



# Governance of woodfuel value chains in Kenya

An analysis of policies, legislative frameworks and  
institutional mechanisms

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RESEARCH  
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Forests, Trees and  
Agroforestry



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Photo by Anthony Kitema/ADRA  
Charcoal sacks in Kitui East.

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# Executive summary

Woodfuel (charcoal and firewood) have consistently met over 70% of domestic energy demand for cooking and heating for decades in Kenya. It has been assumed that economic growth and the resultant increases in household incomes will result in charcoal users switching to modern fuels. There is evidence that instead of such a transition, there is a greater energy mix in urban areas where all wealth classes use different energy sources to some degree, a phenomenon commonly known as energy stacking. Over the years, policies and legal instruments have evolved, integrating provisions for production, sustainable supply and efficient use of woodfuel, even strategies towards elimination of woodfuel in the household energy mix. The main legal instrument used, the Charcoal Rules 2009, detail provisions for participation in charcoal value chains in Kenya.

This report on woodfuel governance in Kenya presents results from a characterization study aimed at generating insights and options for more sustainable woodfuel value chains in Kenya under the Center for International Forestry Research–World Agroforestry Center (CIFOR–ICRAF) ‘Governing Multifunctional Landscapes’ program. The methodology consisted of (i) a literature review, (ii) a questionnaire survey and (iii) stakeholder mapping using social network analysis for 113 woodfuel value chain stakeholders in Kitui and Baringo counties. These exploratory studies were conducted during the 2018 logging moratorium, which could have confounded the results. Results indicate that governance of woodfuel in Kenya, like most sub-Saharan African countries, is characterized by legal pluralism, with various legislations mandating different agencies

to guide and support woodfuel resources. Multiple stakeholders had overlapping mandates with limited coordination.

The majority of people in Kitui (79%) and Baringo (92%) were aware of the rules and regulations governing woodfuel production and trade. However, value chain actors believed there were no clear sanctions or penalties for defaulters. Kitui actors indicated that they complied mostly with the logging moratorium Gazette Notice 28, while in Baringo a high proportion did not comply with any rules. Of the respondents, 81% bemoaned a lack of incentives for sustainable woodfuel production. In addition, there were no organized efforts to manage woodfuel resources besides the ban and limited training and access to improved technologies. Despite the many woodfuel provisions detailed in the policies and legislations enacted by the Kenyan government, there are still challenges to achieving sustainable woodfuel production, trade and utilization. Kenya has developed policy and legislative frameworks to guide, control and support sustainable woodfuel production, trade and utilization. However, despite the many woodfuel provisions detailed in the policies and legislations, regulatory and support systems do not seem adequate to achieve sustainable woodfuel value chains as evidenced by periodic bans. For instance, the 2018 logging moratorium renders charcoal ‘illegally legal’. It is legal to produce for subsistence, illegal to transport and trade, but perfectly legal to sell and use without any traceability mechanism. It is important, therefore, to devise institutional arrangements and mechanisms that will facilitate, guide, support and incentivize investments and compliance in the woodfuel value chain.



# 1 Introduction

Like most countries in sub-Saharan Africa, Kenya is still highly dependent on woodfuel, which meets over 70% of domestic energy demand for cooking and heating (MENR 1994; Kendagor and Prevost 2013; GoK 2015). Modern fuels (electricity and gas), though being the most desired cooking fuels worldwide, are seldom available or affordable to most households in sub-Saharan Africa. For decades, energy policies in various countries have been designed with the assumption that economic growth and the corresponding increases in household incomes will result in charcoal users switching to modern fuels (Sola et al. 2019). There is evidence that instead of such a transition, there is stacking where all wealth classes use different energy sources to some degree, (Dalberg 2018; Sola et al. 2019). Dependence on woodfuel in Kenya has remained high for decades, with firewood used by 90% and 26% of rural and urban households, respectively, while charcoal is used by 40% of rural and 47% of urban households respectively (MoE and CCAK 2019). Five years ago, it was reported that 87% of wood used for charcoal production in drylands was sourced from private farms either owned individually or communally (Mutimba and Barasa 2005). However, a more recent study carried out in Baringo, Kitui and Kwale in 2018 showed that 97%, 92% and 68% of households, respectively, sourced trees for charcoal from their farms (Ndegwa et al. unpublished data).

Thus, although Kenya has developed policy and legislative frameworks to guide, control and support sustainable woodfuel production, trade and utilization, there is a lack of adequate support for the development of sustainable woodfuel value chains (Wood and Garside 2014). Repeated bans have been imposed on transportation, yet

the charcoal finds its way to the insatiable urban markets. This was the case with Narok district in 2003 and 2005, which still met 40% of Nairobi's charcoal demand, while Kitui transporters paid their way through police check points to deliver the charcoal in 2012 (KFS 2013). For instance, at the beginning of 2018, the Kitui county government banned movement of charcoal outside of the county, while the national government moratorium of 2018 outlawed cutting of trees in public forests. Several legislative provisions for the production and transportation of charcoal were partially suspended until November 2020 (MEF 2018), since it is difficult to prove the origin of woodfuel products. However, Kenya Forest Service (KFS) released a circular allowing importation and licensed production of charcoal from private farms under the Charcoal Rules 2009 and the Forest Conservation and Management Act 2016. Unfortunately, most of the institutions concerned with woodfuel experience chronically limited financial, human and other resources reducing their capacity to effectively enforce rules, support extension services and promote adoption of the requisite technologies among charcoal producers (KFS 2013; GoK 2015; MEF 2018). This study is part of the broader woodfuel value chain governance study whose preliminary results are presented in Sola et al. (2019). The main objective of this study was to generate insights into the current governance and institutional arrangements for woodfuel value chains in Kenya. The aim was to improve understanding of institutional and operational bottlenecks and advance policy options by: (i) investigating the existence and status of policies and legislative frameworks and (ii) assessing the extent of implementation of the policies/legislation from the perspective of value chain actors and stakeholders.

## 2 Background and literature review

### 2.1 Woodfuel policy provisions

The governance of woodfuel in Kenya is characterized by legal pluralism with many legislations mandating different agencies to guide and control woodfuel resources spread across several sectors: environment, forestry, agriculture and energy at both national and subnational levels (Sola et al. 2019). In most countries the policy and legislative frameworks have evolved over the years, integrating provisions for woodfuel production and use, although charcoal has been banned repeatedly (Sola et al. 2019). For instance, in 2000, commercial production of charcoal from gazetted forests was banned. However, the sale and consumption remained legal (Mutimba and Barasa 2005). The ban was not sustained as it could not be enforced. Subsequent policies increasingly focused on sustainable supply and efficient use of woodfuel, although this came after several attempts that included the Draft Forest Policy of 2005 (Mbuthi 2009), Draft Forest Policy Sessional Paper No. 4 of 2006 and Draft Sessional Paper No. 1 on Forest Policy 2007 (MENR 2006). These had a stronger focus on regulation of the production and marketing of charcoal, but they remained as drafts. It was until the National Forest Policy 2014 was enacted that issues of reducing illegality was promoted with the aim of establishing a chain-of-custody and certification system for all traded wood and wood products (MEWNR 2014).

