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Charcoal Value Chain as a Determinant of Implementation of Environmental Policies: A Case of Charcoal Management Act 2014 of Kitui County, Kenya

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Abstract

As economies grew and their energy needs increased, the global demand for charcoal as a source of fuel experienced a steady rise in the last quarter of the 21st century. Charcoal has been a popular and reliable source of energy to meet the recurring energy deficit in many developing countries as a non-renewable energy source. However, it requires intensive production, and harvesting of trees and other wood sources, a practice that when unregulated, can cause rapid deterioration of tree cover alongside the generation of greenhouse gases. This research sought to find out how the charcoal value chain in charcoal production imparted on implementation of environmental policy in the case of charcoal management law in Kitui County. The research used a descriptive survey methodology to obtain quantitative data through questionnaires. The survey sample size of 205 charcoal producers calculated from a target population of 400 Charcoal Producers with a 5% margin error at a 95% confidence level was targeted. Quantitative data obtained was processed and analyzed using descriptive statistics. The findings indicated that 87% of charcoal producers were not conversant with environmental policies thus impacting negatively on implementation of environmental policies. In addition, 78% of respondents strongly agreed that long value chains between producers and consumers impact negatively adherence to set environmental laws and policies. Consequently, from the study findings, it's concluded that shortening the link between producer and consumer can help increase charcoal sales and enhance the quality of produce. The study recommended the need to increase government support in product value additions to the locals of Kitui County who are heavily on a producer-consumer approach with less bearing on enhancing the products. This would impoverish the financial gains with sound controls against environmental degradation.

Keywords: *Charcoal Value Chain, Implementation, Environmental Policies, Charcoal Management Act 2014*

1.0 Introduction

The world, specifically much of developing countries in Africa perennially faces an energy deficit. Approximately 1.6 billion individuals rely on forests for livelihood around the globe (Vedeld, 2007). Resources obtained from the forests have contributed immensely to people's

livelihoods (Angelsen et al., 2014). Among several forms of sustainable energy available in the world, the process of carbonizing wood to produce charcoal has been rated as the most common method of producing energy (Donev, 2020). This has a direct impact on the environment with numerous policies put in place to curb the negative impact. Understanding the Social determinants of implementation of environmental policy is crucial in sustainable development and most especially, in charcoal management as a case of study.

In mitigating the energy challenges, charcoal-producing countries all over the world have laid down various measures for regulation. Several countries have invested in research and development of solutions to mitigate the furnace preservation and cooling time that widely affects the ecosystem. Further, challenges to the production of charcoal were necessitated by a lack of *legal framework and lack of implementation.* Still, charcoal-related laws and regulations are considered difficult to implement. They are classified as legally voluntary even though they greatly influence the process of charcoal production (Rüter, 2016). Despite the existence of laws and regulations in most producing countries, production and trade in charcoal face challenges in adherence to the set rules leading to prevailing market-led considerations by the stakeholders. Comprehensive frameworks guiding charcoal production have been mostly deficient and, when in existence, they usually tend to be ineffective owing to the absence of clarity, implementation gaps, and conflict of interests (FAO, 2017).

1.1 Problem Statement

Most studies on challenges in the implementation of environmental policies focus on the political goodwill, policy window, and lack of technical abilities to implement and enforce the policies (Wuver & Attuquayefio, 2006; Agyeman, 2008; & Anku, 2006). This study sought to elucidate the social determinants that make it difficult to implement government policies in relation to charcoal management as a key environmental policy in Kenya.

A study by Kiruki (2018) tried to generally analyze the impacts of social, political, and economic effects on the implementation of Charcoal management policies, it failed to examine key attributes associated with a Charcoal Producer as a social entity such as the impact of his/her size of family and level of income as a determinant in policy implementation.

Further, a study by IJSR (2016) elaborated more on the environmental effects of charcoal production revealing that charcoal producers had little regard for the value chain and prevailing legal provisions. In addition, little is known about how the charcoal value chain determines the implementation of charcoal management as a key environmental policy. An additional study by Albuquerque (2019) did not address the impact of the value chain in charcoal production as a social determinant of the implementation of government policies but rather, it dwelt on the level of enforcement by government entities in respect of charcoal producers to security laws. There exists an information gap on the impact of value chains on the implementation of environmental policy. This research attempted to answer the question by evaluating the influence of the charcoal value chain as a key determinant for a coherent implementation of an environmental policy using a framework of the Charcoal Management Act 2014 in Kitui County as a case study.

2.0 Literature Review

2.1 Empirical Review

Prior to the implementation of the environmental laws, the value chain was considered the greatest hindrance to the implementation process and if unmanaged, it would raise the poverty levels for the charcoal producers (Mweemba, 2018). Zambia came up with a comprehensive

policy implementation framework on sustainable management recognizing that the enhanced use of charcoal was driven by the desire to fulfill household energy requirements and was a livelihood option for many of the poor locals (Mabele, 2019). Challenges in the implementation of laws were experienced the remedy was formation of small and manageable charcoal associations that would guarantee close monitoring of producers (Lieu, 2020). A small and organized group of charcoal producers were sensitized on implementation of environmental laws and went ahead to set up woodlots and nurseries for fast-growing species with irrigation support for biomass, support for the development of improved kilns, forestry extension to raise awareness on sustainable production practices and the rules and regulations on licensing (Lieu, 2020).

