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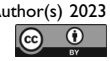
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Charcoal politics in Africa: Value chains, resource complexes, and energopolitics

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Abstract

Charcoal is a primary urban energy source throughout Africa; it is also blamed for massive environmental harm, in particular deforestation and forest degradation. Despite its centrality to urbanization, rural economies, and contemporary environmental transformations, however, charcoal's politics have been relatively underexplored. This article develops three approaches to the study of charcoal politics in Africa by critically assessing the existing literature on charcoal and drawing on studies of the politics of other forms of energy. First, charcoal can be understood as a commodity within value chains, generative of profits and rents. Formal and informal institutions govern charcoal's distribution, and the relative power of actors determines access, control, and proceeds. Second, charcoal is a material object manufactured from trees and distributed through socio-technical infrastructures. It is embedded within "resource complexes" involving political contestation around land, trees, labor, transport, and legitimacy, determining where, how, and by whom charcoal is produced and traded. Third, charcoal is a source of energy within specific energy regimes that underlie political-ecological systems, a form of "energopolitics." Uganda provides a case study illustrating the energopolitics of charcoal as it shapes the state, state–society relations, and visions of development and modernization.

Keywords

Energy, African politics, charcoal, political ecology, Uganda

I Introduction: From Charcoal Policy to Politics

The politics of oil, gas, hydropower, and solar are all subject to extensive study, as are the politics of forests, land, and extractive resources. It is therefore puzzling that the politics of charcoal remain relatively underexplored, despite charcoal being a primary source of energy for urban Africa and being blamed for widespread deforestation and forest degradation in the continent. Produced by carbonizing wood in basic

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kilns in rural areas and then transported to urban areas for use in metal stoves for cooking and heating, charcoal is a multi-billion dollar industry in Africa, with over 10 million people involved in production and trade, and among the continent's top cash crops (Branch et al. 2022; Mwampamba et al. 2013; Sola et al. 2017; Zulu and Richardson 2013). It is the primary fuel for up to 80% of the population of some African cities and its use is expanding with ongoing urbanization at an estimated 3% per year (FAO 2017). It is traded in widespread national and international networks, with powerful actors aligned around the sector (Branch and Martiniello 2018). Charcoal is also highly contentious due to its perceived ecological destructiveness and is subject to production bans, intensive attempts at regulation, and popular and elite contestation. Today it is moving squarely onto national and international conservation, carbon forestry, and sustainable development agendas, a subject of global concern (FAO 2017; Zulu and Richardson 2013). In short, charcoal is a polyvalent material object embedded within diverse regimes of society, ecology, economy, and culture, from tree to atmosphere, rural to urban, producer to consumer, and local to global, all shaped by relations of power, inequality, and force—that is, by politics (Baptista 2018; Bergmann, Roden and Nüsser 2019; Cline-Cole and Maconachie 2016; Walsh 2019).

The growing literature on charcoal in Africa is predominantly concerned with charcoal policy, however, especially the need for formal regulation and technological improvement, rather than charcoal's politics (Branch et al. 2022). This literature often begins with the deficits said to characterize the sector, the "weak, misguided, neglected, underdeveloped, disjointed, overly prohibitive, contradictory or non-existent woodfuel policies and laws, combined with poor enforcement and regulatory capacity" (Zulu and Richardson 2013, 130). It is this regulatory deficit that is blamed for charcoal's ecological and social harms, which include deforestation and forest degradation, economic inequality, indoor air pollution, and loss of government revenue. Many studies thus conclude with programs for regulatory formalization of the institutional framework within which charcoal is produced, marketed, and used, as well as technological improvement, so that charcoal might contribute to, instead of hindering, sustainable development (Sola et al. 2019).

However, such proposals for regulatory and technological reform have little meaning without considering the political interests, structures, and struggles that shape the charcoal sector and with which policy interventions inevitably contend. Attention to the politics of charcoal is crucial for understanding not only its ecological and social impact and potential for sustainability, but also, we argue, the ways that charcoal has underpinned modern urbanism and helped to shape the state, international governance, and social relations in Africa. This article develops three different approaches to the study of charcoal politics by situating and critically assessing the existing literature that addresses the politics of charcoal, as well as by drawing on studies of the politics of other forest resources and other forms of energy to further illuminate the multiple dimensions of charcoal politics. These three approaches are by no means exhaustive of charcoal's political life, but rather represent an attempt to help develop a more robust set of conceptual tools and wider array of disciplinary approaches than is available at present. While this article is specifically geared towards charcoal in Africa due to its centrality to urban energy and to rural economies and ecologies there, it may also provide guidance for approaching other energy sources whose politics have been similarly neglected.

Most of the existing literature that does consider the politics of charcoal treats it as a commodity within value chains, generative of

profits and rents, an approach we engage in Section II. Here, politics are understood as the power relations that determine how those profits are distributed along the charcoal value chain and by whom rents are extracted from that chain. The focus is often on the formal and informal institutions governing distributions of profit and rent, or on the relative power of different actors to access and control the chain to their advantage. In this approach, charcoal is treated like any other abstract commodity within markets, which are shaped—or abused—by certain actors to produce unequal distributions of proceeds.

Next, we consider charcoal not as an abstract commodity, but as a specific kind of material object with certain characteristics—namely, as produced from trees and forests by certain forms of labor and distributed through particular socio-technical infrastructures: in short, as embedded within "resource complexes" (Watts and Peluso 2014). Here, charcoal is not abstracted as just another commodity within value chains; rather, these chunks of carbonized wood are concretely part of political contestation around land, trees, labor, and legitimacy, which may have little to do with financial proceeds and much to do with polyvalent struggles over power and authority. The consideration of charcoal within resource complexes signals the importance of the discursive dimensions of charcoal's politics, how and why certain narratives and images of charcoal are produced, circulated, and deployed. Charcoal's expansive lifespan also requires a multi-scalar analysis across the local, national, regional, and global registers, which we consider via carbon forestry.