Like the forest policy and legislative framework, the major objectives of the Energy Policy of 2004 included ensuring efficient and sustainable production, distribution and marketing of charcoal while minimizing the environmental impacts thereof. (Mugo and Gathui 2010; MoE 2012, Sola et al. 2019). However, the Draft National Energy and Petroleum Policy created an impetus for developing strategies and mechanisms to eliminate biomass fuels as household energy sources by 2022 (GoK 2015, Sola et al. 2019).

### 2.2 Woodfuel legislative provisions

The Environmental Management and Coordination Act No 8 of 1999 was the main legislation providing integration of environmental concerns in national policies, plans, programs and projects including woodfuel management and. It mandated District Environment Committees to control utilization of forest and tree resources including woodfuel, and charcoal production (GoK 1999). The Chapter 385 Forests Act 1942 (revised in 1982 and 1992) also required people to have licenses or permits to access and use from protected forests (Nachmany et al. 2014; Sola et al. 2019).

The subsequent Forest Act of 2005 provided for the establishment of a semi-autonomous agency, the KFS charged with giving policy direction regarding the management, conservation, regulation and utilization of all types of forest areas, among other objectives (GoK 2005; Sola et al. 2019). KFS became functional in 2007 and published the Forest (Charcoal) Rules in 2009. This extended their mandate to licencing production and movement of charcoal by charcoal producer associations (CPAs) and charcoal transporters respectively. First, the rules mean that commercial charcoal producers should be in a registered CPA and acquire charcoal production licenses from the KFS. (GoK 2016). Second, to obtain this license, the applicant is required to have a harvesting permit issued by the KFS forest officer upon submission of a letter from his/her area chief confirming land ownership (GoK 2005; Mbuthi 2009; Sola et al. 2019). The Chief's Act empowers the area chief to regulate timber harvesting and any wasteful destructive activities on trees (GoK 2012). Third, charcoal transporters are required to have a movement permits issued by KFS upon

submission of a certificate of origin and receipts endorsed by the owner of the land as proof of purchase. Last, wholesalers and retailers of charcoal are expected to keep records of the sources of their charcoal, including certificates of origin and movement permits (GoK 2005 2016; Mbuthi 2009; Sola et al. 2019). Likewise, exportation and/or importation of charcoal or charcoal products require possession of a permit issued under the forest (charcoal) regulations 2009 (GoK 2016). KFS therefore is mandated to collect and remit all revenues from these permits, certificates and licenses (Wood and Garside 2014; Sola et al. 2019). In 2016, the Forest Act 2005 was repealed by the Forest Conservation and Management Act (2016). With the advent of devolution, county governments were formed and went on to develop their own charcoal legislation and strategies. Examples include Kitui County Charcoal Management Act (2014) and Baringo Charcoal Production Act (2016), which seek to control production and marketing of charcoal within the county borders with the support of KFS.

In the energy sector, the Energy Act 2006 established the Energy Regulatory Commission, mandated to promote development of renewable energy including biomass energy using fast-maturing trees and commercial woodlots (GoK 2006). In the latest energy policy of 2018, the energy sector sought to promote alternatives to woodfuel as well as collaborate in promoting subsistence and commercial biomass production (MoE 2018).

## 2.3 Key strategies and plans with woodfuel provisions in Kenya

In addition to the policies and legal instruments, several national and county development plans and strategies were developed incorporating issues of woodfuel production, development, utilization and regulation (Sola et al. 2019). Before 1990, the strategies, like the policies and legislations, focused on electricity development and distribution and had less emphasis on woodfuel (Kuboka 2001). In the 2000s, the strategies for energy development were very much influenced by the national focus on industrialization and improving quality of life, as well as environmental management (GoK 1996; Mbuthi 2009; Sola et al. 2019). There was a general thrust toward investing more in renewable energies, such as solar, wind and geothermal, improving efficiency of woodfuel use and subsequently eliminating it as the major household energy source (Sola et al. 2019). Equally there was a strong emphasis on commercial tree growing and farm forestry motivated by the need to attain 10% forest and tree cover (Ministry of Devolution and Planning 2013; Sola et al. 2019).

At subnational level, County Integrated Development Plans are the main guiding documents operationalizing national development strategies and plans, while integrating local priorities. Like the national plans, there is great emphasis on increased electricity access and conservation of forests through promotion of alternative energy efficient technologies as well as increase in forest cover (Baringo County Government 2018; Kitui County Government 2018).

# 3 Methodology

## 3.1 Study sites

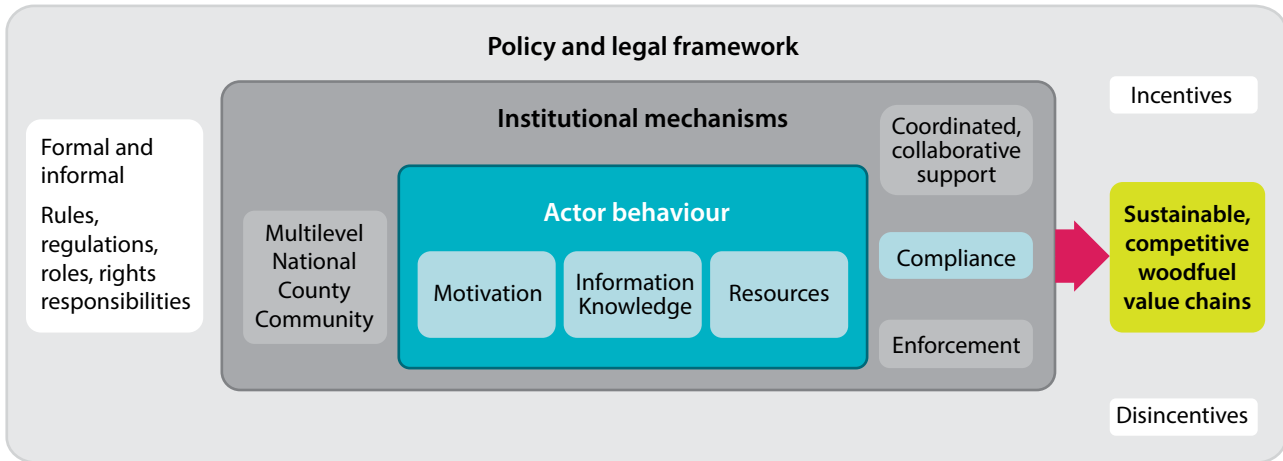
**Kitui County**, lying 160 km east of Nairobi, has been one of the major suppliers of charcoal to most major cities in Kenya (Ndegwa et al. unpublished). It has a land area of approximately 30,496.4 km<sup>2</sup> and is the sixth largest county in the country. The county is considered mostly arid and semi-arid with erratic and unreliable rainfall and temperatures ranging from 14 to 32°C (Kitui County Government 2018). At the time of the 2019 census, the population was 1,130,134 (KNBS 2019). The economy is dependent on agriculture with maize, sorghum, millet, pulses and root crops, and livestock of cattle, goats, sheep and poultry (Kitui County Government 2018). The county is characterized by high levels of poverty and about half of the population does not have access to improved water sources (Kitui County Government 2018). Fuelwood is the main cook fuel source, used by 79.5% of households, more than the national average of 54.6% (Kitui County Government 2018). Tree cover in the county is reported at 7% with an increase in tree cover in recent years and charcoal cited as a threat to forests (Kitui County Government 2018). Most households use traditional stone fires for cooking. Electricity connections are below the national average, with paraffin, electricity, solar and battery lamps the main sources of lighting (Kitui County Government 2018).