A study by Mulenga, (2019) in Zambia on access to electricity and consumption of charcoal among urban households indicated that low-income earners are the main consumers and producers of charcoal. Even though the number of enhanced technologies towards charcoal value chain addition has increased, a high percentage of charcoal produced above ground mounds or underground pits yields high-quality charcoal of immense quantities (Remedio 2017). Existence and Compliance in implementation of policies, laws, and regulations to govern forest management in Philippines have faced challenges posed by producers and consumers decrying poverty as the main challenge (Remedio 2017). For the last 3 decades, Tanzania has embraced diverse policy approaches to conserve the environment. Provision of livelihood benefits to the people has been rated the most attractive selling point for implementation of environmental policies (Mabele, 2019). This entails mutual benefits such as shamba system where farming can be undertaken alongside afforestation in application of a green economy project that examines degradation in Kilosa. A study by Mabele, (2019) examined conflict in the conduct of farming and forest conservation. This was to assess the concepts of justice that farmers express in line with the underlying conflicts. The study was built upon a constituent of political literature that, the empirical analysis of rural people's view of justice in environmental conservation was anchored on practical values of a multidimensional justice framework.

Implementation of public policies on non-renewable sources in both Baringo and Kitui Counties has been one of the areas of reference in the country (Pisces, 2012). A sack of charcoal in both Baringo and Kitui Counties fetches between Ksh107 and Ksh 613 depending on their location and role (Bourne, 2020). These species are chosen due to the heavy charcoal they produce and burn for a longer period, making it economically viable to use. Members of the community, stakeholders, and officials in the County government recognized precedence for the production of charcoal in the value chains. Policies and approaches entail among others proper utilization of biomass, effective usage, controlled processing, and additions in the value chain from producer to the end user.

There is sufficient evidence to demonstrate that charcoal production, especially in the world's tropical regions, has a destructive effect on the environment. The repercussions of charcoal production spread across multiple sectors and institutions. A study by Chidumayo (2013) in Lusaka Zambia revealed that poor charcoal production practices, such as the heavy reliance on traditional earth and pit kilns result in a wood-to-charcoal conversion rate of approximately 20%, which leads to the conclusion that the practice contributes to an overwhelming rate of deforestation because of its inefficiencies. The same findings were corroborated in a similar study by Villazón (2017) on charcoal production in southern Brazil (Remedio, 2017). While the study acknowledges that past failures in charcoal policies are influenced largely by wrong assumptions by relevant authorities involved in addressing the issue, various strategies can

reverse this trend. The study does not, however, define specific links between strategies among them, multi-stakeholder participation, can influence policy implementation, especially at grassroots levels.

3.0 Methodology

The research used a descriptive survey methodology to obtain quantitative data through questionnaires. The survey sample size of 205 charcoal producers calculated from a target population of 400 Charcoal Producers with a 5% margin error at a 95% confidence level was targeted. Quantitative data obtained was processed and analyzed using descriptive statistics. Results were presented in tables.

4.0 Results and Discussion

The study sought to examine whether charcoal value chains were a determinant in the implementation of environmental policy. The study sought to find different opinion of the respondents in regard to whether charcoal value chains was a determinant in the implementation of environmental policy. The findings are shown in Table 1.

Table 1: Level of agreement of the respondents on whether charcoal value chains were a determinant in the implementation of environmental policy

Statement	***F***	***%***	***F***	***%***	***F***	***%***	***F***	***%***	***F***	***%***	**Mean**	**SDV**
There is adequate law and policies in regard to charcoal value chain and management	**27**	**18.2**	**34**	**23.0**	**6**	**4.1**	**37**	**25.0**	**44**	**29.7**	**3.1**	**1.0**
Shortening the link between producer and consumer can help increase charcoal sales	61	41.2	39	26.4	11	7.4	16	10.8	21	14.2	3.4	1.5
Members of the family are consciously aware of the essence of environmental conservation	34	23.0	16	10.8	18	12.2	23	15.5	57	38.5	3.0	1.6
Members of the family are familiar with one or more policies governing charcoal production in the county	28	18.9	13	8.8	16	10.8	50	33.8	41	27.7	2.8	1.1
Average											3.3	1.4

Source: Survey Data (2023)

In the results above, it is clear that the majority of the respondents disagreed as denoted by 54.7%, while 41.2% agreed that there is adequate law and policies regarding charcoal value chain and management. The statement had a Mean of 3.1 and a Standard Deviation of 1.0.

Further, the study established that shortening the link between producer and consumer can help increase charcoal sales as evidenced by the majority of the respondents who agreed as denoted by 67.6 % (41.2% strongly agreed and 26.4% agreed, while 25% disagreed. The statement had a Mean of 3.4 and a Standard Deviation of 1.5.

