

Informality, global capital, rural development and the environment: Mukula (rosewood) trade between China and Zambia

Paolo Omar Cerutti, Davison Gumbo, Kaala Moombe, George Schoneveld, Robert Nasi, Nils Bourland and Xiaoxue Weng



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Executive summary

In much of sub-Saharan Africa (SSA), the informal economy rules supreme. Often defined as unregulated production, distribution and service provision, informal economic activities across SSA provide crucial cash income and employment for both rural and urban populations. Governing the informal economy is a key policy challenge for governments across SSA owing to (1) its contribution to local livelihoods and (2) its common association with illegality, tax evasion and negative environmental impacts. Because of the increasingly globalised trade in commodities, parts of the local informal economy can also be supported by global sources of capital. Zambia is no exception to these trends.

Against this backdrop, this paper focuses on the political economy of the international mukula (rosewood) trade,¹ interrogating the role of global capital, in particular that of Chinese origin in Zambia, and its impacts on rural livelihoods, the environment and resource governance. Three main research questions guided our work:

- 1) How does Zambia's resource governance context – with its pre-existing constraints and power asymmetry – affect outcomes of the informal extraction and trade in relation to livelihoods and the environment?
- 2) Along the value chain, how are upstream informal economic activities – in this case based on a commodity with contested legal origin – shaped by the international trade with China?
- 3) What are the economic, social and environmental impacts of the commodity trade and subsequent government interventions?

Recent mukula production in Zambia, we found, could have amounted to about 110,000 cubic metres (m³) per annum, with revenue losses of about US\$3.2 million, and estimated bribes paid to state officials of about US\$1.7 million.

Results also show that rural villagers are increasingly forging direct links with foreign investors, producing innovative business models that accelerate the rate of small-scale production and extraction of resources – all the while still embedded in the rural

¹ It was a difficult choice whether to employ the more recognisable, but possibly misleading term 'rosewood', or whether to call the species 'mukula', as it is known in the Zambian context and in recent press coverage. We ultimately opted to use the term 'mukula' consistently throughout this paper. There is no agreement in the available literature about whether 'mukula' refers to a single species or to several species. In Zambia, and across the border in the Democratic Republic of Congo (DRC), key informants often report that mukula (or 'mkula') is *Pterocarpus chrysothrix*, now more commonly referred to as *P. tinctorius* Welw. among specialists, with notably *P. chrysothrix* Taub. (1895) and *P. stolzii* Harms (1915) as synonyms. For details see: www.villegge.ch/musinfo/bd/cjb/africa/details.php?langue=en&id=62768 Look-alike is a common phenomenon and could play a role in the general uncertainty about 'mukula'. More research is needed to bring clarity to this issue and allow scientific investigations at the population level.

economic system characterised by legal ambiguity and limited government oversight. As a consequence, such models repeat historical patterns of exploitation: while local cutters receive an average price of about US\$23 per cubic metre of timber harvested, manufacturers in China pay about US\$1,000–1,100 per cubic metre to importers, before any further processing is done on the exported logs.

Across time and along the chain, politics, vested interests and elite capture have left little space for environmental concerns regarding the sustainability of mukula production – or any other species, for that matter. And yet results point towards potential negative environmental impacts directly linked to the evolution of the chain over the years, irrespective of the policy decisions taken in the name of better management. Importantly, these concerns must not only be linked to mukula or look-alike species, but also to the broader impacts on the delicate *miombo* ecosystem and its structure, soil and fauna when deprived of a locally abundant species or group of species.