**Baringo County** is situated in the Rift Valley region of Kenya. The equator runs through the southern part of the county. It has an area of 11,015.3 km<sup>2</sup>, of which 165 km<sup>2</sup> is covered by lakes (Baringo County Government 2018; Pepela, et al. 2019). Rainfall ranges from 1500 mm per annum in the highlands to 600 mm per annum in the lowlands, and temperatures from 10 to 35°C (Baringo County Government 2018). The population was 666,763 in 2019 based on

the census (KNBS 2019). Nomadic pastoralism is predominant in some parts of the county with much of the land being community land, while private/freehold land makes up 45% (Baringo County Government 2018). A quarter of the county is reported to be under forest cover but the spread of invasive *Prosopis juliflora* has also been substantial with a coverage of 18,792 ha reported in 2016, compared to 882 ha in 1988 (Baringo County Government 2018; Mbaabbu et al 2019). Maize and beans are mainly grown in the highlands while sorghum and finger millet are grown in the lowlands. Other grains, horticultural crops and coffee are also grown in the county. Honey production is also practiced in most parts of the county with charcoal production recognized as a value chain activity (Baringo County Government 2018). Just below 10% of the county population is connected to electricity and 59.8% use paraffin for lighting. Most households use woodfuel for cooking with 95,600 using firewood for cooking and 12,600 using charcoal (Baringo County Government 2018).

## 3.2 Conceptual framework

The conceptual framework for the study pivoted on knowledge about a policy and legal framework that aims to guide and control behavior of value chain actors and stakeholders in order to develop sustainable charcoal value chains. Institutional arrangements to support value chain actors have been established at national, subnational and community level defining rules, rights and roles. However, actor behavior is also shaped by motivations, knowledge, information, opportunities and engagement exhibited in levels of compliance, which influences chances of achieving sustainable and competitive woodfuel value chains (Figure 1).



**Figure 1. Conceptual framework**

Source: Authors

The study consisted of three components presupposing that governance of woodfuel value chains is dependent on (i) the existence of known policies that are implemented, (ii) rules and regulations that are enforced and complied with by value chain actors and (iii) coordinated institutional arrangements with capacity to render support and guidance (Sola et al. 2019). The study methodology included (i) a review of literature on key policies and legislation guiding, supporting and controlling woodfuel value chains in the past three decades; and (ii) a survey of woodfuel value chain stakeholders to investigate their state of knowledge and compliance, as well as levels of support, clarity of roles and coordination.

### 3.3 Data collection, analysis and synthesis

The literature review, conducted from May to July 2018, was guided by three components: (i) policies, legislations and strategies for guiding and supporting woodfuel production, trade and consumption; (ii) institutional arrangements for the implementation of policies, legislations and plans and, (iii) status of implementation. In total, 437 articles were retrieved from Web of Science, Scopus, Google Scholar and Taylor & Francis Online, as well as organizational websites (Annex 1). Both original research and review articles were included in this study. Using inclusion criteria detailed in Annex 2, 143 articles were included in the synthesis (Sola et al. 2019).

A survey was conducted in Kitui and Baringo counties between October and November 2018, during the logging moratorium, which could have influenced the results. This was an exploratory study using a semi-structured questionnaire survey, administered to targeted institutions in order to improve understanding of institutional and operational constraints. Thus, an initial list of institutions mandated to regulate and provide support services to woodfuel value chains was drawn from the literature review while interviewees identified during the project launch workshops that comprised about 40 participants in both Baringo and Kitui. The survey was conducted by one enumerator in each country to ensure consistency in questioning and data capture. Value chain actors and stakeholders were selected to participate in the survey during the project launch workshops and then snowball sampling was applied resulting in 113 respondents being interviewed. These included producers, traders, regulators and service providers. Data was collected using electronic data capture on Open Data Kit and later downloaded and cleaned.

The survey had two parts, the first part related to stakeholders' participation, coordination and institutional mechanisms, while the second part aimed at investigating perceptions about woodfuel governance and specifically institutional and operational constraints to sustainable woodfuel value chains. Data was analyzed across sites and type of stakeholders.

Stakeholder mapping results were analyzed and displayed using social network analysis. Analyzing connections between stakeholders to uncover

patterns of interaction by mapping and measuring relationships and flows of critical information and resources between different stakeholders is critical in understanding their interest and influence (Wasserman and Faust 1994; Prell et al. 2009; Lienert et al. 2013). Stakeholder analysis can improve the understanding of stakeholders' perceptions and interests (Grimble and Wellard 1997; Brugha and Varvasovszky 2000), and how these influence outcomes along the woodfuel value chain and overall sustainability, including environmental impact. Woodfuel value chain stakeholders are groups, organizations or individuals who influence or are affected by decisions along the value chain, from production through trade to utilization, and include regulation and advisory service provision.

Data was synthesized, with each stakeholder (also called an actor or node in social network analysis) representing their organization. Sociograms were developed using the R-Studio igraph package (Csardi and Nepusz 2006) and density calculated as the average degree of nodes (the average number of connections per interviewed actor). (Bourne et al. 2020). To assess information flow and control in the network, centrality measures were used to determine the potential control of communication by stakeholders in a network (Freeman 1977;

Wasserman and Faust 1994). First, degree centrality was calculated using the outward and inward number of connections (or ties) an actor had with other stakeholders. Second, closeness, the measure of communication efficiency of was calculated. This is determined by how close a node is to every other node in the network (important nodes are close to other nodes); actors with high closeness can transfer information quickly to the whole network. Third, betweenness was measured. Betweenness is the extent to which each node (stakeholder) falls on the shortest communication path connecting pairs of actors, acting as a bridge in the network (Freeman 1977; Landherr et al. 2010).

### 3.4 Limitations

There were some limitations to this study. First, the surveys were conducted during a logging moratorium covering the whole country and a charcoal movement ban out of Kitui County. As such, some respondents were not willing to answer questions which might implicate them or authorities. Second, the majority of respondents were men, as they occupied most technical staff positions in the sector. Gender disaggregation of the results therefore did not yield any useful information.

# 4 Results

## 4.1 Organizations supporting, guiding and controlling woodfuel value chains

Results from the survey indicated that institutions known to guide, regulate and control woodfuel activities were the KFS, chiefs, county government and the police in both counties. Although many institutions were identified as being mandated to govern the woodfuel value chain, most respondents said KFS was the main one in Kitui (81%), while in Baringo it was less clear as many were mentioned. Most of these institutions were national agencies, 54% and 65% of the respondents in Kitui and Baringo, respectively, compared to less than 25% for county- and community- level organizations (Table 1).

