment, Water and Natural Resources (2013). Ninety nine percent of charcoal production is largely through inefficient traditional earth kiln (Kareko, 2001; Mutimba and Barasa, 2005). Despite the huge amount of revenue generated by the charcoal industry as compared to the other products (Figure 1), the charcoal producers and vendors remains poorly remunerated. Charcoal has been ranked third after tea and horticulture sectors.

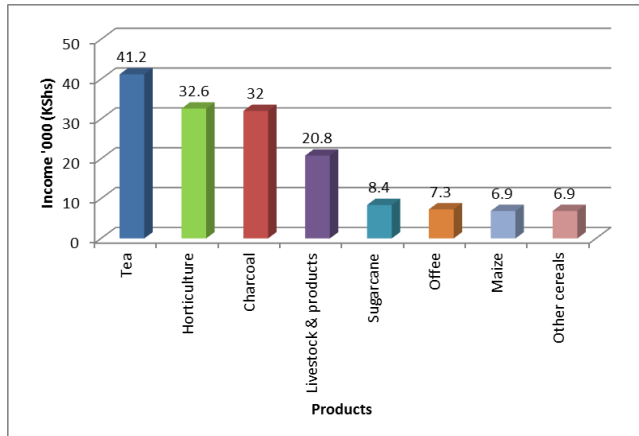


Figure 1. Comparison of Gross Revenue from Charcoal with other Products, 2004

Source: ESDA 2005, CBS 2006

In Kenya, biomass energy sector issues are addressed by the following government agencies: Kenya Forest Service (KFS), Renewable Energy Division of Ministry of Energy and Petroleum (MoE&P), Agroforestry Unit of Soil and Water Conservation Branch (SWCB) in the Ministry of Agriculture, Livestock Development and Fisheries, Public Administration, Kenya Forestry Research Institute (KEFRI), National Environmental Management Authority (NEMA), Security agencies, Non-Governmental Organization (NGOs), Community Based Organization (CBOs) and the local communities.

In the past decade, policies to encourage the use of renewable energy have grown in importance as part of the effort to reduce dependence on non-renewable energy sources such as fossil fuels and as part of strategies to address global warming (Trossero, 2002). Most of the respondents were aware of the regulations governing the trade in charcoal as outlined in the Forest Act, 2005 and Charcoal Regulations, 2009. The Forest Ecosystem Conservator for

Kitui County has been organizing stakeholders into charcoal producers' and marketing associations as provided by the new Charcoal Rules, 2009 (Legal Notice No. 186 of 24th December 2009). These Charcoal Rules require the stakeholders to establish charcoal producer/marketing associations before they can be licensed by KFS/County government to produce, transport and market charcoal. There are a lot of bottlenecks encountered in trying to enforce a charcoal movement ban that has been in place for Ukambani (Kitui, Makueni, Machakos, Mwingi) and Mbeere Forest and woodland zones before the charcoal regulation rules were enacted. Efficiency tree resource harvesting and utilisation is required where citizen and Institutions should produce results that meet the needs of Society while making the best use of resources at their disposal (Sophie *et al*, 2005). Based on the earlier study in Kitui County on sustainable charcoal production (Githiomi *et al.*, 2011), there is lack of information on the social economic contribution of charcoal value chain to local households' livelihood. Therefore, this study sought to document the contribution of the charcoal value chain to people's livelihoods through sustainable charcoal production technologies and marketing.

EXPERIMENTAL

A market survey targeting 95 Charcoal Marketing Association members was undertaken in Kitui, Kitui East and Kitui North. Kitui County is the sixth largest in terms of size and covers an area of 30,520 square kilometers. Its population size was 1,000,012 based on 2009 census and is divided into eight sub counties namely Mwingi North, Mwingi West, Mwingi Central, Kitui West, Kitui Rural, Kitui Central, Mutito and Kitui South. The name Kitui means 'a place where iron goods are made'. The county is diverse covering various ecological zones with some areas being semi-arid (Agro-ecological zones III and IV) which is characterized mostly by dry spells. The county lies between the altitude of 400m and 1,800m above sea level and its geographical coordinates are 1° 22' 0" South, 38° 1' 0" East. The respondents were interviewed using a pre-tested questionnaire which covered socio-economic characteristics, quantities handled,

pricing and markets and policy and legal issues. The survey information was complemented by observations, interviews with five key informants and secondary data. The survey findings were validated in three community workshops. The collected data was analyzed for Gross Profit Margin using MS Excel and SPSS computer packages.

