

Charcoal provision in the informal settlements of Kampala: charcoal practices and the value chain.



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Cover: A vendor's charcoal supply in Kanyogoga, Kampala

Abstract

Charcoal is the main energy source for cooking in the informal settlements of Kampala, where few alternatives are available. Using a practice-based approach, the first half of this study details the key role that charcoal plays in the informal settlements and how it is incorporated in cooking practices, as well as the vulnerabilities being faced in these settlements. Life in the informal settlements is often characterised by uncertainty, an absence of reserves and limited resilience. For these communities, changes in the availability and cost of charcoal could have significant ramifications.

Such disruptive changes in charcoal provision are already ongoing with rapidly increasing prices, and are likely to become far more disruptive in the near future unless the charcoal sector is overhauled. As the second half of this study details, current practices in the charcoal sector are unsustainable and rapidly exhausting limited forest resources. The regulative framework for the charcoal sector is fragmented and haphazardly applied. The sector mostly operates informally and fails to take into account long-term environmental costs. In its current guise, few incentives exist for actors in the charcoal sector to invest in more sustainable practices. If the status quo is maintained, the long-term impact of unsustainable charcoal practices will be strongly felt not only by the rural communities due to the loss of ecosystem services in the areas of environmental degradation, but also in the informal settlements of Kampala where charcoal acts as the lynchpin holding together the practice of cooking. As such, energy (in)security in the informal settlements is intrinsically linked to food and water security, and therefore requires an integrated cross-sectoral response.

Beneficial reform of the charcoal sector can be achieved through streamlining of the regulative framework and greater formalisation of the currently largely informal sector. This would improve monitoring and allow revenue from licensing to be reinvested in sustainable forest management, while providing specialized professional actors with a long-term stake in maintaining forest resources and greater incentive to invest in more sustainable production techniques. Alongside such improvements in the charcoal sector, the high dependence on charcoal in the informal settlements should be reduced. Due to the absence of advanced infrastructure and limited funds available, in the short-run briquettes present the most likely candidate to achieve a shift away from charcoal. Briquettes are the most affordable alternative and would require minimal disruption to existing cooking practices. Briquettes do not represent a long-term solution, but they might help enable a grace period for a smoother transition away from charcoal and improve the resilience of the informal communities.

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Preface

First of all, I would like to thank my supervisor Bas van Vliet for his valuable ideas, feedback and guidance throughout the process of writing this thesis and making this study possible in the first place. I also owe a huge debt of gratitude to my second supervisor Patience Mguni and the ResNexus team (Jimmy, Doreen and Tonny) for all their help during my stay in Kampala, not only in guiding me throughout the fieldwork itself but also in allowing me to benefit from their preparatory work establishing connections, laying the groundwork in Kanyogoga and Bwaise and conducting countless observations and interviews over a period of several months. I would also like to thank all the interviewees who took the time to sit down with me and share their views and experiences relating to life in the informal settlements of Kampala or the functioning of the charcoal sector in Uganda. Lastly, I would like to thank my family and friends for keeping me sane during these charcoal-obsessed months (as far as my claims to sanity may go), and especially my fiancée Bengisu for demonstrating immeasurable patience, kindness and understanding throughout the entire process.

1. Introduction

The majority of households in Sub-Saharan Africa, a little under 80 percent of the total population, rely on biomass as their main energy source for cooking (IEA, 2014). This percentage has dropped very little over the past decades and due to strong population growth, the actual number of people cooking with biomass has increased to around 780 million (IEA, 2014). The main forms of biomass used are fuelwood (wood in its natural state) and charcoal (wood having undergone carbonisation), with the former more prevalent in rural areas while the later is used more in urban areas (Schure, 2014). Charcoal is preferred over fuelwood in urban areas (amongst other reasons) due to its higher energy content, ease of transport and storage, greater accessibility in cities and lower smoke production (although burning charcoal, especially indoors, still presents a considerable health hazard) (Zulu & Richardson, 2013).

This is also the case in Uganda, where charcoal forms the primary cooking fuel in Kampala, the foremost urban area of the country. Uganda is one of the fastest growing countries in the world, and its current population of over 40 million is projected to double in size by 2050, while also rapidly urbanising in the process, with the percentage of the Ugandan population living in urban areas projected to double by 2040 (BEST, 2014). Both these factors will likely greatly increase demand for charcoal, but current levels of demand are already exhausting forest resources.

Charcoal production has increased rapidly in Uganda over the past decades and is contributing significantly to forest degradation. Forest coverage in Uganda is estimated to have gone from 24 percent of the total land area in 1990, to 14 percent by 2010 and estimated to have fallen to 9 percent by 2016, illustrating a rapid rate of decline (Charcoal Survey 2016; MWE Interview). It should be emphasized that the primary driver of environmental degradation is often agricultural expansion, in which income from charcoal production offers secondary benefits but in many cases does not form the main reason for clearing land (Mwampamba et al., 2013). Nonetheless, charcoal production exacerbates the problem and can feed into a vicious cycle, as described by Iiyama et al. (2017: 6): “Deforestation may provide landowners with even minimal, one-off charcoal income and agricultural land ready for cultivation. However, it can lead to a vicious cycle of decreasing long-term agricultural productivity due to permanent damage to ecological systems and loss of ecosystem services”. The key aspect contributing to this vicious cycle is that the long-term value of forest resources is not properly taken into consideration, and thus provides few incentives to engage in more sustainable charcoal production (Iiyama et al., 2017).

The importance of charcoal as an energy source used to be considered mostly in terms of its status as a ‘transitional fuel’ on the ‘energy ladder’, a theory which implies that with economic

development energy preferences also evolve, moving up from ‘lower’ fuels to cleaner, more convenient and more efficient sources – with charcoal simply representing a midway point (Zulu & Richardson, 2013). However, as has increasingly come to be recognized, this perspective understates the important role charcoal plays in the lives of millions, as well as presenting a rather simplistic portrayal of energy preferences in general (Hiemstra-van der Horst & Hovorka, 2008; Masera, Saatkamp & Kammen, 2000; Zulu & Richardson, 2013).

Although a large segment of Ugandan society relies upon charcoal as their main source of energy, the production and distribution of charcoal is not particularly transparent and mostly operates in the informal sector. In recent years, several studies have attempted to shed some light on the workings of the charcoal trade in various countries in sub-Saharan Africa (e.g. Schure, 2014; Smith et al., 2015; Baumert et al., 2016). In the case of Uganda, one particularly relevant study stands out, namely that of Shively et al. (2010) which indicated that there was a lack of information regarding the charcoal trade, and that “knowledge of the characteristics and role of other actors in the value chain – including middlemen, transporters, traders and retailers – is limited and largely based on anecdotal evidence” (Shively et al., 2010: 271). This study succeeded in sketching out an informative portrait of the charcoal trade to Kampala from three particular districts. The exploratory nature of the study in a largely uncharted sector naturally leaves some questions open, such as how the trade functions in other districts which can vary in physical and institutional infrastructure (Khundi et al., 2011). Both the economic and policy landscape in Uganda have undergone rapid developments in the years following this study and may have transformed aspects of the charcoal trade.

Moreover, although over the past decade new institutions and governance arrangements in Uganda regarding the biomass sector have emerged, the level of coordination between various responsible agencies and the overall effectiveness of regulation can be questionable (BEST, 2014). Lastly, the social impact of the charcoal trade is often not considered equally across the chain. The charcoal trade offers opportunities and risks alike, such as a potential source of supplementary income or as driving the exploitation of labour (Zulu & Richardson, 2013), and these are often considered from the perspective of the rural producers who clearly can both benefit or suffer from the trade. However, the perspective of the consumers at the opposite end of the chain is more often neglected or taken for granted. This neglects the considerable vulnerability of urban consumers dependent on charcoal. For instance, access to alternative energy sources is often limited due to high costs or a lack of necessary infrastructure, especially amongst the poorer segment of urban consumers in poorly serviced informal settlements, which strengthens dependence on charcoal.

Therefore, an important aspect that should be recognized throughout the following considerations regarding the charcoal chain, is the exposure of the urban poor of Kampala to potential fluctuations in energy services and the need to reduce such vulnerabilities. This impact of the charcoal chain on the urban poor is a subject that deserves greater attention and will be the guiding feature throughout this thesis. To emphasize the interdependent connections between charcoal provision and urban charcoal usage, this study will focus on the intermediary field where charcoal distribution and charcoal practices meet.

Although this study will focus on energy, it should be recognised that energy issues often also relate to other areas. One way to consider energy is as part of the energy, water and food nexus in which developments in one affect, and in turn are affected, by the other areas. Traditionally, energy, water and food are largely treated in isolation. For instance, a ministry of Agriculture looks at food and a ministry of Energy focuses on energy, with little interaction between them which thus entrenches ‘silo thinking’ (Bazilian et al. 2011). Issues are then framed through these particular perspectives, as Bazilian et al. (2011: 7897) describe: “If a water perspective is adopted, then food and energy systems are users of the resource ... from a food perspective energy and water are inputs ... In any case, the perspective taken will affect the policy design. This is due to the specific priorities of the institution or ministry, as well as the data, knowledge and analytic breadth of the tools of the associated experts and support staff”.

From the nexus perspective, the challenge is to break through such silos with a more integrated approach that considers trade-offs, synergies and interactions in the areas of energy, food and water (Bazilian et al., 2011). It is beyond the scope of this study to apply both such a broad cross-sectoral approach and a thorough analysis of the charcoal chain. Nonetheless, this study recognises the often-times interconnected nature of the policy domains of energy, water and food, and seeks to highlight such connections when deemed relevant while still maintaining the focus on energy.

Research goal:

The aim of this study is to explore the connections between charcoal practices and the chain of charcoal provision to informal settlements in Kampala, namely the actors and institutions involved as well as the relations between them, in order to develop a clearer picture of the charcoal trade at the intersection of distribution and usage, and identify possible opportunities for policy-makers to make charcoal provision more sustainable and equitable.

Research questions:

This study seeks to answer the following question:

What arrangements, connections and interests can be traced at the junction of charcoal distribution and usage between the actors and institutions involved in providing charcoal alongside the practices incorporating charcoal in the informal settlements of Kampala, and what governance opportunities follow from the identified arrangements, connections and interests to make charcoal provision more sustainable and equitable?

The following sub-questions will assist in answering the main question above, and have been divided into three themes (theoretical, empirical and analytical) for the sake of clarity:

1. Theoretical:

-What can be revealed from charcoal provision in the informal settlements of Kampala when applying a value chain analysis? What is the benefit of applying such an analysis to the charcoal sector and what are its drawbacks?

-What added benefit does the application of social practice theory bring to the analysis of charcoal provision?

2. Empirical:

-What role does charcoal play in the cooking practices of the informal settlements of Kanyogoga and Bwaise?

- What alternatives to charcoal are available in the informal settlements and how viable are they in comparison to charcoal?

-What actors and institutions are involved in the distribution of charcoal to the informal settlements of Kanyogoga and Bwaise in Kampala and what role do they play? How do these relate and interact in connection with charcoal users and what interests are at stake?

-How do institutions shape charcoal provision in Kanyogoga and Bwaise and the wider charcoal chain?

-To what extent are practices in the informal settlements shaped by charcoal distribution or vice versa?

3. Analytical:

- What opportunities can be identified in the governance of the charcoal trade at the junction of distribution and usage in order to make it more sustainable and equitable? Which aspects of the charcoal trade are most amenable to reform, and what are the environmental and social implications of potential policies targeted at these links?

Brief outline

The following chapter will set out the conceptual framework for this thesis, detailing the approach that will be taken up in this study and the concepts upon which it relies. This is followed by a methodology chapter which describes the study area and the methods used during the fieldwork, as well as potential issues to be encountered and inherent limitations in this study that should be kept in mind. We then arrive at the first empirical chapter, ‘Zooming in: Charcoal in use’, which firstly details the practice of cooking and its constituent elements in the informal settlements of Kampala. This chapter covers the role that charcoal plays in the informal settlements and how it is incorporated in cooking practices, as well as the vulnerabilities being faced in these settlements and in particular issues that flow from charcoal usage in its current guise.

We then turn to the second empirical chapter, ‘Zooming out: The charcoal value chain’, which moves up from charcoal distribution in the informal settlements to take a broader view of the charcoal sector in Uganda. It details the actors that are involved in the sector, the particular role they play, the benefits they accrue from the charcoal trade and the manner in which they maintain their position. This chapter also looks at the institutions that shape the charcoal sector and considers their environmental and social impact.

The next chapter, ‘Charcoal governance opportunities’, is more analytical in nature. It seeks to identify the main issues in the charcoal sector and areas amenable to reform. In considering potential measures to make the charcoal chain more sustainable and equitable, it pays especial attention to their potential impact in relation to the informal settlements. The analytical chapter is followed by a discussion of the key theoretical and practical issues encountered during this study. Lastly, the findings of this study and answers to the research questions posed above are set out in the conclusion, alongside recommendations describing the most attractive measures from the perspective of this particular study.

2. Conceptual framework

2.1 Value chain analysis

A study of the various actors and institutions involved in the charcoal sector, as well as the environmental and socio-economic impact of the trade, could be approached in numerous ways. One specific approach that stands out as being a particularly appropriate starting point, is value chain analysis. The following section seeks to answer what can be revealed from charcoal provision to the informal settlements of Kampala when applying value chain analysis. First, some of the general ideas behind value chain analysis will be discussed, before continuing with more specific examples of value chain analysis as previously applied to the woodfuel or charcoal sector, which will help guide the approach taken up in this study.

Value chain analysis can be applied under various guises (e.g. ‘*filière*’ and global value or commodity chains) which can vary somewhat in their methods and approach. The older *filière* approach has its roots in the French post-colonial state with heavy emphasis on agricultural goods in developing countries, focused on commodities at the domestic or local level and being seen as more purely empirical in nature, although later work has included greater analysis of power relations and markets (Raikes, Jensen & Ponte, 2000). The later global value or commodity chain (GVC/GCC) approach is, as the name indicates, far more global in scope, encompassing the entire trade in a specific (more often industrial) commodity and gives more attention to the institutional framework and how international trade is organised (Raikes et al., 2000). As Raikes et al. put it in their comparison of the *filière* and global commodity chains, indicating the absence of a clear unified theoretical framework, “both the GCC and *filière* traditions seem to be ‘approaches’ to the study of commodity chains rather than ‘theories’” (Raikes et al., 2000: 409).

At their core though, the various approaches to value chains share some common characteristics. In value chain analysis the whole commodity chain is considered, ranging from production to consumption. At the most basic level, a value chain can be described as “the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use” (Kaplinsky & Morris, 2001: 4). In the case of charcoal, this would entail looking at the chain from tree to stove, with all the various steps in between. This ranges from cutting, carbonization, packing, transportation, storage, to the sale and subsequent use of charcoal in stoves, tracing the diverse actors and institutions involved in the trade along every step of the way (Schure et al., 2013).

Although value chain analysis has mostly been applied to analyse firms and countries participating in trade at a global level, it can also usefully be directed towards analysis at the domestic level, with perhaps greater emphasis on aspects such as the national policy landscape in which a particular value chain plays out (Kaplinsky & Morris, 2001). In recent years, several forest governance studies have undertaken such value chain analysis (e.g. Wiersum, Ingram & Ros-Tonen, 2014) including some focused on woodfuel or charcoal (e.g. Shively et al., 2010; Smith et al., 2015; Baumert et al., 2016), which are particularly relevant to this study and highlight the practical use of such an approach. The benefit to policy-makers of such value chain analysis regarding woodfuel can be quite clear: “Knowledge about the structure and distribution of profits and margins along value chains provides information to policy makers about potential opportunities for improving the welfare gains from forestry-related activities, identifying points of entry for mechanisms that influence levels of production and distribution” (Shively et al., 2010: 271).

Two particularly relevant studies in this field are those of Jesse Ribot (1998) on the charcoal chain in Senegal and Jolien Schure (2014) on the woodfuel trade in the Congo Basin, which both made use of value chain analysis, albeit in slightly different forms. Therefore, it seems worthwhile to look into these studies in somewhat greater detail in the following two sections.

2.2 Value chains and access

Ribot’s study of Senegal’s charcoal commodity chain (1998) is one of the first studies to apply a value chain approach to forest products, in an attempt to trace the distribution of benefits arising from the charcoal trade. As Ribot states, an important aspect of commodity chain analysis is that “it locates production and exchange as embedded within social relations and hierarchies” (Ribot, 1998: 308). This highlights the importance of recognizing the particular social and historical context in which commodity chains are situated. Ribot combined value chain analysis with the concept of ‘access’, using value chain analysis to identify which actors accrued the most benefits (i.e. where the biggest margins per bag of charcoal were and which actors made the biggest profits overall) and subsequently focusing on the concept of access to understand how they accrued these benefits (Ribot, 1998).

Ribot framed the distribution of benefits in terms of ‘access’, because it allowed for a wider scope which goes beyond formal rules and structures governing resource use in terms of ‘rights’, by also incorporating factors such as social identity, relations, wealth or coercion that shape patterns of resource use based on ‘ability’ (Ribot, 1998: 310-312). Considering the often-times informal nature

of the charcoal trade, it seems appropriate to rely on the concept of access which “includes the socially sanctioned and the illicit, the *de jure* and the *de facto*, the right as only part of the ability” (Ribot, 1998: 312). For instance, someone can have the legal right to cut down the trees on his or her property, but this means very little without also having the means and contacts to arrange for the cutting, carbonization and transport, the know-how to navigate through the required paperwork and permits, or the right connections to gain access to a particular market, to name but a few potential barriers (see also Ribot & Peluso, 2003).

Ribot (2005) later refined this access mapping within commodity chains in four steps, which will serve as a template for this thesis (see Methodology for an overview of the various steps). This mapping relies on first sketching out profit distribution within the chain and then using this knowledge to understand which factors play a part in producing potential ‘nodes of concentration’: “The object is to explain the ensemble of mechanisms that contribute to the moment of profit” (Ribot, 2005: 11). Greater understanding of this ‘ensemble of mechanisms’ within the charcoal chain is essential in order to identify suitable governance opportunities which minimize unforeseen or unpredictable outcomes along the chain. A clear picture of the actors involved in the charcoal sector, including their respective interests and the distribution of benefits amongst them, should be seen as a prerequisite for any type of intervention to improve the chain. It is this knowledge which allows us to pinpoint the most suitable areas of intervention, as well as help anticipate potential friction points to be taken into consideration.

Turning towards the research done by Jolien Schure on the woodfuel trade in the Congo Basin (Schure, 2014; Schure et al. 2015), and the formal institutions governing this trade in the wider region (Schure et al., 2013), it immediately becomes clear that her research could be particularly useful for this thesis, considering the aim of this study to explore the charcoal trade and potential governance opportunities to make the charcoal chain more sustainable and equitable. In her PhD thesis on the woodfuel trade in the Congo Basin, Schure adopted a livelihood perspective alongside value chain analysis. Schure states the following with regard to the value of the descriptive, analytical and normative aspects of value chain analysis (which could be equally applicable in the case of this thesis):

“As a descriptive empirical tool it assisted in mapping the actors and socio-economic and environmental outcomes of woodfuel production and trade ... On an analytical level .. value chain analysis assisted in linking production and markets in a multi-local perspective, the assessment of informal and formal institutions shaping access for different actors, and the influence of outside interventions and formalization on internal organization of the chain. As

a normative concept, value chain assisted in explaining differences in access and distribution patterns of value chain actors” (Schure, 2014: 13-14).

Besides highlighting how ‘access’ is also an important theme in the work of Schure, this quotation touches upon several key aspects of value chain analysis on an empirical, analytical and normative level that make it an attractive proposition to conduct a similar analysis of the charcoal trade in Uganda. As an empirical tool, it helps to frame the study area by providing the lens and ‘vocabulary’ through which to trace the actors and institutions involved in the production, transportation and distribution of charcoal in the informal settlements of Kampala, as well as their interactions and respective roles within the charcoal value chain. This can reveal the diverse and dynamic relations that are at play behind the charcoal trade on which so many residents of the city depend. It allows the distribution of benefits as well as potential risks within the chain to be traced alongside the mechanisms which led to and maintain this state of affairs. On a more analytical level, such knowledge is necessary in order to determine where along the charcoal chain there is the most room for improvement, as well as the impact potential changes might have up and down the chain. Lastly, in a normative sense the focus on the distribution of benefits and risks alongside the potential impact of changes also creates space to consider the position of the urban poor more thoroughly, as befitting the goal of this thesis.

Value chain analysis in general has received some criticism such as by Bolwig et al. (2010) for sometimes failing to consider the local context and potential impact of value chain restructuring, stating that this “requires analysis not only of the power relations that exist within the chain itself, but also of power and inequality in the local systems and relationships within which chain actors and their communities are situated” (Bolwig et al., 2010: 174). Addressing such criticism, one of the strong points of the type of value chain analysis as applied by Ribot (1998) and Schure (2014) is that it incorporates the wide range of elements and actors at play in getting charcoal from tree to stove while thoroughly grounding the study in the local context, be it the historical background, social relations or institutional framework. This thesis will follow Ribot’s approach in mapping access to benefits within a value chain to get a better picture of the ‘ensemble of mechanisms’ at play in the charcoal chain. Schure’s value chain analysis of the woodfuel trade in the Congo Basin will also serve as a model, especially in her focus on institutions governing this trade, as will be detailed in the following section.

2.3 Institutions shaping the chain

In the study of the charcoal trade in Central- and West Africa, Schure et al. (2013) attempted to assess the impact of ‘formalization’ on the charcoal sector. Borrowing from a study on supply networks, they view formalisation as the extent to which the charcoal sector is “controlled by explicit rules, procedures, and norms that prescribe the rights and obligations of the individual [companies] that populate it” (Choi and Hong, 2002: 470, as quoted in Schure et al., 2013: 96). These formal rules are enforced through an outside third-party, as opposed to informal arrangements which come from, and are upheld by, actors within the chain itself (a distinction which will be discussed in greater detail further on). In general, formalisation is seen to bring certain benefits if properly enforced. An example of this is the confirmation of property rights, which provide the holders of these rights greater incentives to invest in long-term improvements, since these rights provide them with a degree of certainty that they will actually accrue the benefits themselves of any investments that they make (Schure et al., 2013).

For instance, in the case of charcoal this could be the development of tree plantations, which would require initial investment as well as long-term funding to manage, but thorough enforcement of property rights would guarantee that the investors would be able to collect the return upon their investment. Therefore, as Schure et al. point out, the “building [of] formal institutions is often considered as the path to manage charcoal production more sustainably” (Schure et al., 2013: 96). However, they argue that this fails to properly take into account the potential negative impact of poorly planned or implemented government initiatives which can result in ineffective or counter-productive measures, which is why their study sought to find out under what conditions institutions are more successful and equally beneficial to the various actors in the value chain (Schure et al., 2013). This is where Schure’s study is especially interesting from the point of view of this thesis, in the focus on the institutional framework governing the woodfuel trade.

Schure defines woodfuel institutions as “the formal and informal rules and regularized patterns of behavior between different actors in society and associated enforcement mechanisms that shape access related to woodfuel production and trade” (Schure, 2014: 69-70). This again brings the concept of ‘access’ to the fore, as also highlighted by Ribot, and links it further with the role played by enforcement mechanisms within the institutional framework that shape the charcoal sector. As Schure herself acknowledges, the definition of institutions that she applies leans heavily on the earlier work of Leach, Mearns & Scoones (1999), who offer the following distinction between formal and informal institutions: "Formal institutions may be thought of as rules that require exogenous enforcement by a third-party organization. ... Informal institutions, however,

may be endogenously enforced; they are upheld by mutual agreement among the social actors involved, or by relations of power and authority between them” (Leach et al., 1999: 238). They emphasize the importance of recognizing the role of power relations amongst actors and the social context in which these play out, especially in order to understand ‘socially embedded’ informal institutions (Leach et al., 1999). Formal and informal institutions are not seen as operating in isolation, but can instead lead to "competing notions of legitimacy, in which actual entitlements are influenced by the interplay of these competing rule sets in the context of prevailing power relations" (Leach et al., 1999: 238). To illustrate this, Leach et al. offer the example of selective application of laws, with the powerful and well-connected being able to circumvent formal fines or punishment, whereas less powerful actors face different outcomes.

The dynamic flexible nature of informal institutions, which can more rapidly adapt to changes in social or environmental conditions, is also contrasted with the relatively more static rule-based framework of formal institutions (Leach et al., 1999). Furthermore, informal institutions are not only dynamic, but can also be quite resilient. As Leach et al. point out, "owing to the embeddedness of informal institutions, institutional change in society may be a slow, "path-dependent" process, even if formal institutions, such as legal frameworks, macroeconomic policies or political regimes, change quickly" (Leach et al., 1999: 238). Such institutional characteristics of dynamism, legitimacy or resilience have clear repercussions on the policy front and, at the very least, must be kept in mind and reckoned with when attempting to develop new policy initiatives, especially in areas such as the charcoal sector where the lines between formal and informal can be particularly blurred.

These implications with regard to policy were further explored by Schure et al. (2013), namely what impact the introduction of formal institutions or the ‘formalisation’ of existing informal institutions had on the charcoal trade and those involved in it. For example, they looked at whether formalisation limits the livelihood options available to certain actors along the charcoal value chain and thus might increase their vulnerability. Although formalisation could be beneficial in both environmental and social terms, they found that across Central- and West-Africa the impact of formal or informal institutions could vary strongly according to local conditions or the capacity of the state. For example, in some cases stricter regulation could lead to marginalisation when only certain actors are effectively targeted or encourage corruption, whereas reliance on informal institutions with regard to forest products could potentially offer greater opportunities for poverty alleviation, but were also linked to dependence, unequal risk distribution, as well as a more limited capacity to deal with environmental degradation compared to formal institutions (Schure et al., 2013: 96). Such findings would seem to confirm the importance attributed by Leach et al. (1999) to

placing institutions in the context of local power relations. These findings also act as a cautionary tale when it comes to the development of formal institutions, highlighting how these do not always have the desired outcome, but can also have a negative impact if poorly planned or improperly enforced.

The institutional framework developed by Leach et al. (1999) and adapted by Schure in the context of the woodfuel value chain, is especially significant for this thesis in identifying opportunities for policy-makers to make the charcoal chain more sustainable and equitable. Leach et al. point out some of the challenges policy-makers can encounter when attempting to enact reform, having to confront both ‘issues of power’ (i.e. existing power relations which might resist or capture institutional reform) as well as ‘questions of uncertainty’: "Because institutional arrangements are dynamic, influenced by the ongoing practices and agency of numerous social actors, as well as by contingent events in economy and society, institutional design cannot assume predictable outcomes" (Leach et al., 1999: 241). Greater consideration for the institutional arrangements pertaining to the organisation of the charcoal trade seems highly relevant for this thesis and could lead to valuable insights regarding governance opportunities. Therefore the role of institutions within the charcoal value chain, and especially the potential impact of greater formalisation (in both negative and positive terms), will be an important feature of this study. The possible impact of greater formalisation in the charcoal sector of Uganda will be revisited in chapter five and six, with special consideration for its potential role in reducing environmental degradation associated with the sector.

However, alongside the interesting approach to institutions that Schure’s study offers and which will guide this thesis, there is another aspect of her study which this thesis intends to avoid or, rather hopefully, remedy. Although Schure includes ‘urban demand’ as a dimension of the value chain in her ‘Livelihoods – Woodfuel Chain’ framework (see for example Schure, 2014: 16), this ‘dimension’ receives relatively little attention overall. Her focus is towards the other end of the value chain, namely the rural producers. Although value chain analysis does consider the distribution of benefits (or risks) along the whole chain and is frequently used in a normative sense to locate opportunities for more equitable distribution (e.g. Ribot, 1998; Smith et al., 2015), the impact of such proposed changes on the end-user is not always thoroughly considered, leading the urban consumer to be left behind. In the case of charcoal, it forms a key energy source for a large segment of Kampala’s inhabitants and any changes further up the charcoal chain could have profound ramifications for those dependent on it. This neglect of the end-user is something which this study seeks to address, to shift the emphasis in value chain analysis more towards the urban consumers.

2.4 Social practices

To offset the potential risk of not paying proper attention to the end-users in the value-chain, and thus in the context of the Ugandan charcoal trade of potentially overlooking the plight of the urban poor of Kampala when considering governance opportunities, this study will rely on social practice theory as a supplement to the value chain analysis. Although very suitable in this regard, it should be stated that social practice theory is not just relevant for research focused on end-users but also offers macro benefits (as will be discussed in section 2.5). The following section will briefly describe what a practice-based approach entails, in which the work of Elizabeth Shove will feature quite heavily, before continuing with the ‘practical’ side of how this will be applied in this particular study in the context of charcoal provision in the informal settlements of Kampala. This will include a short discussion on the added benefits that a practice approach would bring to this study, as well as considering (although admittedly not necessarily resolving) the theoretical and practical challenges involved in combining value chain analysis with practice theory.

Practice theory entails a way of looking at social life that goes beyond individuals or structures, and instead centres on ‘practices’ as the main unit of analysis (Spaargaren, 2011). In this, it is “based on the idea that in the continual flow of activities it is possible to identify clusters or blocks of activities where coordination and interdependence make it meaningful for practitioners to conceive of them as entities” (Røpke, 2009: 2491). These entities, or practices, have been defined by Andreas Reckwitz in the following oft-quoted definition:

“A ‘practice’ (*Praktik*) is a routinized type of behaviour which consists of several elements, interconnected to one other: forms of bodily activities, forms of mental activities, ‘things’ and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge. A practice ... forms so to speak a ‘block’ whose existence necessarily depends on the existence and specific inter-connectedness of these elements, and which cannot be reduced to any one of these single elements” (Reckwitz, 2002: 249-250).

This definition succinctly ties in the many aspects to be considered in practices, of which the ‘inter-connected’ and ‘irreducible’ nature of various elements deserve especial emphasis. For example, when we consider something such as the practice of dancing, it is immediately obvious that we cannot reduce it to specific bodily movements or a state of mind, but instead need to look over a vast array of elements which all come together to form this practice. The performance of a practice is not only dependent on knowledge of particular bodily activities or a shared understanding of the

act, but is also clearly shaped by ‘things’ such as (in this case) a dance floor, musical instruments or particular outfits. In some of the earlier works that developed practice theory the place of objects was not yet fully recognised (Shove et al., 2012), but later contributors such as Reckwitz emphasise the important role of objects in practice theory as “necessary components of many practices – just as indispensable as bodily and mental activities. Carrying out a practice very often means using particular things in a certain way” (Reckwitz, 2002: 252). Objects thus inherently carry within them the potential for enabling or constraining activities.

Building on the definition of practices provided by Reckwitz, Shove, Pantzar and Watson (2012: 22-24) put forward a more simplified model of practices based on three elements, namely: ‘materials’ (things, objects, infrastructure), ‘competence’ (skills, practical know-how, bodily knowledge) and ‘meaning’ (mental activities, symbolic meaning, emotional state). Like in Reckwitz’s “specific inter-connectedness” of elements, they emphasize the integrated nature of practices which only exist through the linkages between elements, stating that this also implies “two related possibilities: one is that relevant elements exist but without being linked (proto-practice); the second is that practices disintegrate when links are no longer sustained” (Shove et al., 2012: 24). The dynamic nature of linkages between elements shape the evolution or dissolution of practices, which will be an important aspect to consider in this study, both in considering existing charcoal practices as well as the viability of potential alternatives. As Pantzar & Shove stated in this regard, which is particularly relevant when considering the potential of alternative practices, “if innovations in practice are to take root, requisite ingredients including materials, images and the potential for building new forms of competence must already exist” (Pantzar & Shove, 2010: 457). In their example on the practice of ‘Nordic Walking’, the successful uptake of this innovation did not come completely out of the blue, but instead built on the prior existence of various elements such as, for instance, notions regarding health and exercise, interest in nature and outdoor activities, existing walking trails, active sports organisations, and so on (Pantzar & Shove, 2010).

As the authors admit themselves though, the ‘three elements’ model brushes over some complex issues such as whether material, competence and meaning can actually be easily distinguished between or where to place meaning and emotion within practices, and can thus be accused of oversimplification (Pantzar & Shove, 2010; Shove et al., 2012). However, keeping such flaws in mind, this simplified model still holds significant potential in its practical application, considering the rather abstract nature of practice theory. As Røpke points out, this fairly abstract nature can otherwise lead to some complications when attempting to develop an empirical study, such as how to delimit a practice and which elements to include or exclude, and states that such

decisions must be guided by the research purpose (Røpke, 2009). So using the ‘three elements’ model provided by Shove et al., how would a study of charcoal provision fit in a practice approach?

An important first step is “recognizing that energy is used not for its own sake but as part of, and in the course of, accomplishing social practices” (Shove & Walker, 2014: 47). Continuing this line of thought, Shove and Walker attempted to frame the concept of energy within social practice, stating that from this perspective “understanding energy is first and foremost a matter of understanding the sets of practice that are enacted, reproduced and transformed in any one society, and of understanding how material arrangements, including forms of energy, constitute dimensions of practice” (Shove & Walker, 2014: 48). In this sense, the role of charcoal would be considered as part of the practices in which it is present, which would entail looking at how charcoal constrains or enables activities with, for instance, the practice of cooking being an obvious candidate. The three elements model would serve to dissect the elements coming together in the practice of cooking, before zeroing in further on the key aspects of charcoal.

Policy relevance

Regarding the relevance of such an approach at the policy level (which is after all one of the considerations of this thesis), it is important to consider the urban consumers and their reliance on and vulnerabilities towards particular energy services. Failure to consider such aspects could otherwise lead to potentially flawed policy initiatives. Although Elizabeth Shove stated the following regarding a rather different context than energy services in the informal settlements of Kampala (namely energy policy in the UK), her warning to policy makers not to overlook the dynamic nature of consumption still rings true, in that it can lead to “a somewhat technocratic approach that fails to engage with the big questions of what our needs are and how they are constructed and reproduced. In effect, demand ... is taken for granted and so taken out of the equation” (Shove, 2004: 1053). Shove argues how the abstraction of the concept of energy (e.g. discussing it only in terms of cost or efficiency) limits policy debate by removing energy demand from its moorings within practices. She makes the point that the energy efficiency discourse maintains itself by fixing in place, and subsequently reinforcing, notions of present-day standards of living and services required, which ends up putting us on a particular narrow path of suitable policies, funding and innovation (Shove, 2017). Therefore, to avoid such scenarios policy-makers attempting to affect energy usage must take into consideration the practices and material arrangements on which energy usage is based and the social context in which they play out (Shove & Walker, 2014). The practice approach can thus help guide the development of policy initiatives

with regard to the charcoal sector, by firmly grounding it in an understanding of existent charcoal-based practices, the interplay of elements involved and the function they serve.

Shove's ideas regarding the potential negative impact of focusing on energy efficiency (as locking in current standards of energy usage) have been countered by others who argue that efforts in energy efficiency are in fact making real progress (e.g. Fawcett & Rosenow, 2017; Rosenow et al., 2016), but this ongoing debate still raises some interesting points. For instance, it might highlight an overlooked aspect of the value chain approach, which after all often focuses on improving efficiency along the chain, but thus perhaps falls victim to the trap Shove warns of, namely that it fails to encourage more substantial change in consumption patterns. Although the actual extent to which the pursuit of energy efficiency is harmful remains debatable, getting more to grips with consumption patterns and their potential transformation, not just improving efficiency, can be seen as another potential benefit in supplementing the analysis of the charcoal chain with a practice-based approach on the consumption side.

First placing charcoal in the local context and looking at how it is incorporated in practices by consumers at the household level in the informal settlements of Kampala, should also bring to the fore the exposure of the urban poor to potential fluctuations in charcoal provisioning. Initially placing the centre of gravity on usage of charcoal in local practices before zooming out and working up the charcoal chain outwards from the city, hopefully allows a shift in perspective regarding the charcoal value chain which centres on urban vulnerabilities and the need to reduce these. A practice approach also acknowledges how the demand for charcoal has deep roots that do not just depend on price or efficiency, but are intertwined in various practices. For instance, it can be rooted in a local culture through a style of cooking built around charcoal, which might lead charcoal demand to be far more robust than one would expect based on price or availability of alternatives. Especially when considering potential interventions and alternatives to charcoal, the practice approach thus serves a useful function by shining more light on this robustness and can help to make sense of the deeper level of entrenchment in charcoal use. Such aspects should be taken into consideration in determining governance opportunities to make the charcoal chain both more sustainable and equitable.