The business structures and models described in this document are also largely unrelated to – and indeed unconstrained by – established national borders and regulations. They are fluid in nature and easily move across borders. In Zambia's case, the search for mukula and rosewood more generally has spread across neighbouring countries such as the Democratic Republic of Congo, Mozambique and Malawi over a short period of time, causing havoc in those countries' natural capital. Power hierarchies at all levels of the state and across borders try to benefit as much and as quickly as possible, ultimately hampering the establishment of sustainable businesses. Because many operations in the timber export value chain need to be arranged well in advance, greater numbers of 'insecure' or 'unclear' elements or events in the chain render business riskier. These are not insurmountable barriers to doing business, as demonstrated by our results, but they increase the number of buyers and traders who hesitate to make any medium- to long-term investments, which are needed for well-managed, sustainable and efficient forest sectors in Zambia and beyond.

All this creates new challenges for national governments and the international community in promoting rural development and sustainable use of natural resources such as land, timber and minerals. Such a 'globalised' rural informal economy urgently calls for innovative policies that can maximise the benefits of global capital flowing directly to rural populations and minimise the negative impacts associated with the environment, revenue losses and resource governance. Better integrated regional solutions are needed. In addition, given a long history of failures with the business model of logging concessions, the Zambian government must step up its efforts in protecting the Zambian forests and its people's long-term livelihoods by actually implementing the innovative measures included in the Forests Act of 2015 regarding community, joint and private forest management.

More broadly, findings speak to a powerful dynamic across sub-Saharan Africa which is moving from exceptional to more and more common: existing national laws have proven insufficient to contend with fast-spreading, spatially-disconnected and financially-intensive business models. While Zambian forests were being emptied of rosewood, the Zambian government was still deliberating on potential countermeasures, and buyers and traders had already started storming the forests of Malawi, DRC and Mozambique and shipping containers of timber from Kenya, Tanzania, Mozambique, South Africa and Namibia.

Domestic solutions are bound to fail where commodities can be grabbed before national laws even realise that something is wrong. International agencies (such as INTERPOL), laws, regulations, agencies (such as customs) and conventions (such as CITES) exist that can, and do, help in the effort. But, as our documentation reveals, what is necessary first and foremost is a better regional, supra-national integration of sub-Saharan countries where such commodities can be found and harvested. Unless that is done, countries will keep perfecting their own laws, only to find that implementation is useless because the resource is already gone, and their fragile forests irreparably damaged.

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Acronyms

ACC	Anti-Corruption Commission
ADB	African Development Bank
AU	African Union
CFM	Community forest management
CITES	Convention on International Trade in Endangered Species
CSO	Central Statistics Office
CSOs	Civil society organisations
DEC	Drug Enforcement Commission
DFO	District forestry officer
DRC	Democratic Republic of Congo
FAOSTAT	Food and Agriculture Organisation online statistical database
FD	Forestry Department
FEVCO	Forestry and Environmental Vision Consultancy
FGDs	Focus group discussions
FNDP	Fifth National Development Plan
GRZ	Government of the Republic of Zambia
Ha	Hectare (10,000m ²)
IAPRI	Indaba Agricultural Policy Research Institute
ITTO	International Timber Trade Organisation
JFM	Joint forest management
KII	Key informant interviews
LoC	Letters of consent
MLNR	Ministry of Lands and Natural Resources
MTENR	Ministry of Tourism, Environment and Natural Resources
NAPSA	National Pension Scheme Authority
NGO	Non-governmental organisation
PACRA	Patents and Companies Registration Agency
PE	Political economy
PFAP	Provincial Forestry Action Programme
PFM	Private forest management
PFO	Provincial forestry officer
REDD+	Reducing emissions from deforestation and forest degradation
SNV	Stichting Nederlandse Vrijwilligers (Netherlands Development Organisation)
SSA	Sub-Saharan Africa
TA	Traditional/customary authority
UN-COMTRADE	United Nations commodity trade database
VCA	Value chain analysis
ZAFFICO	Zambia Forests and Forestry Industries Corporation
ZEMA	Zambia Environmental Management Agency
ZP	Zambia Police
ZRA	Zambia Revenue Authority

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Photo: Leaves of the mukula tree, Zambia. Credit: CIFOR, 2018.