Finally, charcoal is not simply a commodity within value chains, nor simply a resource within social-ecological complexes; rather, it is of crucial importance specifically as a source of energy that is critical to African urban life and thus to modern African states (Baptista 2018; Castán Broto 2019). We seek to engage the politics of this dimension of charcoal through the concept of "energopolitics," which considers "how energic forces and infrastructures interrelate with institutions and ideations of political power (Boyer 2014, 309; Huber 2015). In order to illuminate the politics of charcoal-as-energy, we pay attention to the particular urban forms and urban-rural relations it has enabled, as well as the political structures, identities, and contestations that are enabled by the forms of energy the state relies upon. Section IV illustrates this approach by considering charcoal's place within Uganda's energopolitics.

In brief, we consider the politics of charcoal as a commodity within value chains; as a resource within social-ecological complexes; and as a form of energy within energopolitical regimes. The conclusion returns to the question of charcoal policy, demonstrating how these three approaches to charcoal politics can illuminate the challenges and processes of charcoal policy in novel ways.

II Charcoal as a Commodity Within Value Chains

As noted, the most prevalent approach to the politics of charcoal tends to represent the path of charcoal from tree to stove as a value chain, in which charcoal is a commodity subject to a series of value-additions from which actors derive proceeds, either as profit or rent. As Ihalainen, Schure and Sola (2020, 2) put it, this approach makes "visible dynamics of inclusion and exclusion along various nodes of the value chain, providing insights into the role of formal and informal institutions in supporting or regulating the chain…as well as examining linkages and power relations between chain actors and stakeholders." Politics is thus located in the institutions and relations of power that shape the charcoal value chain, particularly by enabling and disabling access to and control of the market in ways that determine distributions of proceeds (Agyei, Hansen and

Acheampong 2020; Schure et al. 2015). An unequal distribution of proceeds can signal unequal distributions of institutionalized or non-institutionalized power along the value chain, a useful approach to grasping the politics of an industry that is often outside of formal regulation and in which power and authority can be hard to locate. This section explores the insights provided by existing studies of the politics of charcoal as a commodity before considering these approaches' limitations.

2.1 Politics Along the Value Chain

Value chain analysis situates charcoal politics in a relational network of actors that shapes how charcoal is produced, distributed, and consumed, leading to different arrays of benefit and harm. This approach requires a comprehensive view of charcoal's trajectory, from tree to kiln, transport, market, stove, and, ultimately, atmosphere (Baumert et al. 2016; Ihalainen, Schure and Sola 2020; Ribot 1998; Shively et al. 2010; Sola et al. 2019). Charcoal begins its life as the woody biomass of trees or shrubs, derived from land under an array of tenure regimes, including farmland, plantations, woodlots, on-farm trees, private forests, or protected areas. The (in)formal arrangements of rights and privileges determining access to trees already has a major impact on distributions of proceeds (Jagger 2014). Different modes of production also produce different values, depending on tree species, whether trees are coppiced, selectively cut, clear-cut, or uprooted, and whether exclusively for charcoal or as part land clearance. Production can be carried out under different labor arrangements, including by local farmers, unemployed youth, or migrant work crews, both men and women, with different earnings. Carbonization technologies and efficiencies vary, from earthmound to metal kilns, with profitability varying significantly. Charcoal may be transported by producers on bicycles to nearby markets, by small dealers with motorcycles or trucks to towns, or by large cartels, military, or government using fleets of trucks over hundreds of kilometers. The largest markets are in urban areas, where charcoal is typically distributed in a sprawling network of dealers, enabling consumers to purchase large sacks or a few handfuls. By-products may also form part of the value chain, such as greenhouse gases that are commodified as negative emissions resulting from more efficient production or reduced consumption.

At each one of these steps, different configurations of power and institutions shape access to the value chain and to its profits. One common pattern is for powerful actors—particularly merchants, transporters, and wholesalers—to control key nodes where profit is concentrated (Agyei, Hansen and Acheampong 2018; Obiri et al. 2014; Ribot 1998; Schure et al. 2013), while numerous small producers, whether working independently or as hired labor, barely reach subsistence levels. Large-scale dealers, possibly with vertical integration of production and trade, have been represented as having a "bundle of power" around access to resources, licenses, markets, and transport, conferring an advantage over small producers and dealers (Baumert et al. 2016) and able to steer the market towards their interests (Sander et al. 2013). This power can be institutionalized formally or backed up by informal force (Agyei, Hansen and Acheampong 2020; Ribot 1998). Inequalities can translate into differential market power: urban merchants can have significant capital, information on wholesale markets, networks of transporters, and political influence, giving them power over prices, labor, and debt obligations. The geographical dispersion of small producers with limited information, and dealers' capacity to find new supplies, further reinforce power imbalances and the resulting unequal profits (Agyei, Hansen and Acheampong 2018; Ribot 1998).

Other patterns have also been identified. Different value chains, with different associated

power structures and distributions of proceeds, can arise side-by-side: Smith et al. (2019) compare a production site near the Mozambican capital and one near a small northern town. In the former, "charcoal production is dominated by non-local (mostly urban) large-scale operators and wholesalers, who typically employ migrant producers and retain >90% of profits"; whereas in the latter, lesser demand promotes income diversification among small producers who accrue significant economic benefits and better ecological outcomes. Large quantities and more complex chains may lead to more unequal distributions of income and environmental harm, as the power shifts to larger from smaller producers and dealers.