2.5 Including practices: practical or not?

Having gone over some of the key aspects of practice theory and how this could feasibly be applied in the context of charcoal-based cooking practices in the informal settlements of Kampala, the potential benefits of such an approach have hopefully become evident. There is however a significant issue regarding the inclusion of a social practice approach alongside value chain analysis

that has so far gone unaddressed, namely how the two frameworks can effectively be combined. After all, they deal in rather different ontologies and units of analysis and therefore are not a straightforward fit. How exactly does a study open with a focus on practices, a unit of analysis which subsumes the traditional dichotomy between individuals and structures, and then proceed into value chain analysis focused on specific actors and institutions? It must be admitted that it can be challenging to find the interconnections between the ‘levelling’ perspective of a practice approach, with its “flat ontology” of social life (Schatzki, 2015: 17, as quoted in Byrne & Bartiaux, 2017), and the top-down perspective of value chains. This thesis makes no grand claim to resolving such issues at a theoretical level, but in acknowledging the inherent friction between the approaches can at least try to foresee complications and potential solutions at a practical level.

Firstly, the above mentioned contrast should be seen in a slightly more nuanced light. Gert Spaargaren details the limitations of relying solely on either an individualist or structuralist explanation of (sustainable) consumption, and sees a practice based approach as balanced between these two, “which pays attention to both agency and structure, which makes room for (combining) both bottom-up and top-down dynamics of change, and which recognizes the mutual influencing and co-shaping of human actors on the one hand and objects and technological infrastructures on the other” (Spaargaren 2011: 815). As indicated here, in a practice approach agency and structure are balanced but do not disappear from consideration, and there is indeed space to consider both bottom-up and top-down aspects (i.e. in the case of charcoal provision, moving from the household level of charcoal usage to the institutional level shaping charcoal provision).

As stated before, an important goal of this study is to put the urban view first when considering the charcoal chain, a prioritization which the practice approach starting at the household level undeniably helps achieve. From this point onwards in the study, one potential pathway is offered by Davide Nicolini in his toolkit for a practice-based approach, which depends on alternating between ‘zooming in and zooming out’:

“The package requires first that we zoom in on the details of the accomplishment of a practice in a specific place to make sense of the local accomplishment of the practice and the other more or less distant activities. This is followed by, and alternated with, a zooming out movement through which we expand the scope of observation following the trails of connections between practices and their products” (Nicolini, 2012: 219).

From this point of view, the charcoal chain can be seen as being made up, in essence, of a series of inter-connected practices, ranging from practices of cooking, to selling and buying, and so on. However, besides the manifold complications in delineating the various practices to be associated

with the charcoal sector (to prevent the study from exponentially spreading out of control), as well as research requirements going far beyond what is possible in terms of time and resources available, this ‘practice-chain’ approach might also create problems further down the line in this study when attempting to translate findings to the policy field. Although admittedly sidestepping the issue at the theoretical level, framing through the more familiar lens and vocabulary of the value chain would be far less problematic in this regard, both for the researcher and interviewees, as well as the intended audience.

Considering how this study intends to first look at charcoal based practices amongst urban consumers before moving further up the charcoal chain, some similarities can still be found with Nicolini’s concept of ‘zooming out’ to gain understanding of the wider picture in which practices are played out and how they are inter-connected. This is of course a somewhat superficial resemblance, but it does indicate a point in the analysis where a transition from practices to value chain would be less jarring. Furthermore, Nicolini mentions that “the zooming in and out is achieved by switching theoretical lenses” (Nicolini, 2012: 219). Although he implies the switching of lenses within a practice-based world-view, his concept of ‘zooming out’ does create some space for introducing an alternative approach. Although the zooming out would no longer entail a study of connected practices, but instead substitute practices for connected actors and institutions, it would arguably perform a similar function in placing urban charcoal practices within the wider picture. It must be conceded that this jury-rigged construction does not offer any concrete solution in merging the theoretical framework of practice theory with that of value chain analysis, but it does offer some small justification for brushing over this issue and in practical terms serves to smooth over the transition from a practice-based chapter to a value chain perspective in this study. Approaching the issues surrounding charcoal provision from these different perspectives will hopefully shed more light on the problem and open up various avenues that a single approach perhaps would not enable.

2.6 Operationalization

This section takes the key concepts discussed above and places them in more concrete terms as identifiable items to be looked for in the empirical chapters and how they are connected.

Practice of cooking

Applying the ‘three elements’ model, the practice of cooking consists of interconnected elements categorized into (1) ‘materials’, (2) ‘competence’ and (3) ‘meaning’ (Shove et al., 2012). Following the model provided by the ResNexus team (see Methodology), these elements are further

subdivided under the categories of Food, Water and Energy. In his toolkit, Nicolini (2012: 221) identifies general questions geared towards bringing (1) material elements of practices to the fore: “What artefacts are used in the practice? How are the artefacts used in practice? What visible and invisible work do they perform? In which way do they contribute to giving sense to the practice itself? ... Which type of practical concerns or sense do artefacts convey to the actual practising?”. Zooming in further on the specific practice in question, ‘materials’ capture the things, objects and infrastructure used in the practice of cooking. This includes the various utensils and equipment (e.g. knives, spoons, pots, pans, stoves) used in the process of cooking, as well as raw materials required (e.g. types of food and fuel and their sources) and other objects used in preparation and clean-up.

Nicolini (2012: 221) also offers some general questions which can help guide the identification of (2) ‘competence’ elements: “What are people doing and saying? ... Through which moves, strategies, methods, and discursive practical devices do practitioners accomplish their work? ... How is [the] practice accomplished through the body?”. More specifically in the context of cooking, ‘competence’ captures the skills, practical know-how and bodily knowledge in the practice of cooking. This may concern where to get the best or cheapest ingredients (be it food, water or fuel) and how to check their quality, the various techniques applied to prepare particular meals (e.g. steaming, frying or boiling food), the actions involved (e.g. practical aspects such as how to light a stove or control the temperature), and how these skills are shared.

Lastly, (3) ‘Meaning’ concerns the mental activities, symbolic meanings and emotional states that form the backdrop for the practice of cooking. General questions to consider that help highlight such elements in practices: “What are the mundane practical concerns which ostensibly orient the daily work of the practitioners? What matters to them? What do they care about? What do they worry about in practice? What do they see as their main object of activity? ... When would they say the practice has been accomplished?” (Nicolini, 2012: 221). This can touch upon the reasoning behind cooking choices (e.g. cooking something because it is more nutritious or cheaper), or why it is important to do something a certain way when cooking (e.g. culturally specific cuisine).

Vulnerabilities

After having sketched the cooking practices in the informal settlements, we turn towards the various vulnerabilities faced by people living in these settlements, with an emphasis on those aspects connected to and affected by charcoal usage. As pointed out, amongst others, by Hogan and Marandola (2005), vulnerability has become a broadly used concept in many disciplines, but it can be challenging to provide a measurable definition as vulnerability is used somewhat differently in

various approaches. For instance, UNISDR (2009) offers the following definition of vulnerability in the specific scenario of disaster risk reduction: “The conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards”. This is a useful definition which touches upon many important aspects of vulnerability, but it largely does so in the face of a sudden disaster, and might not adequately capture vulnerability on a more daily ‘chronic’ basis.

As Hogan and Marandola (2005: 461) emphasise, such daily aspects are important to consider, and they point for example to the efforts of Blaikie et al. (1994) to seek “to analyse disasters without separating them from the daily life of people and of the risks these people face throughout their lives”. Blaikie et al. (1994: 9) offered the following notion:

“[B]y “vulnerability” we mean the characteristics of a person or group in terms of their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard.’ It involves a combination of factors which determine ‘[. . .] the degree to which someone’s life and livelihood is put at risk by a discrete and identifiable event in nature or in society.’” (as quoted in Hogan & Marandola, 2005: 463).

Relying on these definitions together hopefully places sufficient emphasis on the vulnerabilities of daily life in the informal settlements of Kampala. It also captures an important corollary of vulnerability, namely ‘resilience’, which the UNISDR (2009) defines as “[t]he ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard”. In this sense, vulnerability is broadly considered in terms of exposure to particular hazards, and the capacity to deal with outside shocks or crises and the consequences thereof. Although these are admittedly not sharply defined concepts, for the purpose of this study it provides a sufficient platform to build upon.

Charcoal chain

Aspects of the charcoal chain will be discussed from production to consumption, from tree to stove. This discussion is guided by a categorization based on literature review (Ribot, 1998; Shively et al., 2010; Schure, 2014; Smith et al., 2015) of groups active at various stages of this chain. This has resulted in a classification of seven types of private actors (see Methodology) engaged in particular tasks along the chain, from the cutting and carbonisation of wood, to handling official paperwork or unofficial payments, to transportation and distribution, and finally consumption. A separate section considers the formal and informal institutions relevant to the charcoal sector, relying on the

definition provided by Schure who defines woodfuel institutions (which will be applied more narrowly as charcoal institutions in this thesis) as “the formal and informal rules and regularized patterns of behavior between different actors in society and associated enforcement mechanisms that shape access related to woodfuel production and trade” (Schure, 2014: 69-70). This definition in turn relies upon the formal and informal distinction made by Leach et al., 1999: 238): "Formal institutions may be thought of as rules that require exogenous enforcement by a third-party organization. ... Informal institutions, however, may be endogenously enforced; they are upheld by mutual agreement among the social actors involved, or by relations of power and authority between them". For example, government licensing of the charcoal trade is discussed as part of the formal institutions defining the charcoal sector, while bribery is important element of the informal institutions shaping the charcoal chain.

Benefit distribution in the chain concerns the relative share of profit (based on cash income) being made by the different actors from the charcoal trade. Following Ribot (1998; 2005) this distribution then leads to the analysis of the mechanism through which actors control and maintain their access to these benefits. To offer an example of such mechanisms, an actor might rely on his expertise (e.g. how to carbonise wood efficiently), capital (e.g. being able to afford to buy sacks of charcoal in bulk) or social ties (e.g. having a distribution network), or a combination thereof. Such aspects will guide the discussion of access.

Governance

The following aspects will guide the analysis of governance opportunities in chapter 6. When discussing governance in relation to the charcoal sector, an important element to discuss at some length is decentralisation, because it can be considered one of the key defining aspects of governance in Uganda (see Chapter 5.3). Decentralisation is especially critical in the charcoal sector which, being widely spread across the country, crosses many borders and operates at many scales of local government, thus coming into contact with many aspects of the decentralised state.

Likewise, another important aspect which defines the charcoal sector of Uganda and warrants discussion, is ‘informality’. This partly relies on the previously mentioned distinction between formal and informal institutions by Leach et al. (1999) and Schure (2014). One cannot discuss governance in Uganda without decentralisation, but neither can governance be discussed without addressing informality. The impact of the informal nature of the charcoal sector can be traced at different levels, affecting monitoring and enforcement at the local government level, while the limited information available about the sector due to its informal character can complicate planning and coordination at the ministry level.

Having discussed informality, this is naturally followed by a discussion of formalisation. This relies on the previously mentioned concept of formalisation, namely the extent to which the charcoal sector is “controlled by explicit rules, procedures, and norms that prescribe the rights and obligations of the individual [companies] that populate it” (Choi and Hong, 2002: 470, as quoted in Schure et al., 2013: 96). In contrast to the existing often-times informal arrangements in the charcoal chain, which come from and are upheld by actors within the chain itself, formalisation concerns a transition towards formal rules enforced through an outside third-party. Other aspects which will guide the analysis of governance opportunities follow from the preceding value-chain discussion, namely the distribution of benefits in the chain and the access mechanisms upon which actors rely. This is used to consider the potential impact of suggested policy measures.

3. Methodology

The following chapter describes the approach taken up in this thesis. It details the research area, the various methods applied and lists the conducted interviews and the observations on which the study relies. It sets out the scope and considers the constraints which were to be taken into account both before commencing with fieldwork and throughout the study itself.

3.1 Research design

This study relies on a qualitative case study design, in which the study area concentrates on the informal settlements of Kanyogoga and Bwaise in Kampala. Bwaise is in fact a big parish containing several zones, so the study area should more accurately be referred to as Bwaise III, although in the text this will simply be shortened to Bwaise for convenience sake. Low-lying Kanyogoga is situated in the south-east of the city near Lake Victoria next to open wetlands and is exposed to frequent flooding during heavy showers. It is built on a narrow strip of land around an old railroad track which is no longer in use, although this may change with potential government plans to renew the railroad-network (MakSPH Interview). Bwaise lies north-west of the city centre in a more built-up area than Kanyogoga, near an industrial site with many carpentry workshops. Kampala is built on a number of hills and Bwaise is situated in one of the flood-prone valleys between these hills. This flooding can be so severe that the oft-heard Ugandan saying “water is life”, has been given the locally well-known addition of “unless you live in Bwaise”.

These two sites represent settlements at different levels of development. Bwaise is an older settlement and has slightly more advanced infrastructure (e.g. more watertaps supplying piped water), whereas Kanyogoga has developed more recently and can be considered more informal, which includes greater uncertainty about the future of the settlement. In recent years, Bwaise has seen some investment in improving basic services and infrastructure that might be developed further, which seems to imply greater acceptance of this settlement and potential acquiescence in transitioning eventually to a more formal status. Since Kanyogoga is actually built around a derelict railroad track (which may be reclaimed in the near future) right alongside wetlands that are supposed to be off-limits to residential building, its status is far more precarious. These variations between the chosen study areas might reveal subtle differences regarding the vulnerabilities faced by local communities, and present slightly different risks as well as potential avenues for improvement.

3.2 Data collection

This study relies on a mix of methods, namely semi-structured interviews, observations and studying of policy documents where available (e.g. from relevant ministries). Literature review also helped establish the initial categorization of actors in the charcoal chain. Alongside in-depth interviews with experts and actors in the charcoal chain, there was also room for more informal conversations, particularly in cases where interviewees could otherwise be hesitant to share potentially sensitive information if it were to take place in a more structured interview setting. In total sixteen interviews were conducted, not counting short informal conversations throughout the fieldwork or during the World Café (see below). It should be noted that upon arrival it was discovered that Bwaise is more strongly geared towards firewood than charcoal (due to the close proximity of wood workshops which allow people to pick discarded wood for a small fee), and therefore interviews with charcoal vendors and traders are concentrated in Kanyogoga since this settlement offered greater access to actors in the charcoal chain. The interviews with actors in the charcoal chain were accomplished with the help of translators from the ResNexus team and were all recorded, translated and transcribed (see Table 1 below for an overview of the interviews conducted). The interviews with experts were also recorded and in some cases exactly transcribed, while in other cases only note-taking was relied upon. Observations featured in the early stages of research, especially the social practice part of this study. Observations were also relied upon to gain insight into aspects of the charcoal trade to which stakeholders might not wish to draw attention, that is, “to obtain data on ‘illegal’ or hidden practices” (Schure, 2014: 22).

Table 1: Interview list

In text reference	Date conducted	Description Interviewee
BEETA	19-10-17	Consultant (advising the MEMD) and vice-chair of Biomass Energy Efficient Technologies Association (BEETA) which is a member of the umbrella organisation UNREEEA. Also owns a large scale briquette-making factory (Uganda Green Fire), which was visited.
CREEC	17-10-17	Derrick Kiwana, Bioenergy Technician at the Centre for Research in Energy and Energy Conservation (CREEC), affiliated with the Makerere University.
EASE	04-10-17	Irene, founder of Engaging Action for a Safe Environment (EASE), active in briquette production in Kanyogoga.
KCCA	06-10-17	A representative of the Urban Planning department at the Kampala Capital City Authority (KCCA).
MakSPH	16-10-17	Dr. John Bosco Isunju, lecturer at Makerere University, School of Public Health (MakSPH). Has worked on wetland encroachment and vulnerability in informal settlements (including Kanyogoga).
MEMD	11-10-17	Assistant-Commissioner of renewable energy at the Ministry of Energy and Mineral Development (MEMD).
MWE	12-10-17	Senior Forest Officer, Monitoring & Assessment, at the Ministry of Water and Environment (MWE), overseeing the National Forestry Authority (NFA).
NEMA	19-09-17	Senior District Support Officer coordinating the Western Region, at the national Environment Management Authority (NEMA).
Retailer 1	20-09-17	‘Mama’ Reagan, local charcoal vendor in Kanyogoga, also conducts business on the side cooking food.
Retailer 2	20-09-17	‘Mama’ Dora, local charcoal vendor in Kanyogoga, also sells pre-prepared food.
Retailer 3	20-09-17	‘Mama’ Juma, local charcoal vendor in Kanyogoga.
Retailer 4	04-10-17	Local charcoal vendor in Kanyogoga, also sells produce.
Retailer 5	04-10-17	Local charcoal vendor in Kanyogoga, also has a little shop selling packaged food and other small household products.
Trader 1	04-10-17	Small-scale trader new to the trade (has made two trips to production areas), also personally involved in transportation and retail.
Trader 2	04-10-17	Mid-level trader, active in the trade for 16 years (note: interview conducted by phone).

UNREEEA	27-10-17	Noah Asinge, Information and Partnership Officer at the Secretariat of the Uganda National Renewable Energy and Energy Efficiency Alliance (UNREEEA), an umbrella organisation for the private energy sector.
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The first stage of research looks at cooking practices in the informal settlements, particularly the role of charcoal within these practices, and uses the previously mentioned ‘three elements’ model provided by Shove et al. (2012). This requires distinguishing the three elements of ‘materials’, ‘competence’ and ‘meaning’ in the practice of cooking. However, it should be made clear that the practice side of this study is largely built on observations made by others. This study is heavily indebted to the work done by the ResNexus team¹, whose detailed observations in Kanyogoga and Bwaise over a period of several months captured the varied elements coming together in the practice of cooking. The ResNexus Project relied on the method of ‘shadowing’ practitioners in the act of cooking (including preparation and clean-up), a method of observation which closely follows practitioners to capture their actions, sayings and the context within which a practice is performed, to enable the researcher to gain an insider’s perspective of the practice at hand (Nicolini, 2012). These observations were done using a ‘debrief scheme’ divided into various categories to simplify the process for the observer and make sure the observations (as well as their accompanying interpretations) covered the various aspects necessary for the study. This is why the references are termed ‘Debrief *n*’ (see Table 2 below for an overview of the observations). The ResNexus team also organised focus group discussions (FGD) in Bwaise and Kanyogoga, of which I could happily attend one (while receiving transcripts from the team for both). Lastly, the Resnexus team also organised a World Café day, a format of rotating group discussions which brought together stakeholders from the informal settlements, NGOs and local government. The discussions were divided into tables on Energy, Food and Water and I participated as a scribe for the Energy table, which provided a great opportunity to gather information on the role of charcoal and alternatives in the informal settlements through various perspectives. It also offered greater insight on connections between the fields of energy, food and water and the general challenges of life in the informal settlements. Without the efforts, time and resources invested by the ResNexus team in establishing contact with the local community, identifying research participants, observing their cooking practices over a period of time and organising group discussions, this study would not have been possible, and therefore owes a huge debt of gratitude to their efforts.

1 ResNexus refers to an ongoing study into ‘Resilience and vulnerability at the urban Nexus of food, water, energy, and the environment’. See www.resnexus.org for more details on the various aspects of the project. Fieldwork is currently being conducted at three sites (Kampala being one of them) by the different partners of the project (from the University of Sao Paulo, the University of Sussex and Wageningen University).

Considering the overarching aim of this thesis to study and identify opportunities to improve the charcoal chain, it should be kept in mind that the practice chapter is meant to provide a snapshot of the practice of cooking in the informal settlements, and should by no means be seen as a completely exhaustive account of all the aspects that enter into it (for that, see the forthcoming publications of the ResNexus group). The focus of this thesis is, and remains, charcoal, with other aspects discussed as far as is necessary to provide context and illustrate connections with the field of energy.

Moving up the charcoal chain associated with the chosen informal settlements, the intention of the thesis is to expand the study area link-by-link in the chain to eventually encompass the entire charcoal supply zone of the settlements in question. Although this may be the intention, it should be reaffirmed that the urban consumers remain the clear priority within this study, and therefore the extent to which it is possible to move further upstream in the charcoal chain is dependent on the progress made during the field work. Due to the ‘opaque’ nature of the charcoal chain, the various stakeholders can be difficult to find (Shively et al., 2010). Therefore, stakeholder selection moves along the charcoal chain, starting from consumers and using a snowball approach to find further actors.

Table 2: Debrief list (source: ResNexus)

Debrief <i>n</i>	Shadowee, <i>n</i>th observation, date and location
Debrief 1	Ms. Annette Kabogere Nana - 1 st observation 13-07-17, Kanyogoga.
Debrief 2	Ms. Annette Kabogere Nana - 2 nd observation 20-07-17, Kanyogoga.
Debrief 3	Ms. Annette Kabogere Nana - 3 rd observation 29(?) -07-17, Kanyogoga.
Debrief 4	Ms. Betty Awori - 1 st observation 13-07-17, Kanyogoga.
Debrief 5	Ms. Betty Awori - 2 nd observation 19-07-17, Kanyogoga.
Debrief 6	Ms. Betty Awori - 3 rd observation 29-07-17, Kanyogoga.
Debrief 7	Ms. Florence Adong - 1 st observation 19-07-17, Kanyogoga.
Debrief 8	Ms. Florence Adong - 2 nd observation 29-07-17, Kanyogoga.
Debrief 9	Ms. Ramula Kyohirwe - 1 st observation 11-07-17, Kanyogoga.
Debrief 10	Ms. Ramula Kyohirwe - 2 nd observation 28-08-17, Kanyogoga.
Debrief 11	Ms. Selly - 1 st observation 28-08-17, Kanyogoga.
Debrief 12	Ms. Alice Nabbumba - 1 st observation 14-07-17, Bwaise.
Debrief 13	Ms. Alice Nabbumba - 2 nd observation 18-07-17, Bwaise.
Debrief 14	Ms. Alice Nabbumba - 3 rd observation 23-07-17, Bwaise.
Debrief 15	Ms. Halima Nassanga - 1 st observation 14-07-17, Bwaise.

Debrief 16	Ms. Halima Nassanga - 2 nd observation 21-07-17, Bwaise.
Debrief 17	Ms. Halima Nassanga - 3 rd observation 01-08(?) -17, Bwaise.
Debrief 18	Ms. Nakimera - 1 st observation 08-07-17, Bwaise.
Debrief 19	Ms. Nakimera - 2 nd observation 19-07-17, Bwaise.
Debrief 20	Ms. Nakimera - 3 rd observation 07-08-17, Bwaise.
Debrief 21	Ms. Shamim Nanyunja - 1 st observation 21-07-17, Bwaise.
Debrief 22	Ms. Shamim Nanyunja - 2 nd observation 12-08-17, Bwaise.
Debrief 23	Ms. Winnie Namyalo - 1 st observation 14-07-17, Bwaise.
Debrief 24	Ms. Winnie Namyalo - 2 nd observation 21-07-17, Bwaise.

Mapping access

This study follows Ribot (1998; 2005) in mapping access within the charcoal chain through several steps. As Ribot states, “[t]his method provides two maps: one of profit distribution and one of mechanisms, structures and processes at work in the control and maintenance of that distribution” (Ribot, 1998: 313). The first step is to identify all relevant actors. Based on literature review (Ribot, 1998; Shively et al., 2010; Schure, 2014; Smith et al., 2015), the various actors that are involved in the charcoal trade can roughly be divided into the following categories (in keeping with the goal of this study to pay greater attention to the exposure of the urban poor of Kampala, these have been listed starting from the urban consumers outwards):

1. Consumers
2. Retailers
3. Wholesalers/ urban broker*
4. Transporters
5. Merchants/traders
6. Agents/middlemen*
7. Producers/landowners

*Note: Neither Smith et al. (2015) nor Schure (2014) explicitly mention these two categories, while the more detailed value chain categorization by Ribot (1998) and Shively et al. (2010) do not share the same category distinction, with agents being absent and wholesalers present in the analysis by Ribot, whereas the opposite is true for Shively et al. Therefore, to avoid making assumptions prior to the field work, both categories were initially taken up in this thesis.

Each category could be further subdivided, and neither should this framework be assumed to be always applicable or accurate, but it serves as a rough guide to start with, which could be further refined with results from the field work. Since this study is concerned with charcoal provision in informal settlements, the *consumers* (1) to be considered will initially be limited to inhabitants of the chosen settlements. *Retailers* (2) can range from small local vendors to stallholders at markets. Ribot (1998) makes a distinction between retailers and *wholesalers* (3), in which the latter possess the capital and storage facilities to buy in bulk from traders (i.e. one or several trucks' worth) and then distribute to smaller retailers, while he characterises retailers as purchasing charcoal only in small quantities and selling directly to consumers (unlike wholesalers). Somewhat surprisingly, this distinction was not made by Shively et al. (2010) in their study of the charcoal chain in Uganda, but it seemed useful to take this up as will be detailed in the chapter on actors in the value chain.

Regarding '*transporters*' (4), Smith et al. (2015) found great diversity in the different types of transporters (e.g. small scale transporters on foot or by bicycle, by mini-bus, lorry drivers) but since their study looked at a much smaller town with more direct close connections to the rural hinterland, it could not be assumed that the same variety is present in Kampala. *Merchants/traders* (5) buy from producers and sell to urban wholesalers or retailers, but not directly to consumers. They may own their own transportation or arrange it through a third party.

Shively et al. (2010) define *agents* (6) as "middlemen between producers and traders. They do not buy and sell charcoal, but rather collect commissions for connecting producers with traders" (Shively et al., 2010: 273). This category was absent in Ribot's study. It should be kept in mind that there might be vertical integration within the charcoal trade, with some actors perhaps not fitting neatly into a single category, but instead occupying several roles (Ribot, 1998). This will be considered as far as possible, but following Shively et al. (2010), the option will be kept open to focus only on the (self-)identified primary role.

The next step in Ribot's access mapping is to evaluate cash income and profit between the various levels of the charcoal chain, which requires information on charcoal quantities handled, purchase and sale prices, as well as expense data (Ribot, 2005). Such quantitative data will be sought through interviews with actors in the charcoal chain. However, where actors are unwilling to share such information or give only vague estimations, this information will be supplemented through alternative sources (e.g. through expert contacts, policy documents or literature review). Reliance on such secondary sources is also necessary for information on activities further upstream in the chain, where time and resource constraints prevented direct contact with relevant actors.

Ribot also calls for the evaluation of the distribution of income and profit within the same level (e.g. whether profits are relatively evenly distributed amongst traders or highly concentrated amongst a few), but acknowledges the many practical challenges in making such an assessment (Ribot, 2005). Therefore, this thesis will focus more on the final step to use the benefit distribution garnered from interviews with actors in the charcoal chain alongside secondary sources, to analyse how access to benefits is “maintained and controlled at different levels of a market... via a variety of mechanisms. By mechanisms, we mean threats of violence, social ties, social identity, knowledge, skills, credit, permits, licenses, quotas, collusion, and so forth” (Ribot, 2005: 11). Based on this analysis, the subsequent link will be made with the policy level to search for governance opportunities, which will also be supported through literature and document review to assess the impact and feasibility of potential policy initiatives.

The Charcoal Survey (2016), a study of the charcoal sector intended to provide a baseline of the value-chain, will feature heavily in describing the charcoal chain, but it will be used far less when considering consumer aspects. This perceived oversight might be questioned, so a brief explanation is in order. Although the survey included respondents from Kampala, based on answers about where households cook during the dry and wet season (around 73 percent reported to cook their meals either in a separate building or in separate kitchen attached to the main house (Charcoal Survey, 2016: 75)), it would seem that the respondents are most likely not from informal settlements such as Kanyogoga or Bwaise where such options are largely unavailable. Another important factor might be the broader spectrum of consumers, which include rural areas that rely much less on charcoal and where more space is available, which would further distort the findings of the survey from the perspective of a study focused on the informal settlements of Kampala. Whereas the charcoal trade aspects in the Charcoal Survey are consistently divided into regions with figures given for these specific areas (i.e. comparing the cost of supplying charcoal to Kampala with the cheaper supply for the smaller town of Gulu), the consumer figures are sometimes bunched together so that our already ‘suspect’ figures from Kampala (i.e. probably not informal settlements) are taken together with those from rural areas, as for example when stating that the majority of households collect rather than purchase their main fuel for cooking (Charcoal Survey, 2016: 80). Considering the overarching goal to put the urban consumers of the informal settlements centre stage, heavy reliance on the Charcoal survey for consumer aspects would not be appropriate.

3.3 Scope and limitations

As stated previously, this study seeks to encompass the actors and institutions associated with the entire charcoal chain of the districts in question, link-by-link from the urban consumers onwards. The informal nature of the charcoal trade and the limited time available makes it challenging to assess in advance how far along the charcoal chain this study will realistically be able to go. This study relies on the snowball method, so it is difficult to predict where this might lead since a lot depends on the willingness of various actors to speak in detail about a sensitive or potentially incriminating subject. It must be conceded that time and budgetary constraints, as well as the numerous complications in finding and approaching actors engaged in informal (and sometimes illegal) work in not easily accessible locations, where the presence of this researcher will certainly not go unnoticed and might not always be well-received, might mean it would not be possible to personally interview the various types of actors further up the charcoal chain. Therefore, this study was prepared in advance to rely more upon secondary sources (expert interviews and document review) to describe their roles and interests.

Furthermore, it must be admitted that the same constraints in time and resources will also necessarily affect the scope of the social practice aspect of this study, which will therefore concern more of an exploration of practices incorporating charcoal rather than an in-depth study of the full range of bodily and mental activities, objects, motivations, meanings and understanding coming together in the performance of inter-connected practices. However, considering the aim of this study, such limitations should help to keep the study on track and maintain the overall focus on the role of charcoal in the informal settlements, rather than getting entirely lost in the tall grass of various inter-connected practices around cooking.

It should also be reiterated that, as Shove et al. (2012) emphasized themselves, their simplified ‘three elements’ model might overstate the extent to which it is possible to distinguish between the elements of material, competence and meaning in practices. It might not always be clear where to draw the line between them, or whether something belongs in one category or the other. At this point the author’s personal (and potentially flawed) interpretation might be a deciding factor. In some cases, the categorization might even be deliberately overridden for the sake of clarification, but this will be explicitly stated.

Since the scope of this study is restricted to the two study areas of Bwaise and Kanyogoga, care should be taken in extrapolating the findings from this study into any assumptions that these two communities are representative of the informal settlements of Kampala as a whole. Regarding interviews with local actors in the informal settlements, due to language barriers (some speak

English, but the majority speak the local Luganda language) this requires the help of a translator. Luckily the researchers from the ResNexus team who helped with translating are very knowledgeable about the issues relevant to the study, but nonetheless having someone in between the interviewer and interviewee always risks missing some information or nuance. Such aspects should be kept in mind when considering the results from the interviews. Another minor factor that should be taken into account is seasonal variation. Since the field work for this study was limited to a two month period (September-October), it was not possible to personally assess seasonal variations in charcoal production and transportation costs, and their subsequent effect on retail prices. Instead, this was addressed through expert interviews and document review.

Lastly, the constraints in time and resources as well as the informal nature of the charcoal trade will affect the amount and type of information that can be garnered for value-chain analysis. It must be explicitly stated that reliance on secondary sources or potentially vague profit estimates will obviously have implications for the level of accuracy that can be achieved in the benefit distribution. However, for the purpose of this study a rather limited profit distribution can be sufficient, as long as the broad brush strokes of this picture provide enough information to study the mechanisms by which (if not the exact degree to which) actors profit, which then still allows us to work towards potential policy opportunities based on the identified mechanisms.

4. Zooming in: Charcoal in use

This empirical chapter provides an overview of the way charcoal is used in the informal settlements of Kanyogoga and Bwaise. Using a practice-based approach, it seeks to determine the role that charcoal plays in the cooking practices of the informal settlements. Based on the previously discussed ‘three elements’ model provided by Shove et al. (2012), it will first set out the various elements coming together in the practice of cooking. In this sense, charcoal simply constitutes one ‘material’ element (albeit an arguably formative one) of this practice alongside several others, as well as the diverse forms of ‘competence’ and ‘meaning’ coming together in cooking. After having set out this general sketch of cooking practices and their constituent elements, section 4.2 zooms in further on the enabling and constraining characteristics of charcoal usage itself. This entails looking at some of the issues associated with charcoal dependence and mapping the resulting vulnerabilities.

4.1 The practice of cooking: Materials, competence and meaning

This section is organized according to the three elements model, with sections on ‘materials’ (things, objects, infrastructure), ‘competence’ (skills, practical know-how, bodily knowledge) and ‘meaning’ (mental activities, symbolic meaning, emotional state). For the sake of clarity, the materials section has been further subdivided into the following categories (borrowing the template provided by the ResNexus team): Food, Water and Energy. Various cooking utensils and equipment are required to perform the practice of cooking in the informal settlements of Kanyogoga and Bwaise. This includes many items that would be broadly familiar around the world, such as aluminium or stainless steel pots and saucepans, knives, spoons and ladles for stirring, plastic bowls and dishes, whose uses likely require little explanation (unless used in a very striking way). However, there are also ubiquitous items such as plastic jerrycans for fetching and storing water (Debrief 1 - 24), and clay or metallic stoves for cooking that are perhaps less familiar (even if millions across Sub-Saharan Africa use them daily). These will be discussed briefly in the relevant sections as they come up, with the stoves naturally warranting special attention considering the focus of this study. Lastly, textboxes are included that take a closer look at what alternatives to charcoal are available in the informal settlements and the extent to which they are viable competitors.

4.1.1 Materials (things, objects, infrastructure)

Food

Some of the staples of the local cuisine are posho (made from maize or cassava flour cooked to a thick porridge-type consistency), matooke (boiled or steamed and mashed bananas), yams, ‘Irish’ potatoes, rice and beans, with an accompanying sauce or stew made from groundnuts, spices, onions and tomatoes. These meals only rarely include meat. Despite their proximity to Lake Victoria, the shadowees from Kanyogoga reported that they ate fish very rarely due to relatively high prices (FGD Kanyogoga). In general, the main types of food being cooked were reportedly shifting and such adaptations should be seen in the local context of rising prices. For instance, traditional staples such as matooke were seen to be less affordable than they used to be, and therefore being replaced more often by cheaper alternatives such as cassava posho (FGD Kanyogoga). Although admittedly the subject of changing prices might not fit entirely in the category of material elements, due to its impact on food choices made by shadowees and thus the actual material make-up of cooking, it seems relevant to briefly discuss it here, especially since it also relates to the role of charcoal.

A commonly heard complaint was that goods are becoming more expensive and scarce (FGD Kanyogoga and Bwaise) with shadowees having to go further than usual to find what they need at an affordable price, such as the example given by one shadowee that she usually buys two tomatoes for 200 Ugandan shillings (UGX) near her home, but now has to walk about a kilometre to buy two tomatoes for 400 UGX (Debrief 2). Another described how beans used to cost 500 UGX, but that nowadays a kilogramme of beans cost 1300 UGX (Debrief 20). Matooke in particular was frequently mentioned as becoming unaffordable (e.g. FGD Kanyogoga; FGD Bwaise). However, not only has food itself become more expensive, but also the main way of preparing the food, thus squeezing budgets from two fronts. Charcoal prices in Kampala have shot up over the past year by as much as thirty percent (The Independent, 2017), the reasons for which will be discussed in greater detail in the 'Zooming out' chapter of this thesis. Suffice to say here that many shadowees pointed to the high price of charcoal as one of the bigger challenges they face in meeting their daily needs, with the result that cooking time has become a more important factor when considering food (i.e. cooking food that takes less time so that charcoal consumption is reduced). Food choices are thus partly being shaped by charcoal, a theme which we will most certainly return to.