1

Introduction

In much of sub-Saharan Africa (SSA), the informal economy rules supreme. Often defined as production, distribution and service provision by unincorporated and/or unregistered firms and workers that stand outside a country's social protection, tax and regulatory systems (Husmanns 2003; Hansen 2008), informal economic activities in rural and urban areas across SSA occur in sectors such as agriculture, forestry and mining. They provide crucial cash income and employment for the populations, especially for youth and women who may otherwise be excluded from the formal economy (Weng 2015). Governing the informal economy is recognised as a key policy challenge for governments across SSA due to both its contribution to local livelihoods and its common – albeit often incorrect – association with illegality, tax evasion and unsustainable practices (AU 2008; ADB 2013; Benson 2014). As a result of the increasingly globalised trade in commodities, parts of the local informal economy may also be supported by global sources of capital.

Rural villagers across SSA are increasingly forging direct links with foreign investors tied to global capital, which accelerates the rate of small-scale production and extraction of resources – all the while still embedded in the rural economic system characterised by legal ambiguity and limited government oversight. This

poses new challenges for both national governments and the international community in promoting the rural development and sustainable use of natural resources such as land, timber and minerals. Such a 'globalised' informal rural economy urgently calls for innovative policies and adequate implementation to maximise the benefits of global capital flowing directly to rural populations while minimising the negative impacts associated with the environment and revenue losses. Zambia, our focus here, is no exception to these trends and concerns.

Zambia defines the informal economy as “the carrying out of economic activities outside established control structures of the government; non-registration with the Patents and Companies Registration Agency (PACRA), National Pension Scheme Authority (NAPSA), and Zambia Revenue Authority (ZRA)” (Phiri and Nakamba-Kabaso 2012). While operating outside of government regulations, the informal economy in Zambia still produces and distributes a broad array of economically valuable goods and services through a network of unregistered entities (Ndhlovu 2011). Despite (or perhaps because of) the economic benefits provided by the informal economy, especially among the economically marginalised populations, tensions exist between those who benefit from the formal versus the informal economies.

The formal economy private sector and state officials are often ill-prepared to deal with access and user rights of natural resources claimed by rural villagers and small-scale producers active in the informal economy. The relationship tends to be lopsided, with the power of (formal) private capital and state officials much greater than that of communities making a living in the informal economy (Phiri and Nakamba-Kabaso 2012). Large mining companies, for example, have historically enjoyed privileged access to the Zambian government (Gadzala 2010). In the forest sector, this is illustrated by the lack of consultation with communities and lack of framework for villagers to participate meaningfully as economic actors within the formal national policy framework for forests and other natural resources until very recently (PFAP 2005; GRZ 2008; Aongola *et al.* 2009; Leventon, Kalaba *et al.* 2014; GRZ 2015; Kokwe and Matakala 2015). The high barriers to entry into the formal economy faced by rural populations have significant livelihoods implications: rural households on average earn more than 45 per cent of their incomes from off-farm economic activities such as agriculture trade, artisanal logging, mining and charcoal trade (Hagglblade *et al.* 2010) – mostly conducted beyond the purview of the state.

The informal economy is one of the few options for rural populations to partake in economic activities that generate vital income. Against this backdrop, our research interrogates the role of global capital, in particular that of Chinese origin in Zambia. In recent years, the role of Chinese investments in natural resource extraction and trade has attracted much attention across SSA (Kamwanga and Koyi 2009; Østfold 2013; Schoneveld *et al.* 2014). While allegations of illegality and negative social and

environmental impacts abound in grey literature as well as the media (Mwenda 2017), few studies have systematically assessed the impacts on small-scale producers linked to Chinese investment. Here, we use the informal economy lens to examine both the opportunities and challenges for rural development and sustainable resource use created by the international trade of one commodity – timber – with contested legal origin. Three main research questions guide our work:

- 1) How does Zambia's resource governance context – with its pre-existing constraints and power asymmetry – affect the outcomes of the informal extraction and trade of one commodity, notably in relation to livelihoods and the environment?
- 2) Along the value chain, how are upstream informal economic activities shaped by international trade with China?
- 3) What are the economic, social and environmental impacts associated with the commodity trade and subsequent government interventions?