Generally, these institutions were perceived by the value chain actors to have authority to control access. In addition, a third of the respondents also believed they or their organization influenced woodfuel regulation to a significant extent,

more so in Baringo than Kitui. This makes coordination in woodfuel governance critical. Thus, institutional arrangements for supporting, promoting, developing and regulating woodfuel production, utilization and marketing involves many government agencies (Sola et al. 2019). For instance, the Kitui Charcoal Management Act 2014 states that the enforcement team comprises representatives of various government agencies: (i) County Ministry of Environment and Natural Resources; (ii) KFS; (iii) Kenya Wildlife Services; (iv) county revenue department; (v) National Police Service; (vi) county village, ward and sub-county administrators; and (vii) selected community members (Kitui County Government 2014). So far, the implementation of this act has faced a number of challenges, including inadequate enforcement capacity at county level and corruption in general that allowed non-residents to plunder forest resources and produce charcoal unsustainably in the county.

**Table 1. Institutions regulating and supporting woodfuel value chains**

Regulatory institutions	Baringo	Kitui	Total
	% Respondents		
Kenya Forest Service	54	81	69
County revenue department	29	16	22
Charcoal Producers Association	31	5	17
National Environmental Management Agency	33	3	17
Kenya police	4	24	15
Ministry of Interior	8	17	13
Chiefs	8	13	11
County Ministry of Environment and Natural Resources	0	21	11
Community-based organizations/non-governmental organizations	12		5
Others: Kenya Wildlife Service; village administration; Ministry of Energy; sub-county administration; United Nations Food and Agriculture Organization; judiciary; Ministry of Water; ward administration	<8	<8	<8

## 4.2 Knowledge on rules and regulations for woodfuel value chain governance

The institutional assessment survey indicated that the majority of stakeholders, comprising actors, service providers and regulators, in Kitui (79%) and Baringo (92%) were aware of rules and regulations governing woodfuel production and trade. However, knowledge of the legal provisions mandating the institutions to govern woodfuel value chains was very limited across all stakeholders. The Forest Act, Kitui Charcoal Management Act, County Act and Kenya Constitution were believed to be the main legislations mandating institutions in Kitui, while

in Baringo it was the Forest Act and Charcoal Rules as well as CPAs and community bylaws. However, most of the stakeholders believed they were partly enforced thus partly effective (Figure 2).

A total of 16 organizations were said to monitor woodfuel use and enforce regulatory provisions (Table 2). The main ones were KFS, local administration (chiefs), the County Enforcement Unit, police and CPAs. The monitoring mechanisms were perceived to be very effective by almost 27% of the respondents, while 27% and 56%, including regulators and support service providers, suggested they were not effective at all.

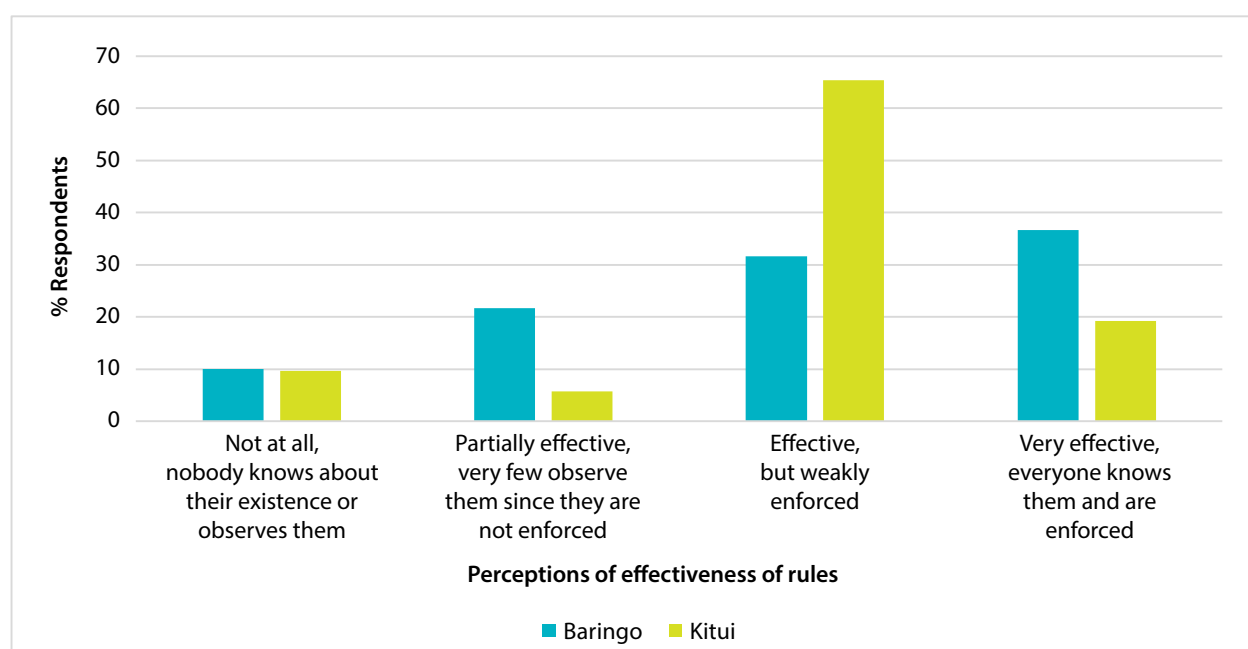


Figure 2. Effectiveness of rules for regulating woodfuel value chains in Kitui as perceived by the stakeholders

Table 2. Institutions responsible for monitoring woodfuel value chains

Institutions	% Respondents		
	Baringo	Kitui	Total
Kenya Forest Service	94	61	77
Local administration	71	27	48
Ministry of interior/Police	29	27	28
CPAs	50	2	24
Baringo County Government	25	39	12
Kenya Wildlife Service	8	10	9
Community	17	0	8
County Ministry Environment and Natural Resources	0	10	5
Others: NEMA Ministry Agriculture; Kenya Forestry Research Institute; Judiciary	<7	<7	<7



### 4.3 Stakeholder roles, interactions and networks in Kitui and Baringo counties

The majority of the stakeholders in the network were either services providers, regulators or held dual roles of regulator and provider of support services (Figure 3). In some cases, regulators were also engaged in trade or production of charcoal, resulting in potential conflicts of interest, particularly when regulation and trade were undertaken simultaneously.

Baringo County had a denser stakeholder network than Kitui County (Figures 4 and 5). Dense networks are critical for coordination and information dissemination. The more connections there are, the easier it is for information to flow between stakeholders (also called nodes in networks). A denser stakeholder network in Baringo may have contributed to the greater awareness of rules and regulations and more institutions playing a large role in governance. In Kitui, the study could have been constrained by respondents being reluctant to provide information since charcoal trade/transportation outside the county had been banned, leading to a lower average degree of nodes. Information exchanged was mainly on management of trees and woodfuel production, environmental conservation,

regulation and enforcement (Table 3). In Baringo County, national and county government along with non-governmental organizations (NGOs) played central roles in the network. The CPAs and other community-based organizations linked producers, traders and agents to these central stakeholders. Environmental groups were prominent in Baringo County compared to Kitui, with interactions regarding environmental conservation being more often reported in Baringo (Table 3), most likely due to the presence of designated conservation areas in the county.