To gain some insight into the impact food price rises might have, it might be useful to briefly consider income and food expenditure in the informal settlements (at the time, one euro was worth roughly 4000UGX). One shadowee reported daily expenditure on food of between 6000 and 10.000 UGX (Debrief 3), another gave the figure of 12000 UGX a day (Debrief 6), while a third reported to spend 80.000 UGX a month on food (Debrief 7). Several factors are at play here of course, such as the household size (which varied considerably amongst the participants of this study) and the available income (which was a sensitive topic that could not be freely discussed, but with monthly incomes of between 150.000 and 250.000 UGX mentioned (Debrief 11; Debrief 7)). This seems to broadly correspond with some of the figures found during an earlier study in Kanyogoga and other nearby informal settlements, where the majority of respondents reported monthly household expenditure in the range of 100.000 – 200.000 UGX (36.1%) or 200.000 – 300.000 UGX (37.2%) (Isunju, Orach & Kemp, 2016). Other estimates were offered of average earnings in informal settlements of around 5000 UGX a day, but with the disclaimer that precise figures were not available (Interview KCCA). Monthly rents were mentioned of 50.000 and 60.000 UGX (Debrief 22; Debrief 11), but again this could vary significantly. Suffice to say that reported price increases such as an extra 800 UGX per kilogramme of beans (as stated earlier) can have a strong impact on the available budget for food, with households in the informal settlements often having very limited or no financial reserves. For example, one particularly vulnerable shadowee stated that she only

buys half a kilogramme of beans at a time because she cannot afford a full kilogramme (Debrief 22).

In general, rising food and fuel prices have affected food choices for lower-income communities, with cheaper fast-cooking food such as greens and posho replacing more expensive slow-cooking foods such as matooke (FGD Kanyogoga). We thus see how the material element of food is strongly linked to cost-saving ideas which override notions of nutrition or taste. As one shadowee explained, if she does not cook posho then she cooks rice, because these two do not take as much time to cook as matooke (Debrief 3). Another stated that they eat greens when other food is not freely available because it is cheaper (Debrief 11). A third explicitly stated that she mainly makes cassava posho because it is the most affordable staple food (Debrief 4; also FGD Kanyogoga). As an example of reducing cooking time, she also explained that she removes the (edible) stalks from greens, because otherwise it takes longer to cook and then uses up more fuel (Debrief 4).

Such stories point to growing food insecurity in response to which various coping mechanisms are applied, such as switching to faster cooking foods or adapting by having only one main meal a day (usually only done by adults while children more often still have a second meal) (Debrief 6; Debrief 9; Debrief 10). In such cases, they just 'take tea' in the morning (which can imply a small bun on the side) and have the main meal in the early evening when all the household members have returned home from school or work (Debrief 1). Such adaptations mean that less money is spent on food but also that they only cook once a day which saves on fuel, with this being explicitly mentioned by several shadowees as a strategy in times of scarcity (e.g. Debrief 1; Debrief 6; Debrief 11; Debrief 21).

Some shadowees prepare food early in the morning to fit with the routine of those going to work or school, but usually these meals do not entail an elaborate cooking process but just (re)heating food leftover from the last meal or some porridge (e.g. Debrief 1; Debrief 7). Younger members of the household are usually given cassava or maize porridge (Debrief 1; Debrief 7; Debrief 9). Cassava porridge can be cooked in a short time (ten to fifteen minutes, whereas maize porridge takes longer), and it can be prepared with or without milk, depending on whether money is available (Debrief 1). Porridge can also be kept warm in a flask overnight, with the dual advantage that it is ready for whenever a child wants it as well as saving on the time and resources that would otherwise be required to cook it in the morning (Debrief 9).

Once the necessary food, fuel and water have been acquired, the cooking process of course depends on the type of food available, with for instance beans taking longer to cook (and also need to be sorted and washed first to get rid of stones and dirt) (Debrief 5). The following example

(based on Debrief 2, 4 and 7) offers a glimpse of what an average meal might entail: First, after sorting and washing the beans, the stove is lit and the beans are cooked for several hours until ready. Subsequently they will be fried with a sauce (for instance made from chopped tomatoes, green peppers, onions, spices). Next, water is brought to a boil to make posho (from maize or cassava flour) and once this is completed, the sauce is briefly warmed and the meal can be served. To make the most of the fire if it is still going, water can be boiled for drinking or tea, or rice can be made to be saved for the following morning, after which the fire will have gone out and the cooking session ends (Debrief 2). In order to maximise efficient fuel usage, all these actions in the cooking process are carefully organised (e.g. using the dying embers to boil drinking water or tea for the next day), as will be discussed in more detail further on.

Water

Although so far largely unremarked, water is of course a hugely important material element in the practice of cooking. It is indispensable throughout the various steps of the cooking process, from the preparation phase when washing food, to the actual boiling and steaming of food, or simply boiling drinking water and preparing tea, to the washing up stage when cleaning the cooking equipment and utensils. Next to water itself, there is also the necessary infrastructure and equipment to get water in the context of the informal settlements, i.e. plastic jerrycans for carrying water from taps or springs, and containers to store the water at home.

Starting with the collection of water, the time spent on this task naturally varies depending on the availability of water and how close the source is, with some living nearby spring wells so that it only takes a few minutes (e.g. Debrief 2; Debrief 15). Others might have to go much further, such as one woman in Bwaise who described how if they lacked the money to pay for water from the nearby taps (which operate based on pre-loaded water tokens), they have to fetch water from a well which takes about 30 to 45 minutes, while during (admittedly rare) droughts it can take up to two hours due to crowds (Debrief 21). Other households in Bwaise also rely on water from such wells during water crises (Debrief 23). In discussing her preference for water from paid standpipes, another shadowee from Bwaise talks about the time otherwise lost when collecting spring water, even mentioning that fights might break out over access to these wells (Debrief 13).

Once collected in plastic jerrycans (5/10/20 litres), ‘raw’ water (unboiled) is stored in whatever container is available, often the jerrycans themselves which frequently do not have any coverings (Debrief 1; Debrief 9; Debrief 15). Daily water usage can be anywhere from 1 to 10 jerrycans, depending on the size of the household and whether it is needed just for cooking and drinking that day or also for cleaning and washing clothes, which can almost double the amount

needed (e.g. Debrief 1; Debrief 15; Debrief 23). Water usage is also affected by whether water is free of charge (i.e. from spring wells) or not (i.e. from paid taps, usually for 100-200 UGX per jerrycan). In general, we can observe that water usage is guided by similar cost- or time-saving ideas as food. This touches upon another difference between Kanyogoga, which borders the wetlands and where open spring water is freely available year-round, and Bwaise which has a greater number of standpipes (which require payment) and only a few spring wells. This difference will be discussed in more detail in the chapter on ‘vulnerabilities’. For now, it should be stated that due to the risk of contamination, those relying on water from open wells are advised to filter or boil their water before consumption, which is where charcoal enters the picture.

Energy

The majority of the participants in this study, and in the informal settlements in general, use charcoal burning stoves. However it should be stated that a significant group also rely on firewood used in a traditional three stone setup, especially in Bwaise due to the wider availability there of firewood. This is because of the large number of carpentry and furniture workshops sited near this district, which allow people to come pick wood-shavings and leftover wood for free or a low fee. In Kanyogoga, firewood is far less available and therefore fewer people make use of the three stone setup when cooking. Sometimes people still switch from more expensive charcoal to firewood when it becomes (temporarily) available, for example picking timber from construction sites (Debrief 5), or sending their children to collect wood washed away during floods in the surrounding wetlands (Debrief 9). Nevertheless, this wood supply is rather unreliable, so easily accessible charcoal tends to be the main option in Kanyogoga.

In Bwaise the previously mentioned presence of carpentry and furniture workshops which produce plenty of wood waste, means that firewood is far more important, as illustrated by the statement of one participant from Bwaise that “everyone here uses firewood, most people cannot afford charcoal” (Debrief 18). This also demonstrates the main appeal of firewood compared to charcoal, namely the lower price. They can go to the carpentry workshops and industrial park to collect firewood, with a variable price range: “Sometimes I get for free, sometimes I buy” (Debrief 15). If free woodchips and offcuts are unavailable, one shadowee mentions it is still possible to buy a sack of firewood for around 5000 UGX (Debrief 24).

However, even in Bwaise the supply of firewood is not always reliable. The supply depends on the carpentry workshops which can be affected by power cuts, because when the machines in the workshops cannot function, they do not produce any wood waste (Debrief 21; Debrief 22). On such days, unless they have stored some firewood, households postpone cooking until the machines are

running again (Debrief 22). Moreover, since the local demand for firewood is high, some days households might fail to acquire enough wood to cook.

Regarding the type of stoves, there are charcoal stoves of various types, ranging from traditional small clay ones or widely used cheap metallic ones, as well as costly but more efficient improved cookstoves (e.g. with ceramic lining to better retain heat). Preferences vary, with one shadowee explaining that she prefers the simple clay stoves because they light up quickly and retain heat better than the metallic ones, thus saving on charcoal (Debrief 3), while another preferred the smaller clay stove because the bigger ones tended to consume more charcoal (Debrief 6). This points to concern with efficiency in charcoal usage, but at the same time it must be noted that none of the shadowees reported making use of improved cookstoves which can burn charcoal more efficiently (with the higher price-tag perhaps being a barrier or unfamiliarity with the product). When cooking with firewood a traditional three stone setup is usually used, while some with access to electricity (often-times illegally tapped in the informal settlements) have an electric cooker (e.g. Debrief 11). As a brief aside regarding electricity, informal settlements are often not connected to the grid, and while the spread of decentralized electricity grids is promising, presently this type of electrification is geared more towards household lighting and still largely unsuitable for cooking purposes (Jagger & Kittner, 2017).



Figure 1: An improved stove with ceramic lining (foreground), alongside a traditional metallic one.

The average household in Kanyogoga uses about 1000 to 2000 UGX worth of charcoal a day (e.g. Debrief 1, Debrief 4, Debrief 7, Debrief 9). It is interesting to note that charcoal in the informal settlements is not sold in fixed quantities with a fluctuating price (e.g. 1 kg for 2000 or 3000 UGX) but rather at a fixed price with fluctuating quantities (e.g. 0,5 or 0,4 kg for 1000 UGX). Instead of raising prices, vendors reduce the size of the container with which they measure the charcoal (Interview Retailer 1; Interview Retailer 5). The provision of charcoal will be discussed in more detail in the ‘Zooming out’ chapter, but what is relevant here is that if people cannot raise their expenditure on charcoal, they can still buy a certain amount but have to make due with less. The advantage being that people are at least not priced out of purchasing charcoal

entirely, but on the other hand 1000 UGX worth of charcoal now lasts only one day instead of two (Debrief 8).

Textbox 1. Improved stoves and their viability.

Improved stoves come in various forms with varying price-tags and levels of burning-efficiency, while some also reduce exposure to emissions such as particulate matter. The most common improvement is to apply a ceramic lining to better retain heat, but due to still ongoing standardization stoves do not yet perform consistently (World Cafe). The most efficient stove currently available in Uganda can achieve an energy conversion rate for charcoal of around 38% (CREEC Interview). Despite the higher price-tag of improved stoves, such efficiency gains over traditional stoves can add up to significant savings in the long-run. However, the initial outlay for improved stoves (currently at around six times the cost of a traditional stove) acts as a barrier, especially for many inhabitants of informal settlements who already struggle to meet routine expenses. This limited uptake is compounded by perceived durability issues with improved stoves, such as the ceramic lining that can be damaged if handled roughly (such as when shaking it to remove the ash), whereas the traditional stoves are sturdier and cheaper to replace (CREEC Interview). The improved stoves are also seen as less user-friendly because they are much heavier due to the extra ceramic lining, so they cannot be moved around as easily as the traditional stoves (CREEC Interview). Lastly, issues of time and convenience play a part, since improved stoves may take more effort to light and can have a longer cooking time, although using less charcoal in the process and thus saving money (UNREEEA Interview). Despite the demonstrable savings and potential health benefits to be achieved through improved stoves, uptake is limited for both financial (e.g. the initial investment and replacement cost) and ‘practical’ reasons (e.g. slight variation in cooking competencies which requires practitioners to alter their actions, and different meaning attached to these stoves, being considered less convenient or durable).

Barriers to alternative energy sources

Considering the overarching focus on charcoal usage, it would be worthwhile to briefly delve a little deeper into the constraints regarding potential alternatives, before continuing with cooking competencies in the informal settlements. Although at risk of stating the plain obvious, it should be clear that the relationship between the energy source and accompanying cooker or stove is very close, with the two mostly going hand-in-hand (i.e. an electric cooker without having access to electricity is rather pointless). In this sense, these material elements are intertwined and to some extent act as bundles which lock-in users. Borrowing from Akrich (1992), Shove et al. (2012: 47)

describe this type of arrangement as a ‘closed’ script, in which particular material components are closely related while constricting others, or as they put it, the means by which “material arrangements configure each other”. To put this in the context of energy usage, once you have invested in a particular stove, you use the fuel associated with that stove and do not switch easily to alternatives (although there are exceptions such as briquettes, see below). This can be shaped or limited by access to necessary infrastructure (e.g. whether an electricity connection is even possible), but the cost of the stove is an important factor too, with the cheap metallic stoves of around 4000 UGX presenting a far more permeable barrier than an improved cookstove starting at around 25.000 UGX, let alone a full LPG-setup of around 250.000 UGX (Interview CREEC). Partly due to initially committing to a particular type of stove and the subsequent price-tag barrier in acquiring a different type (e.g. gas or electric), users are more likely to persist with the initial stove rather than transitioning to another energy source. This is especially true when considered in the context of the informal settlements where due to the cost involved and limited availability it is unrealistic to consider households as having equal access to the various options (i.e. having both an electricity connection and electric cooker as well as an improved stove and charcoal). Other factors such as meanings attached and habits long established with the existing material arrangements, also come into play. Thus despite the big price increase for charcoal, it still remains the main available cooking method for the majority of the community in Kanyogoga.

Some households supplement their charcoal by using briquettes alongside it, which they state is more economical by lengthening how long their charcoal supply lasts (Debrief 24), with one shadowee pointing out that an amount of charcoal that normally is consumed in one day can last three days when she uses briquettes (Debrief 3). However, not everyone is equally aware of the potential of briquettes. Some know how they work and were even taught how to make



Figure 2: Briquettes being made with a simple hand-crank by EASE in Kanyogoga.

briquettes themselves, but now either lack the equipment to make them or state that briquettes are not widely available (Debrief 6; Debrief 8). The fact that briquettes need to be used in slightly different ways also presents a barrier for people to start using them.

Textbox 2. Briquettes and their viability.

Briquettes are made with carbonized biowaste or ‘lusenyente’ (small bits of charcoal broken during handling), mixed with clay and cassava flour which act as a binder, before being pressed together in a machine and subsequently dried in the sun for a few days (EASE Interview). The exact process can vary depending on the available machinery and ingredients. For instance, the small-scale producer EASE based in Kanyogoga was originally founded with a focus on waste management in the community (as a way of using biodegradable waste, e.g. matooke and cassave peels), but due the cost of collecting and carbonising the waste they rely more on lusenyente which local members of the organisation can acquire for free from their vendors (EASE Interview). While this may work in the short-term, this will change once vendors realize the value of the lusenyente they currently give away or dump, and this process also remains reliant on charcoal and cannot be scaled up. Other issues are the use of cassava flour as a binder (food for fuel) and the significant bottleneck of the current drying process which even for larger scale production still largely relies on drying in the sun, and thus causes many complications during the rainy season (but it is hoped solar dryers can eventually help improve this process).

Most briquettes can be used in the same simple stoves as charcoal, although they take a little longer to light and should be spaced apart for optimum use. Improved stoves could help burn briquettes more efficiently. Compared to charcoal, the emissions associated with briquettes are variable (but certainly still causes exposure to health hazards), as is the strength with which it burns since “[t]he combustion properties of briquettes – such as calorific value, moisture content, volatile matter and ash content, and the emission of gases and particles – are influenced by the type and amount of raw materials” (FAO, 2017: 66). Briquettes tend to burn more evenly and for a longer time than charcoal (4-5 hours versus 2 hours for an equivalent amount of charcoal), so they are especially useful for slow-cooking foods (EASE Interview). However, charcoal lights quickly and burns strongly, which is perceived as a benefit despite its higher cost, as the founder of EASE stated in this regard: “The community really prefers charcoal, because it is fast. It burns fast, no need of waiting, no need of work, it is very convenient” (EASE Interview: 2). Improvements in briquettes are narrowing this gap, but such aspects might require demonstrations to avoid dissatisfaction.

The significant cost-saving aspect of briquettes (currently by up to half of daily energy costs and potentially by several factors once the production process becomes more efficient (FAO, 2017)), either used on their own or as a supplement mixed together with charcoal, presents a demonstrable benefit. Other advantages of briquettes are that they require no more advanced infrastructure than charcoal for distribution and usage, so that it can compete in the same areas such as informal settlements. In this sense, if availability can be improved, briquettes can be considered as reliable as charcoal. Other than some differences in lighting and a longer cooking time, required cooking competencies are also roughly similar.

Only one of the shadowees in this study had an electric cooker and requisite electricity connection (Debrief 11). They paid 10.000 UGX a month for this unlimited (seemingly illegal) connection, which is significantly cheaper than using charcoal on a daily basis for 1000-2000 UGX, although it did come with challenges due to intermittent electric shocks or disconnections, which required them to pay someone to reconnect their wire (Debrief 11). Having unlimited electricity (unless disconnected, when she resorts to charcoal) means that this particular shadowee does not need to incorporate most of the energy-saving measures applied by the other households in this study.

4.1.2 Competence (skills, practical know-how, bodily knowledge)

This section looks at the various skills and competences that are required to engage in the practice of cooking, ranging from knowing how to properly use a charcoal burning stove or three stone setup, where to get the best materials (be it food, water or fuel) and how to check their quality, how to make particular meals such as matooke or posho, or various tricks to getting the most out of the available food and energy. Certain foods require some specific knowledge on cooking methods in order to accomplish them. For instance, a commonly used tricks to steam food such as matooke or sweet potatoes, is to place banana stems ('mizingonyo') from leftover peelings at the bottom of the pan so that the food sits on top of these and does not get soaked in the water (which would affect the taste) (Debrief 13; Debrief 15; Debrief 18; Debrief 23). The transference of such knowledge can start at a young age, as was observed in the case of one mother who said she was teaching her eight year old daughter to cook in case she fell ill so that the daughter could take over then (Debrief 21). Throughout the observations, it was quite common for shadowees to instruct or scold their family while cooking on the correct way to do something. It should be noted that these family members were exclusively female, while men were never observed as being involved in the cooking process. What follows are some examples of the type of skills being shared, as well as some aspects of cooking which could vary amongst the shadowees.

Starting with the practical know-how behind operating stoves using charcoal, firewood, briquettes or electricity, there are various aspects to consider, which of course are not the same for the different type of stoves. Cooking with firewood on a three stone stove brings different challenges. For instance, firewood, especially when not dry, tends to produce more smoke than charcoal which can be both an irritant and health hazard (i.e. wet fuel results in more products of incomplete combustion such as particulate matter and carbon monoxide (Jagger & Kittner, 2017)). Some shadowees argue that it is better to dry the wood in the sun first so that it can light more easily (Debrief 18). Shielding the fire from the wind can also help with the smoke, but as one shadowee explained, she used to have such shields but they were stolen by scrap metal collectors

(Debrief 21). Cooking with firewood is mostly done outside (amongst other reasons due to smoke production and fire risks) on a three stone setup. This means the cook cannot be very mobile, so that when it rains the fire must be transferred into portable charcoal stoves as far as possible and the outside cooking area covered to prevent it from getting drenched so that cooking can resume more easily once the rain has passed (Debrief 21). In general, cooking with firewood is not the preferred option as far as convenient usage goes, but tends to be out of necessity because it is more affordable than charcoal, as stated explicitly by several shadowees (Debrief 18; Debrief 21).

Cooking on fire, both charcoal and wood, can be challenging because it is not easy to regulate the heat, which can lead to food getting burnt. To prevent this from happening requires some skill, not only in handling the food and regulating the fire but also to do so without getting burnt in the process (e.g. by using a heavy cloth when transferring pans or embers to another stove) (Debrief 18). Charcoal and to a lesser extent firewood (but not all types of briquettes) can be transferred from stove to stove depending on cooking needs, e.g. transferring some embers to a smaller stove to quickly fry something on the side or boil water for tea while the main fire is kept in a bigger stove, which offers the cook some flexibility (although one should take care not to get burnt in the process).

Using a charcoal burning stove requires skills in lighting a fire, keeping the fire going throughout your cooking session while maintaining a fairly constant temperature, all without being wasteful with your charcoal (which is of paramount concern). Several shadowees mentioned waxed sticks for lighting the fire, but stated that these are no longer available (Debrief 12) or that they cannot always use them if funds run low, in which case they improvise (Debrief 2). In such cases common wisdom on the best way to light a charcoal stove with the means available is to use polythene bags, as many participants in the study were seen to do (e.g. Debrief 2; Debrief 7; Debrief 9; Debrief 12). The process of lighting a charcoal stove to the point where it is ready to use can take around 30 minutes (Debrief 7). The burning of polythene bags exposes the shadowees to toxic fumes alongside the smoke produced by the stove itself, which can be especially hazardous to their health if cooking in confined spaces due to the risk of carbon monoxide poisoning (MakSPH Interview).

The best way to organise the cooking process throughout the day seemed broadly similar amongst the shadowees. Preparation for cooking the main meal can start early, such as one shadowee who starts around eleven in the morning (unless cooking beans, which require an even earlier start due to the longer cooking time) and first goes to her vegetable garden in the surrounding wetlands to harvest what is available for that day (Debrief 4; Debrief 5). Food is usually bought on a daily basis in small quantities from little informal shops ('mudala') and vendors

in the neighbourhood (Debrief 3; Debrief 7; Debrief 11). The households observed mostly do not stock food in bulk, due to limited funds as well as limited storage space and lack of refrigeration at home. One of the few exceptions mentioned is the example of slow-cooking beans, which one shadowee cooked in bulk (around one kilogramme for 2 – 4 days) to save on fuel usage (Debrief 3). That way she could just quickly fry a certain amount of the already cooked beans when needed rather than having to use a substantial amount of fuel each day to cook it from scratch. However, due to the lack of refrigeration in the informal settlements and the hot climate, this could be a risky strategy.

Another exception of cooking in bulk are three participants in the study who not only cook for their own household consumption, but also sell small quantities of food such as cassava, matooke, beans, potatoes, pumpkin and meat (e.g. chicken necks, cow head and offal meat when available) to customers (Debrief 12; Debrief 15; Debrief 23). During the focus group discussion in Kanyogoga, it was also mentioned that purchasing food in bulk could be a cost-saving measure if the money is available, with someone giving the example of buying “20kgs of beans at a fair price because when you buy in bulk, you can get beans for 3000/= at 2500/=, so the 500/= buys something else at home” (FGD Kanyogoga: 8). However, based on the observations of shadowees, food was mostly purchased on a daily basis and not in bulk, perhaps reflecting the lack of financial reserves to make bulk purchases.

Cooking styles can vary, such as for those shadowees who run small businesses selling food and are therefore cooking greater amounts of food. For them it might be more important to have all the food ready in time for customers rather than maximising their cooking efficiency in terms of energy usage. One example is a shadowee who runs about four charcoal stoves simultaneously so that she can prepare different things at the same time (Debrief 23). However, she is still careful with the amount of charcoal she uses, for instance placing clay stones at the base of her stoves in order to retain heat when the fire dies down rather than having to add more charcoal (Debrief 23).

It should again be emphasized that in order to be properly understood, certain actions in the practice of cooking need to be seen against the backdrop of financial pressure being faced by households. As mentioned earlier, both food and charcoal prices are felt to be on the rise which has led to various tactics to reduce energy usage. An example of such a tactic is boiling water on the fire remaining after cooking and then using flasks to store hot water, tea or porridge overnight rather than having to light the charcoal stove in the morning as well (Debrief 1; Debrief 9). Another handy trick to conserve energy was demonstrated by one shadowee, namely to cover the fire with a pan once she had finished cooking in order to extinguish the fire and thus be able to use the remaining charcoal the next day (Debrief 5). Others reported a similar tactic, to extinguish the fire with water

and then dry the charcoal in the sun. These actions and others such as reducing the number of meals and switching to faster-cooking foods are taken in response to rising prices of goods, foremost of which charcoal. The high cost of energy relative to the overall expenditure on food has led to a range of energy-saving measures being adopted.

Social capital

Social connections also play a part in acquiring food and fuel. People tend to purchase charcoal from the same nearby vendor that they know and trust. In return for such customer loyalty, the vendors often give charcoal on credit and were also repeatedly observed (during interviews with the vendors in Kanyogoga) to add an extra amount of charcoal on top of what had been paid for (i.e. an extra handful or scoop). Several shadowees reported periodically buying on credit, both food and fuel, when funds are low (e.g. Debrief 7; Debrief 14; Debrief 21), while another shadowee selling food allowed customers to pay later (Debrief 18). The same importance of social connections is also true for acquiring firewood in Bwaise, as illustrated by the comment made by one shadowee while cutting up a pumpkin: “One of the sides of the pumpkin will be for one of the carpenters, he gives me free firewood” (Debrief 19).

Such strong social connections are important not only between vendors and customers, but also between households themselves. For example, to reduce charcoal usage, one of the shadowees does not light her charcoal stove when she needs to prepare a small meal (such as porridge for her grandson), but instead visits her neighbour who has an electric cooker and allows her to prepare food there (Debrief 9; Debrief 11). In return, during periodic electricity cuts, that shadowee helps her neighbour prepare her meals using a charcoal stove (Debrief 11). Such mutually beneficial relationships provide something of an informal safety net and there seems to be a shared understanding of the importance of maintaining such relationships, as exemplified by one shadowee when she stated: “I give food to some people so that when I do not have salt, they can give me some money to buy salt” (Debrief 19).

Social capital offers some resilience in times of scarcity, but (to briefly look ahead) is also relevant to consider from the point of view of spreading alternative cooking practices that do not rely on charcoal as much. As Shove et al. (2012: 160) state: “[T]he density and character of social bonds is important for how practices travel and for the populations they encounter and attract”. The tight-knit social networks in the informal settlements, especially amongst women who are seen as responsible for cooking, point to the existing women’s groups active in the community (as mentioned during the FGD Kanyogoga) as offering valuable entry points for introducing and popularizing potential alternatives (e.g. briquettes or improved stoves).

4.1.3 Meaning (mental activities, symbolic meaning, emotional state)

Next to the actual material and practical skill needed to cook, we should also consider the mental activities and symbolic meaning behind the practice of cooking. For instance, people use firewood or charcoal not only out of convenience but also because it is seen as a traditional way of cooking. Using charcoal is also considered essential if you want to make traditional food such as matooke, which is widely believed to only acquire its distinctive delicious flavour when cooked on charcoal. For instance, there was one participant in this study that usually cooked on an electric cooker. However, it is noteworthy that even though she had this cheap electric connection, she still sometimes bought charcoal to cook specific foods such as matooke (Debrief 11). Interestingly, such views are not unique to the informal settlements, but were also expressed during interviews with policy-makers who acknowledged the irony that, despite their greater awareness of the negative impact of charcoal, they still sometimes cooked with charcoal at home (with the taste of certain food playing a part) (Interview MWE; Interview NEMA). Charcoal is also often associated with speed and convenience, since a fire can quickly be lit to boil some water for tea or fry some food, unlike for instance firewood or briquettes, which take longer to get going (Interview EASE). On the other hand, reliance on firewood is more associated with poverty, since the main reason for choosing firewood over charcoal is the price. Furthermore, unlike the supply of wood, charcoal is widely available in all districts with vendors usually just a short walk away, so it is perceived as very reliable and represents security (Georg & Jones, 2016). Charcoal is not susceptible to intermittent power cuts and can easily be bought on a daily basis. Moreover, it can be stored safely in measurable amounts for long periods of time and represents a secure source of energy which cannot be tapped illegally or leave households with unexpected costs at the end of the month.

As stated before, cooking is largely seen as the responsibility of women while men are supposed to bring home money (although in the case of some shadowees, the men were either absent or not contributing, e.g Debrief 4; Debrief 21). Indicative of such attitudes, one shadowee explained why she helped people cook: “We grew up from good homes so we cannot let men cook while we are looking on” (Debrief 19). This household division of responsibilities was also visible elsewhere. Looking at the collecting of water, this task is usually designated to the younger members in the household unless they are too young, in which case women are again deemed responsible. In most of the households studied, ‘fetching water’ was a chore assigned to the children (Debrief 1, Debrief 4, Debrief 9, Debrief 15, Debrief 19), it being argued that children should contribute in some way and that it freed up the women to deal with more demanding or dangerous work which the children could not do (Debrief 1). Similarly, collecting firewood (especially relevant in Bwaise) was also often assigned to children. Since due to the gendered division of tasks

it is mostly women who are responsible for cooking (or for certain specific chores children), they would shoulder the majority of the burden if water, food or fuel become scarce, as will be discussed in more detail in the ‘vulnerabilities’ section.

Putting food on the table in tough conditions with limited income, means that skills in cooking efficiently without being wasteful of food or fuel are considered very important. Those that have mastered the ‘art’ of cooking in this sense, are able to make ends meet, making sure that their family are well-fed with limited resources. As detailed above, the importance of efficiency was visible throughout the cooking process of most shadowees, be it in switching to faster-cooking foods, cooking only once a day or using various tricks to better retain heat and prevent charcoal wastage. Some shadowees expressed a clear understanding about the nutritional value of a balanced diet, especially for their children (e.g. Debrief 19; FGD Kanyogoga) but that maintaining this in the face of rising prices was a challenge. In this sense, cooking is strongly related to ideas about health, as issues surrounding water quality demonstrate as well.

Preferences and awareness

Decisions about whether to boil drinking water or not depend on the available knowledge about the quality of water and the health impact this might have. A few shadowees reported trusting the quality of their water based on the fact that it comes from a spring well (Debrief 1, Debrief 22), seemingly believing that this guaranteed quality without being aware that open spring wells can easily be contaminated. Another shadowee reported seeing boiling of water as a waste of time and energy, stating that she had not fallen sick from drinking unboiled water (Debrief 4), although during subsequent visits she said it did at times affect her children and mentioned that raw water from a nearby well sometimes causes their body to itch, which is why they collect from one further away (Debrief 5).

However, only a few actually reported drinking unboiled water from open wells (Debrief 4; Debrief 15) while the majority seemed to share a sense of awareness of how water can be contaminated and reported boiling water before drinking it (e.g. Debrief 7; Debrief 9; Debrief 11; Debrief 12; Debrief 21; Debrief 24). This understanding is demonstrated by one shadowee who explicitly reported not trusting the quality of the nearby water without first boiling it, because of its proximity to latrines which can contaminate the well during the floods, stating that she used to drink it without boiling but contracted typhoid (Debrief 8). Nonetheless, the shadowees who boil their drinking water might still be exposed to health risks associated with poor water quality through other aspects of the cooking process, namely when washing or handling food while using raw water (World Café). Alternatives to boiling water do exist but are not often or consistently used (which

raises questions of its own). For example, one shadowee had access to a simple water filter in her home given to her by a local NGO which she uses occasionally (Debrief 1), but she still seemed to prefer boiling her drinking water despite the extra cost, perhaps because she trusts it more (Debrief 2).

Many of the shadowees prefer to cook outside, but their reasoning for this preference might vary. Some stated the lack of space inside as well as the higher risk of accidents indoors with many young children around (e.g. Debrief 4), although as one shadowee emphasized, care should still be taken when cooking outside which is why she never leaves the vicinity when cooking to prevent accidents from occurring (Debrief 3). A few of the participants in the study demonstrated some knowledge of the hazards of cooking indoors with charcoal stoves. For example, one stated that she cooks outside because cooking inside gives her an allergic reaction to the soot and smoke from the fire, as well as making the house hot and suffocating (Debrief 7). Another knew that the smoke is bad for your health which is why she lights her charcoal stove outside and does not bring it inside until it becomes less smokey, but she does not seem aware of the indoor hazards of carbon monoxide poisoning (Debrief 9). Others seem uninterested or unaware of these hazards, with one woman sitting in a poorly ventilated room stating “I cook from inside because when I cook from outside I will have no way of protecting myself from the sun” (Debrief 13).

Cooking outdoors can bring problems such as the risk of theft, as evidenced by one shadowee’s wind shields for her three stone stove stolen by those picking scrap metal (Debrief 21). The risk of theft seems to vary per area, with one shadowee stating that she had not heard of any food theft in her neighbourhood although she knew that it happened elsewhere (Debrief 3), while another reported it was a serious problem which required her or one of her children to always keep watch by the cooking area, or otherwise to lock the food in her house when she has to go away (Debrief 6). In general, it can be stated that high reliance on charcoal or firewood mostly necessitates the practice of cooking to take place outside, due to reasons such as cramped housing conditions, hazardous smoke production and the higher risk of fire spreading (although cooking outside still exposes cooks to smoke and fumes and accidents can still occur outside with children running around or animals such as goats knocking over stoves). The threat of accidents, theft or rain require the shadowees to remain in the vicinity of the cooking area throughout the often-times lengthy cooking process and thus binds the cooks to the house. In this sense, it can be argued that the gendered attitudes regarding the domestic role of women are reinforced through the practice of cooking.

Conclusion

The above discussion of cooking practices has traced the complex role charcoal plays in the informal settlements. The practice lens has highlighted how the material element charcoal has deep roots that tie in to existing cooking competencies, is perceived as convenient and reliable (an especially valuable characteristic in the informal settlements where services are more often characterised by inconsistency and uncertainty) and reaffirms traditional attachments (e.g through charcoal flavoured matooke).

Looking ahead with an eye on potential interventions to reduce charcoal dependency, these deep roots imply that charcoal cannot be easily dislodged. As Georg and Jones (2016: 245) also found regarding the challenges in introducing cooking innovations in informal settlements, adoption of such innovations “goes far beyond availability and affordability ... The commonly stated “build it, and they will come” approach fails to take into account cultural nuances and contextual drivers that may dramatically affect product uptake”. New innovations may be very attractive from a technical viewpoint, but whether these will find fertile ground as new elements in existing practices is by no means certain. As Shove et al. (2012: 132) state: “[E]lements cannot travel everywhere. Potential journeys are variously constrained by physical limits and by the social geography of pre-existing practices and the traditions, meanings, material infrastructures and competences associated with them. These constitute uneven landscapes of possibility”. Therefore it is important to carefully consider the various aspects coming together in existing cooking practices before developing innovations to substitute charcoal, to see whether they are likely to fit or not.

4.2 Charcoal dependence: Mapping vulnerabilities

This section zooms in further on the enabling and constraining characteristics of charcoal, and the consequences of relying on charcoal as the main source of energy for cooking in the informal settlements. This entails looking at how energy usage is connected to, for instance, food and water (in)security and what potential risks people are exposed to as a result of charcoal dependence; that is, mapping the vulnerabilities associated with charcoal usage. This discussion will also touch upon some general aspects of the challenges faced by the communities in Kanyogoga and Bwaise, which initially might not seem directly related to energy but play their part in adding to the vulnerabilities of the informal settlements. An interesting feature here is how these challenges might affect the two communities of Kanyogoga and Bwaise differently due to slightly different local conditions. A

significant amount of information on vulnerabilities in informal settlements was gained through frequent discussions with members from the ResNexus team.

Charcoal and health

A direct issue related to charcoal usage are the rising prices of charcoal over the past years. Over the past decade, charcoal prices in Kampala have shot up from around 20.000 UGX a bag to 70.000 or even 80.000 UGX (Interview MWE; The Independent, 2017). This price rise affects lower-income households such as those in the communities of Kanyogoga and Bwaise the most, since they lack the reserve to make up for this increase. The resulting energy insecurity affects many other facets of life, both directly because these require energy (e.g. for boiling drinking water or cooking food, or resorting to firewood and thus increasing exposure to smoke and particulate matter) or indirectly (e.g. greater health risks by drinking unboiled water or not being able to buy medicine in order to afford charcoal). Both direct and indirect connections to charcoal usage and their resulting impact will be discussed below. Starting with one of the more straightforward issues to be associated with charcoal usage, it is clear that people are at risk of inhaling hazardous fumes and particulate matter (PM) when burning charcoal. This negative health impact rises significantly when using a charcoal stove in enclosed spaces, which also poses the risk of carbon monoxide poisoning. Usage of wet fuel, either charcoal or firewood, further increases the exposure to health hazards with more incomplete combustion resulting in higher emissions of CO, PM and other volatile organic compounds (VOCs) (Jagger & Kittner, 2017).