Value chain analysis is increasingly exploring the diverse forms of power—for instance, the gendered nature of land access, labor roles, and authority—that determine how proceeds are distributed (Ihalainen, Schure and Sola 2020). While men often predominate in production (Baumert et al. 2016; Shively et al. 2010), in Ghana, cultural norms about gender labor roles have led to women's prevalence in wholesale and retail (Agyei, Hansen and Acheampong 2018). Politicized ethnicity can also factor in, as production may be dominated by certain ethnic communities or shaped by differential access to land, labor, and capital; similarly, rural–urban relations also determine incomes (Faye and Ribot 2017; Ribot 1998). In short, multiple and intersecting axes of difference determine the formal and informal power shaping charcoal value chains and their unequal profits.

2.2 Rents Fueling Politics

A second strand in the literature on charcoal as a commodity addresses how political power differentials enable the extraction of rents, both formal and informal, from value chains and how those rents can support political actors. In contrast to other extractive energy resources such as oil, states are normally not the only, or even the primary, stakeholder in charcoal value chains. Thus, allocation of rents is subject to complex negotiations among producers, transporters, dealers, and the various state, non-state, and community actors who claim authority over trees, land, roads, and markets.

Formal institutions can include forestry departments, local governments, energy commissions, police services, traditional bodies of chiefs or elders, community organizations, producers' groups, and others, often with overlapping or contradictory claims. For instance, taxes and licensing fees for tree cutting or transport can vary significantly: taxes collected from producers range from as high as 33% in Malawi, to about 8% in Ghana (with traditional institutions reaping 4% of the profit), to even less elsewhere (Agyei, Hansen and Acheampong 2018; Baumert et al. 2016; Smith et al. 2015). Rents are also extracted without formal regulation, as police, military, customs agents, local government, forestry officials, and others may take advantage of charcoal's often ambiguous legal status, especially in transport, to demand informal or illegal payments. These "rents of non-enforcement" (Côte and Gautier 2018, 167) have been estimated to account from 2% to 20% of the final price of charcoal (Agyei, Hansen and Acheampong 2018; Baumert et al. 2016; Kambewa et al. 2007; Shively et al. 2010). This informal taxation may even be considered legitimate among dealers or consumers if costs are less than formal taxation (Laudati 2013). The policy literature often calls for the formalization of rents as state revenue; depending on the underlying political arrangements, however, formalization may further benefit operators with the capital and connections needed to operate under restrictive regulations while marginalizing small producers (Brobbey, Hansen and Kyereh 2021; Iiyama et al. 2017). State taxation can also create incentives for government actors to unsustainably maximize production and revenue.

Given the significant contestations around securing substantial charcoal rents within this

often semi-illegal space, it is not a surprise that violence can arise around the value chain. Taxation and other fees, whether by state or traditional authorities, may be violently imposed upon and resisted by producers, dealers, or exploited communities (Agyei, Hansen and Acheampong 2020). In the Democratic Republic of Congo, informal taxes on forest resources are described by Laudati (2013, 44) as "not only survival strategies during periods of conflict, but…legitimate forms of local opposition and socio-economic structures within a wider predatory state system." In the extreme, charcoal may become a "conflict resource" (Le Billon 2014), as recent studies explore how violence secures charcoal rents and is fueled by those rents in turn, for instance as a source of revenue for militias in the DRC (Marijnen and Verweijen 2020). In Somalia, charcoal has been a source of illicit revenue for Al Shabaab, who produced charcoal at gunpoint with teams of migrant, sometimes forced, laborers. Meanwhile, humanitarian vehicles were reported to be transporting charcoal, as the Kenyan contingent of AMISOM charged illegal "taxes" on exports from Somalia's ports (Monitoring Group 2015; Rembold et al. 2013).

Attention to the distribution of profits and rents among different actors along the charcoal value chain can help illuminate the power balances among institutions and interests in this often obscure realm. It also recognizes the central importance of financial gain in driving the charcoal industry and its political contestations. Yet this approach has its limitations. Using the value chain as an analytical tool abstracts charcoal from its context and treats it as just another commodity or forest resource, simply with different distributions of profits due to different arrangements of power. The conceptual distinction between a value chain and an exogenous set of political institutions that shape that value chain and determine profits and rents can neglect those institutions as dynamic contexts of political struggle and contestation that determine how, where, and by whom charcoal is produced, and are shaped in turn by charcoal production and trade (Branch and Martiniello 2018). As we explore next, the value-chain approach to charcoal politics can be supplemented by an analysis that does not treat charcoal as an abstract commodity, but as a specific kind of material object that is part of dynamic social-ecological complexes. These complexes encompass relations of production and trade and are characterized by contestation and struggles over money but also over power, authority, and symbolic stakes (Cavanagh, Vedeld and Trædal 2015).

III Charcoal Within Resource Complexes

Charcoal can be a commodity within value chains, but it is also a material object produced from trees growing on particular pieces of land, worked on by certain people's labor, transported and sold in specific infrastructures, and consumed by certain people. Charcoal is thus embedded in a diversity of different socio-ecological complexes that are shaped by a wide array of dynamic social and political relations and structures that need to be taken into account (Leach and Scoones 2015); the concept of the "resource complex" is useful here, defined as the "configurations of historically and geographically contingent institutional and political economic forces" within which resources are embedded and that they are shaped by (Watts and Peluso 2014, 184).