Interactions between stakeholders were mainly around issues of management and planting of trees, charcoal production and environmental conservation as indicated by more than a third of the respondents in both counties (Table 3). However, unlike Baringo, in Kitui there were no indications of exchanges to facilitate trade, which could have been a result of the sensitivity of the topic during the charcoal ban in that county.

The stakeholders that held the networks together and prevented fragmentation were KFS, the Kenya Forestry Research Institute (KEFRI) and the county governments as they were the most connected. NGOs (Caritas, the Adventist Development and Relief

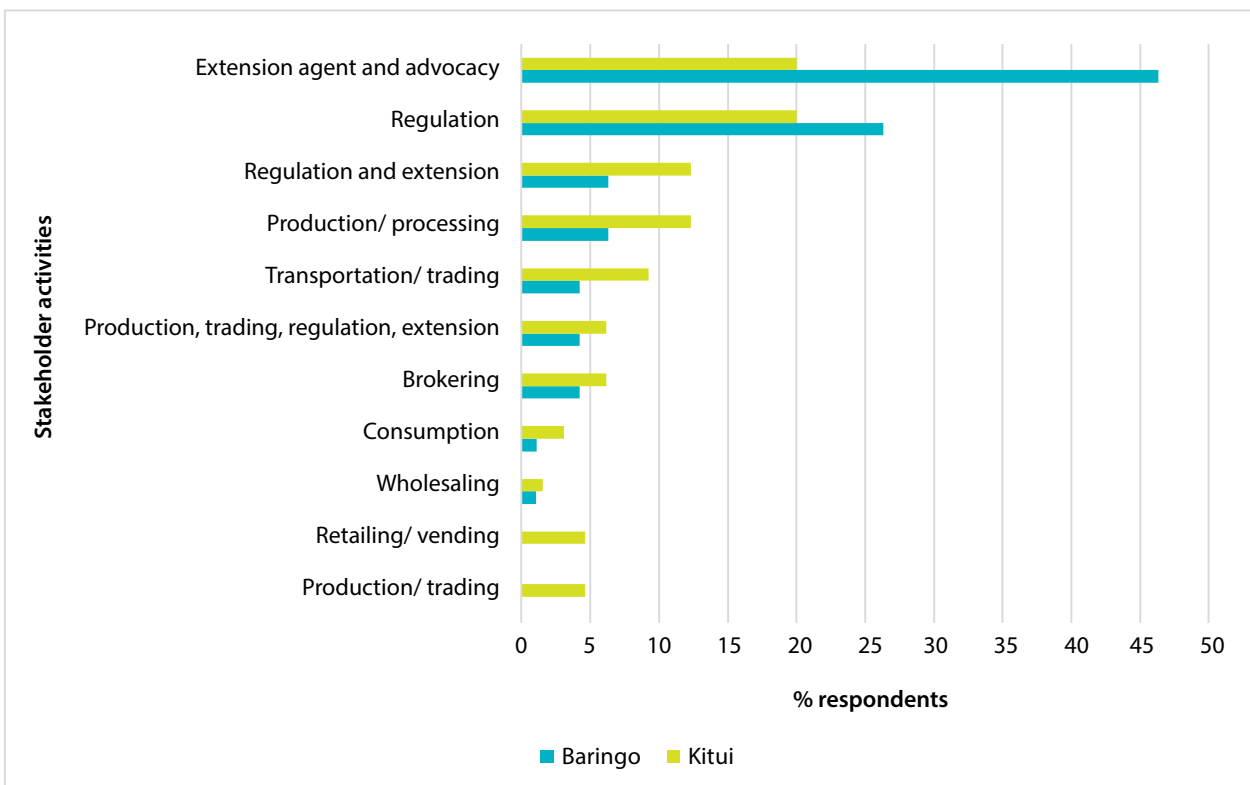


Figure 3. Roles and activities of woodfuel value chain stakeholders in Kitui and Baringo

Agency (ADRA) and World Vision), CPAs and some national government institutions were equally key in facilitating and controlling information flow/communication between stakeholders as measured by degree of centrality. Betweenness also suggested that most of these stakeholders were

not only connected but also had the potential to control information flow related to woodfuel production, trade and regulation by acting as bridges between network segments. However, measures of closeness centrality identified a different set of key stakeholders indicating that additional stakeholders,

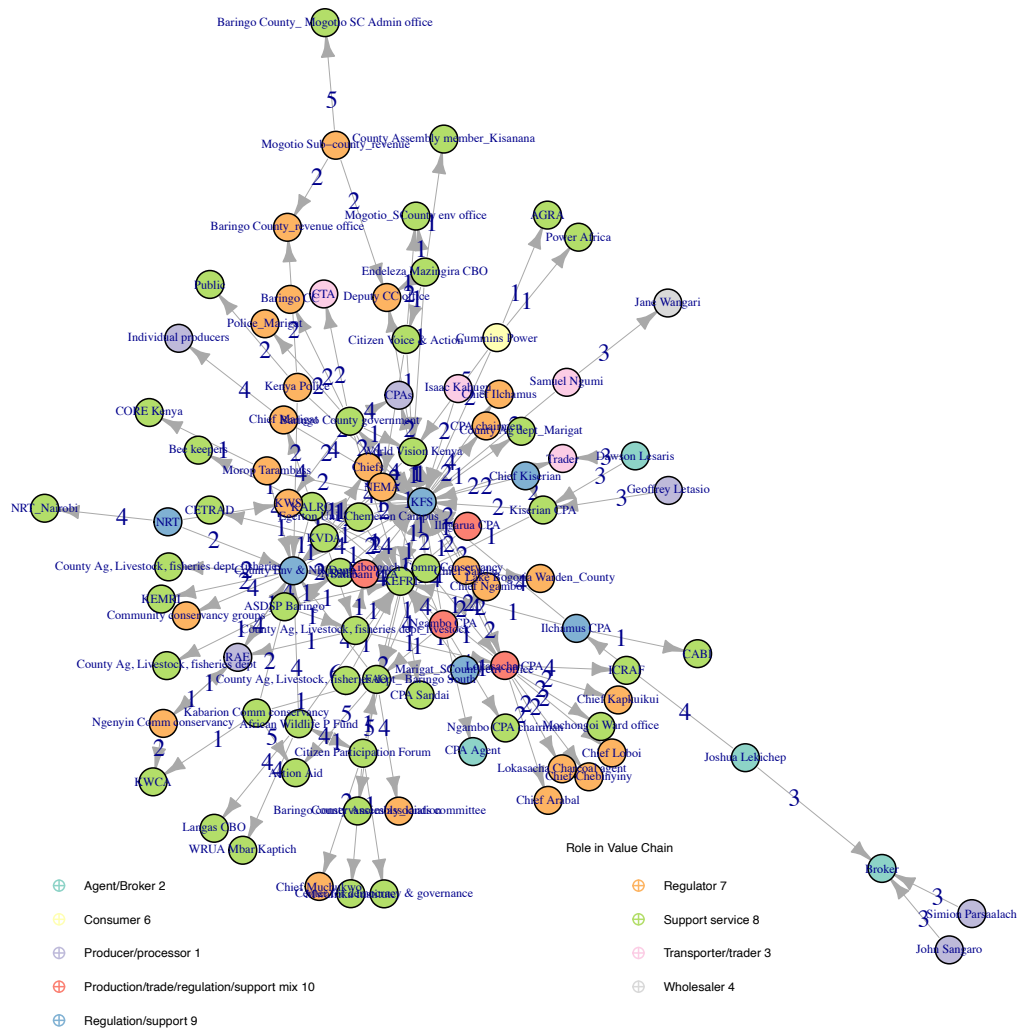


Figure 4. Baringo County stakeholder network showing stakeholder role (color) and interaction type (numbers in Table 3) in the woodfuel value chain