Improved cookstoves might be able to reduce this negative health impact, but due to their steep price-tag tend to be out of range for the average household living in an informal settlement. The issue is not only the price-tag (although this might be the main problem). Improved stoves which reduce health hazards associated with burning charcoal or wood, are widely seen as being less efficient than regular stoves (World Cafe). Even the stoves marketed



Figure 3: A variety of improved stoves being tested at CREEC. Standardisation is still ongoing in Uganda.

for greater efficiency have not been taken up much yet. This problem is compounded by the fact that standardization is still ongoing, so not all cookstoves meet the same standards, which affects public trust about improved stoves in general (World Cafe). They are also slightly more fragile in use than the simple metallic stoves, since the ceramic lining inside improved stoves (which helps retain heat) can crack when handled roughly, for instance when attempting to shake out ash (Interview CREEC). Although the same can happen with the traditional clay stoves, when these break the user can easily and cheaply replace it, but with the improved stoves this represents a more significant lost sum (by a sixfold factor or more (Interview CREEC)) as well as requiring more money to replace it. The initial high outlay for an improved stove, the lack of consistency amongst these stoves and their perceived fragility, all make people less willing to attempt the switch, even if in the long run a more efficient stove might be able to save considerably on the amount of money spent on charcoal.

It should be noted that the previously mentioned health hazards associated with cooking disproportionately fall on women, since almost exclusively women are deemed to be responsible for cooking. Due to this gendered division when it comes to cooking, women bear the brunt of any associated complications, not only the health hazard from burning charcoal or firewood and using polythene bags for lighting, but also for instance having to go further to get food, water or charcoal at affordable prices. They are also the ones who are tied down to the home throughout the lengthy cooking process, because they cannot leave the fire or food unattended (due to the risk of accidents or theft). The rising price of charcoal also means that some women (and children) might spend more time collecting firewood instead, either in search of wood carried off during flooding or from construction sites (e.g. Debrief 5; Debrief 9), or as in Bwaise by picking up discarded wood and woodchips in the carpentry workshops. In turn, this reliance on firewood would lead to greater exposure to the health hazards associated with burning firewood, which generally produces higher emissions of particulate matter but lower emissions of carbon monoxide compared to using charcoal stoves (Jagger & Kittner, 2017).

Charcoal in connection to water

One problematic aspect of life in the informal settlements that was mentioned in the previous chapter, was the challenges people faced in obtaining clean drinking water. Since these settlements are by definition situated in areas which were not officially intended for habitation, they can lack piped water-systems as well as proper sanitation. This means that in some cases the only available water sources are open spring wells (as in Kanyogoga, although not in Bwaise), which due to the

often-times poor sanitation and frequent flooding in these areas can easily become contaminated with faecal matter or other pollutants.

Such contaminated wells can rapidly spread disease. Therefore, it is deemed advisable to filter or boil the water before drinking. In the context of the informal settlements and the limited resources available, this can pose a significant challenge. This becomes especially relevant when looking through the ‘charcoal-tinted’ glasses of this thesis, because the main fuel that would be used in the informal settlements for boiling water is charcoal. Barring sudden infrastructural reform in informal areas such as Kanyogoga (i.e. improving sanitation and providing more safe piped water), rising charcoal prices will increase challenges regarding poor water quality and the decision on whether to boil water or not.



Figure 4: An example of recent flooding in Kanyogoga after heavy rain. It also shows how the community is built right on the edge of wetlands, where farming occurs.

The essence of this challenge seems to have been neatly captured by one of the shadowees discussing awareness of water quality and why many people drink without boiling: “[W]e have a saying that, ‘I am sick when I have fallen sick.’”. (FGD Kanyogoga: 9). That saying points to weighing the uncertain health risk of drinking unboiled water versus the certainty of spending the money on charcoal to boil it (as also brought forward in discussions with the ResNexus team). Drinking water from potentially contaminated spring wells might make some people sick (in which case the cost of treatment or lost work days most likely outweighs the cost of charcoal to preventively boil water), but some people could also seem to be fine for long periods and thus would have saved some money otherwise spent on charcoal. The higher the cost of charcoal, the more appealing it might become to run this uncertain risk. If you boil water, you might not have enough money for food, so it becomes a question of prioritizing food, water or health (MakSPH Interview).

However, issues surrounding water should not be presented as overly clear-cut. For example, the previously mentioned difference between freely available spring water in Kanyogoga and greater reliance on standpipes in Bwaise presents both benefits and drawbacks. Those in Kanyogoga can use water more freely without having to worry about the cost involved and also do not suffer water crises in times of drought, whereas those in Bwaise need to be more careful with water usage and can face real difficulties in acquiring water during droughts if they lack money to pay for piped water. Even though water from standpipes might be easily accessible, people might still prefer to use water from open spring wells, as one of the community leaders in Bwaise put it succinctly: “People don’t



Figure 5: One of the few rudimentary sanitation projects in Kanyogoga less vulnerable to flooding. To avoid paying, many still use the wetlands or open pit latrines instead.

want to pay for something which they can get for free” (World Cafe). Freely available spring water was mentioned by inhabitants of Kanyogoga as an important reason for staying in this area (MakSPH Interview). At the same time, the open spring wells in Kanyogoga are at much greater risk of contamination, and this alongside the high charcoal dependence in this area potentially points to people becoming more vulnerable to hazards arising from consuming unsafe water.

Charcoal in connection to food

Turning to the role of charcoal in connection to food, the preceding section already emphasized how local diets are changing and food choices are being shaped partly by the need to reduce energy usage (i.e. switching to faster cooking food with potentially lower nutritional value). An interesting example of adaptive strategies in times of scarcity is presented in the case of one shadowee (Debrief 4 - 6). Health problems led her to lose her job as a security guard, with the loss of income affecting both the type of food (switching to cheaper and fast-cooking food such as cassava posho or greens)

and frequency of meals (eating only once a day) for her household (Debrief 6). To supplement the food she can purchase, this same shadowee rents (informally) a small plot in the surrounding wetlands where she grows greens (gobe) and yams, selling a little of her produce but retaining most for her own household consumption (Debrief 4). This response is an example of reducing food insecurity through self-sufficiency. It should be noted that this adaptation is possible due to local conditions (i.e. available farmland) and touches upon one of the differences between Kanyogoga and Bwaise.

Kanyogoga is situated next to open wetlands near Lake Victoria, whereas Bwaise is surrounded by built-up areas and thus has very little land available for farming. Therefore, there are fewer options available for the inhabitants of Bwaise to reduce food insecurity, whereas in Kanyogoga the available produce from the surrounding wetlands makes them less sensitive to food scarcity in general, as well as providing the opportunity to resort to farming themselves. In fact, a significant proportion of the population in informal settlements near wetlands derive the most or even their entire income from cultivation (with this high dependence in turn making forced evictions even less palatable, despite the encroachment of the wetlands threatening its important function as a natural water filter) (Kabumbuli & Kiwazi, 2009). Incidentally, there is also a gendered aspect to cultivation in the wetlands (and thus greater exposure to the hazards of working in the wetlands as well as the long time spent on this task), since this work falls mostly to women (Kabumbuli & Kiwazi, 2009). Cultivation in the nearby wetlands gives the inhabitants of Kanyogoga easy access to a cheaper food market (although as the preceding chapter made abundantly clear, they are still affected by a rise in prices), which was mentioned as an important benefit of living in this area, alongside the presence of free water from spring wells (MakSPH Interview).

However, these advantages in Kanyogoga come with some significant drawbacks. The proximity to the wetlands carries several risks, such as greater exposure to mosquitoes and other parasites (and associated diseases and infections such as malaria). The biggest direct hazard is flooding (the impact of which is made worse by the increase in built-up land), which can spread sewage and waste, while the subsequent waterlogging provides greater breeding grounds for disease vectors (mosquitoes and flies) and can lead to disease outbreaks which naturally carry over even to those not directly affected by flooding (Isunju, Orach & Kemp, 2016). The nearby presence of a sewage treatment plant exacerbates these problems due to the frequent flooding of low-lying Kanyogoga (an almost daily occurrence during the rainy season), with sewage (also from the poor sanitation facilities of the community itself, e.g. shallow pit latrines) carried in the floods directly entering homes and contaminating springs wells. Thus Kanyogoga's reduced vulnerability with regard to food comes at a rather steep price in terms of exposure to other hazards.

Furthermore, the wetlands which are increasingly being encroached upon for settlements and farming, are intended to act as a natural filter for waste water coming from Kampala before being discharged into Lake Victoria, which forms the main source of water for the city (Isunju, Orach & Kemp, 2016). Thus the long-term impact of such encroachment is that greater pollution and eutrophication of the lake has increased the cost of treatment and thus raised the overall costs of water supply to Kampala (Kabumbuli & Kiwazi, 2009; Isunju, Orach & Kemp, 2016). Although this appears to be a bit of a stretch in relation to charcoal, it could be argued that indirectly the more money being spent on water treatment by the National Water and Sewerage Cooperation (NWSC), the less money is available to expand or improve water- and sanitation infrastructure. As discussed in the previous section, poor water and sanitation services in turn raise the risk of drinking unboiled water, thus bringing us round to the earlier dilemma of using costly charcoal to boil water or not. This link with charcoal is somewhat tenuous, but it is clear that the higher risk of flooding in the low-lying communities near the wetlands can affect water quality (where the link with charcoal has already been established). Moreover, the fact remains that the manifold problems faced by local authorities in supplying this fast-growing city with water and in providing other basic needs, are exacerbated by a pattern of informal development. This sets us on the path to discuss some of the long-term issues associated with the expansion and functioning of informal settlements, namely unplanned development in areas vulnerable to flooding and poor or non-existent infrastructure, with which we will continue in the following section.

Formal versus informal settlements

As the preceding discussions have shown, in many ways day-to-day decisions in communities such as Bwaise and Kanyogoga are underpinned by varying degrees of uncertainty. People often have little to no reserves, and for many a day without earning can mean a day without food, or at the very least force them to make difficult decisions about prioritizing water, food or their health (e.g. whether to spend money to boil their drinking water or risking drinking it raw in order to buy more food). One of the main underlying causes for the precarious nature of life in the informal settlements is already pointed to by the qualifier ‘informal’, namely the ambiguous status of the settlement itself.

Looking first at what makes an informal settlement, the following key aspects of informal settlements or slums are given in the National Slum Upgrading Strategy and Action Plan (MLHUD,

2008), and combine the definition given by UN-HABITAT with parameters deemed specific to the Ugandan context, namely:

“(i) Inadequate access to safe water, (ii) Inadequate access to sanitation and other infrastructure, (iii) Insecure residential status (iv) Poor structural quality of housing (v) Overcrowding ... in combination with one or more of the following attributes [for Uganda]; (i) an area that attracts a high density of low income earners and or unemployed persons, with low levels of literacy (ii) An area with high rates / levels of noise, crime, drug abuse, immorality (pornography and prostitution) and alcoholism and high HIV/AIDS prevalence. (iii) An area where houses are in environmentally fragile lands e.g wetlands” (MLHUD, 2008: 34-35).

These aspects need only be present in varying degrees and combinations for an area to qualify, but in the case of Kanyogoga and Bwaise almost all aspects are applicable (with the minor exceptions that only Kanyogoga is situated in fragile wetlands, while Bwaise is somewhat infamous for high levels of prostitution and more crime).

The slum upgrading initiative has been described as forming a mandate for local government to act (Interview KCCA). Despite this mandate, the task for local government is complicated by limited finances and the high number of informal settlements, with over 60% of Kampala’s population estimated to be living in such settlements (Usunju, Orach & Kemp, 2016). Moreover, the system of private land tenure in Uganda has placed severe limitations on the capacity of the state to plan and develop urban infrastructure since it does not directly own the land but must always negotiate with and offer compensation to individual owners (Interview KCCA; MLHUD, 2008).

By its very nature, an informal settlement is predicated upon an unplanned setting in which formal



Figure 6: Kanyogoga is located on the edge of the wetlands, where many people farm. Trash that goes uncollected is dumped in the wetlands, but this trash can often return in the communities carried by the floods.

landownership is often ill-defined or ignored entirely. This does not mean to say that any kind of organisation is completely absent or dysfunctional. Informal landownership might function well enough in the short-term, as evidenced by some level of organisation in Bwaise and Kanyogoga in which property is fairly clearly demarcated, with people renting their homes from landlords (who may not necessarily hold legal title to the land but whose claims to the land are not challenged within the community) and this ownership being widely acknowledged. For example, as previously mentioned one of the shadowees in Kanyogoga rents a plot of land in the surrounding wetlands for about 50.000 UGX a month and is able to farm there (Debrief 4). The area where she rents is quite clearly divided, with people knowing which plot belongs to whom and seemingly respecting these boundaries, even though the 'landlord' they are renting from (and thus the person through which these claims are held) most likely does not own this land since it forms part of the railroad land. In rare instances the local authorities might intervene and demolish buildings (e.g. Debrief 15, one of the shadowees in Bwaise whose home was demolished to make room for a taxi park) but on the whole these communities function on the basis of such informal ownership.

However, there is often no guarantee that this state of affairs remains stable in the long-term. The negative consequences of such uncertainty are fairly self-evident. Investing in infrastructural or home improvements becomes far less attractive if the investor cannot be assured of benefiting from the investment in the future. Why make such investments if you might be kicked off the land in a few years? It should be stated that this risk is not the same across the board, with the situation in some settlements being more precarious than others. For instance, in the case of Bwaise, it is more established and its infrastructure is somewhat more developed (e.g. its piped water system) when compared to Kanyogoga, which is a smaller and newer settlement built on a narrow strip of land along the wetlands where a derelict railroad-track lies, and which in fact runs right through the community. The land around the railroad belongs to the railroad company and talk of plans to renew the railroad-network mean that there is more uncertainty about this community's future than in Bwaise (MakSPH Interview). As a side-note, this again points to a slight variation in the type and intensity of vulnerabilities in the communities of Kanyogoga and Bwaise.

Added to this uncertainty is the dilemma faced by local authorities of whether they should improve services to informal settlements (e.g. expanding the electricity grid or improving sanitation) and thus implicitly condone the originally unauthorized habitation of these areas, or if they should deliberately offer no or only minimal services since they do not wish to encourage unplanned settlement, especially in designated floodzones (MakSPH Interview). This challenge in reconciling informality with planning also seems to contain an inherent conflict between short-term and long-term interests (e.g. providing immediate housing and improving services in existing

settlements versus planned railroad expansion or environmental protection of wetlands), and complicates infrastructural development in Kampala (MakSPH Interview).



Figure 7: The old railroad-track around which Kanyogoga arose is clearly visible here and functions as the main thoroughfare. Livestock (goats, chickens, ducks and sometimes a cow) are kept in the community, although in this case the herd is being led to pasture in the nearby wetlands.

Issues of uncertainty and planning versus informality could be discussed in even more detail, but this perhaps deserves its own study. The relevant point to make here in relation to charcoal usage, is that informality prevents proper infrastructural planning and development. This in turn has repercussions on the energy front, such as limited expansion of the electricity network. Due to its flexible nature (e.g. easy to transport and store, and not requiring any advanced infrastructure, just a

cheap clay or metallic stove), charcoal fits perfectly in this ‘energy vacuum’ and is very well suited to the informal setting. Without infrastructural development, which in turn is linked to resolving complex issues of planning (e.g. in overcoming issues around private landownership, limited financial means and the planner’s dilemma of sanctioning informality), it would seem that informal settlements will continue to be an ideal playing field for charcoal with few viable alternatives.

Conclusion

The above mentioned issues and vulnerabilities provide only a sampling of the type of difficulties faced by households living in informal settlements such as Kanyogoga and Bwaise, but they point to the important role charcoal plays in day-to-day life. Charcoal acts as the lynchpin holding together a wide range of issues (such as water quality, food security or exposure to health hazards) which in turn are strongly affected by the rising price of charcoal. At the very least the lack of energy affects flexibility, for instance in not being able to choose freely what to eat based on what is available, or nutrition or simply taste, instead having to emphasize the time necessary for cooking. In more extreme cases, it necessitates households to forego some meals entirely.

The informality of the settlements acts as a barrier to improvement of infrastructure, with little to no investment due to uncertainty. As discussed, this provides ideal ground for charcoal to step in, which requires only rudimentary infrastructure and is easy to transport and use. Since households in the informal settlements cannot easily replace their reliance on charcoal, adjustments are made in other fields in response to rising charcoal prices, forcing households into stark choices between food, water and health. This decision-making process associated with such choices (e.g. whether to spend money boiling water or save money by drinking it raw, but risk getting sick) illustrates how uncertainty underpins the precarious nature of life in the informal settlements. It points to living day-to-day with no reserves and little resilience, in what can almost be described as a survival economy for some households: a day not earned, means a day not eaten.

Conclusion Chapter 4: ‘Zooming in’

This chapter has sketched in broad-brush strokes the practice of cooking and its constituent elements in the informal settlements of Kampala. It has traced the important role that the material element charcoal plays and also the various meanings attached to it. Charcoal represents a reliable energy source in the informal settlements, where reliability is often in short supply. It is seen as quick and convenient, and is strongly linked to traditional local cuisine. Charcoal is also important in ensuring clean drinking water. Essentially, charcoal is a perfect fit in the informal setting with its limited infrastructure and day-to-day mode of life, since charcoal requires only rudimentary infrastructure and equipment and is available for purchase in small quantities on a daily basis. With the rise in charcoal prices, efficiency and cost-saving measures have become the guiding principles behind cooking for many households. Health, taste and nutrition remain important elements, but cost is of overriding concern. Since households in the informal settlements often have limited reserves and few alternatives to charcoal are available, they are forced to make savings in other areas which leaves them more exposed.

Looking ahead somewhat, to minimize the negative impact reform in the charcoal sector might have on the most vulnerable urban consumers dependent on charcoal, in the long-run it would be beneficial to take more steps to improve the infrastructure and provision of services in existing informal settlements. More realistically in the short-term, improving the provision of briquettes would seem desirable, since briquettes would slot in most easily in existing cooking practices as a supplement or replacement of charcoal. The briquette represents a material element that can ‘travel’ almost as widely as charcoal across what Shove et al. (2012: 132) termed the “uneven landscapes of possibility” (as previously mentioned). Regarding the debate on informal settlements, although future expansion of these settlements and encroachment on protected areas such as the wetlands should be prevented as much as possible, the many vulnerabilities faced by the existing communities points to the need for service expansion there as outweighing the risk of condoning illegal settlement.

5. Zooming out: The charcoal value chain

In this second empirical chapter, we move up from charcoal distribution in the informal settlements to take a broader view of the charcoal sector by applying a value chain perspective. The first section of this chapter maps the different actors that are involved in the charcoal sector and the particular role they play. The second section considers the extent to which various actors, in relation to one another, accrue the benefits from the charcoal trade. The third section then turn to the institutions that shape the charcoal sector and traces their impact. The last section then looks at the manner in which actors uphold their position and maintain access to benefits. It considers the connections and arrangements between actors and institutions in the charcoal sector, and the resulting outcome for actors' respective share of benefits and risks.

5.1 Actors in the chain

The following section looks at the actors that are involved in the charcoal chain and describes the various roles they perform within that chain. Where relevant, it will also detail some practical aspects of the process of charcoal production, transportation and retail alongside potential consequences stemming from these processes to provide an overview of the charcoal trade from tree to stove. This includes recent developments and trends in the burgeoning sector as well as what has been driving this growth. Literature review led to the initial categorization of actors in the charcoal trade (see 'Methodology') and forms the starting point for what follows, but this categorization has been adapted where deemed necessary, while it should also be kept in mind that due to vertical integration within the chain, some actors do not fit neatly into specific categories (Ribot, 1998; Shively et al. 2010). Lastly, it should be noted that the Charcoal Survey (2016) features heavily throughout this chapter, especially for those areas of the charcoal trade that could not be observed personally. This survey offers a baseline value-chain analysis of the charcoal sector as part of the Green Charcoal Project, which is headed by the Ministry of Energy and Mineral Development and supported by the UNDP, and in cooperation with relevant stakeholders seeks to make charcoal production in Uganda more sustainable (BEST, 2014; Charcoal Survey, 2016).

Consumers

The previous chapter on cooking practices in the informal settlements already touched upon most relevant aspects of charcoal consumption, so the following only briefly reiterates some of the key points to consider as part of the charcoal chain. For instance, the Charcoal Survey highlighted how

Kampala consumes a lot more charcoal than all other urban areas combined, with a daily supply of about 837 (dry season) or 1017 (wet season) metric tonnes of charcoal (Charcoal Survey, 2016: 52). Illustrative of high urban demand and few alternatives, there is also a considerable difference between the price for end-users in Kampala and other areas in Uganda, with the Charcoal Survey reporting an average price of 56.600 UGX in Kampala while the average across Uganda was 27.470 UGX (Charcoal Survey, 2016: 83). It is also interesting to note how the price has increased since 2015 (when the survey took place), with the price of a sack of charcoal in Kampala currently sitting above 80.000 UGX.

It is important to differentiate between general charcoal consumption in Kampala and the more specific scenario being played out in the informal settlements chosen in this study. Consumers in the informal settlements are far more sensitive to price fluctuations and tend to buy and use charcoal in slightly different ways, as described in the previous chapter. Unlike more affluent households in Kampala which can buy one or several sacks of charcoal at once and then store it for later use, most people in the informal settlements lack the funds to buy charcoal in bulk and instead purchase it on a daily basis, usually for around 1000 to 2000 UGX. Although it is convenient that they are not priced out and can always afford at least a small amount of charcoal, enough for a day's cooking, over a period of time this only adds to the overall financial burden. As Zulu and Richardson (2013: 132) point out: "Lower-income households often pay a higher price per kilogram for charcoal because they buy it in smaller packages; wealthier households will typically purchase larger quantities for a lower price per kilogram". The bitter irony being that those who can least afford it, end up paying more because they lack the financial reserves to apply cost-saving strategies.

Another important distinction between general charcoal consumption and the consumers in the informal settlements, is the absence of alternatives and therefore a high degree of dependence on charcoal. Again this partly is a result of more limited finances in these communities (e.g. not being able to afford a LPG setup), but also has to do with the rudimentary infrastructure of the informal settlements (i.e. no electricity network). This high dependence on a single energy source can exacerbate the impact of fluctuations in the price or supply of charcoal. This has also been pointed out as one of the subtle differences between Kanyogoga and Bwaise, with the latter having an alternative available in the form of firewood left over from the carpentry workshops, and residents of Bwaise thus being slightly less vulnerable to the impact of rising charcoal prices (for the time being at least, while firewood is relatively freely available).

Retailers

This category follows the distinction between those buying and selling in bulk (the wholesalers), who might sell directly to some customers but generally distribute sacks of charcoal to the local vendors (retailers), who in turn sell charcoal to consumers in smaller portions (Ribot, 1998). In informal settlements such as Kanyogoga, charcoal vendors are omnipresent. You can find them every 50 meters or so sitting by the side of the main thoroughfare, with charcoal spread out on a sheet in front of them and one or a few more sacks nearby. The vendors are mostly women and it is quite common for charcoal to form only one aspect of their business. For instance, some vendors also prepare food (e.g. Retailer 1 was frying what appeared to be plantains, and Retailer 2 had made a type of samosas), sell fresh produce (Retailer 4) or packaged food and dry goods (Retailer 5). As a small aside, it was interesting to note how, despite the sack of charcoal spread around her, one charcoal vendor was in fact using firewood for her side-business selling cooked food, indicative of the high value of charcoal (Retailer 1).

These local vendors operate on a very small-scale, with all interviewed retailers reporting that most customers just buy one pail or tin filled with charcoal for 1000 UGX (Retailer 1 – 5). This amount of charcoal is enough for daily use, so many customers come by every day (the vast majority of whom are also women, since they are responsible for cooking). Although charcoal prices are rising rapidly, the price for a pail or tin is kept at 1000 UGX so that customers can still afford it and instead vendors change the size of the container to limit the amount of charcoal that a thousand shillings can buy (Retailer 1; Retailer 5). There is some communication (or in a negative sense, collusion) between vendors on decreasing the container size in order to maintain a profit, so that prices are raised uniformly (Retailer 1). Since these vendors operate at a local level and most people buy charcoal on a daily basis, they tend to know their customers well and offer the regular customers charcoal on credit (Retailer 1 – 5). Although they mostly reported not giving any special deals to people they know, one vendor talking



Figure 8: Charcoal spread out on a sheet in front of a vendor in Kanyogoga. Note the small plastic container used to scoop charcoal into a sack. In response to rising prices, vendors alter the container (e.g. cutting part of it off) to sell less charcoal for the same price (see 5.4 for more detail).

about regular customers explained how “... you must find ways to keep that person coming to your premises to buy charcoal for instance by offering more charcoal to that person” (Retailer 4).

One of the main challenges reported by retailers can be connected with the informal nature of the trade, namely the unpredictable quality of the sacks they buy (which they cannot inspect beforehand) and lack of recourse in such cases (e.g. Retailer 3; Retailer 4; Retailer 5). Sometimes this is deliberate, as when bags are weighed down with sticks or sand to make it seem like denser charcoal, which is considered to be higher quality (Retailer 1; Retailer 5). This is a bigger risk when vendors do not buy from a trusted supplier, but instead get their charcoal from whichever trucks appear. More often it refers to the poor quality of the charcoal itself, which is perceived to be more common nowadays. As one vendor explained:

“[B]ut now we get the charcoal when it is as light as paper; you light a charcoal stove and just one charcoal stove of charcoal may not cook the rice until it is ready. It just melts away as ice because the trees are light. You have nothing to do because he has brought you a sack yet you have no idea of what the sack contains since they bring it when it is tied; in the end, you find that you have made a loss of 20.000.” (Retailer 4 Interview: 2).

Such stories were repeated by others, who stated that there was little that you could do about it and that there is no point in complaining: [I]n most cases, you have already paid for the charcoal and even the vehicle could have already gone. (...) Even if you tell them, all they do is to apologize because they are also not the ones that burnt the wood to yield poor quality charcoal” (Retailer 2: 3). In such cases, all the vendor can do is to give his customers extra charcoal or mix the poor quality charcoal with a sack of good charcoal (Retailer 2; Retailer 4). The fact that most of the charcoal trade takes place on the basis of volume or content (i.e. a full sack or tin) and not weight, has been identified as a contributing factor to the lack of uniform quality (although density is not the only indicator of good quality charcoal) (MWE Interview; Charcoal Survey, 2016).

Breakage of charcoal is also a problem, with a purchased sack containing a high percentage of charcoal fines (‘lusenyente’) which cannot be used in a traditional stove (e.g. Retailer 3; Retailer 5). Again, there is little the vendor can do about this: “You cannot blame the supplier as well; it is just like when you purchase “matooke” in bulk yet you don’t know that it is not the matooke that is used for food but rather for brewing” (Retailer 1: 3). However, in other ways charcoal was compared favourable to matooke, with the biggest benefit being that stocked charcoal maintained or increased its value: “[Y]ou know charcoal doesn’t rot, so even if you have 100 sacks of charcoal, with time they get finished” (Retailer 1: 3); “The fact that charcoal doesn’t rot; even when I haven’t

worked, it still stays in a good state” (Retailer 2: 2). This was considered one of the main attractions of the business, since the initial investment in charcoal would not go to waste.

Wholesalers / Brokers

Although the distinction between retailers and wholesalers has been made in other studies of the charcoal trade (e.g. Ribot, 1998), it was initially not clear whether the category of wholesalers would be applicable in the case of Uganda, as it was for instance not included in the study of the Ugandan charcoal chain by Shively et al. (2010). The distinction is between the wholesalers, who have the capital and storage facilities to buy charcoal in bulk and then sell it on through distribution to the smaller vendors, who only buy and sell charcoal in small quantities. The limited information available on the presence or absence of this type of actor is somewhat conflicting. According to the findings of the Charcoal Survey (2016: 101-102), the vast majority of vendors (77%) are supplied directly by transporters, with only a small percentage (9%) getting their charcoal through market centres and wholesalers. However, from other sources it seems that wholesale plays a bigger role than the above figures would indicate (e.g. BEETA Interview), and can perhaps be linked to the growing level of complexity in the trade, as well as being deserving of consideration with an eye on future goals of professionalization in the sector and more centralized distribution (Charcoal Survey, 2016). At the very least, it warrants the inclusion of a different type of categorization at this point in the chain (if not wholesale per se), namely urban ‘brokers’ acting between the traders and charcoal vendors in the capacity of middlemen coordinating the supply, in which traders simply give their charcoal to the broker who handles things from there (Trader 2 Interview).

Therefore, the following will still describe the general role of wholesalers but bearing in mind their potentially limited role. Alongside wholesalers, this category also describes the role of urban brokers, whose function has some overlap with that of traditional wholesalers (but focuses more on coordinating distribution to vendors directly from the incoming trucks and not so much on buying charcoal in bulk to keep in storage), and who more clearly play a part in the current charcoal trade. Like the traders, those acting as wholesalers or brokers tend to be well-connected and have some capital available, and likewise can remain somewhat elusive figures resulting in a limited picture regarding the details of their business.

Wholesalers buy charcoal in bulk from the trucks transporting charcoal directly from the production areas. Upon arrival in urban centres, these trucks can offload a large portion or even their entire supply with the wholesalers. This charcoal can be kept in a central storage facility before being distributed in smaller amounts to the local shops and vendors (Retailer 5), or taken

directly from the truck and coordinated through a broker (Trader 2). This system is convenient for the traders because that way they do not have to spend a lot of time travelling from neighbourhood to neighbourhood, trying to sell their charcoal piecemeal from the truck or maintain connections with a network of retailers, but instead can fairly quickly return to the production areas and repeat the process of acquiring charcoal. For instance, one trader described how working through a broker, it takes around two days to sell all the sacks and then he can turn back and get more (Trader 2 Interview). Something along these lines was also pointed out by Ribot (1998: 327) in the case of Senegal, about how most retailers cannot afford to pay for a full truck in advance, but could only buy small amounts or pay in instalments: "Since it would not be viable for most merchants to make such frequent 'debt-collecting' trips, they need to build up a clientele of trusted urban wholesalers to whom they can sell, or sometimes advance, their charcoal". One trader also mentions how his broker in turn gives some of the charcoal to another broker, which seems to indicate the possibility of some cooperation between brokers (and potentially collusion such as agreed prices, although this is rather speculative). The advantage for the brokers is that they can purchase the charcoal at cheaper bulk rates and then charge a significant markup when they redistribute it in smaller quantities.

For instance in the case of Kanyogoga, it seems like there are one or two main brokers responsible for the area who have a reliable supply from which most retailers tend to buy (e.g. Retailer 1; Retailer 2; Retailer 5), although other trucks also appear that work independently and some retailers buy freely from these (e.g. Retailer 3). As one charcoal vendor saw the role of brokers: "the owner of the charcoal purchases his charcoal from the village and brings it to town, when they reach town, the owner hands over the responsibility to another person and informs him of the amount he expects from the sales, so the broker makes sales and remains with some money for his own expenses" (Retailer 1 Interview). This does not entirely overlap with what a trader described, since he agrees on a fixed price for his charcoal with the broker beforehand (Trader 2 Interview), but it points to the role of an intermediary between the trader and retailers with the knowledge and network to distribute charcoal once it reaches the urban market. Furthermore, it would seem that these urban brokers can add significantly to the final price of charcoal, as will be discussed in the next section. At the same time, it should be emphasized that plenty of traders and transporters forego the services of urban brokers, and sell straight off the truck themselves (Charcoal Survey, 2016). This is especially common in smaller urban markets, but is also true for the larger market of Kampala, although it is difficult to come by exact figures.

Transporters

Some traders rent the services of transporters on a case-by-case basis (see the ‘trader’ category for more detail). The transport prices depend on demand and vary in the rainy or dry season, with heavy rains making some roads dangerous or impassible. The transporters face such risks as well as frequent police check points which require proper paperwork and more often bribes, with bad roads and the need for bribery being the top challenges identified by transporters themselves (Charcoal Survey, 2016). Since the transporters have to negotiate the poor roads and potential roadblocks, some knowledge of local conditions and connections is useful. Furthermore, charcoal is being transported across growing distances which adds the cost of fuel, thus meaning that transportation can add significantly to the overall cost of charcoal. One example was given of transport in Nakasongola where the transporters can charge the trader up to 10.000 or 12.000 per sack of charcoal (Trader 2 Interview). Another trader went off the main road to buy the cheapest charcoal, but reported then spending a million shillings on transportation because of the muddy roads and the usual check points (Trader 1 Interview).

Like charcoal producers, transporters can be found operating at various scales, from those carrying one or two sacks by (motor)bike, to pick-up trucks or minibuses carrying a dozen or more, to huge ‘Fuso’ trucks carrying up to 120 sacks at a time (Charcoal Survey, 2016; Trader 2 Interview). For instance, one of the traders for Kanyogoga usually uses a mid-sized range of truck which can carry 70 sacks of charcoal (Trader 2 Interview). In some cases charcoal is even transported over water, with an example given by the same trader of charcoal from the Apac district being loaded for free on a government-owned ferry (although not mentioned, this perhaps entailed some small bribe) (Trader 2 Interview). The findings from the interviews and policy documents seem to confirm what was earlier assumed based on literature research, namely how bikes and motorbikes are more predominant in the smaller towns which have closer connections to the surrounding hinterland where charcoal is being produced (Smith et al., 2015), while big trucks play a larger role in the trade to a city like Kampala.

Quite naturally, small-scale transportation (e.g. by bicycle or motorbike) goes hand-in-hand with small-scale production. However, it should be noted that motorbike transportation can also play a useful role in big urban markets like Kampala, where the ‘boda bodas’ (the ubiquitous motorbike taxis) are often seen transporting large sacks of charcoal. In a city with a creaky road network and hectic traffic, they can fulfil the function of last stage delivery, getting the charcoal stored in bulk at a warehouse to the small local retailers who only buy a few sacks at a time. The charcoal retailers interviewed in Kanyogoga were usually supplied by trucks coming in on a regular basis, but as one retailer mentioned, if these trucks were delayed or if her charcoal ran out faster

than expected, she could call her suppliers who would quickly arrange for a sack to be carried to her by motorbike (although the cost of transportation in such cases are hers) (Retailer 1).



Figure 9: Small-scale charcoal transport to Kampala by 'boda boda' and boat, as observed along the shore of Lake Victoria.

However, it must be reiterated that the charcoal trade can operate at different overlapping levels and that not all charcoal goes through wholesalers or brokers for subsequent distribution to retailers. Some charcoal traders go directly to a neighbourhood and sell sacks straight from the truck. These could be trucks servicing an area on a routine basis, or just traders trying their luck. Buying from unknown traders can come with a risk though, as explained by one vendor: “In the beginning, I used to buy from any moving truck; but their quality of charcoal was not good. So I got a relative who connected me to this supplier, whose charcoal is of good quality”(Retailer 2: 4). Reflecting this, the Charcoal Survey (2016: 100) found that around 60 percent of transporters used a network of vendors to sell charcoal in the urban market (although it unfortunately fails to mention

whether this takes place through an intermediary), while the rests reported that they sold directly to the end-users.



Figure 10: A truck loaded with charcoal making deliveries along the road right next to Kanyogoga (the road in Kanyogoga itself is not asphalted).

The way charcoal is currently transported affects the quality and level of wastage, which has been identified as an area which can be improved upon (Charcoal Survey, 2016). Breakage during transportation (into charcoal fines called ‘lusenyente’) due to rough handling during packing and offloading is estimated to waste between five to twelve percent of charcoal (which can add up to about 240.000 tonnes of charcoal annually) (MEMD Interview). This lusenyente cannot be used in stoves so it is often just dumped or given away for free (Retailer 4; Retailer 5), although it can still be incorporated into briquettes (EASE Interview). Poor storage also contributes to this waste, since charcoal disintegrates when it absorbs water, and often charcoal sacks are just left in the truck or on the ground unprotected and exposed to the elements (MEMD Interview).