Framing charcoal as a material resource within socio-ecological complexes focuses attention on the ways that production and trade take place amidst broader social transformations, such as around land tenure, labor relations, age and gender inequalities, or demographic transitions. Control over charcoal production and trade can shape or be shaped by these multiple dynamics in ways that the value-chain approach may miss. The resource complex also enables us to take into account the fact that charcoal production often occurs in conjunction with other activities,

such as land-clearing for agriculture, land-grabbing, or the expansion of plantation forestry, and so its politics cannot be easily divorced analytically from these other power-laden processes. Resource complexes also allow for attention to the intricate ecological contexts of charcoal: for instance, charcoal is often situated in a nexus with other resources, such as water, which determines dynamics of control over or resistance to charcoal production among local communities. A focus on these contextualized forms of contention also invokes the discursive dimensions of charcoal politics, including how different actors—from local residents, to international NGOs, states, forest officials, development agents, transporters, stove designers, or political elites—make sense of and argue over the appropriate place of charcoal within their livelihoods and environments.

3.1 Multiple Charcoal Struggles

Recognizing charcoal within resource complexes calls attention to the overlapping and dynamic struggles around trees, environments, land, transport, labor, and energy—as well as financial gain—in sites where wood is extracted and charcoal is produced, all within a broader landscape of institutions, actors, and authorities extending far beyond the particular trees or forest. The politics of labor, as it is structured through gender, age, and other identities within households and communities, has immense bearing on contests over who gets to—or has to—produce charcoal. Where young, local men produce charcoal, it has generated contentious politics with elders around rural transformation; where migrant laborers are involved in production, it can generate contentious ethnic and national politics (Branch and Martiniello 2018). The politics of land are also a key determinant of charcoal politics, as production involves struggles over land, trees, or forests, entailing questions of property and access rights. While charcoal production may be seen as leading to new socio-environmental conflicts, these are necessarily rooted in historical contestations over land tenure and access, both among inhabitants and between communities and external actors (Leonardi and Browne 2018; Lund and Boone 2013). Local environments are also at stake in the political contention around charcoal, as different modes of production can lead to different ecological impacts (Mwampamba, van Schaik and Castillo Hernandez 2018; Pelletier et al. 2021): in some circumstances, local inhabitants take a more careful approach to production, while large-scale dealers or migrants may produce charcoal destructively on land towards which they have no responsibility (Branch and Martiniello 2018). Environmental damage can give rise to resistance as authorities or commercial dealers seek to open forests to charcoal production while affected communities or activists fight to keep charcoal production out.

Attention to these broader contestations of charcoal resource complexes can reveal the dynamic, plural, and overlapping institutional frameworks that shape charcoal's politics. For instance, producers may attempt to secure their claims to trees through different institutional authorities. By validating rights and granting access, institutions can solidify their legitimacy and authority over resources, people, and land (Agyei, Hansen and Acheampong 2019; Benjaminsen and Lund 2002; Milgroom 2015; Sikor and Lund 2009). Struggles over land institutions can become enmeshed with charcoal dynamics: charcoal may drive the commodification and privatization of land or provoke local customary claims to forests, part of wider struggles over land tenure among state and customary authorities, community groups, commercial farmers, and international agencies. Efforts to promote sustainable charcoal or forest management can be equally subject to, and generate, political conflicts both within communities and between communities and external actors (Mabele 2019).

Multi-scalar authority structures can emerge around charcoal resource complexes: Marijnen

and Verweijen's (2020, 17) analysis of armed conflict in the DRC demonstrates a "particularisation, regionalisation and transnationalisation of regulatory authority" around charcoal. The co-presence of formal and informal state authorities, NGOs, rebel movements, militias, state military, Belgian military support, militarized forest rangers, and international organizations creates plural authorities with the effect of entrenching ethnic politics, inequality, and unaccountability. In South Sudan, Leonardi (2020) documents the expansion of charcoal production and trade in recent years to supply rapid post-war urbanization. The compressed timescale has displaced small producers and traders, in particular women, as charcoal becomes part of the militarized market on which urban residents depend. Expanding charcoal production has overrun existing customary modes of regulating access and use of trees as new forms of militarized authority dominate the industry, producing a particular charcoal resource complex. In some cases, such as northern Uganda and South Sudan, the forms of bodily violence, extortion, and theft that are associated with extraction blur the line between war and peace and shape the constitution of political authority and environmental violence (Branch and Martiniello 2018; Haysom et al. 2021; Leonardi 2020).

Historical inquiry, required to understand this dense fabric of overlapping authorities and rival claims on revenues, trees, land, labor, and legitimacy, is often missing in existing studies of charcoal (Baptista 2018; Cline-Cole 2007; Cline-Cole and Maconachie 2016; Sola et al. 2017). Attention is needed to the recent history of formal state structures but also to colonial rule for the origins of traditional governance arrangements and to contextualize the invocation of tradition in contemporary claims about forests (Berry 2002). Attention to the history of governance can thus illuminate the construction of land tenure arrangements, rules of access and use of forests and trees, and divisions between local communities and outsiders, all providing the basis for charcoal politics.

Historical inquiry also raises the need to engage with charcoal narratives (Cline-Cole 2007; Dewees 2020). Charcoal narratives entail assumptions about where charcoal comes from, who is producing it, who is profiting, and what its ecological and social impacts are, justifying specific forms of state, non-state, or international power over landscapes and people. For instance, narratives of charcoal as fueling crime justify increased security and surveillance; the idea that small-scale producers are to blame for ecological harm justifies intrusive control of rural lives; or the narrative of informality being at the root of charcoal's problems justifies the marginalization or criminalization of livelihood production (Branch et al. 2022; Smith et al. 2015).