Based on the results, we also discuss how Zambia may better address the trade-offs involved in governing an informal economic activity that supports rural livelihoods, very likely harms its forest resources, and presents significant opportunities both for fiscal revenue and rent-seeking behaviours. To illustrate the links between global capital (in particular that of Chinese origin in Zambia), and its impacts on rural livelihoods, the environment and resource governance, we focus on the international trade in the timber 'mukula', as it is known in the Zambian context. It is important to note that, although in the Zambian regulations mukula does appear as *Pterocarpus chrysothrix* or *P. tinctorius* – neither of which is included in the Chinese official list of rosewood species – there is no agreement in the available literature about whether 'mukula' refers to a single species or to various species. In fact, 'look-alike' among species is a common phenomenon that could play a role in the general uncertainty about mukula (Cunningham 2016).

Yet today mukula does reach the international market as rosewood and, anticipating the results, it is worth noting upfront that Chinese buyers report in our interviews that the initial boom in mukula (around 2010–2012) was actually a boom in a fake rosewood market, as mukula was shipped through various ports and 'Chinese businessmen in India', mainly to Vietnam and the Philippines, where it was eventually mixed with *Pterocarpus santalinus* (red sandalwood) and then processed and sold as such on the furniture market in China. Over the years, however, as mukula became a recognised species, at least within traders and final importers on the Chinese market, such trends seem to have decreased, and shipments now occur also directly to China.

1.1 The case of mukula

This paper examines the case of mukula which, in recent years, has been widely harvested, traded and exported out of the country, stirring media, civil society, private sector and government attention alike. It fetches very high prices in China and is part of a wider rosewood trade that affects much of Southeast Asia and parts of Africa and South America (Huang and Sun 2013). China imports large amounts of tropical hardwood species with dark-red colours in the form of logs to make *hongmu* (literal translation: red wood) antique furniture, historically used by the imperial elite and now coveted by the rising wealthy middle class. Because of this international dimension of trade, and the push-and-pull effect that global capital may have on Zambia's regulations and resource governance, mukula is an ideal illustration of one commodity that can theoretically be tightly regulated and traded within the formal economy and yet is almost entirely nested in the informal one (Puustjärvi *et al.* 2005; FEVCO 2007; Lwaile and Gumbo 2016).

Following the first two research questions regarding the governance context and the value chain, in Section 3.1 we specifically examine the role of the Chinese market and both Chinese and non-Chinese operators in the mukula trade and the extent to which they have bolstered informality in rural communities – and at times outright illegality in the timber sector in Zambia. We document how mukula changed from a previously little-known commercial timber species to the dominant Zambian timber species exported to the Chinese market starting around 2010. Between 2010 and 2017, the government responded with an array of conflicting policies, characterised by a 'ban-lift-ban-lift' cycle, with the most recent ban adopted in June 2017. This has sent confusing and conflicting signals to operators along the value chain, from rural loggers to Chinese buyers and even government officials tasked with enforcement at the front line.

Along the value chain, we also study the role of Zambian players, in particular government and traditional authorities who sanction and often participate in the trade. They contribute to shaping the contours that the mukula value chain assumes over time – from partly legal to informal to tout-court illegal – ultimately creating a legal ambiguity that has come to characterise Zambia's forest governance regime in recent years. This ambiguity has engendered policy-practice gaps along the value chain, which ultimately impact the wellbeing of many Zambians and the environment. We investigate the reasons for the gaps between policy and practice by focusing on the behaviours of players in the governance arena. We argue that informality in policymaking is driven by four factors: (1) rent-seeking behaviour at the highest political level, facilitated and reinforced by the legal ambiguity of regulations; (2) rent-seeking behaviour among decentralised officials at lower levels of government; (3) constrained capacity of the Forestry Department (FD) to implement the regulations it is tasked with; and (4), insufficient understanding of market forces on the part of regulators.