Table 3. Reasons for interactions among woodfuel value chain stakeholders

Code	Reason for interaction	Proportion of respondents (%)	
		Kitui	Baringo
1	Management of trees and woodfuel production, environmental conservation	33	41
2	Regulation (information or enforcement)	38	32
3	Sale, purchase and trade of charcoal	17	5
4	Regulation, production and/or trade	12	20
5	Coordination and conflict resolution		3

other than those most connected may be needed to transfer information quickly in the network. The stakeholders identified with higher closeness included more community-based organizations and individuals. Generally, the results indicate that national government departments and NGOs play

important roles in the woodfuel value chains in Kitui and Baringo. Most of the information was relayed during stakeholder awareness meetings, capacity building events and chief barazas as identified by 58%, 35% and 31% of the respondents, respectively (Table 4).

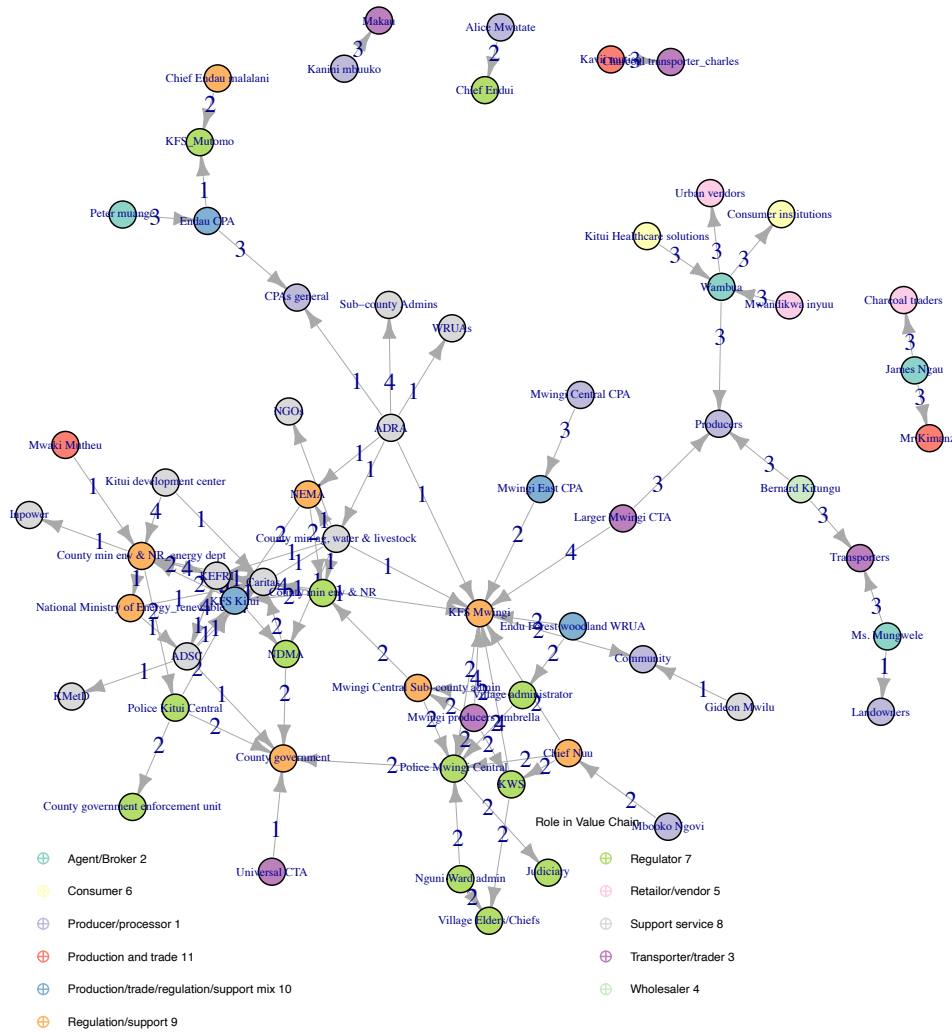


Figure 5. Kitui County stakeholder network showing stakeholder role (color) and interaction type (numbers in Table 3) in the woodfuel value chain

Table 4. Mode of information flow among stakeholders

Mode of information dissemination/communication	Baringo (%)	Kitui (%)	Total (%)
Stakeholder awareness meetings	26	96	58
Capacity building events	40	29	35
Chief barazas/meetings	34	27	31
Phone calls/messages	6	52	27
Seminars	34	13	25
Circulars, briefs	18	15	17
Media – TV, Internet	10	13	11
Reading statutory instruments	0	23	11

#### 4.4 Stakeholder motivation, incentives and compliance

As many as 81% of the respondents bemoaned the lack of incentives for sustainable woodfuel production. For those who responded positively, the main incentives were capacity building, access to technologies, livelihood diversification and management of *Prosopis juliflora* in Baringo county. In addition, most respondents were not aware of any organized efforts to manage woodfuel resources beyond the ban and training or access to improved technologies. Notwithstanding, almost all woodfuel stakeholders interviewed in Baringo (95%) and less than half in Kitui (42%) suggested that production and trade in woodfuel were beneficial. However, most regulators and support service providers argued that the benefits did not justify the investment because: (i) the cost of regulation and enforcement was too high; (ii) there was inequitable distribution of benefits as only middlemen/outsidere/cartels benefit the most; (iii) producer prices have remained unviably low; and (iv) there is no tracibility system such that there is unchecked competition with unregistered suppliers

not bound by any rules (Table 5). In addition, there was limited knowledge and understanding of who was bearing the cost of managing woodfuel resources. In Kitui, respondents mentioned the county government, the community and national government, while in Baringo they believed nobody did, while a few mentioned CPAs, landowners and the community.

This study indicated that value chain actors believed there were neither strong disincentives, deterrents nor clear sanctions and penalties for defaulters in both Baringo and Kitui. Since this study was conducted during the logging moratorium and charcoal ban, most respondents in Kitui indicated that they complied with the Gazette Notice 28. In Baringo a significant proportion indicated they complied with no rules (42%), while some (24%) indicated they complied with the regulation on *Prosopis juliflora* which allows charcoal trade, and others (20%) complied with the Charcoal Rules of 2009 (Table 6). Generally, respondents believed rules were only partially effective because they were not effectively enforced.