3.2 Charcoal and Political Forests

Forests are themselves constructed through political processes, as certain lands and trees have been historically classified and understood as forests or woodlands to enable political power over resources, land, and people. Charcoal resource complexes are thus often part of the constitution of what Peluso and Vandergeest (2020) termed "political forests," as charcoal represents the material object around which assemble discursive constructions of forests and the justification and application of technologies of power (Marijnen and Verweijen 2020). Indeed, charcoal is of interest to states not only because of revenue, but also because of the power and control that can be exerted over often recalcitrant landscapes and people in the name of promoting, regulating, repressing, or banning charcoal production and trade. Thus, charcoal's politics can arise both from the industry itself as well as from the institutions and interventions established in the name of regulating or controlling it, entwined in unexpected ways.

Narratives of charcoal-driven forest degradation—that is, the classification of certain forests or woodlands as threatened or degraded by charcoal production—play a central role in the discursive construction of political forests by justifying a certain set of "solutions" often involving the mobilization of state power (Hecht, Morrison and Padoch 2014). These narratives may at times rely on "false forest histories" (Fairhead and Leach 1995) that misread forest landscapes and, for instance, place the blame for ecological harm on small rural charcoal producers while ignoring the role of the state and large enterprises. It can be in states' interests to blame charcoal for deforestation, since clamping down on "illegal" charcoal production can help support state power over rural populations, including through militarization (Cavanagh, Vedeld and Trædal 2015). It also removes attention from the role of commercial agriculture in land use change, which may be part of state development agendas (Doggart and Meshack 2017). The political classification of trees can give rise to contradictions: in Ghana, for instance, some protected forest reserves degraded by cocoa production and illegal logging are still categorized as "forest lands," while charcoal production landscapes with extensive tree stands are classified as degraded and subject to state intervention (Brobbey, Agyei and Osei-Tutu 2020). These studies recognize how multiscalar histories set the context for understanding today's charcoal fuelscapes (Bergmann, Roden and Nüsser 2019) and politics (Bridge et al. 2013).

Crisis narratives of woodfuel-driven deforestation in Africa are longstanding, signaling the persistence of images of environmental degradation and their political instrumentalization (Fairhead and Leach 1998). But the construction of charcoal crises may rely on the repetition of questionable statistics. For instance, in Uganda, a specific set of figures testifying to a swelling biomass deficit is repeated verbatim throughout reports and articles to establish the unsustainability of charcoal, as today's biomass demand of "44 million tonnes per annum…could easily rise to 135 [million] tonnes" in a context where "the tree resource is estimated to sustainably supply only 26 million tonnes" (MEMD 2013, 13). But the report originally providing these figures admits that "There is scanty and inadequate data with no clearly defined data collection, archiving and updating mechanisms; Facts about biomass energy…are not well known" (2013, 13). Moreover, the methodology for determining the figures of 44 million, 26 million, and 135 million involves a great deal of uncertainty. Nevertheless, this uncertainty is erased as these figures attesting to Uganda's "looming biomass crisis" circulate unquestioned, invoked to justify calls for significant state or international intervention into Uganda's charcoal sector and, necessarily, into the lives and environments of its rural populations (UNDP 2013).

3.3 Charcoal Within Carbon Forests

Carbon forestry is constructing particular kinds of political forests today around charcoal, entailing specific resource complexes (Hecht, Morrison and Padoch 2014; Leach and Scoones 2015). As the 1970s "energy crisis" provided the context for a perceived "woodfuel crisis" and a need for global conservation, so climate change provides the overarching global environmental concern today (Dewees 2020). With land-use change and forestry emissions estimated to account for 35% of Africa's greenhouse gas emissions (Valentini et al. 2014), the drivers of those emissions have become central to transnational climate-change governance and interventions in Africa.

Charcoal is increasingly an object of carbon governance, which depends upon quantifying the mitigation potential of charcoal production (Leach and Scoones 2015). UNDP has called for "robust monitoring" of charcoal production and trade for inclusion in national emissions reduction strategies (UNDP 2013), since charcoal production has been named a "leakage"

of forest carbon emissions, requiring closer surveillance for robust REDD + accounting (Chidumayo and Gumbo 2013). In this context, a "sustainable charcoal" narrative has emerged, in which charcoal systems can be transformed from a cause of deforestation, degradation, and carbon emissions into a sustainable energy source. A familiar set of market reforms are often prescribed, including the formalization of land tenure, forest management, labor and trade, production and consumption technologies, and regulation.

However, the assumption that formalization will create sustainable charcoal neglects the dynamic, hybrid arrangements of formality and informality with respect to land, labor, technology, and governance that constitute resource complexes and political forests (Branch et al. 2022). Any set of regulatory and technological improvements will encounter the landscape of power in which charcoal is produced, traded, and consumed. In this context, the increasing sophistication of remote sensing and modelling promises data to specify the impacts of charcoal governance (Sedano et al. 2016, 2020; Silva et al. 2019), while uncertainty over Africa's emissions profile is invoked to extend surveillance to meet knowledge gaps (Valentini et al. 2014, 400). However, even the most sophisticated integrated assessment models can give only a partial account of socio-ecological systems—not only where data is missing or at insufficient resolution —since remote sensing and carbon accounting must involve simplifications of resource landscapes and users. This discursive simplification can help underpin a material simplification of ecosystems, evident in monocultural plantations that may satisfy the requirements of carbon accounting but marginalize the geographically situated knowledge of local resource users (Fischer, Giertta and Hajdu 2019).

Moreover, charcoal's contribution to greenhouse gas emissions is uncertain and may be subject to systematic overestimations (Bailis et al. 2015, 2017) within a wider context where "a complete and accurate greenhouse gas account for Africa…is not yet available" (Valentini et al. 2014). But whatever their precise quantity, charcoal emissions support the lives and livelihoods of hundreds of millions of mostly poor people. Given the significant lack of dependable data and the often questionable assumptions built into models of landcover, energy use, and emissions, the transnational political structures using them run the risk of being even more divorced from the realities of affected communities and thus even more unaccountable —a potentially dangerous transnationalization of the politics of charcoal resource complexes.