Traders

Before detailing the role of traders, it is important to mention that officially several permits are required to produce and transport charcoal, and that traders might spend a significant amount of time and money dealing with the necessary paperwork (and/or bribery). In these transactions the traders are in contact with, amongst others, District Forest Officers in the area where the charcoal is being produced, traffic police at check points along the road to Kampala and officials inspecting licenses in Kampala itself. These officials are important in the functioning of the charcoal chain, so it might make sense to discuss them here alongside the other categories of actors. However, since they do so in a government capacity in pursuance of their official mandate to enforce regulation pertaining to the charcoal trade (whether or not all these officials actually act according to this mandate is another question), these actors will be discussed collectively in the section ‘Charcoal Institutions’ for the sake of clarity (and convenience).

As mentioned earlier, the traders play a key role in enabling the charcoal trade. Obviously they can come in various forms and guises, from small-timers involved in a one-off deal to the pillars supporting significant portions of the charcoal supply, buying huge plots of land at a time and having several truckloads worth of charcoal transported. For instance in the district of Masindi, alongside small-scale local producers Shively et al. (2010: 272) mention production taking place on a scale that almost beggars belief, through “large-scale charcoal merchants from Kampala who purchase standing trees on areas as large as a square mile and then bring crews of 100 or more workers to clear the land”.

Generally, the traders provide the resources (capital and connections) to purchase the right to cut trees, to fund production and transportation as well as the necessary paperwork or bribes, and have the charcoal delivered in bulk to Kampala or other urban areas. Some might own their own trucks to be used for transportation while others simply rent such services when they need it on a case-by-case basis (MEMD Interview; MWE Interview; Trader 2 Interview). Some also take on the role of wholesaler or even deliver to consumers directly, but this is less common.

The traders are mainly Buganda from central Uganda and Kampala (MWE Interview: 7). Shively et al. (2010) suggest this important because they have the necessary social network for the end market where the highest profits are made, as will be discussed in more detail in the next section. Similar arrangements have been found in other woodfuel chains, where the traders usually come from the urban areas and use their connections to mobilize (either themselves or through middlemen) the transporters or charcoal burners (e.g. Ribot, 1998). They can also just go through charcoal producing areas and purchase ready-made sacks of charcoal directly from producers or

collect from a central pick up point where the agent has already coordinated the various producers to deposit their sacks (Shively et al., 2010).

At the most basic level, the charcoal trade can be based on a simple system of direct sale of charcoal by the producers themselves to consumers, to which can be added increasing layers of complexity by introducing intermediaries at both the production site (middlemen and traders) and the retail market (wholesalers and vendors) (Zulu & Richardson, 2013). However, it should be emphasized that the charcoal sector of a region or country rarely falls entirely in one or the other categorization, and it would seem more accurate to think of a hybrid, or at least overlapping, system of trade, where the simpler system of direct sale co-exists alongside the more complex trade. Direct sale is associated with small-scale production and more common in smaller urban markets closer to the charcoal producing areas (Charcoal Survey, 2016). Nonetheless, even in the big urban market of Kampala exceptions can be found, such as a trader encountered in Kanyogoga who was involved at various levels of the charcoal chain, from production in Gulu, to transportation and final sale to customers in Kanyogoga (Trader 1 Interview). This is also an interesting example of vertical integration in the charcoal chain, since he takes part at all levels of the trade, but such extreme vertical integration across multiple levels is uncommon. More common is to find some overlap between just two levels, such as traders who also take on the role of transporter.

Since the demand for charcoal is highest in urban areas and it is a fairly cheap bulky good sensitive to transportation costs, charcoal production tends to spread outwards from the urban centre as the nearest and most accessible sources of wood are converted first, with the production areas moving further as these most convenient sources are exhausted. For instance, ten years ago most of the charcoal for Kampala was produced within a range of about 50 kilometres, but now charcoal is coming from areas over 200 kilometres away (MEMD interview). This expansion tends to occur not necessarily in circular zones based on absolute distance from the city, but naturally expands along the road network (Namaalwa et al., 2009). For example, the completion of a good tarmac road leading to Hoima was an important factor in the rapid expansion of charcoal production there, by making the area far more accessible for traders from Kampala (Shively et al., 2010: 272). It should be noted that this scenario applies to past and currently practised methods of charcoal production which mostly relies on ‘natural feedstock’ (not plantations), where clear-cutting still predominates and where little to no effort is put into replanting and replenishing forest resources (MEMD Interview; MWE Interview). A charcoal sector based on more plantations and replenishment of forests would look quite different.

For the bigger charcoal markets such as Kampala, the high level of demand and the growing distance to the charcoal producing areas, would seem to necessitate a more developed system of provision involving several intermediaries rather than simple direct sale to consumers. Greater urbanisation is closely related with increasing charcoal demand, and has been identified as an important factor in the case of Kampala (BEST, 2014). As recognized by the MEMD, “the demand is always going up, because the demand for charcoal is actually at par with the ... the rate of urbanization, which is around six percent” (MEMD Interview: 3).

It should be reiterated that the traders are generally difficult to get hold of, as was confirmed through various interviews (e.g. BEETA Interview; MWE Interview). This difficulty was further illustrated by a rare opportunity to interview a trader who supplied a local vendor in Kanyogoga, but who was only willing to talk on the phone (Trader 2 Interview). The informal nature of the charcoal sector and the elusive character of the traders, therefore means that it can be difficult to get an accurate picture of the role they play in the charcoal chain. Although the informal aspect of the charcoal sector generally enables the various actors within it to operate freely, it can also bring uncertain cost. Bribery is a big problem that touches upon every level of the charcoal chain, although encountered most by transporters and traders in the form of fees collected along the trade routes at police check points. For instance, as one trader explained, he has to give money to traffic police encountered along his way to avoid being charged by them, while to those in Kampala inspecting whether he has the necessary license, he offers a small bribe to look the other way (Trader 2 Interview). The issue of bribery was further highlighted by the same trader; when asked about the challenges in his field (aside from the high cost of permits), he replied: “We do not really have big challenges; the traffic officers are the only challenge” (Trader 2 Interview: 4). The issue of bribery will be discussed in more detail in the following sections.

Agents / Middlemen

The connection between the landowner, charcoal burner and trader can be direct, but quite often the initial contact is brought about through an intermediary, especially for production taking place on a larger scale. Agents or middlemen acting on behalf of traders (a function which is sometimes fulfilled by the traders themselves) facilitate the connections between the landowners and charcoal burners. Quite often the landowner lacks the resources or knowledge to produce the charcoal himself or hire a crew to do it for him. This is where the middlemen come in, by connecting the landowners to the traders who do actually have the resources and connections to produce and transport the charcoal. This is how Shively et al. (2010: 273) defined agents, as “middlemen between producers and traders. They do not buy and sell charcoal, but rather collect commissions

for connecting producers with traders”. Although a succinct description of their role, this might understate the variety of functions the agents can fulfil.

These middlemen can act as scouts, searching for suitable land and identifying owners that are willing to sell the trees on their property, at which point the trader can get involved (MWE interview). Following the negotiations between the owner and trader, the middlemen can then also be involved in mobilising the charcoal burners (MWE Interview; BEETA Interview). It is not until this point that the charcoal burners enter the picture in this particular scenario. However, it should be noted that for smaller scale charcoal production, the process can be much simpler, with direct contact between the charcoal burner and landowner (or even the landowner doing the charcoal production himself). Alternatively, middlemen can also help point traders to areas where charcoal is already being produced, informing them where they can find a ready supply of charcoal (Trader 2 Interview). Lastly, the role of middlemen is to help traders coordinate the actual collection of charcoal being produced in several areas, directing the trader to central pick-up points along the main road where producers have been instructed to deliver their charcoal (Shively et al., 2010: 272).

The role of the agent or middleman was largely absent in the study by Ribot (1998) (except for a brief mention in a footnote of the ‘kontrapalaas’ (foremen) who act as intermediaries between the woodcutters and traders, but no further details are given regarding their role). This could arguably have something to do with the rise of mobile phones since that study, which has greatly enhanced communication between the urban traders and the more remote charcoal production sites, creating new opportunities for actors involved in the charcoal trade. Whereas in the past the trader may have taken on the role of coordinator, the ease of communication afforded by the phone may have opened up space in the charcoal chain for agents to come to the fore (but this is only speculative).

Producers

Last in this list of actors are the producers, but quite obviously they and the trees themselves are the starting point in the charcoal-making process. In order to detail the role of the charcoal producers, it could be useful to give a little more information on the sources of wood, trends in production and the relationship between charcoal producers and landowners, with the two not necessarily being the same. The majority of charcoal is sourced from land that is privately owned, although still around a fifth of the wood for charcoal production is estimated to come from Central Forest Reserves (Charcoal Survey, 2016). Forest reserves might be at increasing risk of encroachment as other sources are rapidly depleted while the demand for charcoal is still growing. Forest coverage in Uganda stood at 24 percent of the total land area in 1990 (roughly 4.9 million hectares), but is

estimated to have since fallen back to around 9 percent (MWE Interview). The continued steep rate of decline is visible when laid alongside the figures from 2010 and 2013, when estimated forest coverage stood at 14 and 11.7 percent respectively (Charcoal Survey, 2016: 1).

Based on the findings from the Charcoal Survey, the main charcoal producing areas in Uganda are the central and northern regions, with Kampala mostly relying on charcoal from the Central region (63.4%) and secondly the Northern region (21.8%) (Charcoal Survey, 2016). These regions encompass the districts Luwerero, Nakasongola, Kyankwanzi and Masindi in the frequently mentioned ‘cattle corridor’ (e.g. MWE Interview; MEMD Interview; UNREEEA Interview), with this area presented as a clear example of agrarian drivers of environmental degradation and deforestation. In such cases, clear-cutting of forested land is often done to enable agriculture, in which charcoal production is an incidental benefit but not necessarily the main driver (MWE Interview; Iiyama et al., 2017).

However, although agrarian drivers are the main cause of environmental degradation, it is not always just a straightforward tale of clearing land for agricultural expansion. An added complication can be land disputes or in-migration: “Competition for land leads small holders to clear forest and establish perennial and annual agricultural crops as a way of establishing *de facto* property rights [emphasis in original]” (Jagger & Kittner, 2017: 7). Moreover, charcoal production has traditionally been a coping mechanism for households when harvests fail, as a way of bridging the gap until the next harvest (MEMD Interview; Shively et al., 2010). However, if production does not occur in a sustainable manner (e.g. clear-cutting instead of selective cutting), this raises the threat of a vicious cycle developing, where charcoal production can lead to reduced soil fertility or worsening of droughts, thus increasing the risk of lower yields or failed harvests, which in turn drives further charcoal production and clearance of forested land (MEMD Interview; MWE Interview; Iiyama et al., 2017). The ever-increasing price of charcoal raises the short-term appeal of charcoal production, but can have a detrimental long-term impact. This ‘short-termism’ is perhaps most clearly illustrated by production turning to less traditional tree species (since the traditional species have become scarce), with charcoal even coming from valuable fruit-bearing trees such as the jackfruit, shea nut or mango tree (MWE Interview). The short-term value of the charcoal is outweighed by the long-term benefits that such trees could provide in terms of food security and cash income. As the above examples indicate, the reasons for landowners to cut down the trees on their land can vary, ranging from simply cashing in on an available resource, expanding agricultural land or as a temporary source of income to fall back on when crops have failed (with all the associated side-effects and potential for vicious cycles that this may bring).

Those that own the forested land sometimes produce charcoal themselves, but often the task of cutting down the trees and carbonizing the wood is left to specialized charcoal burners. The findings from the Charcoal Survey seem to indicate that most of the charcoal burners are active in their home locality (Charcoal Survey, 2016: 37), but traditionally these specialized groups are not locals but come from elsewhere, with for instance people from the Musoga region in the East being seen as particularly good charcoal burners (MWE Interview: 7). Perhaps this discrepancy can be explained by higher numbers of small scale local producers versus a smaller specialized group which produces on a larger scale. The majority of respondents (63%) in the Charcoal Survey reported to produce between 0.5 – 10 bags per firing, which also points to more small scale producers (Charcoal Survey: 38), but other sources indicate some production taking place on a very large scale (Shively et al., 2010; MWE Interview).

To avoid having to transport the wood that has been cut, the production of charcoal is often done on-site by stacking the wood and covering it in traditional earthen kilns (mainly the circular ‘kinyankole’ or ‘kasisira’) (UNACC, 2015). One full cycle from cutting the trees, setting up and firing the kiln, to removing the charcoal from the kiln, takes an average of ten to fifteen days and requires the burner to periodically check up on the burning process and make adjustments where necessary (Charcoal Survey, 2016). This lengthy process, including the time spent on the labour-intensive process of acquiring wood and preparing the kiln, limits the number of ‘carbonization cycles’ the charcoal producers can go through to around two cycles per month on average (Charcoal Survey, 2016).

The traditional kilns have a rather low rate of wood to charcoal conversion (10 to 15 %), so that for every kilogramme of charcoal produced, roughly 7 to 9 kg of wood goes to waste (UNACC, 2015; Charcoal Survey, 2016). More sustainable kilns such as the casamance design can reach a more efficient conversion of wood to charcoal of around 25 to 30 percent (UNACC, 2015; Seidel, 2008). Some of these improved kilns can be relatively expensive or have the drawback of being stationary (e.g. brick kilns), requiring wood to be transported at some cost and inconvenience, limiting uptake (Seidel, 2008). As a brief aside, wood might be transported in rare instances, as the example given of charcoal burners illegally clearing the wood in an area and then transporting it to a nearby district where enforcement is not as strict, to go through the lengthier burning process there (UNREEEA Interview). This higher cost or inconvenience does not apply to all improved kilns though, with for instance the casamance being a fairly simple and cheap design in which a chimney is added to an earthen kiln to improve the air flow control, which allows for a more evenly distributed carbonisation process, resulting in higher quality charcoal and less wood wastage (Seidel, 2008: 7).

However, despite government efforts and various NGOs, the uptake of more sustainable kilns and practices is limited in the sector. In part this could be because producers are unaware of improved practices. For instance, some of the charcoal burners leave the wood out to dry before putting it into the kiln, but just as often the wood is placed without drying, which makes the process far more inefficient (Charcoal Survey, 2016). However, it could also be attributed to the often small-scale and temporary nature of charcoal production, which makes the initial investment in an improved kiln a higher financial barrier (Charcoal Survey, 2016). One of the problems with gauging the level of small-scale versus large-scale charcoal production is the inherently informal nature of the sector, as well as reported resistance from the bigger players in the trade with regard to attempts to bring greater clarity and transparency to the charcoal sector (BEETA Interview). Considering the sums of money involved and growing demand, one can assume that those with a big stake in the charcoal business would prefer to maintain the murky status quo, but such aspects will be discussed in more detail in chapter 5.4 on ‘Access’.

Conclusion

The above description of the various actors involved in the charcoal value-chain, alongside some relevant aspects of the role they fulfil, how they relate to one another and the drivers behind the trade, has hopefully painted a broad-brush picture of the charcoal sector and how it functions at different levels. The current rate of charcoal production is clearly unsustainable and has led to rapid deforestation. Stark choices are being faced regarding short-term benefits and long-term costs associated with current charcoal production practices. Regarding the trade itself, the key role played by traders should be emphasized ably assisted by brokers on both ends, with one coordinating producers for streamlined central collection of charcoal, as mirrored by the urban broker who coordinates distribution from a central point (the truck itself) back to small local retailers.

5.2 Benefit distribution

Although discussed at some length before, it should be briefly reiterated that the level of detail that can be reached in this benefit distribution is perforce limited, due to the generally murky nature of the charcoal sector and some especially elusive actors within it. Detailed figures on the quantities of charcoal being traded, the costs along different stages of the trade as well as the profits being made at various levels, are unfortunately often unavailable or the result of guesswork. However, as was discussed in the Methodology, this need not cause undue worry as far as this study is concerned, as

long as it is kept in mind that this concerns no more than a rough sketch of the current benefit distribution that hopefully offers sufficient information on who, broadly speaking, is benefiting from the charcoal trade, from where we can move on towards a more extensive discussion of the mechanisms by which they profit.

A good starting point could be to look at one of the few earlier attempts to study the charcoal chain in Uganda. Shively et al. (2010: 278) looked at three particular districts (Hoima, Masindi and Nakasongola) involved in the charcoal trade to various degrees, and compiled some of their results in the following adapted table (from which the district-specific results have been excluded, since this study does concern itself with regional variation in charcoal production):

Table 3: Average monthly profits and average per-unit margins in Ugandan Shillings. Adapted from Table 6 in Shively et al. (2010): 278.

	Average profit across Uganda <i>(monthly sales minus purchases minus variable costs)</i>	Kampala-based actors
<i>Producers</i>	63.958	-
<i>Agents</i>	169.146	163.200
<i>Transporters</i>	1.163.835	1.430.856
<i>Traders</i>	1.042.578	1.997.289
<i>Retailers</i>	122.478	194.742
	Per-unit margin <i>(monthly profits divided by monthly volume transacted)</i>	
<i>Producers</i>	85.6	
<i>Traders</i>	54.7	
<i>Retailers</i>	39.5	

The Kampala-based value chain actors do not include any producers because production does not take place at any significant scale in this region, while agents and transporters had to be excluded from per-unit margins since these actors have no reported purchase or sales volumes (Shively et al., 2010: 279). This is indicative of the difficulty in factoring in agents and transporters regarding their stakes in the charcoal trade. As an aside, it should be pointed out that no distinction is made here between the bigger retailers buying and selling in bulk (e.g. buying a truckload or selling several sacks at a time) and small local vendors (selling for a 1000 shillings at a time), which might blur the picture somewhat. Furthermore, it is unclear whether the ‘agents’ presented in the table would include the category of ‘urban brokers’ identified in the previous chapter.

It should be mentioned that the survey data relied upon for these figures was collected in 2008, so therefore might represent a slightly dated (if still useful) picture of the charcoal chain. As a starting point, the tentative assumption could still be made that overall benefit distribution is relatively similar, even if prices and costs are not, based upon the slightly simplistic notion that an increase in costs at one level of the charcoal chain will be carried over to the other levels. As one vendor summed this notion up rather nicely, when asked about how she decides on the price of charcoal: “If they hiked the price, then you will also hike it” (Retailer 2). Although intuitively this ‘balanced’ price hiking would make sense, some care should be taken in applying this. Actors do not have equal opportunity to maintain their profit share (as will be discussed in section 5.4). Moreover, being unable to include the impact of the strong rise in charcoal prices and growing urban demand over the past decade, the earlier survey consequently was not able to take into account potentially shifting roles and profit margins in the chain itself.

For instance, with forest resources becoming scarcer and the most accessible areas depleted, the role of the agent may have become more important in locating and coordinating a steady charcoal supply for the traders. Likewise, the ever-increasing distance to the charcoal producing areas would seem to make the role of the transporters more important. Developments in the regulatory landscape and its enforcement, or alternatively the effort and cost involved in circumventing these, may have affected the profits at specific levels in the chain. This underlines the need for a cautionary approach with regard to dated figures, which might not be an accurate representation of current developments in a very dynamic sector. While still relying upon the findings by Shively et al. (2010), to update the figures and distribution they found, this section also looks at the available information from interviews, the Charcoal Survey (2016) and other relevant secondary sources, specifically the price at which charcoal is purchased and subsequently sold on, as well as the variable costs involved at different stages of the chain.

Returning to the benefit distribution found by Shively et al., it is clear that the traders stand out: “On average, each trader sold 20 tons of charcoal over the previous year and earned 79 per cent of the final value of all charcoal counted as sales in the survey” (2010: 276). In general, the traders are widely seen as benefiting most from the trade, earning a far bigger share than charcoal burners or other actors simply by buying ready-made charcoal and selling in bulk (MWE Interview: 9). This further illustrates the seemingly dominant role of traders who accrue most of the financial benefit from the charcoal value chain. As Shively et al. noted themselves, those actors based in Kampala enjoy the greatest profits. They speculated that potentially “this reflects the scale of activity, since larger trade networks allow participants to mobilize supply from a larger set of points around the

country. Transporters and traders have by far the highest profits, which is again a reflection of the scale of activity” (2010: 277).

The scale of the trade was also approached from a slightly different angle by Iiyama et al. (2017: 4), who point out that “[t]he scale of the market and value chain can affect the absolute and relative levels of margins for charcoal producers”. Benefit distribution from the charcoal trade is not uniformly spread across the country, with the previously discussed tighter links between producers and smaller urban markets close to the charcoal producing areas, resulting in a simpler system of direct sale and a different type of distribution where some value-chain categories might be absent. In such a scenario, a producer might have a bigger share of the final profit than when he is part of the more complex (i.e. more intermediaries) and further-reaching charcoal trade of a big urban market like Kampala. Disjointed regulative frameworks can add to the complexity and confusion of the trade (as will be detailed in section 5.3), providing opportunities for some such as traffic police to obtain bribes in exchange for overlooking offences or well-connected traders to profit within this system, while potentially making things more difficult for others such as poorer producers lacking the right connections and who thus have more trouble navigating the bureaucratic maze (Iiyama et al., 2017).

Looking at the first stage of the charcoal chain, the amount of money involved between landowners and traders in getting the right to cut down trees for charcoal production remains a vague area about which information is not particularly forthcoming (MWE Interview). Shively et al. (2010: 272) do give the example of large scale production in Masinidi, where traders buy the rights to large swathes of forested land which they then clear: “The economics of converting woodland to pasture in this way are quite favourable. For example, an acre of land costs about 300 000 UgShs (approximately 166 USD), but a landowner can sell the associated timber to a charcoal producer for as much as 200 000 UgShs (111 USD)”. Changes in prices (both land and charcoal) may have changed things since that study, but it demonstrates the sizeable short-term profits that can be made by cutting down trees for charcoal, while the clear-cut land becomes available for pasture (although the long-term impact can outweigh these benefits, as discussed previously).

Looking at total profits from the charcoal trade though, the landowner’s share of the profit might not amount to much (although as stated before, the production of charcoal might just be a secondary benefit while the main goal is the expansion of land available for agriculture). Iiyama et al. (2017: 6) give the example of a landowner in Kenya who might receive around 1 dollar for every sack of charcoal produced from his land, which the charcoal burners sell to a trader for around 4 dollars who then goes on to sell the charcoal for 18 dollars per sack in Nairobi. Of course there are several additional costs involved along the various stage of the trade, but the landowner’s share of

the pie is relatively small. As alluded to in the preceding section, if the price paid to landowners for the right to cut trees more accurately reflected the actual value of forested land, the landowners would receive a far more significant share (although the final price of charcoal could of course end up being higher too).

Local example of Kanyogoga

Based on the figures provided by a particular trader supplying charcoal to Kanyogoga, we can get a rough picture of the profit he makes from the trade, although he did not give figures for the cost of necessary bribes while also keeping in mind he may have overstated his overall expenses. Since not enough data could be acquired on other traders this should not be considered an accurate reflection of the overall trade, but it provides an interesting example of the steps through which the trader must go to get charcoal to Kampala.

This particular trader locates people who are already in the process of burning charcoal, but which is still in the kiln, and then negotiates about the price (although in case the charcoal is found to be of poor quality, the deal could be renegotiated, which seems to demonstrate a fairly strong position for the trader) (Trader 2 Interview). He confirmed that the prices vary strongly region-by-region and over time (he had spent 16 years in the business already), with charcoal in Nakaseke going for around 25.000 to 30.000 UGX a sack at the time of the interview, although purchasing in bulk could lower the price (Trader 2 Interview). Another trader reported lower prices of 15.000 UGX per bag, but this was part of his deliberate strategy to go deeper into the charcoal producing areas for cheaper prices while spending more on transportation due to the poor condition of the roads (Trader 1 Interview).

Taking the figure of 25.000 UGX per bag and multiplying this with the capacity of the type of truck he normally used (around 70 sacks), gives a total purchase price of around 1.750.000 UGX. For transport, he would pay up to 10.000 or 12.000 a sack, adding another 700.000 to 840.000 UGX to the overall cost (which includes the cost of fuel). Other expenses were mentioned such as a 30.000 UGX 'market due' (a local tax for the truck in the area where they collect the charcoal, 40.000 for a bigger truck), an 80.000 UGX 'development fee' for the sub-county at the district and 59.000 UGX at the District Forestry Office for a permit to get the charcoal (Trader 2 Interview). Along the way to Kampala, frequent checkpoints necessitate the payment of bribes, the total cost of which are not known but, as it is often mentioned as one of the biggest challenges traders or transporters face, it can be assumed to be fairly significant (Trader 1; Trader 2; Charcoal Survey, 2016). The charcoal is then sold for between 45.000 to 50.000 UGX in Kampala to brokers who

subsequently distribute it to local vendors (with the price raised quite significantly during these transactions). Taking the lower estimates of costs and prices (and excluding the potentially significant cost of various bribes), the final profit for this particular trader is, very roughly speaking, around 530.000 UGX per truckload or about 7500 per sack of charcoal. If the figures provided by this trader are accurate, it would seem to point to a fairly big gap between the trader's selling price to urban brokers and the final price for consumers. The trader sold his charcoal for between 45.000 to 50.000 UGX, while reporting that the brokers can get around 70.000 UGX a sack for good quality charcoal (or between 60.000 to 65.000 UGX for lesser quality) (Trader 2 Interview). Meanwhile, the local charcoal vendors in Kanyogoga reported purchasing their charcoal for between 70.000 to 75.000 UGX a sack, while selling it in small quantities (mostly 1000 UGX per customer and around two to three sacks a week) for between 75.000 to 85.000 UGX a sack (Retailer 1 -5). This would seem to indicate a surprisingly big share of the final consumer price (equal to or even exceeding the share of the initial charcoal production) being added on after delivery of charcoal to Kampala.

Nonetheless, a common complaint amongst retailers was their small margin of profit, with some mentioning profits of no more than 2000 UGX a sack or even frequent losses made per sack (e.g. Retailer 1, Retailer 4), but considering the sensitivity to charcoal prices in the informal settlements and how other vendors gave profit margins of around 10.000 UGX per sack (Retailer 2; Retailer 3), this could perhaps have been a result of wanting to understate the extent to which they profited from the trade. Perhaps more importantly though considering the relatively low volumes that the many small local vendors deal in, the total profit made by the average vendor in the urban market might be a lot different from that of a few big retailers or urban brokers, but there is not much information available on this. It does not seem very likely that the potential discrepancy between the charcoal price upon delivery to Kampala and the final price for the end-user could be attributed to the small local vendors, whose share of the total profit from the charcoal trade seems relatively modest (between 2000 to 10.000 UGX per sack). This corresponds to the findings in the Charcoal Survey which, even though it did not look specifically at small vendors in informal settlements and thus includes retailers operating on a slightly bigger scale (selling to more customers and dealing in sacks or half-sacks rather than just 1000 UGX worth per customer), found an average profit margin per sack of a little over 4000 UGX (Charcoal Survey, 2016: 115).

Retailers also face some uncertain costs, but it is difficult to give precise figures. For instance, in order to retain customers if the charcoal is of poor quality, they might give more per 1000 UGX (Retailer 4) or have to mix it with good quality charcoal (Retailer 2). Sometimes the bags they purchased are weighed down with twigs or sand (Retailer 1; Retailer 5). They also face

the cost of charcoal breakage during transportation since they usually cannot inspect the bags closely before purchase, and end up dumping or giving away the ‘unusable’ (excepting briquettes) small charcoal fines (Retailer 1; Retailer 3; Retailer 5).

Conclusion

The main point that the above discussion indicates is that, whatever the exact levels of profit made from the charcoal trade may be, the balance is to some extent skewed in favour of traders and urban brokers. Transporters also seem to do quite well out of the current charcoal trade with the ever-increasing distance to charcoal producing areas, although they (together with traders) also have to deal most with problematic checkpoints and running the risk when paying necessary bribes. It is difficult to say much about the position of charcoal burners in relation to other actors, although considering the laborious task of charcoal burning, their share of the total profit is fairly low. It is also important to consider the scale of the charcoal trade and how this will affect different actors, as Iiyama et al. (2017: 4-5) found: “Increasing rent-seeking activities tend to result in squeezing producers’ margins as low as 10–30% of the final retail price, especially for longer value chains with increasing transportation costs”. So whereas the increasing distances are good for the transporters, the charcoal producers might not see a large share from the higher charcoal prices.

One of the consequences of this skewed benefit distribution, as will be discussed in more detail in chapter six, is that it can lie at the basis of unsustainable practices. When producers and landowners receive only a small share of the profit being derived from the charcoal trade, they have little incentive to husband forest resources. In such a scenario this not only results in an inequitable charcoal chain, but also drives unsustainable practices due to poor valuation of forest resources (Schure, 2014; Iiyama et al., 2017). A further point coming out of the benefit distribution is that it again highlights the difficulty in providing an accurate picture of the charcoal trade in Uganda. With the currently available figures, it is not possible to give exact ratios of benefit distribution. However, this was not necessary to gain an idea of the relative balance between the various levels of the charcoal chain.

5.3 Charcoal Institutions

The following section looks at the role of formal and informal institutions within the charcoal value chain. Keeping in mind the aim of identifying possible governance opportunities to make charcoal provision more sustainable and equitable, it pays special attention to the potential impact of greater formalisation in the charcoal sector (in both negative and positive terms). First the current regulative landscape will be laid out, namely the formal institutions that, as previously stated, can be considered as “rules that require exogenous enforcement by a third-party organization”, before continuing with the informal institutions that “may be endogenously enforced; they are upheld by mutual agreement among the social actors involved, or by relations of power and authority between them” (Leach et al., 1999: 238).

Formal institutions

Starting with the various government ministries, departments and sub-districts involved in some way in the charcoal sector, it quickly becomes evident that a large number of parties are active at some level of the charcoal trade, in which many responsibilities are delegated to lower levels of government. This requires a great deal of coordination between the various parties to prevent overlapping or conflicting regulation. The extent to which this is achieved, and whether the various organisations have the capacity to fulfil their designated roles, is debatable.

Natural resource management was decentralised in Uganda in the 1990s with the stated purpose of promoting local development and improving the effectiveness and efficiency of environmental management, based on the (contested) notion that local communities have more knowledge about their surrounding environment and a corresponding sense of responsibility, and are thus in a better position to act (Oosterveer & van Vliet, 2010). The various levels of local government in Uganda are organised according to their local council rank (LCs), namely councils that operate at the village level (LC1), parish level (LC2), sub-county level (LC3), county level (LC4) and lastly at the district level (LC5), with influence on policy or implementation resting mostly at the LC4 and especially LC5 level (Oosterveer & van Vliet, 2010: 287).

Efforts to decentralise aspects of government took place in several countries throughout Sub-Saharan Africa over the past two decades and enjoyed international support. The enthusiasm for decentralisation is strongly linked to views of weak central governments in this region, which are frequently seen as lacking the resources, infrastructure and capacity to effectively deliver services in often highly diverse and heterogeneous societies, while a decentralised approach could be more effective and strengthen community engagement which in turn offers a greater platform of support

for measures (Oosterveer & van Vliet, 2010). However, as Oosterveer and van Vliet (2010) emphasize, such technocratic and administrative notions can fail to account for political aspects of decentralization in practice, stating that in analysing decentralisation, it is

“... essential to distinguish between the model and the outcome. The results of political decentralization are not necessarily determined by the selected model but, rather, by the interactions among the model, the implementation process, and the specific local and national dynamics through which decentralization is effected” (Oosterveer & van Vliet, 2010: 285).

As they demonstrate, Ugandan efforts regarding decentralisation show how some particular interaction patterns within local contexts contribute to variations and deviations from what the ‘model’ of decentralized governance would imply, as will be detailed further in chapter six.

The most relevant ministries to be discussed in relation to the charcoal sector are the Ministry of Energy and Mineral Development (MEMD) and the Ministry of Water and Environment (MWE). Arguably other ministries could be included such as the Ministry of Agriculture, Animal Industry and Fisheries and the Ministry of Local Government, but from the point of view of this study these play a slightly more peripheral role and therefore will not be discussed in great detail, except in relation to the other ministries as part of the inter-ministerial committee on biomass chaired by the MEMD, which brings together relevant stakeholders for the biomass value-chain (MEMD Interview). A similar inter-ministerial committee led by MEMD, in cooperation with the UNDP and other relevant stakeholders as part of the Green Charcoal Project, led to the development of a Biomass Energy Strategy for Uganda (BEST) which set out potential approaches to a more sustainable biomass sector (BEST, 2014), as well as the subsequent Charcoal Survey (2016).

Without going into too much detail, the existence of such committees and projects does at least indicate some official awareness of the problems surrounding the biomass sector and the need for closer coordination, as damningly pointed out in the BEST report itself: “The institutional and regulatory framework of the biomass sector is scattered amongst various government agencies, lacks cohesion and clear mandates” (BEST, 2014: 21). Some recent examples of inter-ministerial collaboration were given during interviews with officials from the MEMD and MWE, such as work done under the banner of the Green Charcoal Project to bring together their respective expertise regarding the supply (MWE) and demand (MEMD) sides of the biomass sector (MEMD Interview; MWE Interview). However, it was pointed out that the current meeting point for the ministries is mostly at the lower level implementation and it was acknowledged that further efforts are required (though government is hampered by financial constraints) (MWE Interview).

The MEMD is responsible for the demand side of the charcoal sector, providing policy guidance, introducing improved technologies for charcoal production through trainings and demonstrations (such as the casamance kiln), and promoting the uptake of clean cooking options such as improved cookstoves (through a certification scheme) and briquettes (Interview MEMD). The MWE addresses the supply side of charcoal through the National Forestry Authority (NFA), which is one of the agencies within the ministry and its main mandate is to manage the Central Forest Reserves (MWE Interview). Other functions such as law enforcement and licensing for the exploitation of forest products has also been delegated to the NFA, so that the MWE can remain at the strategic level looking at regulation, guidelines and overall coordination, but still maintain oversight over the NFA by supervising its actions against the government performance contract (MWE Interview: 1).

The NFA fulfils its function through District Forestry Officers (DFO) (and their teams of forest rangers and guides), who are present at the local government level and are responsible for the planting and monitoring of forests, advising the District Council on all forestry matters and acting as the liaison for the NFA and other agencies regarding forestry matters (as set out by the National Forestry and Tree Planting Act of 2003) (GOU, 2003). The DFO also form the main contact point for actors in the charcoal chain (MWE Interview). In order to produce and transport charcoal, one should acquire a so-called 'Forest Produce Movement (or Transport) permits' (required for trading not just charcoal but other types of forest products such as timber) and 'charcoal burning permits' from the local DFO. These two permits form the main tools at the disposal of the NFA to monitor and manage charcoal production and transportation (with another license required to sell charcoal), but they are not uniformly enforced across the various charcoal producing districts.

Licensing

Ideally, for each particular district, forest produce movement permits provide a record of who is involved in the trade, what type of tree species are being used, and the volumes being carbonized (MWE Interview: 5-6). However, some deliberate avoidance takes place, both by local government officials who intentionally do not report accurately, as well as by actors involved in the trade who simply try to avoid the fees involved, and this obscures the overall picture of the trade in forest products (MWE Interview). Evasion of movement permits is rampant, with only about 59 % of charcoal suppliers for Kampala in possession of one, with this percentage going down even further in other districts, in some cases to fewer than 20 % of suppliers (and since these figures are based on what charcoal suppliers reported themselves, the actual percentage might even be lower) (Charcoal Survey, 2016: 64). Officially speaking, showing the forest produce movement permit at

checkpoints or to “any official along the transportation route should guarantee the legitimacy of the load and release the holder of the permit from paying additional taxes along the way” (Jagger & Shively, 2015 [Appendix]: 1 -2). However, in reality the permits often do not guarantee exemption from any further fees or bribes along the frequent checkpoints (Jagger & Shively, 2015).

The MWE does not receive money for the forest produce movement permits, instead payment goes towards the local government. The National Forestry and Tree Planting Act of 2003 provides guidelines for managing the sustainable use of forest resources and licensing trade in forest products, but through the Region Act and Local Government Act, local District Councils have the mandate to set their own fees and collect revenue through this (MWE Interview; MEMD Interview; Jagger & Shively, 2015). This has led to diverse and somewhat confusing pricing mechanisms and fees with some districts charging 1000 UGX per bag of charcoal and others up to 5000 UGX, while other districts still charge by whole truckloads (MWE Interview: 6). The local government district is thus an important player in enforcing the licensing of the charcoal trade and it receives a certain percentage of the associated revenue (although this can also provide negative incentives). Since sixty percent of the collected fees must be turned over to the federal government, local governments might be less motivated in enforcing laws or, at least, in accurately reporting the collected revenue (Jagger & Shively, 2015).