The politicised nature of this trade and the governance conditions under which it developed is a central theme running through our analysis. We argue that a dysfunctional forest governance regime in Zambia not only does little to alleviate the pressure on forests in the face of resource-hungry markets and investors, but may also create perverse incentives where rural communities lose out while the powerful and the connected continue to exploit forests for significant profits.

Following the third research question related to impacts, in Section 3.2 we examine the upstream part of the mukula value chain, which largely consists of individual cutters, small-scale operators in pit sawing and chainsaw millers in the rural communities in forested areas – many of whom often operate without some or all of the officially requested paperwork. Their activity has significant implications for rural livelihoods, as demonstrated by our findings on income, expenditure and asset purchases. This concurs with research findings for other high-value species in many African countries and beyond (Mackenzie 2006; Milledge *et al.* 2007; Cerutti and Tacconi 2008; Cerutti *et al.* 2014; Lescuyer *et al.* 2014; Weng 2015; Pacheco *et al.* 2016). Such positive livelihood impacts are, however, short lived and accompanied by potentially serious environmental impacts, as discussed in Section 3.3. This is largely illustrated by the absence of rules surrounding harvesting – neither community-based nor government enforced – that could ensure sustainability of the resource base.

Ultimately, we will show, that desire by the end market and operators to obtain timber as quickly and as cheaply as possible (not restrained by a stronger and more coherent forest governance regime) has led to the development of a *de facto* illegal process for accessing, producing and exporting the resource. That said, mukula exports may still take place on the right side of the law, as provisions are sometimes in place that grant the required rubber stamps for a 'legal' passage at key nodes of the value chain. It would be easy to think that by chocking the engine of this 'machine' with a ban, for instance, on production and export across the entire national territory, one could halt, monitor and later jumpstart the 'machine' again once the correct road conditions are in place. Yet this assumes that any one actor, however powerful, owns the keys to choke the engine or actually turn it off. In fact, as our findings show, this seems to be very distant from the Zambian reality. Hence one needs to approach such 'legalised illegality' from multiple angles, starting with a nuanced analysis of its drivers, impacts and potential solutions. This is what this research aimed to achieve, by critically examining how the Zambian government's efforts to combat the amorphous nature of the mukula business produced unintended negative consequences for the viability of the sector, the livelihoods of smallholders and the very resources that they aimed to manage and conserve.

To better understand the context within which the dynamics above developed over the years, and the results that will be presented later, the next section provides a short overview of Zambia's timber sector.

1.2 Zambia's timber sector: an overview

In this section, we discuss how well the forest governance regime has historically functioned in Zambia vis-à-vis sustainable forest management, poverty alleviation and promotion of a value-added timber processing industry. We present the status of Zambia's forests, discuss the role and capacity of the Forestry Department (FD) in ensuring sustainable use of the forest resources, and finally consider the place of small-scale logging and community forest management in the legal framework. Even before the mukula trade, it will become clear, informality was deeply embedded in the timber sector.

The Zambian government lists the forestry sector as one of the main priority areas for industrial development (UNEP 2015; Häggblom & Partners 2017). Forests cover about 66% (over 50 million ha) of Zambia's total land area. The country holds a total of 2.9 billion m³ of trees, 72% of which stand in the semi-evergreen miombo-dominated forests (UNEP 2015; van Hensbergen and Njovu 2015; Häggblom & Partners 2017). The country currently lists 19 commercial indigenous timber species that account for about 12% of the growing stock (Mukosha and Siampale 2008). In reality, however, exploitation by both domestic and international companies has focussed only on a handful of species under immense pressures, namely *Baikiaea plurijuga*, *Pterocarpus angolensis* (mukwa, or African teak) and *Guibourtia coleosperma* (African rosewood). The official annual deforestation rate of these species is estimated to be 5% since 1996, but estimates vary (Kokwe and Matakala 2015). For example, FAO (2000) indicated that the figure could be as high as 850,000 ha/year. Just as in the rest of SSA, forest degradation and deforestation in Zambia are caused by multiple factors among which small-scale agriculture, charcoal production and commercial logging rank prominently (GRZ 2010).