**Table 5. Proportion of respondents acknowledging existence of benefits from and incentives for sustainable woodfuel production and trade**

Woodfuel value chain stakeholders	Benefits		Incentives	
	Baringo (%)	Kitui (%)	Baringo (%)	Kitui (%)
Actors	100	69	33	15
Consumers			50	33
Regulators	83	10	45	20
Service providers	95	24	29	41
Total	96	42	36	23

**Table 6. Rules that value chain actors complied with in Kitui and Baringo counties**

	Kitui (%)	Baringo (%)	Total (%)
None	4	45	26
Gazette Notice 28	48		22
Charcoal Rules	10	21	16
Regulation on <i>Prosopis</i>		26	14
Association bylaws, CPA, CTA	17	3	10
Other: Forest Act; Chiefs Act; County laws; Kitui Charcoal Management Act	<10	<10	<10

### 4.5 Challenges regarding woodfuel production and trade

Woodfuel value chain stakeholders in Baringo and Kitui listed 15 issues as the major governance challenges in Kenya. Top of the list were corruption, poor market systems, limited livelihood support, limited capacities of the community, and CPA, the

logging moratorium Gazette Notice of 2018 and inadequate legal/policy framework (Figure 6). In Kitui, there was a general perception that there was political will (73%) to address challenges in the sector, while in Baringo some people believed there was no political will (58%). In both counties, it was mostly the value chain actors that did not believe there was political will (63%) (Table 7).

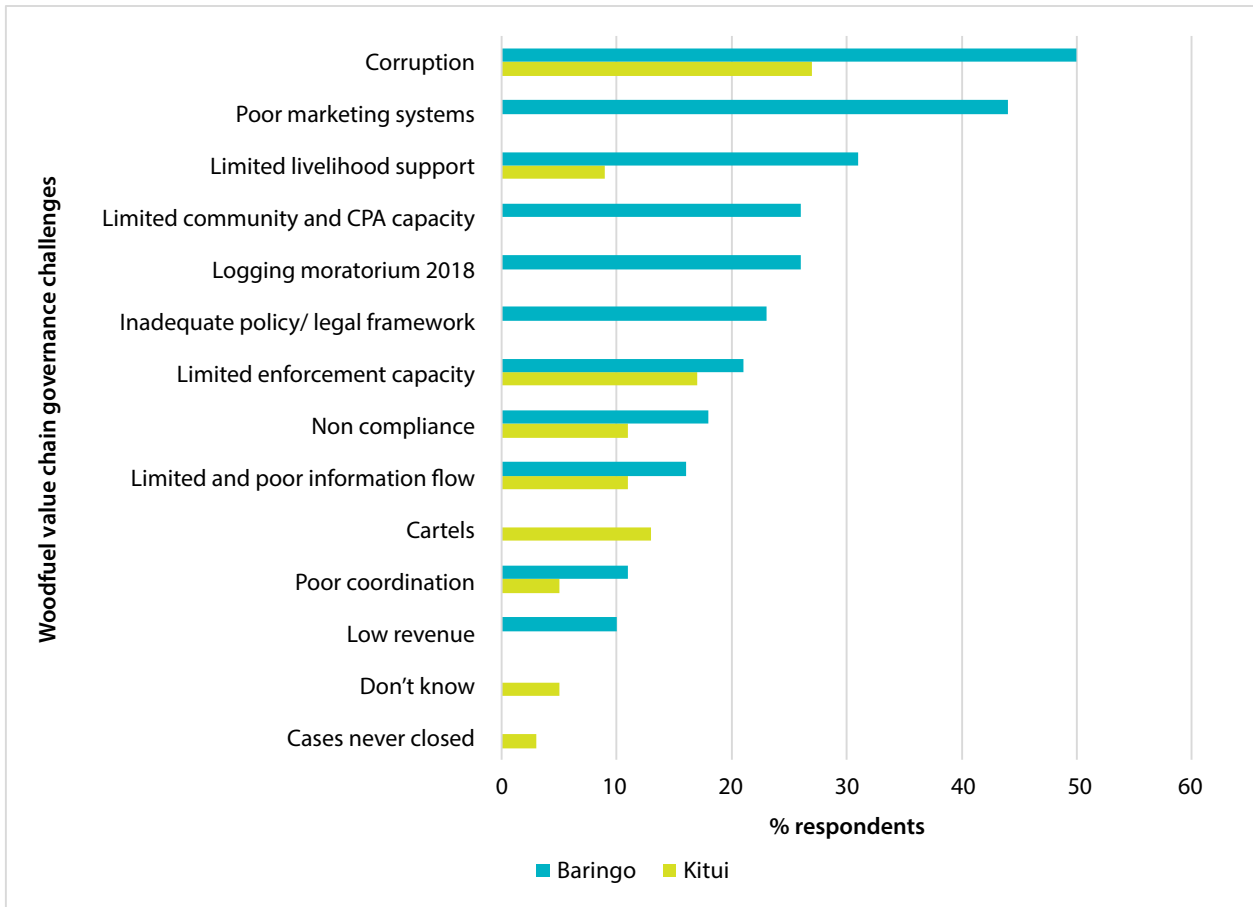


Figure 6. Woodfuel value chain governance challenges in Baringo and Kitui counties

Table 7. Presence of political will to deal with woodfuel governance challenges

	Presence of political will	Value chain actors (%)	Regulators (%)	Service providers (%)	Total (%)
Kitui	No	40	20	6	27
	Yes	60	80	94	73
Baringo	No	66	39	59	58
	Yes	34	61	41	42

## 5 Discussion and conclusion

Kenya has formulated policies and enacted legislation for guiding, managing and supporting woodfuel value chains. The Forest Charcoal Rules 2009 is the key legislation. However, even with well-developed policies and legislative frameworks, charcoal production and distribution are inadequately guided, controlled and supported. Institutional arrangements for regulating and supporting woodfuel value chains are very weak (Sola et al. 2019), as evidenced by repeated bans due to poor enforcement and compliance. Legal pluralism complicates the situation resulting in many institutions being mandated to guide and control woodfuel value chains production, trade and utilization. This is compounded by the delayed and prolonged decentralization of responsibilities espoused by the transition implementation plans. Unfortunately, county governments are not yet adequately resourced to fully take over the support and regulatory functions historically provided by KFS and other agencies. Thus, both national and county government are still important actors in the governance and support of sustainable woodfuel value chains. This means the devolution transition period ended before transition was fully affected, thus counties still require support in developing and implementing woodfuel production, trade and utilization policies, bylaws and strategies.

CPAs play critical roles in the governance of woodfuel value chains, as shown in the stakeholder mapping, and should be given the requisite technical, legal and organizational support to be fully operational. The role of CPAs and other community-based stakeholders in connecting producers, traders and brokers with county and national government remains crucial. In addition, a streamlined enforcement mechanism supporting a sustainable woodfuel value chain requires engagement of a wider set of stakeholders, including private sector players, who were invisible in this study.