IV Charcoal and Energopolitics

Thus far, our engagement with the politics of charcoal lends credence to Cederlöf's assertion that, "When energy has been a concern for political ecologists, it has almost exclusively been conceptualised as a natural resource… an object for human appropriation, subject to controversial geographies of extraction, processing, and distribution" (2019, 1). Instead, he argues, analysis needs to go further to consider the political dimensions deriving from certain resources specifically as *forms of energy*. In this final section, we go beyond value-chain studies of charcoal as a commodity, as well as studies of the social-ecological complexes within which the production of charcoal as a resource is embedded, to explore the politics of charcoal as energy—concretely, as the primary energy source for much of urban Africa and as a major part of the energetic foundation for many modern states, in short, charcoal's "energopolitics" (Boyer 2019). This approach recognizes how "power over energy has been the companion and collaborator of modern power over life and population from the beginning" (Huber 2015, 5), and the ways that "energy is constitutive in the social production of urbanization and the infrastructures that make modern urban life possible." As Huber

concludes, "we need to grapple with the role of energy in fueling the very stuff of social theory – modernity, democracy, capitalism, and ideas of freedom" (Huber 2015, pp. 4, 9).

The growing literature in this vein has focused particularly on oil, gas, and electricity (Mitchell 2011; McNeish and Logan 2012; Urry 2013), with increasing attention to renewables (Degani, Chalfin and Cross 2020). But this focus overlooks that fossil fuels and electricity are not everywhere the primary energy sources for modern politics and urbanism and that they may co-exist with equally or even more important sources, such as charcoal. The energopolitics approach can thus help frame productive questions about charcoal politics even as the literature has tended to take for granted a particular fossil fuel and electricity modernity. For instance, if cheap oil is constitutive of a certain democratic politics among Western oil consumers and of authoritarian rentier-states among producers, then what state forms and social orders do other energies such as charcoal support? And how do confluences of pressures, social and ecological, drive transitions between or change the balance among energy sources?

As Baptista states, "Interrogating the historical dimensions of (socio-technical) energy systems across sub-Saharan Africa is important because it foregrounds how Africans have not been *energy-less*, nor have they been *without* energy systems," signaling "the importance of examining more explicitly the historical and spatial dimensions of contemporary energy systems" (Baptista 2018, 31). We explore the possibilities of such an approach through the following brief case study of charcoal as constitutive of energopolitics in Uganda. Our account broadly charts three periods in Uganda's energopolitics, focusing on the relations between state and society: first, the emergence of charcoal's central place in energopolitics of the late colonial and early postcolonial periods, as its cheap and ready supply enabled the state to absolve itself of responsibility for energy provision to the majority of the urban population; second, the continued importance of charcoal in the context of the 1986-present National Resistance Movement regime, as charcoal was deployed within a broader energy system with the effect of defining (and delimiting) citizenship in specific ways, while also endowing the state with certain strengths and vulnerabilities; and third, the energopolitical implications of a new direction in Uganda's energy policy towards sustainable charcoal in a context of expanded electrification and a future domestic source of oil and gas.

4.1 Uganda: The Emergence of Charcoal Energopolitics

Like many other African countries, colonial urbanism in Uganda saw large numbers of Africans migrating from rural areas into expanding urban centers, especially to informal settlements. Uganda's colonial urbanism was defined by a division between these large informal urban populations versus colonizer European populations and the small group of Africans formally allowed to live and work in colonial cities. Whereas Europeans enjoyed privileges in services, including energy, and the formal African population increasingly claimed entitlements from the state, the informal population was largely left to fend for themselves (Burton 2005; Myers 2011) and secure their own energy, primarily firewood or, increasingly, charcoal. The Ugandan colonial state allowed an expansive charcoal sector to develop, with charcoal produced in nearby counties, transported to Kampala by traders, and then sold throughout the city (Southall and Gutkind 1956). Racialized and class-based colonial urbanism relied upon this "subsidy in nature" present in the plenitude of woody biomass (Neumann 1997) so that the urban underclass could survive without state investment in services (Brownell 2020). The rural population, for its part, almost exclusively used

firewood, also widely and freely available; this subsidy from nature also allowed the state to direct electricity and fossil fuels towards the formal urban population and their more politically pressing demands. Alongside the subsidy from nature was a subsidy from informal rural labor, as the decentralized and widespread small-scale production, and low-cost transport infrastructures, allowed rural and peri-urban producers and traders to shift in and out of production, as supply could adjust to meet demand. Colonial Kampala, and the racial, class, and rural–urban divisions it was built upon, were made possible by charcoal fueling this urban "energized infrastructure." The end of colonialism did little to disturb this order, as Milton Obote's short-lived effort to bring the charcoal industry under the Forest Department was ended by Idi Amin's coup (Gore 2017).

Along with households, Uganda's industrial and commercial sectors also came to depend on charcoal, alongside firewood and other forms of biomass, for basic agricultural processing (tea, coffee, tobacco) and construction (bricks, lime). Of course, some electricity and petroleum were essential to a narrow sector of the economy—running motors, cooling, heating, lighting, and motorized transport—and to middle-class and elite lifestyles. But this division in fuels was not some supposed division between traditional and modern—rather, modern energy, urbanism, industry, and institutions all depended on combined and uneven energies in which charcoal and biomass play a significant part. Charcoal's urban energy primacy has persisted until the present, providing the primary energy for up to 80% of Kampala's population (UBOS 2021); charcoal, wood, and other forms of biomass together provide more than 90% of the total primary energy consumed in Uganda, with electricity contributing 2% and petroleum 10%. Even in industry, biomass energy is more than ten times the electrical energy used and approximately six times petroleum (MEMD 2020).