In most districts, charcoal burners are officially supposed to get a charcoal burning permit from the district office which allows them to burn charcoal for a certain period of time (with no limit on the total volume), but in many cases production takes place without going through the trouble of acquiring this permit (Jagger & Shively, 2015). Having acquired (officially speaking) forest produce movement permits and charcoal burning permits, there are still other miscellaneous fees that traders can encounter, but this varies across districts. One such is termed a ‘loading fee’ and is collected during the loading of the truck by some lower local governments (sub-counties), but others do not (MWE Interview). In many districts they are not able to effectively enforce the charcoal burning permits because the DFO lack the capacity and resources to monitor where burning is taking place across a large swath of land, so instead some of these districts only charge the loading fee (since the trucks can usually be more easily located at collection points and central roads) (MWE Interview; Jagger & Shively, 2015). Shively et al (2010: 276) give the example encountered during their survey of two districts which, due to limited monitoring and enforcement capacity, “abandoned efforts to issue licenses to producers”, and instead relied only on loading fees or other transport based taxes. The focus on transport was also pointed out by the MEMD interviewee, who commented: “So given that most of the production is illegal and unlicensed, so when the local government mounts a roadblock somewhere, for them they will be interested ... in the

transportation levee. Whoever produces, must transport, either by use of bicycle, or a truck, or boda boda. So they have levees for each mode of transport.” (MEMD Interview: 3).

The overall confusion that such varied regulation, and especially its disordered implementation, results in, is reflected by the findings of the Charcoal Survey. In response to a question about how much they have to pay for the documents required in their business, charcoal traders reported forty different charges (with very little agreement in costs), ranging from bag fees (from 500 to 10.000 UGX), to daily council fees (500 - 2000 UGX), to monthly market dues (3000 – 20.000 UGX), to yearly trading licenses (15.000 – 100.000 UGX), to movement permits (40.000 to 200.000 UGX) to name a few (Charcoal Survey: 27). As rightly noted in the Charcoal Survey: “This underscore the demand for standards and harmonization of trade and legal charges of the sector” (Charcoal Survey, 2016: 27).

Informal institutions

By their very nature, the informal institutions of the charcoal sector are more difficult to trace since there need be no written rules or lists of parties involved. These institutions are held up by those active within the trade and the details are simply known to them. The somewhat shadowy nature of the charcoal sector adds to the challenge in getting a clear picture of these informal institutions, because actors in the trade can be difficult to trace and unwilling to discuss their potentially incriminating activities (e.g. bribes paid in lieu of official paperwork).

As noted in earlier chapters, formal and informal institutions do not operate in isolation, which can result in "competing notions of legitimacy, in which actual entitlements are influenced by the interplay of these competing rule sets in the context of prevailing power relations" (Leach et al., 1999: 238). As an example of this, Leach et al. put forward the selective application of laws dependent on power relations and connections amongst actors, which would seem to be quite applicable in the case of Uganda's charcoal sector. For those 'in the know' and with the right connections and money, the official rules need not apply and can be easily bypassed. Bribery to circumvent the necessary paperwork in the charcoal trade is quite rampant at various levels of the sector.

In fact, rather than being dampened, bribery may flourish as a result of the current regulative framework and, more importantly, its limited implementation as a result of financial and staffing constraints, as stated by Jagger and Shively (2015: 1 (Appendix)): “Decentralisation has added additional layers and complexity to monitoring and enforcement, and coordination between the NFA and DFS [District Forestry Service] is limited ... such decentralisation can enhance rent-

seeking behaviour by public officials”. As previously stated, the important role of local government in enforcement together with the current fee structure, creates incentives for local officials to overlook infringements in exchange for a bribe.

However, selective application of laws is not just defined by bribes, since social relations can also play an important part, as Ribot (1998: 327) argued: “Policy circumvention and the allocation of favours by state agents are not random, but run along specific social lines: some merchants can use state access to increase their benefits from the charcoal trade, and others cannot. Hence, both entry into the merchant class and the position within it are supported by the strength of a merchant's social ties”. Whether this is true to quite the same extent in present-day Uganda is not clear (for example there is currently no required membership of co-operatives as in the case of Senegal (Ribot, 1998: 324-325)), but even if watered-down, some importance is certainly still attached to social ties (as will be discussed in more detail in the next section on ‘Access’).

A last example of informal institutions concerns the sale of charcoal in the urban market, which largely takes places informally at roadside stalls. As discussed in previous chapters, in the informal settlements social connections between vendors and customers are quite important and allow for charcoal to be sold on credit. Regarding licenses for those selling charcoal, none of the vendors interviewed in the informal settlements reported to have any type of license or had any contact with officials regarding their business (which considering the informal nature of these settlements perhaps comes as no great surprise). Even with its wider retail scope (i.e. not just informal settlements), the Charcoal Survey found that the majority of vendors (around 70 percent) did not have any license, either because they were new in business, not aware of the need for any license (or where to even get it) or reported that there was no enforcement and it simply was not necessary (Charcoal Survey, 2016).

Formalisation and decentralisation

As previously discussed, Schure et al. (2013: 96) looked at formalisation in the charcoal sector as the extent to which the actors within it are controlled by explicit rules, procedures and norms which impose certain rights and obligations, as enforced by a third-party. Whether actors want to participate in a more formalized sector is dependent on both ‘carrot’ and ‘stick’, namely the expected benefits of participation and the risk of punishment when operating outside of the rules, which of course depends on how effective law enforcement is (Schure et al., 2013). The type of government control that can be imposed was summarized as follows: “Statutory control of forest product value chains takes three main forms: 1) controlling the trade by defining quotas, fixing

prices, licensing the traders and levying taxes or other fees; 2) controlling the access to land and granting harvesting rights to private entities; 3) controlling harvest by licensing harvesters” (Schure et al., 2013: 96). As the preceding discussions have shown, some of these measures have been imposed in Uganda but have met with only limited success, since they are not followed by many actors involved in the charcoal sector. For instance, traders should officially get a forest produce movement permit, but on average (for Uganda as a whole) only about 43% do (Charcoal Survey, 2016: 63). Likewise, charcoal burners require a license to do their work, but many never bother with it since they run only a small risk of ever facing any consequences for failing to abide by the rules.

It is noteworthy that Uganda currently does not have any quota system in place and sets no upper limit to the volume of charcoal that may be burned and traded. As recognized by the MWE interviewee, the absence of quotas could have a ‘deadly’ impact since, at the moment, there is no limit to licensed production and neither are permits refused (MWE Interview: 9 – 10). However, even if this measure was introduced overnight, like with other permits, the imposition of quotas in and of itself would not amount to much without proper enforcement. In such cases it is important to keep in mind the ‘embeddedness’ of informal institutions, even if the formal regulative framework is overhauled (Leach et al., 1999). Furthermore, if not properly implemented, it could even lead to unexpected outcomes such as an increasingly skewed benefit distribution and marginalisation of weaker actors. For instance, as Ribot (1998) found in the case of Senegal, the quota system was widely abused by the most powerful actors, who would simply use other traders as frontmen to acquire a larger share, while the introduction of supplementary quotas seemed entirely dependent on social relations.

The overall impression of limited consequences for failure to abide by rules might partly be due to officials deliberately overlooking offences in exchange for bribes. However, it is also very clear that the district forestry officers responsible for enforcement are constrained by limited funds and staffing, while the difficulty of their task is magnified by the size and terrain of the area they should cover, with charcoal production often taking place in not easily accessible areas (Shively et al. 2010). As Shively et al. (2010: 275) found in their survey, due to staffing and funding constraints, district forestry officers often cannot cover the entire district, but instead “are limited to interacting with value chain participants either in district towns, or at check points set up along major transportation routes. As a result, forest officials interact primarily with transporters and traders” The fact that there is so little contact with charcoal burners obscures the overall picture of charcoal production and makes it difficult to spread more sustainable production practices. It also illustrates

the key role of the traders as the ones who handle most of the paperwork and have the necessary contacts and network required for conducting the business.

The spatial distribution of forest resources alongside the decentralized governance of the charcoal sector and limited funding and staffing of the forestry service, makes it very difficult to enforce restrictions on production, with the current local taxation structure forming a particular hindrance: “The current local tax regime has been characterized as disabling and likely to be more so in the future as it becomes more entrenched, and opportunities to exploit it for personal gains by insiders become more established over time” (Namaalwa, Hofstad & Sankhayan, 2009: 74). This again highlights the potential vested interests behind maintaining the informal nature of the charcoal sector under the current decentralized system.

Although as previously mentioned decentralized governance in Uganda contains some clear strengths, under its current vastly under-resourced and rather uncoordinated form, the decentralized approach to the forestry sector has been singled out as a complicating factor. For instance, as previously mentioned, the current revenue sharing system between levels of government for the charcoal transport fees collected at the local government level has led to flawed enforcement, as illustrated by the findings of Shively et al. for Nakasongola. Regarding the division of revenue collected from transport permits (which are based on the amount being transported), 60 percent should go to the national government, while 40 percent goes to the district, of which another 35 percent should remain (‘should’ being the operative word here) at the sub-county level where collection took place, but this does not always happen: “There are [thus] obvious incentives for sub-counties to underreport revenues from charcoal, given that they retain a minimal share of total amount collected” (Shively et al., 2010: 276).

Even when regulation is properly enforced, the decentralized approach to the charcoal sector creates difficulties. Namaalwa et al. (2009: 75) give the example of earlier efforts to impose stricter licensing and monitoring in targeted districts such as Masindi and Nakasongola that are important to the charcoal trade, which reduced unlicensed charcoal production there, but “mainly as a result of several charcoal producers abandoning the districts for other production areas where no such systems operate”. Such narrowly targeted efforts, although admirable in their aims, essentially lead to a game of ‘whack a mole’ between officials and charcoal producers without remedying the underlying issue. As Namaalwa et al. rightly point out, there is a need for more uniform implementation of regulation in the Ugandan charcoal sector.

Conclusion

Although formalisation is certainly not an inherently positive force, as highlighted by some of the previously discussed negative consequences of poorly enforced regulation or unintended outcomes of narrowly targeted efforts, it should remain clear that there are also many drawbacks in maintaining informal institutions. The cost and uncertainty associated with rampant bribery affects all levels of the charcoal chain, while informality also fosters dependence (“the degree of authority an actor in a chain has over aspects of their work and the share of work-related risks that they absorb in a chain”, Schure et al., 2013: 96). Even more importantly considering the rate of deforestation and the steady pressure resulting from the high demand for charcoal, under these conditions informal institutions largely fail to account for the long-term environmental and social impact of unsustainable charcoal production, an area where formal institutions can perform much better (Schure et al., 2013).

Nonetheless, despite the potential gains to be made through formal institutions, the sobering conclusion reached by Schure et al. (2013: 103) is as follows: “There are many vested interests in the informal systems with producers and rent-seeking actors along the chain and few motivations or disincentives to change. Formalisation only occurs once the pressure on the resource is acute enough that government intervention is required.” This would seem to indicate that a type of tipping-point is required before extensive action is taken, but continuation of the status quo until a crisis point is reached not only might do irreparable damage on an environmental level, but could also have severe repercussions for the people in the informal settlements who are highly dependent on charcoal and currently lack viable alternatives.

On a slightly more encouraging note, current projects and efforts under the Green Charcoal Project seem to already be heading towards some formalisation of the charcoal sector based on a value-chain approach, and the first sprouts of greater awareness and political willingness to act on the issues surrounding the charcoal sector can be glimpsed (MWE Interview; MEMD Interview). The ambitious reforestation targets set in president Museveni’s official ‘Uganda Vision 2040’ (bringing forest coverage back to 24 percent) are perhaps not achievable, but possibly demonstrate some political willingness at the highest level and interest in a more sustainable forestry sector. There are ongoing efforts to set up plantations, to organise and train charcoal traders to give greater consideration to the replenishment side of the charcoal business, and treat it as a long-term business which requires new trees to be planted for future harvests (MWE Interview). Throughout the Charcoal Survey, it calls for the setting up of associations or cooperatives for the various players in the charcoal chain, from charcoal burners to retailers, so that through these platforms the charcoal

market can be harmonized and these groups can be licensed and easily reached for trainings on best practices, sensitization and credit provision (Charcoal Survey, 2016: 139 – 140). The survey keeps repeating the mantra of professionalization and capacity building in the sector. In fact, the study was set up specifically to gain “insight into the status quo of the charcoal value chain ... for *the purpose of formalizing the charcoal business* and promoting its sustainability [emphasis added]” (Charcoal Survey, 2016: 5). Optimistically speaking, all these aspects indicate, if not a complete overhaul in mindset and governance approach regarding the charcoal sector, then at least the first few tentative steps towards greater formalisation.

5.4 Maintaining and controlling access

This section, following the access mapping method proposed by Ribot (1998), analyses the means by which access to benefits in the charcoal sector are maintained and controlled by various actors operating at different levels of the chain. The means and mechanisms identified here will be used in the following chapter to support the search for promising opportunities at the policy level to make the charcoal sector more sustainable and equitable, as well as help assess the potential impact or feasibility of possible policy initiatives.

Ribot (1998) found that the various categories of actors in the charcoal sector relied on different means to maintain access to the benefits flowing from the trade. His findings include both legal (e.g. permits or quotas) and illegal (e.g. price-fixing or bribery) mechanisms, or through other means such as credit arrangements, technical or market knowledge, and social ties. As will be detailed below, there are many similarities between the access mechanisms used in the Senegalese and Ugandan charcoal sector. However, there are also some noteworthy contrasts due to differences in the regulative framework or with certain practices becoming outdated with new and relatively freely available technologies (although access to technologies might be uneven, which should be kept in mind when for example considering the impact of ongoing state efforts to spread more sustainable charcoal production practices under the banner of the Green Charcoal Project).

For instance, one can assume that with the spread of mobile phones and ease of communication, misinformation regarding pricing nowadays plays a smaller part in the market than observed by Ribot (1998) in the 1990s, when urban traders and brokers held much more of a relative monopoly over market information vis-à-vis the rural-based producers, and routinely misrepresented costs and prices to gain a larger share of profits. Naturally misinformation can still be used in other aspects of the trade (e.g. regarding the more opaque side of the total bribery costs involved in getting charcoal

to the urban market), but this example illustrates the shifting of access mechanisms amongst actors in response to changing circumstances, which should be taken note of when considering potential regulatory reform for the charcoal sector.

It should be noted that Ribot (1998: 311) differentiates between the ‘maintenance’ and ‘control’ of access, although of course as ‘complementary aspects’ in defining relationships amongst actors regarding resource appropriation and usage: "Maintenance is about expending resources or powers to keep access open for one's self or others ... Control is the ability to mediate others' access". So for example, some actors might have access to a particular market, but only through a more powerful mediating actor and with very little control themselves. Further distinctions within the concept of access are made by Ribot & Peluso (2003), in distinguishing between rights-based, relational and structural access mechanisms (which encompass diverse aspects such as ‘capital’, ‘markets’, ‘labour’, ‘knowledge’, ‘authority’ and ‘identity’). Considering the scope of this study and keeping an eye on the overarching goal of identifying opportunities on the policy front, relevant aspects of access as mentioned above are discussed individually as needed or bundled together for convenience’ sake where deemed necessary, leaving a more exhaustive analysis of the entire spectrum of access mechanisms and their varied roots to other studies.

Downstream limitations

First of all, as the seemingly skewed benefit distribution implies, access to profits amongst actors in the charcoal chain is not equal. The charcoal trade does not occur on terms of parity between levels and actors, but rather sees some actors dominate using a wider range of mechanisms. Starting at the tail-end of the charcoal chain with the retailers, it is clear that they have relatively limited options to increase their share of profits. The average vendor lacks the capital and connections to arrange for his or her own charcoal transportation, and instead depends on traders and urban brokers to be supplied (and thus to accept the price at which it is offered in the urban market). It is possible to buy charcoal from whichever trucks show up in the neighbourhood, but as discussed previously, vendors then run a greater risk of receiving poor quality charcoal or weighed down sacks, and have no recourse in such cases. Having close social ties to traders or brokers can help ensure a fairer and more trustworthy supply (see for instance Retailer 2, who complained of receiving poor quality charcoal until she was connected to a supplier through a relative).

One could assume that one of the straightforward options available to retailers to increase their profit, would be to simply raise the price at which they sell charcoal. However, this is complicated

by two factors. Firstly, the competition presented by the ubiquitous presence of vendors, who in the informal settlements can be found every fifty meters or so at simple roadside stalls with some charcoal spread out on a tarpaulin sheet in front of them. Were one to unilaterally raise prices, customers would simply turn to other vendors. The informal nature of charcoal retail (especially in settlements such as Kanyogoga or Bwaise), with vendors simply setting up shop wherever they can afford to without acquiring any state license or paying taxes, seems to stand in contrast to the retail landscape of Dakar presented by Ribot, where retailers control vending space through connections with officials and the payment of taxes and rents (although perhaps this discrepancy can partly be explained by the fact that Ribot does not focus on informal settlements) (Ribot, 1998).

The second complicating factor in increasing retailers' profit share is the fixed price of charcoal. Here an interesting parallel can be found with the Senegalese retail sector, although with one point of contrast: whereas in Dakar the price of charcoal was fixed by the state, in Kampala it is seemingly self-imposed due to customer demand to be able to afford small daily quantities of charcoal for 1000 shillings. As Ribot points out, as far as retailers' influence over the final price, they thus only have 'room for manoeuvre' by manipulating weights, which is done using crooked scales (during his observations a 'kilogramme' of charcoal hovered between 740 and 770 grams) (Ribot, 1998: 330). Likewise, in Kampala retailers only have room for manoeuvre by manipulating the container size in which charcoal is sold, for instance cutting the top off of a plastic container so that it holds less (Retailer 5). In both cases, although prices may be fixed, consumers end up with less charcoal for the same price. This only works though if it is done collectively by retailers, and therefore, as stated earlier, requires some communication (or perhaps more accurately collusion) between vendors on decreasing the container size so that prices are raised uniformly (Retailer 1; Retailer 5). There would thus appear to be at least some limited informal network between local vendors in order to achieve this, as also indicated in some interviews regarding communication with other local vendors (or simply by observing each other's stall and equipment) (Retailer 1; Retailer 2; Retailer 5). Nonetheless, opportunities for retailers to 'affect the game' and increase their share of profits are clearly limited. Real influence lies further upstream in the chain as retailers can essentially only play the hand that is dealt to them by traders and urban brokers.

Building on social ties

Moving further upstream, one noteworthy aspect of maintaining and controlling access is the importance of social ties and connections, as illustrated by the example offered by Ribot regarding a close relationship between producers and merchants in Senegal, which might be mirrored to some

extent in the case of Uganda. Ribot (1998) found that the majority of woodcutters and charcoal producers in Senegal were migrants brought in by merchants from outside of the charcoal producing areas. As ‘outsiders’, their first loyalty lies with their merchant patron rather than the surrounding villages in the area where charcoal production is taking place, and thus they have little objection to producing charcoal in a way which might be damaging to the long-term interests of the local population (i.e. clear-cutting of forested land) (Ribot, 1998: 323). For this reason, merchants prefer working with migrant charcoal producers, who in turn are highly dependent on their merchant patron, since the merchant has the connection and capital to protect the producers from fines or extortion: “Those without strong merchant patrons risk losing income to fines and payoffs, even if they are working within the bounds of the law. Ties to the merchant class are thus necessary for the migrants to work safely and profitably in the forests” (Ribot, 1998: 323).

This does not appear to be true to quite the same extent in Uganda, where a significant amount of charcoal production is undertaken by small-scale independent producers, in many cases without any clear evidence of strong merchant ties or protection (Charcoal Survey, 2016). However, without wanting to ‘overcook’ this aspect of social identity, it does seem worth mentioning that traditionally certain groups of outsiders are preferred for charcoal production, such as the Musoga from Eastern Uganda (MWE Interview: 7) or migrants from the West Nile district (Shively et al. 2010: 272), and that perhaps the absence of ties to the local production area contributes to this preference for outsiders. Added to this is the fact that constructing and firing of a kiln requires some skill, which might explain a preference for experienced specialized producers who move from site to site rather than relying on local producers.

Similarly, the importance of social ties and connections is also reflected in the trader category, albeit in a rather different way since the producers traditionally tend to be relatively poor dependent outsiders, whereas the majority of traders tend to belong to particular dominant and wealthy social groups (although again generally not from the charcoal producing areas themselves but from the main urban markets) such as the Buganda in the case of Uganda (MWE Interview). As Shively et al. (2010: 274) point out, since Bugandan traders and transporters earn the highest profits, this “suggests that social networks at the end of the value chain may be a more important determinant of profits than social networks at earlier points on the value chain”. They argue that this is partly due to the fact that contact between forestry officials and actors more upstream in the value chain (e.g. producers) is limited, since the lack of resources and staff means that officials mostly come into contact with actors in towns or at checkpoints on major roads, and thus end up mainly interacting with traders and transporters (Shively et al., 2010). The social network of traders can therefore be considered more important in maintaining access than that of producers.

This relative monopoly on contact with officials and the paperwork involved gives traders a hugely important position in the charcoal trade, since they are the ones with the skills, connections and know-how to navigate the current bureaucratic maze of overlapping regulation and corrupt practices. Other actors might lack these necessary ‘navigation tools’. One could therefore argue that the variety of permits and haphazard local enforcement of licensing due to flawed incentives within the current decentralized system (as previously discussed), actually help maintain the powerful position of the traders. In a similar vein, the informal nature of the trade works in the favour of the traders and urban brokers. Limited information about the charcoal sector as a whole muddies the water for other actors to acquire the know-how about how to conduct the trade, while corrupt practices work in favour of the more powerful that have the capital and connections to deal with it.

The role of capital

As discussed in the previous section on institutions, bribery is an important tool for selective application of laws and receiving favours from state officials, but it also depends on social relations. Social ties to the right people enable certain actors to avoid troublesome inspections or costly fines, which other less well-connected actors cannot circumvent. As Ribot (1998: 325) found, it is especially traders that benefit from social relations: “Selective access to state agents for state-allocated resources, such as licenses or quotas, and for exemption from prosecution for infractions, is another important mechanism by which wealth becomes concentrated within the merchant class.” While the current absence of quotas or merchant cooperatives in Uganda somewhat lessens this impact, the haphazard enforcement of the necessary licensing of charcoal production and transportation still provides plenty of opportunities for traders to put their social relations to good use. The disordered implementation of regulation creates space for wily actors to operate.

Credit arrangements can also be an important mechanism for certain actors in maintaining or controlling access, chiefly for traders and urban brokers who have the necessary capital, while credit also naturally acts as a trade barrier to those unable to acquire it because they lack the right connections (thus restricting the most lucrative positions in the charcoal chain to the more affluent and well-connected) (Ribot, 1998). For instance, traders must have enough capital (or connections to others that are willing to front the costs) to cover the initial cost of doing business, from paying for production (either for ready-made sacks of charcoal or for the more elaborate process of acquiring the rights to cut down a forested area and arranging a team of woodcutters and charcoal burners to produce charcoal), to hiring transportation (or have access to their own vehicles), while also covering the necessary costs for licensing and bribes along the way. Capital presents a perfect

example of the oft intertwined nature of certain access mechanisms. An actor's capital not only works in direct terms insofar as being able to afford things (e.g. sacks of charcoal, permits or trucks) but flows through to other fronts of access. As Ribot and Peluso (2003: 166) describe it: "Wealth or capital also affects other types of access since wealth, social identity ... and power are mutually constituted ... In other words, because of the status and power that wealth affords, those with wealth may also have privileged access to production and exchange, opportunities, forms of knowledge, realms of authority, and so forth."

Ribot emphasizes the intertwined nature of capital and social connections for actors in the charcoal chain, especially in the figure of the trader. As stated earlier in this chapter, traders often make use of urban brokers to arrange for the sale of their cargo rather than spending the time and fuel driving around looking for vendors to sell to in a piecemeal fashion, as Ribot (1998: 327) states in this matter: [T]hey need to build up a clientele of trusted urban wholesalers to whom they can sell, or sometimes advance, their charcoal. This network of 'social capital' is essential: merchants (or would-be merchants) need to trust those to whom they must often advance their product. Hence, operating as a merchant requires both monetary and social capital". Whether urban 'wholesalers' play quite the same role in Kampala has already been discussed, but connections to the more likely candidate of urban 'brokers' seem to be just as valuable, especially for those conducting trade on a larger scale. As stated before, traders also form the main point of contact for district forestry officers and other officials (Shively et al., 2010). A trader's social network can be a helpful tool for a speedier resolution of permit applications, or in finding a more lenient official willing to overlook certain oversights or acts of wrongdoing for a small fee.

Regarding the role of credit in the relationship between suppliers and vendors, Ribot (1998: 328) found vendors to often be dependent in a similar manner as charcoal producers were towards traders, grounded in what he termed "interlocking credit-labour relations", with the more powerful partners in these relationships (i.e. brokers and traders respectively) setting the terms of trade. Since vendors often could not afford to buy charcoal themselves, brokers would supply it on credit, similar to arrangements between traders fronting the cost of production to charcoal burners (or at least providing the necessary equipment and an advance for daily needs during the production process) (Ribot, 1998). Although it is plausible that similar arrangements exist in Uganda, no concrete evidence of this can be presented. The example provided by Schure (2014: 82) from Congo also paints a slightly different picture, since she emphasises how "[i]ntermediaries play a logistical rather than financial role, bulking up, speeding up collection, transport and sales, and avoiding or minimizing taxes" (Schure, 2014: 82).

Again, the informal nature of the trade complicates the above assessments, because it makes it difficult to ascertain the level of small-scale versus large-scale activities within the charcoal sector. The relationships described by Ribot only make sense within large-scale production where traders bring in teams of charcoal burners who are linked to their merchant patron, rather than independent small-scale producers. Likewise, the dependent relationships described by Ribot on the other end of the charcoal chain only seems to fit a scenario with powerful wholesalers or urban brokers who maintain a wide network of affiliated retailers. Moreover, unlike in Senegal where Ribot (1998: 329) found vendors to show ‘a form of loyalty’ to their suppliers by rarely purchasing charcoal directly from traders, the accounts of local vendors in Kampala show far less inhibition regarding such behaviour (other than running a higher risk of receiving poor quality charcoal). Yet this point cannot not be taken too far since informality clouds the picture, which has become a familiar refrain throughout this study.

One could argue that these issues surrounding the informal nature of the trade might also serve a purpose to some actors who benefit from the current murkiness in the sector, since it helps cover the extent of their activities and the sums involved. For instance, there is little information regarding how much traders are paying landowners for access to forested land, which could be part of a deliberate strategy of concealment:

“We don’t know how much they’re paid by the traders, because that is secret, that is between them .. we don’t know what happens there, and also we don’t know how much they pay per acre. So we have some figures but they’re not that authentic, because it’s very difficult to get actual figures of how much a group pays the owner of the land. They don’t always want to be transparent on that” (MWE Interview: 7).

Not having a clear picture of the sums involved in the business makes it more difficult for instance to establish alternative incentives for landowners to maintain the trees on their land in a more sustainable manner rather than allowing clear-cutting without replanting (such incentives are currently under consideration at the ministry level) (MWE Interview).

When considering the role of landowners, it is important to return to one of the key points behind the concept of access, namely how it encompasses more than just straightforward legal rights. For instance, access to markets can be limited through collusion by other actors or a lack of necessary resources. Holding the property rights to forested lands does not necessarily translate into a large share of direct benefits for the landholders, as seen by their relatively modest share of the overall profit distribution. Instead, this benefit is often taken up by the trader who has access to the labour, technical know-how, social connections and capital necessary to actually translate this land

ownership into profit (i.e. to be able to afford the cutting of trees, carbonization, packing, transportation and sale). Officially the landowner would seem to hold the ‘right’ to benefit, but lacks the ‘access’ (e.g. to capital and labour) to enable this benefiting (Ribot & Peluso, 2003).

As a brief aside regarding the potential impact of such arrangements, Schure (2014: 77) comments the following about access to forest resources in the Congo Basin: “Access is always temporary, even for local villagers, and involves payments in cash or parts of production. This temporal nature makes reforestation or domestication unattractive, and aggravates the pressure on tree resources in the region.” Whether this applies to the same extent in Uganda is not certain, but the main point is that it does demonstrate how temporary arrangements can drive unsustainable practices. Since temporary access is likely more common under informal arrangements where access is more fluid and less sharply defined than in formal arrangements, it again points to the informal nature of the charcoal sector as exacerbating pressure on forest resources.

The above discussion brings us to the following rough sketch (**Figure 11** on the next page) of the connections between actors in the charcoal chain and how access to resources and markets is arranged. In this figure, (1) the black arrows represent charcoal; (2) the green arrows concern informal relations, with the arrow direction indicating who generally initiates contact; (3) the red arrows indicate the main credit arrangements and other payments; (4) the blue arrows are the points of enforcement for, respectively, charcoal burning permits, forest produce movement permits, loading fees and bribes. It is important to remember the possibilities for vertical integration within the chain; sometimes the landowner and producer are the same actor (more common in small-scale production), which simplifies dealings upstream in the chain. The same is true for traders, who sometimes take on the coordinating roles of agents or handle transportation themselves, while the urban agents might also be side-stepped by traders going directly to retailers.

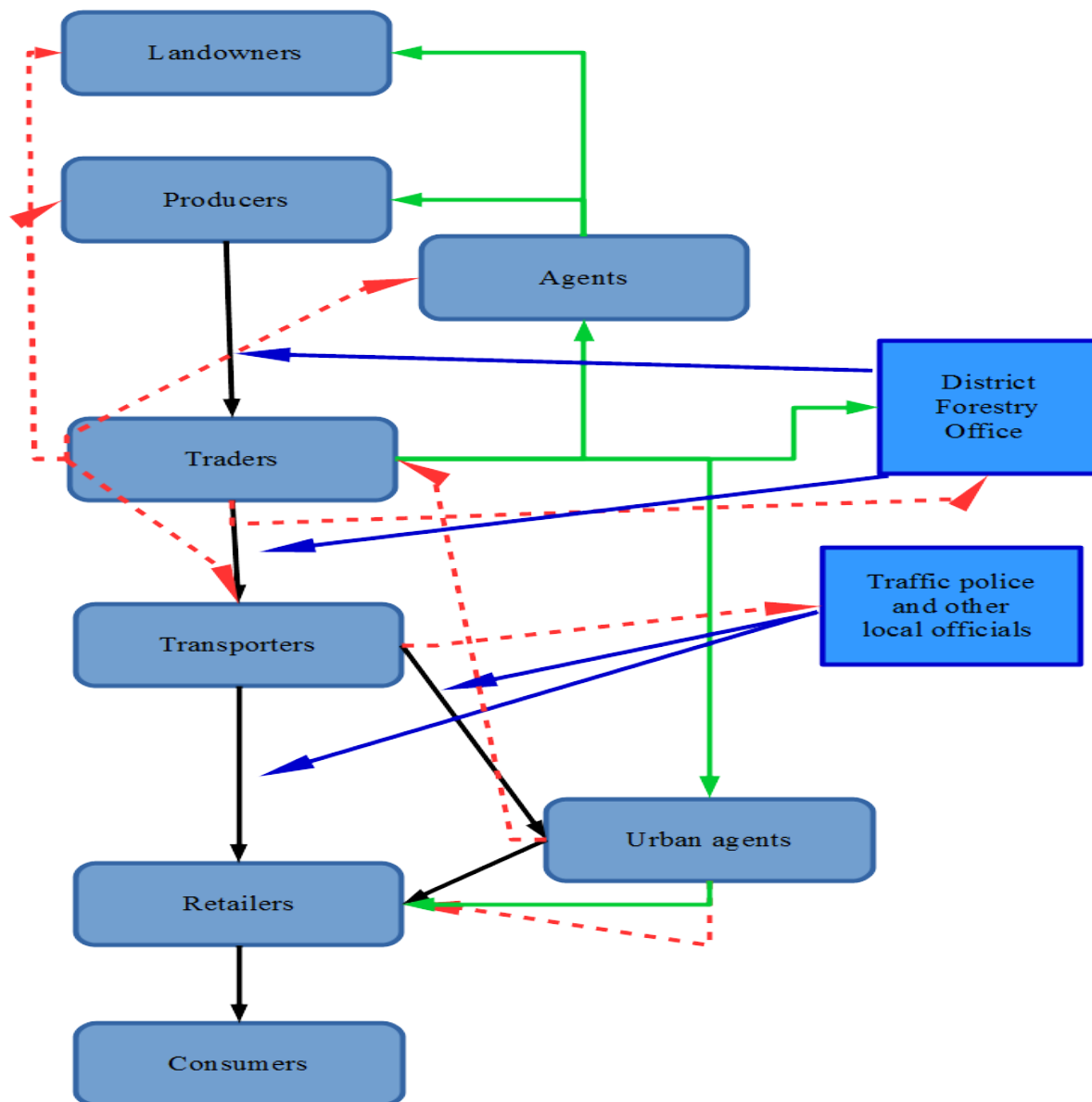


Figure 11: Based on Ribot's 'channels of access' (1998: 326).

Conclusion

In summation, as **figure 11** helps illustrate, we find a variety of access mechanisms across the different levels of the chain, though the options available tend to be concentrated in the centre of the chain (i.e. traders). Downstream, retailers have little room for manoeuvre. They make use of their social relations with urban agents and customers to get the best deals and maintain a loyal clientele, but as discussed, retailers have little leverage over pricing since they must accept what is on offer by traders and agents, and can only use minor manipulation of the containers in which they sell charcoal to alter pricing in their favour. Urban agents have more tools at their disposal to maintain a profit, using their social connections to traders, other agents (and thus possibly collusive action, e.g.

price-fixing) and their networks of retailers, as well as credit arrangements (Ribot, 1998). These agents can seemingly gain a sizeable share of profits (Trader 2 Interview), although to what extent is difficult to verify.

Traders have the widest range of access mechanisms, relying heavily on their capital (e.g. to front production and transportation costs, or through credit arrangements) and social network (e.g. ties to agents and officials) to improve the ease of doing business, since their connections and capital allow traders to acquire permits at perhaps more attractive rates and to speed up the process, while circumventing troublesome monitoring and enforcement of regulation. Here we must remember the point made by Ribot and Peluso (2003) in highlighting the interdependence of certain access mechanisms (e.g. how access to capital ripples through to other fronts). Traders also hold more information than other actors (e.g. about total costs involved, from licensing to bribes) which they can potentially use to their advantage (e.g. price leveraging by misrepresenting costs).

Agents and transporters are more difficult to assess and there can also be a fair amount of overlap between these roles (with traders taking on the coordinating role of agents or dealing with transportation themselves). Agents benefit from an extensive local network which gives them knowledge of charcoal production and allows them to coordinate between traders, landowners and producers. It is clear that independent transporters must possess some capital (i.e. their vehicle) and could use some knowledge of local conditions (e.g. the best roads to avoid checkpoints). The cost of transportation forms a significant share of the final price for charcoal and one could speculate about collusion amongst transporters (i.e. price-fixing) limiting access to markets for other actors, but this could not be ascertained.

Turning to the producers, we must remember the differences between small-scale and large-scale charcoal production (and the difficulty in accurately gauging which type is more prevalent). In the setup where traders acquire large plots of land and bring in teams of woodcutters and charcoal burners, the producers' ties to a 'merchant patron' and their status as outsiders are obviously important. For both small-scale and large-scale production, technical knowledge of the best way to produce charcoal (e.g. the type of kiln to be built and how to control airflow to maintain an even carbonisation process) forms a minor barrier to other actors and allows producers to maintain their position. Since district forestry officers in Uganda are mostly unable to closely monitor the sites of charcoal production due to resource constraints, traders form the main interface between officials and actors in the chain, while producers more rarely come into contact with officials. Lastly in the chain, landowners may have legal rights which give them control over forest access and would seem to give them a strong position to profit from forest products, but since they often have limited

access to the necessary resources to exploit this (i.e. the required knowledge and social network, as well as access to capital and labour), they tend to play a fairly marginal role in the chain.