Understanding Zambia's forest governance requires an examination of the mandate of the FD vis-à-vis its operational reality. The Forests Act of 2015 mandates the FD under the Ministry of Lands and Natural Resources to "promote sustainable forest management to provide forest products and services to present and future generations". Its activities include control, management, conservation and administration of the National and Local Forests.² In the timber sector, the FD carries out this mandate by stipulating licence and fee requirements for concession, production, conveyance, sawmilling and export for varying scale of operations (see Annex 1 for details). To ensure that timber production and trade achieve social and environmental objectives, the licence requirements also include various social and environmental safeguards (see details in Annex 1 and discussion in Section 4).

In truth, the FD mandate is a quasi-impossible task for an agency that has constantly suffered from under-budgeting, irregular budget disbursements and under-staffing (GRZ 2016). For example, between 2012 and 2015, the government budgeted on average

² Forests Act 2015, Section 5 (1) and 2 (b).

about US\$5.5 million per year for the FD. Yet the FD actually only received on average about 33% of the allocation, with the disbursement-to-allocation ratio reaching about 19% in 2014 (Table 1).

Table 1. Budget allocation and disbursement to FD between 2012 and 2015 (US\$ million)

Funds (US\$ million)	2012	2013	2014	2015	Average
Allocated	5.8	4.0	6.9	5.1	5.5
Released	1.9	2.0	1.3	1.4	1.7
Ratio (%)	32.8	50.0	18.8	27.5	32.3

Source: (GRZ 2016)

While Provincial funds may have contributed some budget to some decentralised offices, the overall FD operated on an actual annual budget of (on average) US\$1.7 million in recent years – which puts it second to last among the various departments of the same parent Ministry (GRZ 2016). This is not unique to Zambia. Across much of SSA, due to low-revenue generation, the forestry sector has often been deprioritised vis-à-vis other natural resources sectors in land-use planning and budget allocation (Gondo 2010; Fowler, Abbott *et al.* 2011). This asymmetry of power matters hugely. When a commodity suddenly presents a source of significant profits for people and institutions that feel ‘abandoned’ by the central power (as in the case of mukula in Zambia), elite capture and perverse incentives impede improved policy design, further challenging and thwarting the institutional power of the FD.

The FD’s implementation of the legal framework is thus unsurprisingly weak, and official data are often incomplete (see for example Lukumbuzya and Sianga 2017). The FD must oversee 50 million ha of forests, or an area equivalent to twice the size of the United Kingdom – inaccessible without significant resource allocation – and monitor and enforce the onerous legal requirements over countless small-scale loggers and companies operating across the country. All this is to be done with about 655 staff (including administrative staff) stationed at headquarter in the capital, Lusaka, and in the country’s 10 provinces and 104 Districts, the latter run by District Forestry Officers (DFO) who must carry out all district level functions including extension services to local communities, enforcement of regulations through licensing and patrols, managing protected forests, collecting revenues from the sale of forest products, and managing forest woodlots and plantations.

In actual practice, management for timber production is reduced to the issuance of some sort of official documentation along the way from harvesting to consumption or export, and enforcement is restricted to roadblocks on feeder roads and collection of conveyance fees as a condition of passage. The larger objectives of sustainable forest management

that are embedded into the legal framework remain a distant thought in the everyday work of FD officials. Thus, while Zambia does have a legal framework for sustainable forest management, this remains largely only on paper; adequate implementation is highly unlikely.

The weak presence of the FD at the production level has significant implications for the mukula trade, especially how well the relevant regulations produce their intended impacts on the ground. Indeed, the preference for consecutive bans employed to control the trade, over other measures that would require higher monitoring and extension capacity, partially results from the FD's constrained capacity and budget.