4.2 Charcoal and Citizenship

Subsidies from nature and rural labor allowed the colonial and postcolonial Ugandan state to largely ignore the centrality of charcoal energy (Doggart and Meshack 2017; Gore 2017). Instead, energy policy focused on electricity generation and, recently, oil production and refining as underpinning its vision of a transformed, modern Ugandan economy. Central is hydropower electricity for industry, with little concern for providing power to the population except for those favored by the state or able to pay high tariffs (Gore 2017; Maclean et al. 2016). The centerpiece of this strategy was Nalubaale (originally Owen Falls) Dam, completed in 1954 and the only major source of electricity for 50 years.

In 1986, the Museveni regime revived this strategy when it made rebuilding and expanding electricity supply central to its vision for economic structural transformation (Gore 2017). This led to the expansion of Nalubaale and then several major new hydropower dams. Again, these were not for popular electrification, but rather to power industry and provide to those residential consumers who could afford the high electricity prices. Recent oil discoveries have led to government efforts to build a refinery—but, again, it seems less for popular energy and more for industrial supply (Hickey and Izama 2016).

The split between (naturally-subsidized) popular charcoal for urban areas (and firewood for rural areas) and (state-supported) elite electricity and oil has effectively kept energy outside of broad political contestation. Maclean et al. (2016) draw a useful contrast between Ghana, where a popular entitlement to electricity has been part of national politics since independence, and Uganda, where the majority rural and urban populations lacked the basis for political demands to modern energy sources, which were the subject of negotiations among political, business, and social elites instead. The ready supply of wood

energy allowed the entitlements of citizenship to be defined in specific ways and enabled the state to drive forward a particular development model, all within an international political economy of energy that positions Uganda as needing to rely on a subsidy in nature for its energy. But the fact that charcoal also comprises a major proportion of popular energy in Ghana signals that there is no deterministic relation between energy source and political structures: indeed, charcoal and firewood energy continue to provide the energetic foundation for most African states, but has been part of significantly different political configurations: for instance, in Tanzania, charcoal was mobilized as a foundation for energy sovereignty and independence from imported fossil fuels (Brownell 2020). Furthermore, amidst today's infrastructure (energy and otherwise) boom in the continent, the relations between charcoal, electricity, and fossil fuels will need to be a key focus (Power and Kirshner 2019).

So one task for the study of charcoal energopolitics in Africa is to explore the common political characteristics or tendencies that derive from states' reliance on wood as the energetic basis for society and economy. For instance, this reliance renders the state directly vulnerable to ecological disruptions, as deforestation, whether caused by energy demands, agricultural expansion, or climate change, can threaten wood supply and thus the state's energetic foundations. Environmental problems, whose impact may be more mediated in fossil-fuel-based economies, can thus be immediately relevant to what Carl Death calls the "green state in Africa" (Death 2016). A state dependent on charcoal energopower is also socially and politically vulnerable in specific ways. Mitchell (2011) described the coal energy regime as vulnerable to workers' organization, which was precluded with the transition to oil. Correspondingly, the charcoal regime requires the continued willingness of many small players to produce charcoal, or for large producers to be able to access trees cheaply. This makes production contingent upon rural political pressures, whether against environmental harm or large commercial production (Marijnen and Schouten 2019). The sector is also vulnerable to the decentralized and informal nature of commercialized extraction and trade, which makes traders unaccountable—they cannot be officially forced to increase production and may decide to exit the business without warning. While the decentralized, dispersed infrastructure is vulnerable to decentralized disruption, it also has significant redundancy and resilience built into it as long as trees can be accessed, commodity chains extended, and borders crossed, formally or informally. However, when access to cheap wood starts running low for ecological or political reasons, urban pressure may quickly mount, and so new sources must be found and the charcoal frontier expands further. For instance, Kenya's charcoal production bans led to a massive influx of Ugandan charcoal, while Uganda's own demand has led to sources of supply expanding beyond its borders to South Sudan and DRC (Sola et al. 2021).

4.3 Sustainable Charcoal?

In the last decade, Uganda's energopolitics have shifted in two significant ways. First, access to electric power has been haltingly expanded as electoral competition has intensified. Popular electrification was a primary justification for the Bujagali dam project, and the promise of rural electrification has become prominent in Museveni's appeal to his core constituencies. Despite electricity access improving significantly over recent years (although government statistics are questionable (Trotter and Maconachie 2018), Uganda still ranks among the lowest globally in electricity access. Demands for electrification are coming from provincial towns and cities—for instance, Gulu has seen a wave of protests over unreliable electricity. The state, however, has largely

managed to avoid being the target of protests, as the unbundling and privatization of the electricity sector has conveniently made the private electricity distributor, UMEME, the target of popular ire.