Conclusion Chapter 5: ‘Zooming out’

This chapter has detailed the different actors that are involved in the charcoal chain and the role they play. The traders, ably assisted by middlemen at both the production and retail end, seem to be the key figure within the charcoal sector and benefit most from how the trade takes place in its current guise. Using their capital and social connections, they have the greatest opportunities to maintain and increase their profit share. It is the stage from production to retail that contributes most to the final charcoal prices. The informal nature of the charcoal trade strengthens the trader’s hand. Other actors such as the charcoal vendors nearest to the urban consumers, have only very limited influence on charcoal provision. The skewed benefit distribution results not only in an inequitable charcoal chain where landowners, producers and retailers receive only a small share of the profit being made from charcoal, but it also drives unsustainable production methods. The low valuation of forest resources provides few incentives to invest in more sustainable methods. This is further compounded by the fragmented regulative framework and its variable enforcement, which contribute little to a more sustainable charcoal sector.

Streamlining of the regulative framework is necessary, as well as greater resource allocation at the local government where enforcement of regulation takes place. Monitoring must be improved to gain a clearer picture of the charcoal sector and effective enforcement is necessary to have any influence over the manner in which charcoal is produced. Encouragingly, some tentative steps are already being taken to formalize the charcoal sector, setting up commercial plantations as well as organising and training actors in more sustainable production and transportation techniques. However, considering the scale of the problem and the limited resources currently being dedicated, stronger action is necessary. To this point, the next chapter considers potential measures that can be taken and seeks to identify the most promising opportunities to make the charcoal chain more sustainable and equitable.

6. Charcoal governance opportunities

As the preceding chapters have hopefully made clear, many of the multifaceted issues surrounding the charcoal sector in Uganda are interconnected to some degree. Environmental and social issues are intertwined; rapid rates of deforestation and environmental degradation at one end of the charcoal chain should not be separated from the high charcoal dependence and associated vulnerabilities faced in the informal settlements of Kampala downstream in the chain. Neither can be treated in isolation, without risk of potentially exacerbating the other. A big part of the challenge lies in balancing long-term concerns with short-term needs. Keeping in mind the high level of charcoal dependence, in the short-term a balance must be found in shifting the charcoal sector towards more sustainable practices without greatly interrupting energy provision, while considering transitioning to alternative energy sources in the long-run. This analytical chapter briefly reviews the main weak links in the charcoal chain (i.e. disincentives or disruptive aspects that are eligible for reform) in an effort to trace the potential connections between these issues, without rehashing earlier discussions. Further on, it also seeks to bring together the elements identified in chapter four with aspects from the value chain in chapter five, namely the extent to which practices in the informal settlements are shaped by the system of charcoal provision, and vice versa. In the search for potential opportunities at the policy level to make the charcoal sector more sustainable and equitable, the main object of concern throughout this analysis forms the oft-overlooked informal communities heavily reliant on charcoal and what the identified policy opportunities might mean for them.

Decentralisation

This section continues the discussion started in the ‘Institutions’ section (5.3) regarding the impact of decentralisation on the forestry sector. In its current state, there is a mismatch between the responsibilities given to local governments and the resources allocated to them to perform these tasks. One example of this is the abolishment of the graduated tax in 2005. This used to form an important source of revenue for local authorities, and its abolishment caused a large shortfall in local government budgets, only partially remedied by compensation from the central government (Oosterveer & van Vliet, 2010). As Oosterveer and van Vliet point out, cutting off an important source of local income and redirecting it through the central government works against the process of decentralisation, since the centrally distributed funding is not only inadequate compensation for the abolished tax, but often comes with certain strings attached and thus limits on two fronts the

range of independent action for local governments. Therefore, despite giving local governments greater responsibility for environmental management, the failure to follow this up with an adequate decentralisation of the necessary financial resources, means that in practice local governments have very limited room for manoeuvre within a decentralised system still heavily dependent on central government financing (Oosterveer & van Vliet, 2010).

A decade onwards from the abolishment of the graduated tax, efforts to replace the lost revenue streams at a local level have so far been largely unsuccessful, and has seen continued local government dependence on central government funding (in some cases for over ninety percent of funding needs), while the emergence of more administrative units has decreased the share of available revenue from the compensation fund (The East African, 2016). In fact, the number of districts (let alone sub-counties and parishes) continues to grow, from 80 in 2008, to 121 in 2017, and should reach 134 by 2019 (and perhaps more after that), which in the long-term might provide governance benefits by offering smaller more manageable units, but also “necessitated continuous administrative reorganization at the local level; this meant that more financial resources were spent on administrative tasks and development budgets thinned [Note: this was written about the effects of the rise then to 80 districts, before the current target of 134 had been set]” (Oosterveer & van Vliet, 2010: 287).

The complications resulting from the mismatch between local government responsibilities and allocated resources are compounded by another factor. Although certain powers and responsibilities for environmental management are being devolved to local districts, there seems to remain a desire at the central government level to keep the reins more tightly in hand in certain sectors such as wildlife conservation and forestry through centrally controlled institutions (in the guise of the UWA and NFA respectively), which can lead to tension between the centrally and locally appointed officials and their sometimes differing approaches, as well as potential confusion regarding spheres of influence and responsibilities (Oosterveer & van Vliet, 2010).

Partly this can be seen as a natural tension in environmental management between nominated officials and elected politicians, who are unwilling to push through environmental reform which might anger their local voter-base (e.g. limiting forest resource use to protect forests), but Oosterveer and van Vliet also recognise another related tension which they attribute to the “lack of a mechanism in Uganda to reconcile local authority (horizontal) and sectoral agency (vertical) responsibilities and activities” (Oosterveer & van Vliet, 2010: 292). They give the example of staff from agencies such as the NFA who ideally should work closely together with local officials through decentralized institutions, but sometimes seem to act independently from the local

government without showing much concern for local interests and instead continue to adhere to a more central government line through their agency. Such tensions further complicate the tasks of the already under-resourced institutions of environmental management.

Bringing the impact of decentralisation to focus on the charcoal sector, a clear example of how the current decentralised state of affairs is a cause of flawed enforcement, is the previously discussed revenue sharing system between levels of government for the charcoal transport fees collected at the lower local government level. The manner in which this system is geared (i.e. the relatively skewed balance between revenue to be retained at the local level and passed on to the central government) and executed (e.g. lower local government often not even getting their officially designated meagre share of revenue), creates strong incentives for local officials to misreport on charcoal revenue collected or to overlook infringements in return for a small fee (Shively et al., 2010). The wide variety of enforcement methods (e.g. charcoal burning permits being required in some districts but not in others, where a simple ‘loading fee’ will suffice) adds an additional layer of complexity, which provides further opportunities for collusion between officials and traders. Fees based on the total number of bags also fail to account for the manner in which that charcoal was produced since it does not matter how many trees were cut to produce that amount, and thus provide less incentive for more efficient production (FAO, 2017).

This would point to simplification or streamlining of the regulatory framework as being an attractive proposition, which might entail a less fragmented approach to the charcoal sector, or at the very least a reconfiguration of the current balance in revenue distribution (i.e. providing local governments with proper incentives to enforce regulation by receiving a bigger share from policing the trade). This need for simplification of the regulatory framework has also been recognised in recent government-led initiatives such as the Green Charcoal Project (in cooperation with international support such as the UNDP), and in the Biomass Energy Strategy (BEST, 2014: 22) which highlighted the current fragmented approach to the sector in which “legislation targets specific components of a sector rather than having a multi sectoral and comprehensive approach.” This fragmented approach has left plenty of space for the informal charcoal trade to flourish.

However, as Oosterveer and van Vliet (2010: 293) emphasize, care should be taken not to hold the process of decentralisation itself responsible for the above-mentioned failings or flaws in environmental management, and not to rush to the subsequent response of arguing for a more centralised state. Instead, rather than blaming the model of decentralisation, the more likely culprit tends to be the limited capacity and resources allocated to local governments (and the limited state resources and institutional capacity in general of a still developing country like Uganda), alongside

inadequate attention given to different local contexts and tensions between local authorities and sectoral agencies (Oosterveer and van Vliet, 2010). In the case of the forestry sector, these factors alongside local governments focusing on different stages of the value chain for enforcement or tax collection and applying regulation in a non-uniform manner, has led to a sometimes confusingly overlapping regulative framework (Shively et al., 2010). Nonetheless, Oosterveer and van Vliet make the case that some important steps have been taken in Uganda in the process of decentralisation which have improved political participation and accountability, although significant challenges remain, especially in the field of environmental management. Some of the above mentioned flaws in the charcoal sector associated with decentralisation in its current form, cannot be disconnected from general governance issues encountered in dealing with such an informal sector, as discussed below.

Informality

The manifold problems associated with the informal nature of the charcoal sector, as well as the negative impact of the informal status of communities like Kanyogoga and Bwaise, have been discussed at great length in the preceding chapters. One of the biggest issues with the charcoal chain is the lack of accurate information about the actors and activities taking place within the sector, which has complicated the task of officials in monitoring the chain and developing adequate measures to make the trade more sustainable, since they do not have a clear picture of production levels and ongoing practices. This has allowed some actors with the right connections and capital to navigate murky waters to profit immensely, while the average landowner or producer receives only a modest share of the total profit, which contributes to poor valuation of forest resources and thus limited incentives for sustainable charcoal production.

The informal nature of the trade has allowed certain actors to operate relatively freely and unscathed, using disincentives for proper enforcement at local levels to their advantage. Informality creates space for illicit dealings which can negatively impact both the people and the environment in the charcoal producing regions and the end-consumers in urban areas. Producers are at greater risk of being exploited and face the consequences of environmental degradation associated with unsustainable production, while corruption in general increases transaction costs for all parties involved (Zulu & Richardson, 2013). This brings us to a familiar tale from the literature on forest resource management, the oft-repeated call to combat corruption and improve overall governance.

Such problems were highlighted during interviews, namely that it is possible to have good laws and proper regulation in place, but that if in terms of governance illicit dealings occur, that proper

regulation amounts to very little if it is not properly executed (MWE Interview). As stated previously, the informal nature of the trade benefits certain actors who might be unwilling to operate in a more regulated and monitored sector, and even actively resist efforts to bring greater transparency to the sector (BEETA Interview; Schure, 2014). Furthermore, the current informality of the charcoal trade enjoys support not just from actors within the trade such as the traders who can cover the extent and impact of their business dealings, but also from government actors. As Schure (2014: 133) noted for the woodfuel sector in the Congo Basin, “The vested interests of illicit taxation with officials and controlling entities at road blocks and markets are deeply embedded, which impede the commitment of these actors to support any changes in the system.” One could assume that any efforts to reform the charcoal sector in Uganda would come up against similar resistance. Recent increased efforts to combat corrupt practices in the forestry sector at the ministry level were noted and deserving of praise (MWE Interview: 12), but also demonstrate the extent to which such activities are entrenched not only at the local level but in more central government as well, and thus the magnitude of the task ahead in combatting corruption.

Another key point regarding the informality in the charcoal sector that should be further emphasized, is that in the informal trade the environment is largely not accounted for and the long-term costs associated with environmental degradation are simply not internalized (Schure, 2014; Iiyama et al. 2017). As Schure (2014: 84) states, under ideal conditions the designated value of charcoal would include the long-term cost of resource management, but “[a]s the costs of access to high value charcoal production remain relatively low, the internalized, ‘real costs’ of restoration and more sustainable production practices are not included in woodfuel market pricing”. It would seem that recognition of such costs can be better imposed and enforced by an outside party such as the government which can control actors and set out rights and obligations.

Looking at some of the consequences of the informal nature of the charcoal trade, it is clear that the sector is driven by a steadily growing demand for its product, with this demand being linked to the fast population growth of Uganda and especially the high urbanisation rate. The high demand has driven charcoal production further and further from the urban centres of demand as nearby production areas are exhausted, which in turn has raised prices as charcoal must be transported over greater distances (which includes not only the price of fuel and labour, but also bribery, as transporters become exposed to more extortion opportunities at checkpoints which necessitate the payment of bribes). The lucrative appeal of higher charcoal prices in turn can drive more unsustainable practices, such as clear-cutting to maximise short-term profit while depletion of forest resources (e.g. the *Combretum* species traditionally used for charcoal) has led to the burning of non-traditional tree species (even fruit-bearing trees such as mango or jackfruit) which produce

inconsistent or poor quality charcoal (MWE Interview). The inconsistent charcoal quality as well as breakage during transportation causes problems for retailers downstream, who must offset these losses by raising the final price further to break even or maintain a profit.

Consumers end up paying a higher price, also in health terms. As Jagger and Kittner (2017: 1-2) found in their study of deforestation and biomass usage in Uganda, degradation of high quality biomass has led to a shift to lower quality biomass which “has lower energy densities and higher concentrations of organic materials, leading to incomplete combustion and increased particulate matter emissions ... [Such aspects] influence the generation of harmful pollutants that comprise household air pollution”. Again, the unsustainable practices leading to lower quality charcoal are possible because there is a lack of oversight in this largely informal sector.

The circumvention of the costs associated with formal permits by relying on bribes is problematic enough by raising the cost of charcoal for consumers, but also because this value is being siphoned off by individuals rather than going to the district funding where it could enable reinvestment of this money in more sustainable practices and replenishment of forest resources (Schure, 2014). Doggart and Meshack go so far as to argue that this has to do with commonly held views in the forestry sector, where charcoal production is often inherently ‘marginalized’, and the possibility to use income generated from planned charcoal production to invest in sustainable forest management is neglected: “The lack of investment in forest management perpetuates the unplanned production model, and so reinforces its negative impact on the forest resource base” (Doggart & Meshack, 2017: 3). It is largely true that in the past policy-makers in sub-Saharan Africa saw charcoal as little more than a relatively dirty ‘transitional’ fuel on the energy ladder (only little better than firewood), and that as a country developed economically, the energy-mix would naturally move up the ladder to cleaner and more efficient sources (Zulu & Richardson, 2013). This often led to the charcoal sector being neglected and opportunities to make it more sustainable not being actively pursued. However, judging by the recent efforts of the MEMD and MWE with regard to the charcoal sector, it would seem that such views increasingly belong to the past, and that the importance of charcoal for the millions using it on a daily basis has become more recognised. In Uganda, there is a growing awareness and political willingness to act with regard to the charcoal sector, while there are several ongoing efforts (admittedly still in the beginning stages) to set up plantations, organise the actors in the trade and spread sustainable charcoal production practices (MWE Interview; MEMD Interview).

Formalisation

As the above indicates, a natural response to the issues associated with informality in the charcoal sector would be to call for greater formalisation, but care should be taken since developments to formalize the sector can also aggravate existing flaws. As a brief cautionary tale regarding the stated aims of professionalization and formalisation in the charcoal sector (Charcoal Survey, 2016), which includes setting up of associations, it could be useful to mention one of the examples of collusion encountered by Ribot (1998). He found that, following government efforts to professionalize the charcoal trade through associations, due to much higher levels of organisation amongst traders working within co-operatives, they were able to control the terms of trade by collectively setting up fixed prices which placed other actors such as producers at a severe disadvantage (Ribot, 1998). Likewise, the impact of a formal quota scheme was circumvented through the use of frontmen working in collusion with the traders and ended up more narrowly concentrating benefits amongst a handful of powerful traders (Ribot, 1998). Other examples also abound of a one-sided focus on a particular sector such as production providing little overall benefit while leading to an uneven targeting of specific actors such as rural producers (Smith et al, 2015). The lesson here is that care should be taken that professionalization of the charcoal sector occurs across the board (i.e. not just for traders) and does not exacerbate the already skewed benefit distribution.

The drive towards formalisation of the charcoal sector through policies based on a value-chain approach was criticized by Iiyama et al. (2017) as being often one-dimensional, looking only at specific stages and measures (e.g. a ban on illegal production), while ignoring the complexity of the charcoal chain and the importance of charcoal production as a livelihood source in rural areas. At the same time, Iiyama et al. (2017:12) concede that “[i]n turn, advocating the status quo of the continued adoption of unsustainable charcoal production because of its “pro-poor” nature should not be the ultimate solution”. Their criticism of the value-chain approach towards the charcoal sector seems to forget that, although different stages and specific measures are certainly considered, this is done from a holistic perspective which in fact seeks to bring together the full range of activities represented by charcoal, from tree to stove.

Although Iiyama et al. are right to point out that many people in rural areas rely on charcoal production as a source of supplementary income or as a coping mechanism when harvests fail, in its current guise this does little to solve the unsustainable exploitation of forest resources (as they themselves concede). Moreover, it should be remembered that agriculture is often “dependent on the ecosystem services that forests provide, such as regulation of water quality and flow, protection of soils from erosion, and provision of habitats for pollinators and predators of crop pests” (Doggart

& Meshack, 2017: 3). in the long-term the same rural communities that might benefit from using charcoal production as a livelihood strategy, are strongly affected by the potential vicious cycle associated with unsustainable practices (e.g. clear-cutting), in which charcoal production results in environmental degradation which can lead to reduced soil fertility or worsening of droughts and thus increases the risk of lower yields, which in turn drives more people to produce charcoal. Informal charcoal production can benefit rural producers in the short-term, but fails to take into account the costs of the detrimental environmental impact in the long-term. Formalisation of the charcoal sector would seem a necessary prerequisite to enable more effective environmental management, since it provides greater incentives for long-term investments (e.g. investing in replanting or more efficient kilns). Therefore, despite the aforesaid criticisms and potential complications, the findings in this study indicate that the most promising path towards a more sustainable and equitable charcoal sector still lies in greater formalisation. A key area for improvement mentioned by Schure (2014) and Iiyama et al. (2017) that should be taken into consideration though, concerns improving the position of the producers and landowners at the start of the charcoal, as detailed below.

Benefits and impact distribution

The uneven benefit distribution within the charcoal chain contributes to continued reliance on unsustainable practices. Landowners and producers receive only a small share of the final profit from the charcoal and this provides few incentives to switch to more sustainable practices, which in the short-run might reduce their profits even further (e.g. selective cutting instead of clear-cutting). It is also important to keep in mind that revenue from charcoal production is frequently just seen as an added benefit of clearing forested land, with the main reason often being expansion of agricultural land (MWE Interview; Doggart & Meshack, 2017). In such cases, there naturally is a lower interest amongst the landowners in sustainable charcoal production, since they might not be interested in maintaining a long-term charcoal business but rather want to clear the land so that they can plant their crops or let their cattle roam. However, more sustainable practices such as selective tree-cutting actually would not exclude the land from also being used for agricultural purposes. In fact, the ecosystem services provided by forested land can have a long-term beneficial impact on agricultural production, so that sustainable charcoal production and agriculture can function well side-by-side (Iiyama et al., 2017). The current valuation landowners and producers might place on wood stock does not seem to accurately reflect its true value compared to the final charcoal price in

the urban market, let alone when one considers the wider ecosystem services that the trees provide (Schure, 2014; Iiyama et al., 2017).

To gain a better valuation of forest resources and make sustainable charcoal production more attractive, action should be taken to improve the position of landowners and producers within the charcoal chain. As demonstrated in the previous chapter, aspects that currently skew the charcoal trade in favour of traders and middlemen, and limit access for landowners and producers, are the wide array of regulation to meet and its non-uniform implementation across districts (e.g. charcoal burning permits in some districts, loading fees in others, all at various costs) and especially the selective application of regulation (which the well-connected can circumvent). Such hurdles limit participation and also cloud the total costs involved, making it difficult to ascertain what the actual profit margins of traders and middlemen are and thus what a more equal share of producers should be.

To this end, as also recommended in the Charcoal Survey (2016), simplification and streamlining of the regulative framework related to the charcoal sector is desirable. Enforcement of regulation should become more uniform across districts to prevent ‘whack-a-mole’ scenarios from arising, while rent-seeking behaviour along the chain should be targeted to bring down overall costs. Such actions are of course simpler said than done, since reform of the charcoal sector and its corrupt practices can be difficult to achieve due to deeply embedded vested interests (Schure, 2014). It would require long-term efforts and sizeable resources dedicated to building up institutional capacity both at the central coordinating ministries and agencies, as well as at the local government front actually implementing and enforcing regulation. The limited state resources available and many pressing issues on other fronts in Uganda naturally complicate this capacity building. However, the present cost of averting a future fuel crisis, considering the impact this would otherwise have on a large segment of both the rural and urban population, would be much lower than continuing the status quo and letting the problem reach critical levels. Regarding political willingness to act on the charcoal front considering the struggle for limited resources, one could cynically point to past riots related to high food and fuel prices (as most recently in 2011) as providing strong motivation to avert any future fuel crises, but this perhaps strays too far from the current discussion.

Successful formalisation depends on assiduous use of both ‘carrot’ and ‘stick’ in getting actors to participate in a formal charcoal chain. The benefits of participation should be made clear (e.g. subsidized trainings and tools for more sustainable charcoal production), while the risk and high cost of operating outside of the formal chain should be demonstrated through effective enforcement

of licensing (Schure et al., 2013). Part of this approach, also recommended in the Charcoal Survey (2016) and by various interviewees (MEMD Interview; MWE Interview) entails greater professionalization of the charcoal sector, by bringing actors together through associations and supporting the development of plantations to move “away from the natural feedstock to a dedicated feedstock” (MEMD Interview: 7). Replanting in particular should become a standardized aspect of charcoal production and is in fact already part of policies being pursued in a few districts, but the vast majority of districts (over ninety percent) have not yet done the same (MWE Interview). The same is true for standardizing selective cutting which would be far more sustainable than clear-cutting, but currently there is no limit to the amount producers can cut (MWE Interview). Supporting large-scale production using plantations might marginalize rural producers who currently gain a supplementary income through small-scale charcoal production (Schure, 2014), but the benefit of such an approach would be that large-scale producers with more capital would have a greater capacity to invest in necessary improvements and technologies for sustainable production, invest in replanting and thus maintain their business in the long-run (MEMD Interview).

Sustainable forest management in which both ‘pre-harvest inventories’ (ensuring annual wood harvesting does not exceed the replenishment rate) and ‘post-harvest management’ (restoring affected land) are followed could lessen the impact of wood harvesting for charcoal production if it manages to address issues such as “the frequency of harvesting (the “felling cycle”) and its intensity, the rotation length ... and the conservation of soil and biodiversity” (FAO, 2017: 58-59). Fast-growing acacias are a popular species for plantations and several acacia lots were already observed during the fieldwork in Uganda. With proper management practices such as using a coppice management system (in which, based on rotating plots, trees are cut down close to the ground but the stump left intact for new shoots to grow from), yields of over 18 tonnes of woody biomass per hectare can be reached with a rotation of 12 to 14 years (translating to 1.8 to 5.95 tonnes of charcoal depending on kiln efficiency) (FAO, 2017; Okello, O’Conner & Young, 2001). Particular acacia species are well-suited to plantations because they coppice easily (which prevents soil erosion because the root structure remains intact), can grow in high density and produces good quality charcoal from its hard wood (Okello, O’Conner & Young, 2001). However, intensive monoculture plantations can reduce biodiversity and soil quality (FAO, 2017). Nonetheless, by reducing pressure on natural forests, biodiversity can hopefully be maintained and plantations using the above mentioned forest management practices can contribute to a more sustainable charcoal sector.

There are some promising examples of formalisation such as in Rwanda, which managed to create a more sustainable charcoal sector which is derived mainly from planted trees, with very little

illegal production from natural forests (Iiyama et al., 2017; FAO, 2017). As detailed by Iiyama et al. (2017), the state played an important part by supporting plantations and encouraging sustainable production methods, streamlining and further decentralizing regulation which is largely in the hands of local districts (e.g. issuing permits and collecting taxes). Specialized intermediaries ('charcoal masters') still play a big role in Rwanda in coordinating and handling the dealings between producers and the local government, but these actors apparently operate firmly within a formalized chain and reduce transaction costs for producers. How exactly this transformation of the role of middlemen took place is not expanded upon in this example by Iiyama et al. (2017), but in general terms it can be attributed to strong incentives to operate within the formal chain alongside powerful disincentives to stray due to more effective enforcement. These improvements also contributed to a greater awareness amongst producers of how tree planting and sustainable harvesting could be a profitable venture in the long-term, with farmers dedicating their marginal land where crops would yield little profit to wood plots (both for timber and charcoal) (Iiyama et al., 2017).

At the same time, we must also remember that urban consumers pay the final price for charcoal, so scenarios wherein traders and middlemen simply transfer higher costs to the consumers or where the supply of charcoal is drastically interrupted, should be avoided. For instance, for the Democratic Republic of Congo Schure et al. (2015) found that circumvention of formal permits and licenses through the payment of bribes cost about half of what the official paperwork would have cost, which might raise the scenario of higher prices in a more formalized chain (although it is of course questionable whether these illicit 'savings' were translated to lower prices for the final consumers or simply pocketed by the middlemen themselves). Another example was the suggested possibility to raise taxes on charcoal as a way to internalize the (currently unheeded) environmental cost of production, and thus promote the switch to cleaner but more expensive energy sources (NEMA Interview). Although this would go some way towards making alternative energy sources more competitive against charcoal, the extra cost would unevenly impact the informal communities, with the burden falling overwhelmingly on those least able to afford it.

Policy-makers considering any potential reform should bear in mind its impact on the available charcoal supply in the urban markets and how this might affect the final price for consumers. Ideally, alternatives would be made cheaper to improve their viability rather than charcoal more expensive. Realistically speaking though, the limited financial resources available mean that any such subsidies would not lower the price enough for most cleaner (but expensive) alternatives such as LPG to become competitive with charcoal, even at the current rapid rate of rising prices. For instance, the MEMD found that while a kilogramme of charcoal currently costs around 1500

shillings, a comparative amount of energy as LPG cost around 9000 shillings (and also requires investing in a different setup rather than the simple charcoal stoves) (MEMD Interview).

However, one particular alternative that might be more promising is the briquette, since it is already close to competing favourably on price, and also matches several other aspects of charcoal that make it an attractive proposition in the informal settlements. The potentially negative impact on the charcoal supply could be partially offset by greater support for the briquette-making industry, in order to make briquettes more available and a viable alternative (or at least a supplement) to charcoal. Such support could range from reducing the tax pressure on briquette-makers (UNREEEA Interview) or through other types of subsidies, while it would most likely also entail campaigns to spread awareness about the effectiveness and benefits of briquettes (hitherto not widely used and often looked upon sceptically). Although the Ministry of Energy looks favourably upon briquettes as an alternative to charcoal (MEMD Interview), its efforts to promote the uptake of briquettes have so far been relatively minor in scale and largely ineffectual.

Still, as evidenced by the recommendations in the Charcoal Survey and the stated goals at the ministry level, this might be changing (MEMD Interview; MWE Interview). For instance, alongside the development of plantations, another promising strategy proposed in the Charcoal Survey and by the MEMD links in to previously mentioned initiatives promoting briquettes. It would entail using more non-woody forms of biomass such as fast-growing grasses and shrubs, as well as up to 1.2 million tons of agricultural residue (e.g. maize cobs, coffee husks or bagasse from sugar cane) and dried organic municipal waste, which are (perhaps somewhat optimistically) estimated to provide enough biomass for briquettes to be able to replace up to half of current charcoal needs (Charcoal Survey, 2016). This would greatly increase the available biomass supply and reduce pressure on forest resources, while also benefiting the briquette-making industry since non-woody biomass must be used in briquettes following carbonisation (MEMD Interview). Such strategies would seem to present more of a 'win-win' situation, since it would reduce pressure on forest resources while increasing the availability of briquettes that (if properly supported with campaigns demonstrating its uses and encouraging briquette uptake) would offer urban residents an affordable, and perhaps even cheaper alternative to charcoal which could work equally well with the existing limited infrastructure in informal settlements such as Kanyogoga or Bwaise. At this point, to balance the efficiency-centred improvements along the value-chain, it would be useful to return to the cooking practices in the informal settlements to consider the impact some of the above-mentioned reform options would have and the viability of alternatives to charcoal.

‘If not charcoal, then what else?’

This question was posed by an interviewee to highlight the vulnerability of informal settlements in the face of rising charcoal prices (MakSPH Interview). As repeatedly argued, the high price of charcoal has significant repercussions in the informal settlements where the population often has limited to non-existent financial reserves to absorb this impact, leading instead to a variety of coping mechanisms (e.g. no longer boiling drinking water to save on charcoal or skipping meals entirely) which raises the spectre of other striking vulnerabilities. As shown in chapter four, cooking practices in the informal settlements are highly dependent on charcoal for a variety of reasons, ranging from health concerns (e.g. having to boil drinking water), cultural tastes (e.g. a local cuisine built around food such as matooke which requires a charcoal flavour), habits (e.g. being accustomed to always using charcoal, which is seen as convenient and reliable), limited viable alternative energy sources (e.g. firewood often not being freely available in urban areas, while LPG is too expensive) and poor infrastructure (e.g. informal settlements often not being connected to the electricity grid). All these factors contribute in one way or another to maintaining a steady demand for charcoal, although we can distinguish between factors which are linked to a clear preference for charcoal, of which the desired charcoal flavour is a straightforward example, versus other aspects which point to charcoal as being only the ‘winner by default’, best exemplified by the lack of alternative energy sources and poor infrastructure in the informal settlements. Both of these types are important to consider since cooking practices are built on these different elements coming together, but obviously the ‘winner by default’ category would seem to be a promising starting point to consider in proposing potential initiatives to shift reliance away from charcoal.

It might be useful at this stage to return to the proto-practice concept offered by Shove et al. (2012), which implies that particular elements that can form a practice might be ‘out there’ but not yet linked in an actual practice. In this sense, we can consider the various elements (‘material’, ‘competence’ and ‘meaning’) that could be linked in new ways in the cooking practices of the informal settlements, with especial consideration for those that might challenge linkages to charcoal, although it should be strongly emphasized that practices cannot simply be invented or managed. Nonetheless, some limited steering by businesses or policy-makers might be possible to influence “the range of elements in circulation” (Shove et al., 2012: 19), although it is the practitioners who determine the actual making and breaking of links. An excellent example of this is offered in the study on Nordic walking by Pantzar and Shove (2005; 2010). They looked at how this practice challenged old links between elements (e.g. between material and meaning, how walking with sticks was seen as a sign of infirmity) and created new ones (walking with sticks for enjoyment and being sociable). They found the following, which serves as a useful example:

“[I]f innovations in practice are to take root, requisite ingredients including materials, images and the potential for building new forms of competence must already exist (proto-practice). In the case of Nordic Walking, these included an existing infrastructure of public paths, a system of formalised leisure time, a body of ideas about health and nature, a network of relevant social institutions (in particular, sports organisations) and a widespread interest in outdoor activity” (Pantzar and Shove, 2010: 456).

In the case of challenging charcoal, this points to some alternatives being more viable candidates than others. The limited infrastructure of the informal settlements must be considered alongside existing cooking competencies, staples of the local cuisine, attitudes towards different fuels and food, and other habits or preferences in cooking. Although pricing remains of paramount concern, these other elements must be factored in. Thinking in such terms, in the short-run it would seem to preclude energy alternatives which require a more developed infrastructure such as cooking with electricity (or at the very least would necessitate significant investment in grid expansion, which still might not guarantee an increased uptake in cooking with electricity). This is because the alternative must match charcoal, which works very well in the current informal setting due to its easy handling and storage, and relatively low cost, requiring no big initial investment but only a simple stove to use and is available for purchase in small quantities for daily usage to meet limited household funds.

Briquettes would seem to be a better fit, because unlike some other alternatives, it requires minimal disruption to existing cooking practices. It can slot in as a replacement or supplement of charcoal, since it seems that it can incorporate many of the existing linkages to charcoal, to name a few; (1) briquettes would not be affected by the limited infrastructure in the informal settlements any more than charcoal is, and could be transported and stored in the same way; (2) briquettes could be bought and sold in the same manner as charcoal, even using the same existing social network between charcoal vendors and customers; (3) most types of briquette can be used in the same cookstoves as charcoal, in the same manner as the stoves are used now (e.g. cooking outside in the open); (4) although lighting of briquettes requires a little more effort and some knowledge on the best way to space them, it would not be as dramatically different as switching to electricity or LPG; (5) to keep the charcoal flavour of certain foods, briquettes could be mixed together with some charcoal (in such cases not entirely replacing charcoal but supplementing it); (6) briquettes do not demand radically different cooking competencies, just a slightly lengthier cooking time since most types of briquette burn less strongly than charcoal but for much longer (making it especially

suitable for slow-cooking foods such as beans, but less so for quick cooking tasks) (EASE Interview; UNREEEA Interview; CREEC Interview; MEMD Interview).

To somewhat counter this rose-coloured view, there are certainly also issues with regard to briquettes. Even for briquettes, although some elements are in place, others would need to be nudged in and uptake would have to be stimulated through information campaigns. As an aside, since cooking is almost exclusively done by women, any campaigns attempting to raise awareness about the benefits of briquettes would do well to target women, since they are the ones buying and using charcoal. Although briquette distribution can utilize the same limited infrastructure as charcoal, to fully tap the potential of non-woody biomass, agricultural residues and other forms of bio-waste for briquette-making, might require investments in improved transport infrastructure to access and recover such biomass sources (FAO, 2017). Perhaps most importantly, briquettes do not present a particularly clean source of energy, both in terms of health (since the burning of briquettes still causes exposure to similar health risks as burning charcoal) and efficiency (since the conversion of biomass to energy is far from efficient), and therefore in the long-term other cleaner energy sources would be more desirable. Nonetheless, in the short-term briquettes present a very viable alternative that could be scaled up quickly and at relatively low cost, and especially could work quite well in the informal settlements, where (barring any sudden flood of infrastructural investment and energy subsidies) there are few alternatives for which as strong a case can be made as for briquettes.

Conclusion

Some tough political decisions are inevitable, namely in balancing limited resources, local and national concerns, short-term and long-term needs, environmental priorities versus economic or social ones, and many other problems which will rarely result in solutions pleasing to all parties, but these issues should be tackled head-on sooner rather than later. Formalisation of the charcoal sector, if pursued correctly and thoroughly, would lead to greater oversight and control over practices within the sector and offers the most in terms of making the sector more sustainable and equitable. A key aspect of this approach would be ensuring that local governments have the resources to meet their responsibilities in monitoring and enforcement, preferably through revenue streams over which they have some control rather than depending almost entirely on funds from the central government. Rather than waiting for the charcoal sector to reach crisis levels before strong action is taken to formalise the trade, as happened in other countries, acting sooner can prevent further detrimental environmental degradation and disruption of ecosystem services, and hopefully avoid

the worst of the hardships to be faced by both rural and urban communities compared to maintaining the status quo.

7. Discussion

This chapter will discuss the key theoretical and practical issues encountered during this study. Foremost amongst these are general debates on the merits of energy-efficiency or disruptive technologies as guiding policy measures, as well as the value of a practice-based approach in this particular study.

During the fieldwork in Uganda and the interviews conducted, I was struck by some aspects related to the charcoal chain that were worse, and others that were better than expected. Some negatives that stood out were the severity of environmental degradation, as evidenced by the steep rate at which forest coverage was being reduced and which was showing little sign of levelling off, with forest coverage going from an estimated 24 percent of the total land area in 1990, to 14 percent in 2010 and 9 percent by 2017 (MWE Interview; Charcoal Survey, 2016). Of course this is only partly a result of unsustainable charcoal production, since other drivers such as agricultural expansion also play a key role. However, coupled with the seemingly insatiable demand for woodfuel in a fast-growing country and especially the strong demand for charcoal in rapidly expanding urban areas where there are few feasible alternatives that are affordable for the majority of the population, it seems unavoidable that this must bring increasing pressure to bear on already declining forest resources.

Alongside such negatives, there were also some tentative positives. The situation was better than expected in the sense that there seems to be a growing awareness of the problems associated with the charcoal sector and a willingness to act, albeit slowly. Some institutions and organisations appear very much on top of the problems in the forestry sector and are already aware of or actively applying value-chain analysis to identify weak points and bottlenecks and propose improvements along the charcoal chain (e.g. by the MEMD and MWE under the banner of the Green Charcoal project, as well as private sector organisations such as UNREEEA). Yet whether such value-chain based approaches looking at efficiency-savings along the chain are sufficient to address some of the aforementioned issues remains debatable.