Furthermore, charcoal is often rendered 'illegally legal' due to periodic bans which criminalize some parts of the value chain while legalizing others. Under most bans and moratoria, it is illegal to commercially produce and transport, while it is perfectly legal to sell and use charcoal (Sola et al. 2019). In fact, most of the charcoal is 'illegal' as it is produced by unregistered CPAs, most of whom do not have a requisite capacity for self-regulation and self-governance to comply with the regulations (MEF 2018; Sola 2019).

The study results suggest that there was limited knowledge about and low compliance with rules and regulations, which could be attributed to the lack of incentives for sustainable woodfuel production and trade, as well as limited support for organized efforts to manage woodfuel resources. As shown in the conceptual framework of this study, the policy and legal frameworks together with institutional mechanisms should guide and shape actors' behavior by motivating and incentivizing them to comply and contribute to sustainable woodfuel value chains.

Nonetheless, the charcoal value chain has remained resilient despite the bans and moratoria throughout the decades and is likely to continue for the foreseeable future. Since the 1980s, there has been a projection that people would transition from biomass fuels to more modern energy sources, but this has not happened in most sub-Saharan countries. Woodfuel is easily accessible, affordable or the preferred energy source in the form of charcoal for urban households and in the form of firewood in rural areas (Sola et al. 2019). In urban areas, charcoal has two categories of users: urban charcoal-dependent poor and users by choice in the middle- to high-income households (World Bank 2014). This implies that in addition to cost, other factors such as how the energy source meets needs and fits into the cooking culture play a role in

energy choices. Thus, woodfuel will continue to be the primary energy source of choice for many in rural and urban households (Shankar et al. 2020). Therefore, the need for inclusive, collective and coordinated development and implementation of mechanisms for guiding and supporting sustainable woodfuel value chains

in Kenya cannot be overemphasized. But what exactly would incentivize compliance? What interventions and investment are required to incentivize and catalyze sustainable woodfuel production and trade? Answers to these questions are pertinent in making woodfuel, especially charcoal value chains, more sustainable.

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# Annexes

## Annex 1 Search terms

1. (woodfuel) AND (Governance) AND (Kenya)
2. (woodfuel value chains) AND (Governance) AND (Kenya)
3. (woodfuel) AND (policies) AND (Kenya)
4. (woodfuel value chains) AND (policies) AND (Kenya)
5. (woodfuel) AND (legislative frameworks) AND (Kenya)
6. (woodfuel value chains) AND (legislative frameworks) AND (Kenya)
7. (woodfuel) AND (institutional mechanisms) AND (Kenya)
8. (woodfuel value chains) AND (institutional mechanisms) AND (Kenya)
9. (woodfuel) AND (value chains) AND (Kenya)
10. (woodfuel) AND (Kenya) AND (Governance)

## Annex 2 Inclusion criteria

Component	Specific information for inclusion
Woodfuel policy provisions	<ul style="list-style-type: none"><li>• Provisions for woodfuel production</li><li>• Provisions for wood fuel trade</li><li>• Regulatory agencies, coordination, planning</li><li>• Woodfuel recognition</li><li>• Tree planting</li><li>• Wood and charcoal production</li><li>• Charcoal licensing and trade</li><li>• Firewood licensing and trade</li><li>• Woodfuel alternatives</li><li>• Production /consumption technologies</li><li>• Incentives and financing</li><li>• Private sector engagement</li><li>• Biomass research</li></ul>
Woodfuel Legislative provisions	<ul style="list-style-type: none"><li>• Provisions for woodfuel production</li><li>• Provisions for wood fuel trade</li><li>• Regulatory agencies, coordination, planning</li><li>• Woodfuel recognition</li><li>• Tree planting</li><li>• Wood and charcoal production</li><li>• Charcoal licensing and trade</li><li>• Firewood licensing and trade</li><li>• Woodfuel alternatives</li><li>• Prod Consumption technologies</li><li>• Incentives and financing</li><li>• Pvt sector engagement</li><li>• Biomass research</li><li>• Charcoal ban</li></ul>

continued on next page

Component	Specific information for inclusion
Woodfuel management strategy/plan	<ul style="list-style-type: none"> <li>• Provisions for woodfuel production</li> <li>• Provisions for wood fuel trade</li> <li>• Regulatory agencies, coordination, planning</li> <li>• Forestry and woodlands, tree planting</li> <li>• Energy strategy</li> <li>• Environment strategy</li> <li>• Agriculture</li> <li>• Woodfuel</li> <li>• Charcoal production and trade</li> <li>• Research in wood production, processing technologies</li> <li>• Incentives and financing</li> <li>• Gender considerations</li> </ul>
Institutional arrangements for implementing the legal framework	<ul style="list-style-type: none"> <li>• Mandate, roles, responsibilities, activities of, departments of national and county governments dealing with forestry, energy, environment, agriculture, wildlife, policing</li> </ul>
Implementation of policy and legal framework	<ul style="list-style-type: none"> <li>• Clear policy and legal framework</li> <li>• Institutional and regulatory arrangements in place /coordination/conflict resolution</li> <li>• Institutional capacity and financing</li> <li>• Incentives for compliance</li> <li>• Corruption and political interference</li> </ul>
Environmental, economic, cultural and social drivers for woodfuel production and trade	<ul style="list-style-type: none"> <li>• Affordable energy source</li> <li>• Poverty/ lack of opportunities</li> <li>• Ready urban markets</li> <li>• Employment/livelihood</li> <li>• Land clearing</li> <li>• Incentives to transition</li> <li>• Corruption</li> <li>• Lack of effective policy means</li> <li>• Contribution to national development</li> </ul>



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Successful woodfuel value chain governance is dependent on the existence of known policies that are implemented, rules and regulations that are enforced and complied with by value chain actors and institutions with capacity to regulate and render support. Kenya has formulated policies and enacted legislation for guiding, managing and supporting woodfuel value chains. These policies and legal frameworks have evolved over the years, integrating provisions for sustainable production, distribution and use of woodfuel. However, even with well-developed policies and legislative frameworks, charcoal value chains are inadequately governed, beset by illegality, weak institutional arrangements, overlapping mandates and limited coordination and cooperation. Nonetheless, charcoal value chains have remained resilient despite the bans and moratoria throughout the decades and likely to continue in the foreseeable future. Limited knowledge, lack of incentives for sustainable production and limited support for organized efforts to manage woodfuel resources are contributing to low compliance with rules and regulations. Therefore, the development and implementation of interventions coupled with appropriate investments to incentivize and catalyze sustainable woodfuel production and trade cannot be over emphasized.



RESEARCH  
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Agroforestry

This research was carried out by CIFOR as part of the CGIAR Research Program on Forests, Trees and Agroforestry (FTA). FTA is the world's largest research for development program to enhance the role of forests, trees and agroforestry in sustainable development and food security and to address climate change. CIFOR leads FTA in partnership with Bioversity International, CATIE, CIRAD, INBAR, ICRAF and TBI.

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