In addition, the study established that most of the respondents disagreed as presented by 54% (15.5% strongly agreed and 38.5% agreed, while 33.8% agreed that members of the family are consciously aware of the essence of environmental conservation. The statement had a Mean of 3.0 and a Standard Deviation of 1.6.

In the last statement, most of the respondents disagreed as represented by 61.6%, while a very small number of the respondents agreed as denoted by 27.7% that members of the family are familiar with one or more policies governing charcoal production in the county. The statement had a Mean of 2.8 and a Standard Deviation of 1.1. The findings portray that shortening the link between producer and consumer can help increase charcoal sales irrespective of the available environmental laws. Moreover, the study found that there is inadequate awareness of policies and legal frameworks in regard to charcoal value chain and management. The study confirms that existing policies and laws are not fully implemented due to challenges related to various levels of value chains.

More so, the findings reveal that there is a need for the enactment of laws and policies based on levels of value chains that will guide the management and regulation of charcoal production in Kitui and environmental policies at large. The findings are in line with those of (Shure, 2017) who established that an increase in depletion of forest cover consequently increases the distance between the market places thus compelling an increase in the cost of production and pressure on underlying legal frameworks. A study by Mulenga (2019) in Zambia on access to electricity and consumption of charcoal among urban households indicated that low-**income** earners are the main consumers and producers of charcoal. Even though the number of enhanced technologies towards charcoal value chain addition has increased, a high percentage of charcoal produced above ground mounds or underground pits yields high-quality charcoal of immense quantities (Remedio, 2017). Existence and Compliance in implementation of policies, laws, and regulations to govern forest management in Philippines have faced challenges posed by producers and consumers decrying poverty as the main challenge (Remedio, 2017) For the last 3 decades, Tanzania has embraced diverse policy approaches to conserve the environment. Provision of livelihood benefits to the people has been rated the most attractive selling point for implementation of environmental policies (Mabele, 2019).

The analysis is further confirmed by qualitative analysis where the main themes emerging from the objective are summarized in the section. Sample from the Charcoal Management Committee, which had 12 members, and a selected number could provide the needed insights in a formal and informal capacity. Primary data collection from representatives of the Charcoal Management Committees was collected through personal interviews. Personal interviews were powerful tools for collecting qualitative data. They were great for documenting the beliefs and attitudes of the respondents towards elements of the study. The interviewees were coded to provide confidentiality and anonymity using alphabetical letters from A-Z. The summary of verbatim is as shown in the section.

The study found that charcoal burning has empowered residents both socially and economically, tougher environment has been negatively impacted by these activities. This was supported by a male interviewee who stated that:

Charcoal burning has empowered people; this is because this activity has enabled us to get money not only to eat but to educate our children as well. Also, through this business, we can meet different people thus enhancing our socialization. However, we are only concerned with our livelihood about environment conservation by ensuring trees are not depleted it is not our responsibility as long I get my livelihood. His assertion was supported by another female interviewee who stated that I don't care about environmental conservation, what I care most is whether her children can get food and I can be able to pay their school fees, Though, also charcoal burning can result in the degradation of both biodiversity and vegetation, however, if am shown an alternative source of livelihood I can shun this business of charcoal burning.

The findings portray the majority of the residents in Kitui County engage in charcoal burning due to a lack of alternative activities to get their livelihood. The findings are in agreement with those of (Smith, 2016) who established that participating in the production and transportation of charcoal enhanced actors' financial muscles and delivered other benefits, such as improved access to goods, services, and opportunities for diversification of livelihood. These gains contributed to the reduction of actor's vulnerabilities and improved their standards of living. However, profits were embedded in the availability of resources. Lack of resource management in charcoal production has led to unsustainable practices in harvesting. This led to localized degradation of forests and benefits to charcoal livelihood became unsustainable in the longer term. The lack of a sustainable environmentally commercial sector and the introduction of punitive measures and regulations increased actor's vulnerabilities and reduced income thus undermining market and livelihood security. This is despite the few positive effects on forestry protection of resources (Smith, 2016). Moreover, the results correlate with those of (FAO 2017) which indicated charcoal production had contributed to both biodiversity degradation and vegetation degradation. Degradation in vegetation entails a reduction in the quality and quantity of woody species, grass, and herbs in the environmental outcast.

5.0 Conclusion

From the study findings, it's concluded that shortening the link between producer and consumer can help increase charcoal sales and enhance the quality of produce. However, there is inadequate policies and legal framework in regard to charcoal value chain and management. The existing policies and laws are ineffective due to challenges in implementation. The implementation of these laws fell short of expectations due to the failure to consider producers' family sizes, producers gender orientations, level of income, and the impact of charcoal value chains in the implementation of environmental policies.

6.0 Recommendations

The study recommended the need to increase government support in product value additions to the locals of Kitui County who are heavily on a producer-consumer approach with less bearing on enhancing the products. This would impoverish the financial gains with sound controls against environmental degradation.

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