Efficiency along the chain

The value-chain approach towards the charcoal sector that has led to some of the proposed strategies mentioned in the preceding chapter, is not without its detractors and some legitimate criticism can arguably be levelled at the energy efficiency focus that forms its premise. One could argue that incremental energy savings along the chain, be it through the introduction of more efficient kilns with a carbonisation rate of 30 percent rather than 10 or 15 percent (e.g. the casamance or Adam retort kiln recommended in the Charcoal Survey (2016)) or better packaging and storage of charcoal sacks which reduces breakage from the currently high estimates of up to 12 percent (MEMD Interview) or promoting of more efficient cookstoves which can reach up to 38 percent energy conversion for charcoal (CREEC Interview), although all admirable initiatives, do not move away from a charcoal-centred energy perspective and fail to achieve any radical overhaul in types of energy usage. As mentioned in the ‘Conceptual framework’, Elizabeth Shove (2004; 2017a; 2017b) has discussed such aspects of the ‘energy-efficiency debate’, although it should be stated that applying this to efficiency in the charcoal sector of Uganda might be taking some liberties with her original arguments and the context in which they appear. She warns of the trap that thinking only in terms of ‘efficiency’ removes energy usage from its moorings within practices and thus precludes any far-reaching solution to the problems of energy consumption, since it fails to take into account the reasons why and how we use energy (i.e. not for its own sake but as part of practices (Shove & Walker, 2014)). For this reason the cooking practices of the informal settlements were more firmly included in this study to gain a better understanding of how charcoal is being used, but the criticism still stands with regard to many of the proposed efficiency measures along the charcoal chain. For instance, it was conceded that the value-chain approach being adopted under the Green Charcoal Project does not place much emphasis on consumption (MEMD Interview: 2).

Essentially, Shove (2017) argues that focusing on efficiency can be a misguided or even damaging approach by locking in current levels of demand and consumption as well as our understanding of energy services. She questions whether the focus on energy efficiency actually contributes to changing fundamental expectations and attitudes towards energy, and instead sees proclaimed efforts towards greater energy efficiency as a fig-leaf ‘enabling’ unsustainable patterns of energy usage. Her views have been criticized by others as failing to recognise the sizeable energy savings that have been achieved through efficiency measures and evidence that it can help reduce demand, while also questioning whether “current service expectations really are unsustainable” (Fawcett & Rosenow, 2017: para. 8). Shove’s response to this is that her main argument is not about whether efficiency savings can be sufficient or not to offset the negative impact of high energy

usage while continuing to meet demand (which she argues cannot be predicted anyway), but rather emphasizes the “more important point is to recognise that societal needs and demands are not given: they are negotiable, dynamic, and in part constituted by technologies and policies, *including those of efficiency* [emphasis in original]” (Shove, 2018: para. 6). As she goes on to state, she readily acknowledges that through efficiency measures specified needs can be met with fewer resources, “[b]ut in taking ‘needed’ services for granted such measures also ‘fix’ historically and culturally specific interpretations of comfort, light, travel, etc.” (Shove, 2018: para. 7).

This presents a very compelling argument about efforts to improve energy efficiency, which one might be forgiven for considering as generally good, worthwhile and well-intentioned. Although by no means condemning all such measures as inherently flawed, it highlights how energy efficiency measures can actually help perpetuate the behaviour and habits that they seek to lessen, or at the very least result in misguided attempts to address them. By jumping ahead to questions such as ‘how can we make this more efficient?’, it might be distracting us from more fundamental questions such as ‘Why do we need this?’. Although in many cases there can be a perfectly reasonable and valid reply to such questions, it can bring to the fore the underlying changeable notions on which ‘needs’ are based and the meanings we attach to these needs, which we tend to skate over when we simply focus on efficiency.

Moreover, greater efficiency in charcoal production for instance, does not necessarily mean that fewer trees will be cut down but instead could simply mean greater production of charcoal, and thus even perversely higher charcoal usage by consumers due to greater availability and potentially lower prices. Shove (2017b) points to the ‘Jevons paradox’ as a historical example of improved efficiency (in the use of coal) counter-intuitively leading to greater consumption (due to the relative lowering of the price). Simply relying on improved efficiency without tackling the habits in energy usage at the root of the problem, would present only a temporary solution. Similar concerns can be seen in the projections made by Namaalwa, Hofstad and Sankhayan (2009: 74) regarding sustainable charcoal supply in Uganda, who factored in more efficient technologies in both production and consumption (e.g. kilns and improved cookstoves), but on its own did not see such efficiency gains as preventing an eventual depletion of forest resources without tackling growing charcoal needs: “[T]he use of improved technologies would achieve biomass savings only in the short-run and delay the “crisis” period”.

Shove makes a strongly convincing case about the way we currently look at energy efficiency as locking in unsustainable patterns of energy usage, and when applied to the charcoal sector how more efficient charcoal production and consumption can still lead to environmental degradation due to growing demand, but the key point here might be the very different context in which these

discussions take place. It would be remiss not to mention that the debate initiated by Shove largely concerns policy-makers' focus on energy efficiency in Europe, for instance with regard to reducing carbon emissions in response to climate change, which presents a rather different context and levels or types of energy usage than that in Uganda, and therefore might negate some of her criticisms. In the cases discussed by Shove, it concerns such things as standardized heating levels in homes or more efficient freezers and washing machines, which are arguably relatively superfluous forms of energy usage when compared to the critical role charcoal plays in meeting basic needs in the informal settlements and the vulnerabilities flowing from potential changes in energy provision (e.g. drinking unboiled potentially contaminated water or skipping meals entirely to save on energy usage). The debate on the efficacy of energy efficiency solutions makes some very valid points and also demonstrates some weaknesses behind the value-chain approach to charcoal in not giving enough consideration to consumption, but this should be considered in the Ugandan context of a rapid rate of environmental degradation coupled with a high degree of vulnerability in the informal settlements, where improved efficiency in the charcoal sector can potentially contribute to averting environmental and social crises. Although a strategy focused on efficiency savings by itself might not be the solution, it might buy some time for a transition to other energy sources and create space for greater consideration regarding how this energy is being used.

In a more general long-term context, Shove's message does deserve to be taken into consideration. What this would mean in practical terms for the efficacy of energy efficiency strategies can be found in the distinction that Shove makes between 'good' and 'bad' efficiency (a distinction which she readily acknowledges presents a "slippery slope"), in which "identifying what I call 'good' forms of efficiency depends on carefully articulating the meanings of 'need' and service that they sustain" (Shove, 2018: para. 8). Through such continuous reappraisal the dynamic nature of needs would be embedded in efficiency measures and given room to evolve, rather than committing to fixed needs based on rigid interpretations at a specific moment in time.

'Practice makes perfect'

One of the distinguishing aspects of this study was to include practice theory alongside a value-chain analysis, by actually starting with the cooking practices in the informal settlements before working our way outwards along the charcoal chain. At this point, it would be useful to reflect on this approach and especially to consider what the practice focus brought to the table. What exactly was the added benefit of the practice perspective? What would have changed if practices were not taken into consideration? Notwithstanding some of the issues acknowledged early on in the

conceptual framework which still stand, such as oversimplification in the ‘three elements model’ or inherent problems in combining the ‘levelling’ perspective of practices with the top-down perspective of value-chains (see Chapter 2.5), I would make the case that the practice perspective forms a valuable addition that opened up avenues that otherwise may not have been spotted. The practice approach helped to firmly ground this study of charcoal in the context in which it is actually being used. It succeeded in bringing greater attention to the complexity of charcoal consumption, and especially the crucial role charcoal plays in the often overlooked informal communities of Kampala. This approach helped to highlight how charcoal functions as a lynchpin in the cooking practices of the informal settlements, and illustrated that without proper planning the abrupt removal of this ‘keystone’ could (to continue the metaphor) potentially send the entire edifice tumbling down.

Without studying cooking practices in the informal settlements, the level of dependence on charcoal and the lack of viable alternatives would not have come forward as clearly. First zooming in on these settlements showed how households are already adapting in the context of rising charcoal prices and the difficult choices that they face. What was made shockingly clear during the fieldwork, was the generally precarious nature of life in the informal settlements and the extent to which the availability and cost of charcoal dictated a range of vulnerabilities. Due to very limited or non-existent financial reserves for many people in the informal settlements, a day not earned can mean a day not eaten. Such uncertainty as a constant factor of life affects all decisions, including those related to charcoal. It points to a style of day-to-day living in what can almost be described as a ‘survival economy’, with no reserves and little resilience. As such, cooking practices represented a good illustration of life in the informal settlements, because cooking touches upon many of these aspects (e.g. day-to-day living, gendered division of responsibilities, food/water/energy insecurity, and other vulnerabilities). The practice of cooking captures many of these issues and acts as a prism, presenting a focal point to look through at life in the informal settlements.

Looking at charcoal as a material element of cooking practices rather than just considering charcoal consumption as part of a value chain analysis, also demonstrated how charcoal usage is not just based on price and availability, but has deeper roots with linkages to the various elements coming together in the practice of cooking. Charcoal is certainly valued for its low price and easy availability, but other meanings are also attached to it; within the informal settlements with their limited infrastructure and sporadic service provision, charcoal is perceived as reliable and convenient while the distinctive flavour that food cooked over charcoal acquires, is an important aspect of local cuisine and reaffirms cultural attachments. Charcoal has traditionally been used in urban settings and represents a familiar style of cooking (e.g. slow-cooking food prepared over a

long period of time and cooked outdoors on simple stoves) to which people are accustomed. Such aspects related to charcoal should be taken into consideration to identify the most fertile ground for improvement and suitable alternatives that would fit more easily within existing patterns of energy usage.

It is doubtful whether charcoal usage could have been traced with the same level of nuance if the value chain analysis had not been supplemented with a practice-based approach. This would have affected the feasibility and effectiveness of suggested policy opportunities and, considering the manifold vulnerabilities related to charcoal dependence, could have unforeseen consequences for the communities living in informal settlements. The lack of viable alternatives in the informal settlements means that any disruption in charcoal provision, either as a result of overly aggressive regulative measures or by continuing the status quo leading to a rapid decline in wood stock, could have strong ramifications regarding not just energy, but also food and water security.

The value of a practice-based approach is greater recognition of the kaleidoscopic nature of elements coming together in energy usage, which complicates any attempted transition away from charcoal. For instance, from a non-practice based perspective a transition towards electricity could be promoted, but it would quickly become clear that this most likely would not work in the short-term in informal settlements. Not just because of the obvious lack of necessary infrastructure but also in less obvious ways, how it would represent a radical break with existing cooking habits and preferences. It would for instance ignore the constrictive material relation between fuel and stove which often excludes alternatives (i.e. an electricity connection when you only have a charcoal stove is rather useless, and would require additional investment in a second stove which represents a significant hurdle in the low-income informal settlements). Imagining that the financial hurdle of absent infrastructure is somehow overcome, one would encounter additional unforeseen problems.

For example, cooking on an electric stove would force many Ugandans to give up on food like matooke, which would represent a tough sell (to put it mildly). More likely it would necessitate a dual setup (and extra expenses) in which households also keep a charcoal stove for traditional food, such as maintained for this very purpose by the only shadowee in this study with an electricity connection (Debrief 11). An electric cooker would also move cooking practices indoors and require more space, which would be a real problem in the informal settlements where many live in small one- or two-room homes with the entire household and only cook inside when faced with heavy rain. Since most households in the informal settlements buy charcoal on a daily basis because they lack the funds to buy in bulk, monthly electricity bills would represent a challenge. In some areas they have started using an electricity credit scheme to which customers can load credit similar to the water token scheme previously mentioned, but some challenges remain when considering how this

would work in the informal settlements. There is a risk of illegal tapping taking place and people might be worried about footing a large bill at the end of the month. By contrast, charcoal is perceived as a secure source of energy which you can easily measure and safely store.

These are just a few examples and taken individually none of these issues might seem insurmountable, but the cumulative effect would make such a transition incredibly disruptive. Every additional break with the existing material infrastructure, past habits or preferences that an alternative energy source represents, seems to add a degree of friction to the potential uptake of the alternative. Changes on one front can necessitate changes on other fronts, and although the old adage that we are ‘creatures of habit’ is an exaggerated generalisation, when many things change drastically all at once, such developments might encounter greater resistance and raise the difficulty of alternatives catching on. From the vantage-point of practices, the more attractive proposition would be to encourage a transition towards alternatives that fit better into the existing practices rather than those that radically break with past habits and preferences.

Some of the above mentioned arguments relate quite closely to a general debate on whether it is better to pursue a strategy of incremental change or disruptive innovation. Essentially (though this is of course a gross simplification), a strategy of incremental change builds upon the existing framework and seeks to improve it while causing minimal disturbance, whereas adherents of rapid change envision a more abrupt break with past practices by utilizing disruptive technologies. Looking through the practice lens has contributed to this study considering measures leaning more towards the former than the latter camp. Although the urge behind disruptive technologies to ‘sweep out the old’ is naturally appealing, such initiatives often fail to take into consideration the context in which these technologies are simply dropped and ignore existing patterns of usage and the meanings attached to it. This can lead to limited uptake of the technologies being introduced (which might have required significant investment of limited resources that could have been used more effectively elsewhere) or negatively impact existing networks of energy provision and the livelihoods of the actors involved. Although in theory these initiatives might be admirable, proponents of disruptive technologies often fail to properly consider how the things they seek to replace are part of practices and cannot be judged purely on functional grounds (‘it heats food’), but also have other meanings embedded within it (‘How can I cook matooke in a solar cooker?’). Besides such aspects, something like a solar cooker may be a great technical solution but if it is suddenly introduced in a community it could also undermine the entire existing infrastructure of how people get energy and the livelihoods dependent on this system.

Methodology and issues encountered

The chosen study areas highlighted the importance of placing charcoal in context. It revealed some subtle differences between Kanyogoga and Bwaise in the fields of energy, water and food security. While in Kanyogoga the surrounding low-lying wetlands provided access to cheaper produce and the freely available spring water was considered a benefit of living there, this environment also exposes the community to greater risk of flooding and disease. The presence of the wood workshops near Bwaise offers a cheap alternative energy source (although how stable this situation will remain is not certain), but exposes the women who cook to greater health risks. Lacking such an alternative, the community in Kanyogoga is more dependent on charcoal and thus more sensitive to fluctuations in charcoal prices. Such differences expose communities to varying vulnerabilities and point to the value of an approach that is sensitive to the particular local context.

Starting with the practices in the informal settlements also helped centre the urban poor in considering the charcoal chain, whose exposure to potential fluctuations in energy services and associated vulnerabilities has too often been neglected. However, it must be admitted that in seeking to remedy a perceived oversight, the pendulum may have swung too far in the opposite direction. While attempting to shine a light on the plight of the urban poor, this study may have been guilty of moving too far from the rural communities and how changes in the charcoal sector will affect them. It seems that with the advent of a more professionalized sector and large-scale plantations, there will be less space for rural charcoal producers who only periodically engage in small-scale charcoal production, and who might not have the means and expertise for the more efficient and sustainable charcoal production as envisioned in the Charcoal Survey and Green Charcoal Project. Such changes in the charcoal sector might cut off the rural communities from a valuable source of supplementary income from charcoal production in the off-season or when struck by poor yields or crop failure.

The example of formalisation offered by Rwanda gives some hope that it is also possible for small-scale farmers to benefit from a more formalized sector by maintaining small wood plots on less fertile ground alongside their fields, gaining a fair share of the final profit by supplying the wood resources while leaving the actual charcoal production to professionals with the necessary equipment and expertise. Whether this would adequately make up for the lost income from informal small-scale charcoal production and would reach the same rural actors currently involved in the sector is difficult to predict. At the same time it is also clear that maintaining the status quo would not be doing rural communities any favours in the long-term, since the environmental degradation associated with current unsustainable practices could have a detrimental impact on farming

activities. How exactly to mitigate the potential negative impact of reform in the charcoal sector for these rural communities is a question going beyond the scope of this study and left largely unanswered, but this is an area deserving of more attention.

One of the main issues encountered throughout this study was the lack of information concerning the informal charcoal sector. There is no clear picture regarding the level of charcoal being produced at a small-scale versus large-scale, nor is there reliable information on the sums involved in bribery or buying rights to forested land. This complicated many aspects of this study and might bring into question whether it was worthwhile to pursue the model of benefit distribution or access mapping of Ribot. I would argue that despite the lack of accurate figures, it still revealed some useful aspects of the mechanisms being used to maintain access to profit in the charcoal chain. Moreover, the very fact that detailed information is not forthcoming and that there is actually some resistance to shed more light on the sector, indicates how some actors are benefiting under the vague status quo. As discussed, this demonstrates the vested interests in maintaining the informal nature of the sector and the difficulties that may be encountered in trying to formalise the charcoal chain.

For a similar reason, although this came as no surprise, it proved to be very challenging to get in touch with actors in the charcoal chain and this forced a greater reliance on document review for activities further upstream in the chain. On a more positive note, interviews with actors from ministries and other relevant organisations were more forthcoming than anticipated, and the connections and efforts of the ResNexus team proved to be invaluable in this regard. As a brief aside, although this study was very lucky to have access to knowledgeable translators from the ResNexus team, language barriers presented a challenge when operating in the informal settlements. In one memorable case in Kanyogoga, the interviewee did not speak the local Luganda language but only spoke Kiswahili, so a local man offered to help with the translating. This led to the slightly comical situation of the author's questions in English being translated by the translator into Luganda and subsequently by the local man into Kiswahili, with the interviewee's answer then returning via the same circuitous route. In the end, five people were involved in this game of 'Chinese whispers', with all the risk of confusion and changing questions, answers and meaning that such communication entails. It also made it more difficult to pursue interesting answers which could lead to unexpected results or change questions on the spot, and was further complicated by time pressure when talking to the retailers (with customers coming and going). In hindsight, some of the questions could have been changed to reveal more useful information. For instance, to get a better picture of credit arrangements and relationships between suppliers and retailers, it would have

been useful to ascertain whether vendors received any assistance in acquiring the necessary capital to get involved in the business, although naturally this would have been a sensitive topic.

This chapter has covered both theoretical and practical issues encountered during this study. It touched upon the debate on energy-efficiency and disruptive technologies as well as the merits of a practice-based approach. Such debates are ongoing and unresolved, but this chapter has at least indicated what position is adhered to in this study. The following chapter will cover the findings of this study in more concrete terms, namely the results of the practice approach regarding the role of charcoal in the informal settlements alongside the outcome of the charcoal chain analysis, on the basis of which opportunities have been identified to make charcoal provision more sustainable and equitable.

8. Conclusion & Recommendations

Having answered in the above discussion the theoretical questions posed in this thesis, we now turn towards the questions of an empirical and analytical nature posed at the start of this study. Together, these help to trace the arrangements, connections and interests at the junction of charcoal distribution and usage between the actors and institutions involved in providing charcoal alongside the practices incorporating charcoal in the informal settlements of Kampala. From this follow the proposed opportunities to make charcoal provision more sustainable and equitable.

Charcoal in the informal settlements

Regarding the general role of charcoal in the cooking practices of the informal settlements of Kampala, it can be stated that it plays a crucial role for the vast majority of households, forming the main (and often sole available) energy source for cooking. Looking more specifically at the study areas of Kanyogoga and Bwaise, we find that charcoal acts as the lynchpin of cooking practices in the former, while being of slightly less importance in the latter due to greater reliance on firewood. In Kanyogoga there are currently very few viable alternative fuels for cooking that can compete with charcoal. The highly informal status of the settlements (more so in Kanyogoga than the somewhat more established, although certainly still informal, settlement of Bwaise) severely limits any investment in service provision, be it in sanitation or energy. Charcoal fits perfectly in the conditions found in informal settlements, requiring no advanced infrastructure for distribution or consumption, and being affordable in small daily quantities to the low-income households of these

settlements. Charcoal's wide availability and easy storage means it is perceived as a reliable energy source, and it represents a familiar mode of cooking which has been used for a long time and forms an important part of traditional local cuisine by imparting a charcoal flavour to food.

Few alternatives can match charcoal in these key aspects, with affordability being the most important stumbling block, but certainly not the only one. Bwaise is unusual in having the option of firewood available in an urban setting, due to the presence of the nearby wood workshops. Firewood is only preferred due to its low costs, being considered more inconvenient than charcoal because it takes longer to collect and is heavier, takes longer to light, requires more constant attention, produces more irritating smoke, and cannot be transferred easily or taken inside when it rains. The unique circumstances which make firewood an option in Bwaise cannot be repeated across Kampala nor would this be desirable, since firewood does not represent an improvement over charcoal in either environmental or health terms. Cooking with electricity or LPG is far more expensive than charcoal and is currently not feasible in informal settlements, not only because it requires significant investment in infrastructure and equipment, but also because it represents a radical break with existing cooking practices and would be very disruptive. In the short-term, briquettes represent a more viable and less disruptive alternative energy source. If briquettes are made widely available, they can match or even better charcoal in many aspects and slot in fairly harmoniously in existing cooking practices with relatively minor alterations.

Concerning the extent to which cooking practices and charcoal distribution shape one another, we can identify some aspects of charcoal distribution that are geared towards meeting the particular needs of the informal settlements. Charcoal is sold on a daily basis in small quantities at a fixed price, so that even those with very limited funds are not priced out of purchasing charcoal entirely, but can still acquire a small amount. Moreover, most vendors also sell charcoal on credit to known local customers. Since many households in informal settlements have little to no financial reserves, cooking plans are often made on a day-by-day basis depending on available funds and ingredients. The fact that charcoal is available in such small quantities or on credit offers some flexibility, albeit often at a greater overall cost since buying in bulk would be cheaper, but such expenditure is simply not feasible for most households.

On the other hand, cooking practices in the informal settlements are also being shaped by charcoal distribution. The rising cost of charcoal due to the exhaustion of easily accessible forest resources and growing demand, has led many households to change how they cook. Some try to save on charcoal usage by switching to faster-cooking foods such as greens and posho, rather than slow-cooking (but nutritious) beans. Another approach is to save on charcoal by cutting the number of meals they prepare and eating a full meal just once a day. The influence of higher charcoal prices

is also felt in other areas. Due to the higher reliance on spring-fed water in Kanyogoga and the risk of contamination because of frequent flooding and poor sanitation, charcoal is also important in enabling access to clean drinking water through boiling. The rising cost of charcoal and limited funds available to most households in the informal settlements, means they face increasingly difficult choices in balancing certain costs today against uncertain costs in the future (spending money today to boil water that could otherwise go towards food, rent or other necessities versus risking the uncertain health impact of drinking unboiled water). Thus changes in charcoal distribution can also have repercussion on the front of health, food and water security.

Actors and institutions in the charcoal chain

Regarding the actors and institutions that are involved in the distribution of charcoal to the informal settlements, the role they play and their interactions, we can distinguish between actors operating at particular levels and trace how they relate to one another. At the local level nearest to the urban consumers in the informal settlements, charcoal is distributed by small-scale vendors who have a few sacks of charcoal which they sell in small amounts. These vendors sell from informal roadside stalls without any license and due to the competition from the large number of actors involved at this level of distribution, often rely on their social network for loyal customers. The vendors have minimal influence on charcoal distribution, and are only able to maintain a profit in the face of rising prices by reducing the container size in which they sell charcoal (and only if done collectively).

The local vendors acquire their charcoal through brokers arranging distribution on behalf of traders or straight from the trader's truck passing through the settlement. The brokers play an important part in coordinating urban distribution using their knowledge of charcoal demand and network of local vendors. They can help speed up distribution for traders, freeing them up faster to return to charcoal production areas and repeat the cycle, rather than spending time selling charcoal off the truck in a piecemeal fashion (although plenty of traders do take this approach). Likewise, in between the producers and traders we often can find middlemen performing a similar function to the urban brokers by coordinating production and collection of charcoal. The charcoal is brought to Kampala either by transporters hired by traders or the traders themselves, depending on the size of their operations and capital available. This level of the trade contributes most to the final price of charcoal due to the cost of transportation over ever-increasing distances (truck, driver and fuel), necessary trade licensing and the need for bribes at frequent roadblocks. These costs, especially bribery, are not transparent which offers traders opportunities to misrepresent costs and increase their profit share. Charcoal bought for between 15.000 to 25.000 UGX in the production areas ends

up being sold to vendors for 70.000 to 75.000 UGX. This of course includes the shares of traders and brokers, and profit distribution seems skewed in their favour.

As this illustrates, the charcoal producers and landowners receive only a relatively modest share of the final charcoal price. Embedded within this discrepancy lies a low valuation of forest resources, which drives unsustainable practices in the charcoal sector such as clear-cutting and offers few incentives to invest in replanting or costly but more efficient production techniques (e.g. improved kilns). This is further compounded by little to no oversight at this level of the trade. Officially charcoal production should be licensed through burning permits, but the limited resources available to the District Forestry Officers assigned this task means that monitoring of production rarely occurs. Instead, the limited resources available for licensing efforts are concentrated in local urban centres and along major highways. This results in official contact with actors from the charcoal sector being concentrated in the figure of the trader or transporter, while contact with producers (and thus potential influence on the manner in which charcoal is being produced) is more rare.

Regarding how institutions shape the charcoal trade, as the above indicates the charcoal trade mostly operates informally, albeit with an ebb and flow of formal institutions at particular points. At the production level, dealings between landowners, producers, middlemen and traders are largely governed by informal institutions upheld amongst the actors themselves with only limited oversight. The next phase in the trade from production to transportation forms the main point of official contact in the guise of trading permits issued by DFOs and other forms of licensing (e.g. loading fees), as well as later inspection along the road by traffic police. However, here we can find what Leach et al. (1999: 238) termed "competing notions of legitimacy, in which actual entitlements are influenced by the interplay of these competing rule sets in the context of prevailing power relations". The formal permits compete with informal 'permits' (i.e. bribes) which allows well-connected actors to circumvent formal regulation. Such actors have a strong stake in maintaining the informal nature of the charcoal sector, but this informality also lies at the heart of current rates of environmental degradation.

Potential measures

Turning towards potential opportunities, as the preceding chapters have illustrated and following from the identified arrangements, connections and interests in the charcoal chain, there are various avenues through which to pursue a more sustainable and equitable form of charcoal provision. One of the core problems that lies at the foundation of many issues coming out of the charcoal sector,

concerns the monitoring and enforcement of the fragmented regulative framework. Currently, the resources at the disposal of local governments in order to accomplish their assigned role in monitoring and enforcement are clearly inadequate (Oosterveer & van Vliet, 2010; Shively et al., 2010). Instead of centrally allocated funds compensating for the abolished graduated tax, local governments should have greater control over revenue streams. As part of this, changes should be made in the current imbalanced division of revenue collected through charcoal permits, in which the lion's share does not stay at the local government level at which the revenue is being collected (Shively et al., 2010). To provide greater incentives for accurate reporting and enforcement of regulation at this lower level, a larger share of collected revenue should remain at the local government level actually doing the collecting. Care should be taken that this does not lead to perverse incentives for local authorities to increase charcoal production in their district if this is done in an unsustainable manner. Moreover, part of the collected revenue should be earmarked for reinvestment in environmental management in the district and replenishment of forest resources (Schure, 2014).

Giving greater control to local governments is important, but it should be emphasized that there is still a very useful role to play for the centrally organized sectoral agencies such as the NFA in coordinating amongst the different districts and providing the necessary expertise. In view of the administrative situation wherein many new districts are constantly being created, it is good to have a knowledgeable core from which to draw. However, in light of the findings made by Oosterveer and van Vliet (2010), it is important to encourage these agencies to work more closely together with the local authorities, so that they are properly embedded in the local context rather than attempting to impose a central government line and thus forming a source of friction.

As per the recommendations of the Charcoal Survey (2016), the current regulative framework should also be simplified. The current diversity in required permits and fees across the various districts can act as a barrier for actors lacking the right connections and know-how, while creating more opportunities for corrupt practices. Streamlining is necessary to prevent more 'whack-a-mole' situations arising between the different districts, although this entails a challenging task in finding the right balance between a more uniform approach to the sector and letting districts largely set their own local agenda. A more cross-sectoral approach is required but currently cooperation between relevant ministries still largely occurs only at the lower levels (MWE Interview). Collaborative projects such as the Green Charcoal Project (MWE Interview) or inter-ministerial cooperation such as in the existing committee on biomass chaired by the MEMD and joined by representatives from the MWE, NFA, the ministry of Agriculture, the ministry of Local Governments and the KCCA

(Interview MEMD), are very encouraging and should be further developed to ensure a more collaborative approach to the charcoal sector at higher government levels.

Greater formalisation of the charcoal trade can contribute to standardization of more sustainable practices. Therefore, the recommendations made in the Charcoal Survey (2016) to professionalize actors in the charcoal sector and support the development of plantations are repeated here, albeit while keeping in mind some of the potential risks and shortcomings of formalizing if not properly pursued. Within the current informal charcoal sector, the environmental cost of charcoal production is not internalized and short-term gains outweigh long-term benefits of maintaining forests. This ignores the impact of environmental degradation on agriculture which supports the majority of rural households. As discussed, charcoal production can lead to a vicious cycle of environmental degradation. Improving the margins for producers and landowners to gain a greater share of revenue from the charcoal trade could contribute to a better valuation of trees and promote more sustainable practices. To this end, it is also important to shift charcoal production away from natural feedstock towards greater reliance on planted trees, ranging from small-scale plots to large-scale plantations. Care should be taken that this process does not lead to further conversion of natural forests to plantations, even if the land is already degraded (but not yet deforested) (FAO, 2017). Using the previously discussed forest management practices, such as greater consideration for pre- and post-harvest management (e.g. careful inventorying to not exceed the replenishment rate and restoring degraded land) or the acacia plantations following a coppice management system, a more sustainable charcoal sector can be achieved and pressure on natural forests can hopefully be reduced.

Herein lies a potential weakness in the proposed formalisation, regarding the position of rural communities that rely on charcoal production for supplementary income. Considering ministry goals to promote large-scale plantations (MEMD Interview, MWE Interview; Charcoal Survey, 2016), rural communities might lose out more than others. As some form of amelioration, a scenario of formalisation could be envisioned similar to that found in Rwanda (Iiyama et al., 2017). The promotion of large-scale plantations need not exclude small-scale plots, but production should be geared towards professional producers who have the means, knowledge and equipment for more sustainable charcoal production. In this scenario, it would be envisioned that small-scale landowners and rural communities can still play a part in the charcoal sector by developing wood plots on less arable land, albeit a role limited to supplying wood resources while specialized actors would handle the charcoal production.

Looking more specifically at the junction of charcoal provision and cooking practices, one of the most promising ways forward would be to support the production of briquettes (e.g. through tax

exemption such as advocated by UNREEEA) and increase their availability on the market. This would also include campaigns to promote the uptake of briquettes, not merely making them more widely available but also demonstrating correct usage of briquettes (either on its own or as a supplement to charcoal) and the advantages briquettes entail. Such information campaigns should best be targeted at women, who in most cases are responsible for cooking and making the necessary purchases. Taking the example of Kanyogoga, a useful entry point could be some of the existing women's groups active in the community (FGD Kanyogoga) or greater support for fledgling briquette-makers located in the settlement itself such as EASE which have already established some contacts in the local community.

Although small-scale briquette-making in the informal settlements can certainly play a part, the need for much greater briquette production to ensure wide availability at low cost, points to larger scale production as being necessary. Similar to the debate on small-scale and large scale charcoal production, larger production facilities with sufficient capital would be better able to accommodate the necessary equipment for efficient briquette production. This would likely include the need to carbonize biomass prior to briquetting (which can be a rather inefficient process), following the advice from the Charcoal Survey (2016) to utilize more non-woody biomass and agricultural waste.

A second strategy focused at the intersection of provision and cooking practices in the informal settlements and which could run parallel to initiatives supporting the usage of briquettes, would be to improve the uptake of more efficient cookstoves. The stoves would lengthen household supplies of charcoal or briquettes, while certain stoves can also provide a health benefit by reducing the exposure to harmful emissions such as particulate matter. Although cost-saving in the long-term, the current price-tag of most efficient cookstoves (at around six times the cost of a traditional stove) acts as a significant barrier to many inhabitants of informal settlements who live day-by-day and already struggle to meet routine expenses. They can therefore ill-afford the extra investment in an efficient stove, even if it might save money in the long-run by reducing charcoal consumption. The MEMD is already promoting the use of more efficient stoves, but for such stoves to come in range of the average customer in the informal settlements would require more support for the stove-making industry to bring down costs. As previously mentioned, there are also some practical issues limiting uptake which would have to be addressed, such as the variable performance of stoves due to a lack of standardization (World Cafe), the longer cooking time required when preparing food on these stoves (although saving fuel in the process) (UNREEEA Interview), or the ceramic lining cracking due to rough handling (e.g. shaking out ash) which the traditional metallic stoves can easily withstand (CREEC Interview). The efficient stoves would therefore also require a more elaborate information campaign regarding its advantages and correct usage.

Considering the limited funds available, due to the wider price gap between improved and traditional stoves compared to briquettes and charcoal which are roughly the same price (with briquettes actually being slightly cheaper now due to the rise of charcoal prices), a strategy focused on briquettes would seem more appealing. If extra funds are available, a complementary strategy focused on supporting and promoting improved stoves would be a worthwhile addition and, unlike briquettes, could provide more health benefits to consumers (depending on the ongoing development of improved stoves which lessen exposure to hazardous emissions from either charcoal or briquettes). Briquettes have been singled out this study as the most attractive alternative, at least in the short-run, since it not only can compete with charcoal on price and make use of the same limited infrastructure in the informal settlements, but also because briquettes require minimal disruption to existing cooking practices.

This is precisely the point that adherents of disruptive technologies take issue with, namely that something like the briquette represents minimal change whereas they argue that this does not go far enough and greater change is necessary to achieve more sustainable resource usage. There are some parallels here with the energy-efficiency debate taken up by Elizabeth Shove and it certainly contains some valid points, but I would offer a similar response. Briquettes are by no means intended as the end-all solution, but represent a short-term fix that is more workable and more likely to succeed than alternatives, while being less likely to negatively impact those currently dependent on charcoal provision. Briquettes can largely be transplanted onto existing infrastructure without causing widespread disruption (i.e. the same vendors selling charcoal can start selling briquettes and do not need to lose their livelihoods). When compared to the significant necessary investments to enable other alternatives (e.g. LPG or electricity) to compete with charcoal, the resources required to support the briquette-making industry in order to produce and distribute briquettes on a scale that would make it as widely available as charcoal, are far more modest. Considering the limited funds available, this would make investing in briquettes more effective. As referenced in chapter 4.1 regarding practices and their constituent elements, in the “uneven landscapes of possibility” (Shove et al. 2012: 132) the briquette element has greater opportunity to ‘travel’. Briquettes do not represent a long-term solution and should eventually be replaced themselves, but they might help enable a grace period for a smoother transition away from charcoal.

There are many potential avenues to pursue in order to make the charcoal chain more sustainable and equitable, while also minimizing the negative impact for the most vulnerable living in the informal settlements. From the perspective of the informal settlements, as befits an issue with touches upon a wide range of vulnerabilities, a more integrated approach which looks at energy provision but also beyond is desirable. Energy (in)security in the informal settlements is

intrinsically linked to food and water security. For example, by investing in improved sanitation and providing clean drinking water at low cost in communities such as Kanyogoga, the high dependence on charcoal and the vulnerabilities linked to this dependence could be lessened by no longer requiring water to be boiled. This is just one example of how the policy domain of sanitation can be connected with the energy domain and illustrates the potential value of the cross-sectoral nexus approach.

Furthermore, the informal status of these settlements leads to a lot of uncertainty which not only negatively affects the lives of the inhabitants and the decisions they face, but also prevents the development of infrastructure which could make a significant contribution in improving the resilience of these communities, and thus negate some of the potential negative impact if charcoal provision were to be disrupted. Some of the suggested measures would have a greater impact than others, while some are likelier to succeed than others or can be achieved at a lower cost. There does not seem to be any silver bullet amongst the various proposed strategies, but rather requires a mixed approach which incorporate several measures which tackle different aspects of the problem. The need for such an approach reflects the range and complexity of issues associated with the charcoal sector and the manifold vulnerabilities that flow from charcoal dependence in the informal settlements.

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