RESULTS AND DISCUSSION

Charcoal production in Kitui County

The main economic activity is subsistence farming where maize, beans, green grams, sorghum, cowpeas, pigeon peas, cassava and millet were grown. Crop production was constrained by unreliable rainfall, infertile soils and poor farming practices resulting in frequent crop failure. This has forced the local community members to turn to charcoal production as a fall back strategy especially during years of severe drought. The charcoal producers were involved in charcoal production, farming, business, livestock production, bee keeping and tree nurseries with an average monthly income of KShs. 21,746. In Kitui County, charcoal is produced from woodlands, bushlands, woody grassland and farmlands with an estimated productivity of 0.64, 0.44, 0.25, and 1.44 m³/ha/year respectively (MoE, 2002). The proximity of Kitui County to Nairobi and Thika, makes the two markets, a preferred source of charcoal by transporters. However, production of charcoal in the county was unsustainable as there is minimal replanting of trees coupled with low survival rates and unsustainable management of woodlands leading to poor regeneration of the preferred charcoal production species. The adopted traditional charcoal production technologies are perceived to be wasteful or inefficient with low recovery rates of between 10-15%. The preferred charcoal species are *Acacia tortilis*, *Terminalia prunoides*, *Senna abbreviata*, *Balanites aegyptica*, *A. melifera*, *A. nilotica*, *T. brownii* and *A. gerrardii* in the order of priority. The incentive in the commercialization of the production and marketing of charcoal include source of income, subsistence consumption, source of employment, ease of access to permits and the introduction of efficient technologies in that

order. The domesticated and improved charcoal productions technologies that have been used in Kitui County include the improved earth kiln, brick or half orange kiln, casamance and metal kilns in the order of priority.

Marketing of Charcoal

Charcoal is a popular industry in most dryland areas such as Kitui and it is major lifelines for many charcoal producers who are vulnerable due to food insecurity come any slightest dry spell. Despite the fact that the respondents were members of Charcoal Producers Associations (CPAs), most of the charcoal was either marketed by individual members (76%), groups (17%) or families (8%). There is need to empower the CPAs to market charcoal on behalf of their members as a group which has the advantage to negotiating for higher prices. The factors that positively influenced charcoal production include profitability of the business (50%), un-employment (21%), availability of raw materials (19%) and family business (10%). Charcoal was packaged in either 90 kg or 50 Kg sacks (used to package maize and sugar respectively). The majority of the respondents still packaged their charcoal in the 90kg bags (99%) as compared to the 50kg sacks (1%). The 50 kg sacks were gaining popularity following the increase in their prices and preference by small car owners especially along the Garissa-Nairobi Highway. The findings showed that charcoal was selling at an average price of KShs 400 per 90 kg bag for an average of 28 bags per producer in 2013. Charcoal producer in Kitui North received higher prices as compared to the other areas. Shorter distance from Nairobi and Thika, good road network and increased number of transporters were indicated as some of the reasons for better prices in Kitui North. The CPAs need to operate a well-coordinated transport system to charcoal collection points to improve on cash flow to their members as opposed to middlemen/transporters. The pricing of charcoal was negotiable between CPA members and among various CPAs. The price of charcoal was mainly influenced by season (44%), buyers (40%), market forces (8%), food security (5%) and others (4%). The highest recorded prices were observed during the rainy season when most of the producers are busy engaged in

farming activities. The charcoal market segments consisted of households (6%), hotels (6%), vendors (49%) and wholesalers (39%). There were many charcoal vendors though the quantity of charcoal handled was small as compared to whole-sellers who are few in number but handle large quantities of charcoal at a time. Most of the charcoal produced was exported to other locations such as Nairobi (71%), Thika (43%), Kitui (8%), Mwingi (6%) and Mutomo (6%). Out of the 1.6–2.4 million tonnes of charcoal consumed in Kenya annually, 10 per cent goes to the capital city, Nairobi (Njenga *et al*, 2013).