Second, following in a trend already seen in other countries such as Kenya and Rwanda (Kenya Ministry of Energy 2020; The World Bank 2012), "sustainable charcoal" has appeared in Uganda's energy policy, or in some strands of what is a decentralized and sometimes contradictory set of energy policies, strategies, and declarations (Gore 2017; Trotter and Maconachie 2018; UNDP 2013). This new interest has arisen from several factors: a recognition that charcoal will not soon be displaced by electricity; increasing awareness of the vulnerabilities faced by wood-based energy in the face of deforestation and climate change; donor interest in small-scale bioenergy; and political protest, both rural against the environmental harm of commercial charcoal production and urban around the rising cost of living. Certain state actors have begun an engagement with charcoal energy instead of ignoring it or actively opposing it, most notably in the 2019 Draft National Energy Policy (MEMD 2019) and draft biomass policies (MEMD 2013). The program is largely within the "green charcoal" narrative, of improved efficiency of production, better forest management, better stoves, and improved regulations throughout the value chain (Branch et al. 2022). Thus, instead of ignoring charcoal while tacitly allowing it to provide the state's energetic foundation outside of formal regulation, there may now be a move towards regulation, formalization, and sustainability, bearing with it implications for Uganda's political alignments and possibilities. How far this new tendency will go is uncertain: the president's continued insistence on structural transformation through energy modernization, the boom in hydropower, and a planned oil refinery all signal a continued ideological focus on "modern" energy. There are also material factors working against state commitment to sustainable charcoal, including the loss of trees caused by expanding commercial farming by elites and foreign investors; large-scale commercial charcoal extraction by national elites and a preference for short-term looting of natural resources over long-term sustained exploitation; and the power of elites and the urban middle class who are oriented towards stabilizing electricity and fossil fuel, with little concern for charcoal. So whether Uganda will engage comprehensively with charcoal as part of the energetic basis of society will depend on the material and ideological struggles between different factions within state and society, as those are entwined with ecological forces.

V Conclusion: From Charcoal Politics Back to Policy

Seeing charcoal's politics through the lenses of charcoal as a commodity within value chains, as a resource within socio-ecological complexes, and as a politically foundational energy source allows a diverse set of engagements with charcoal's long social life from tree to atmosphere. Charcoal as a commodity considers its shifts from form to form along the value chain linking rural and urban, production and consumption; charcoal as a resource speaks to the material and symbolic political struggles in rural production sites; while charcoal as energy deals with the implications of the long-standing centrality of urban consumption and energy infrastructures. These three approaches enable charcoal's politics to be considered across various registers, in Bergmann, Roden and Nüsser (2019, 6) words, the "multiple spatial scales (such as the urban, regional and national), sectors (such as forestry and energy) and stakeholders (including policy-makers, consumers, brokers, sellers and producers)." It also enables analysis of charcoal politics to consider the "spatial and historical dimensions" often

missing from analysis of energy in Africa, crucial given that a "joint time-space understanding of energy systems is necessary if we are to make sense of future energy transitions" (Baptista 2018, 30).

At the beginning of this article, we noted that the predominant trend in the literature on charcoal in Africa tends to ignore charcoal politics and instead focus on charcoal policy. Moreover, the literature tends to take a technical approach to policy, framing the charcoal sector as suffering from deficits of governance and technology that require filling through intervention for positive change, whether in an energy transition from charcoal to "modern" energy or in a transformation from "dirty" to "green," sustainable charcoal. The question of transforming the charcoal sector is indeed of crucial importance given the extensive ecological and social harms associated with its production, marketing, and consumption, and given its sustained importance as a key energy source for urban and peri-urban Africa. However, as Baptista has made clear, "bringing about energy transitions will require more than just the creation of efficient energy markets and technological leapfrogging" (Baptista 2018, 30). This is because "energy interventions are the outcome of complex and diverse processes of resistance, negotiation and contestation, often with unintended consequences for both nature and society" (Cline-Cole and Maconachie 2016)—that is, the outcome of political processes. We conclude this article by showing how these three approaches can each innovatively reveal a different dimension of the politics of charcoal that is immediately relevant for charcoal policy and for possible transitions away from charcoal more broadly. We thus hope that this helps illustrate the utility of a rigorous engagement with the politics of charcoal even in addressing supposedly narrow policy questions.

First, considering the politics of charcoal as commodity raises questions of who is profiting and thus indicates what interests and actors may be aligned behind current charcoal policy; this can reveal hidden obstacles or opposition to the transition to sustainable charcoal or away from it entirely and thus possible reasons as to the failure of green energy interventions. Conversely, those losing economically may be able to be mobilized as possible allies in transforming the sector. Such configurations of interests can thus help predict the possible outcomes of charcoal interventions and develop strategies for transitions. Second, charcoal as a resource draws attention to the many socio-ecological complexes of which charcoal is part, as well as the discursive and material components of those complexes. Thus, charcoal policy must take into account the politics and ongoing struggles around labor and land; it must consider the histories of state power over forests and rural people; and it must take into account the expansion of transnational authority through climate change adaptation and mitigation. It also must see charcoal as entwined ecologically with other systems, such as water. Charcoal within resource complexes also makes clear the importance of the narratives around charcoal as a terrain of policy intervention themselves.

Finally, charcoal as energy, in particular as urban energy, raises perhaps the most challenging and neglected questions for policy, as "current energy initiatives rarely take into account the colonial and postcolonial path-dependencies and historical contingencies of the energy systems they seek to transform" (Baptista 2018, 31). This is not politics as interests methodologically separable from social reality, but rather politics as relations of power embedded in the very structures of society, economy, and culture, through which charcoal as an energy source has often been foundational to contemporary urbanization, state formation, society, and international order. This is not to suggest that charcoal policy at any but the most global scale is impossible—since that would be a recipe for no policy at all—but,

rather, that possible transformations to charcoal systems should be sought in the dynamics of these wider contexts. At the same time, while awareness of the influence of wider contexts should not paralyze charcoal policy making, such awareness is indeed necessary in planning any charcoal intervention, even at the smallest scale. Charcoal empowers—materially and politically—as do firewood, water, wind, and fossil fuels. Discerning the diverse pathways through which this power operates is a crucial step towards sustainable and just energy futures.

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