Study findings revealed average costs associated with charcoal handling include: security for charcoal of KShs. 3,000 per month, movement permit fee of KShs. 20 per bag, equipment hiring fee of KShs 1,250 per month, purchase of standing trees at KShs. 600 per tree, store rent of KShs. 500 per month, labour charges of KShs. 400 per person per day, cess fee of KShs. 50 per bag, membership fees of KShs. 300 per year and transport charges of KShs. 240 per bag. Transporters/wholesalers (91%) were the main beneficiaries of the charcoal trade since they purchased cheaply

from the producers, transported using trucks to Nairobi and Thika where charcoal fetches higher prices of between KShs. 1,200 and 1,600 depending on season. Dismal numbers of respondents thought the producers (5%), retailers/vendors (2%) and government (2%) were also beneficiaries of the charcoal business. Mean monthly income from charcoal to the producers was estimated at KShs. 10,700. Producers in Kitui East received the highest incomes of KShs. 14,400. The least income from charcoal was received in Kitui South at KShs. 5,400. Interviews with charcoal wholesalers revealed that they received an annual income of KShs. 1,906,880 which translates to a monthly income of KShs. 158,907 with an average profit margin of 34% in the range of 17-79% making the wholesalers sole beneficiaries of the charcoal business (Table 1). Charcoal was fetching an average price of KShs. 1,200 in Nairobi and Thika. Waweru (2012) established that charcoal producers, small-scale transporters and retailers (who far out number more powerful wholesalers and transporters) receive a very small share of the final market price.

Table 1: Income by Wholesalers (KShs) in '000'

Cash flow	Case 1*	Case 2*	Case 3*	Case 4*	Case 5*	Overall
Returns on Charcoal sales	7,680	4,320	14,400	5,280	5,760	7,488
Investment costs						
Purchase	2,160	1,620	7,200	2,160	2,160	3,060
CMA levies	12	-	-	12	6	6,
Transport	1,920	720	3,840	960	480	1,584
Loading	96	72	216	96	-	96
Off-loading	240	-	-	240	240	144
Packaging	240	108	432	240	240	252
Permit fee	96	72	288	96	96	130
Cess fee	96	-	288	96	96	115
Management fees	480	-	-	480	-	192
Security	18	18	-	18	-	11
Storage	10	10	-	10	-	6
Sisal twine	-	-	29	-	-	6
Total costs	5,368	2,620	12,293	4,408	3,218	5,581
Profit	2,312	1,700	2,107	872	2,542	1,907
Profit margin (%)	43	65	17	20	79	34

*Note: Case represents an individual charcoal wholesaler

The marketing of charcoal is associated with both positive and negative impacts. The positive impacts include employment creation for producers and improved kilns artisans and improved incomes to various players along the market value chain. As the finding has shown the attractive prices can accelerate tree cutting which definitely comes with environmental concerns such as deforestation and huge costs on mitigation measures.

CONCLUSION

Charcoal in Kitui County is mainly produced using the traditional earth kilns with low uptake of the other improved charcoal production technologies. The gross earnings to producers, vendors and wholesalers averaged KShs 11,000, 51,000 and 160,000 respectively per month in 2013 at a retail price Kshs. 400 per bag. The ban on charcoal movement has lasted for four years, negatively impacting on the charcoal trade. This has forced some CPA and non CPA members to resort to illegal trade in the commodity. The enactment of the Kitui County Charcoal regulations, 2014 has been finalized in readiness for implementation. It is necessary to initiate awareness creation and sensitization of CPA members on renewal of membership and registration with the Attorney General (AG's) office, initiate recruitment of new members especially those involved in illegal charcoal production, construct and operationalize the charcoal collection centres and maintain good record. Also, there is need to link CPAs to credit providers especially in the acquisition of loans to purchase or hire trucks to transport charcoal. It will be prudent for CPA members to join the savings and loan schemes to enhance the charcoal business by providing credit facilities to members at a reasonable interest. It was observed that charcoal marketing comes with both benefits that range from employment opportunities to improved income and costs such as global warming and enormous environmental mitigation costs. Lastly, CPAs in collaboration with other stakeholders should diversify their incomes and ensure the conservation of the environment through alternative tree based enterprises such as carbon trade, honey production, establishment

of tree nurseries and commercialization of pods from Acacia species for fodder as a better option to the destructive tree harvesting for charcoal production.

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