Despite these challenges, a recent positive development in Zambia's forest governance regime is the increasing consideration given to forest-dependent communities in the legislation, notably the Forests Act of 2015. Historically, Zambia's forest regulation has barely considered small-scale logging, the type of operations conducted by rural villagers mostly using axes and handsaws (the smallest type of forest extraction licence was the pit sawing licence, withdrawn from the Forests Act of 2015 due to difficulties with policing and monitoring). The Forests Act of 2015 represents an important milestone, as it provides for joint forest management of forest resources with communities, though the implementation guidelines are still being drafted. Once operational, it would allow benefit-sharing of tree resources – especially commercial timber – with local communities. If offered an alternative legal way of generating income from timber, small-scale loggers (who almost always come from local communities) could be incentivised against illegal harvest. Though the latest focus on community forestry is a welcome development, implementation faces serious challenges if the aforementioned capacity and resources issues are not resolved. Indeed, community forestry requires significant extension services for it to be successful.

1.3 Implications beyond Zambia

The mukula case also helps shed light on some of the limitations of national policies when they are developed and adopted in isolation from broader regional and global dynamics, and without necessary attention paid to the creativity of private capital in search of highly valuable commodities.

This allows 'leakage' effects to develop, which simply shift negative impacts from one geography to another, as illustrated by the recent large-scale expansion of mukula harvesting and trade into Zambia's neighbouring countries such as Malawi, Mozambique and the DRC. In addition, the ambiguity about which species are officially recognised as mukula or *hongmu* (rosewood) contributes to the fast-changing demand for any species that fit the requested characteristics. For instance, mukula is not among the 33 species recognised as *hongmu* by the Chinese government; it has not been included in the CITES 2016 decision to add some rosewood species, particularly from Africa, to Annex II; and

indeed it has been 'discovered' and added to the list of Zambian commercial species only recently. Yet, initially because of its characteristics and resemblance to the listed rosewood species, and later its commercial recognition as a valuable species on its own, operators have been very active in harvesting, trading and promoting it, and mukula and other similar species fetch very high prices on the international market, with direct socio-economic and environmental consequences in production areas.

This active and fast-shifting business model challenges current policymaking on rural development and resource governance, particularly in SSA but also beyond, as small-scale timber production for commercial purposes is booming across much of the continent and has become a key source of income for rural communities (Milledge *et al.* 2007; Hicks 2013). This is partly because such an atypical model (when compared to the historically more geographically and financially 'static' timber concession model) is not fully acknowledged, and much less legislated for, in the current forest or environmental legal frameworks. It links farmers-turned-loggers with capital (foreign and domestic) provided by individuals and small- and medium-enterprises firmly embedded in the informal economy. This creates a dynamic value chain and market that develop outside the formal concessionary model, and yet at critical nodes (such as the delivery of export permits), maintain the necessary links to the latter.

Though largely invisible in the official statistics of timber production in many SSA countries including Zambia, this type of business has attracted a broad array of operators (Cerutti *et al.* 2017). The latter often operate in the grey space between legality and illegality for several reasons: (1) generally high barriers of entry due to unrealistic legal requirements for small-scale operators or farmers-turned-loggers in rural villages (where such regulations are largely unknown); (2) lack of enforcement capacity on the ground by the agencies with such mandate; and (3) confusing and at times conflicting regulations issued by a multitude of 'authorities'. Yet, for various reasons discussed in more detail in the following sections, the model greatly impacts both the socio-economic and the environmental conditions found in rural areas. As such, policies need to go beyond simplistic 'enforce or ban' models currently applied to most illegal logging debates, and instead find innovative ways of tackling the (sometimes hard) trade-offs between positive financial impacts and negative environmental ones.

This paper is organised as follows: methods (Section 2), followed by a results section (Section 3). The results section is subdivided into an overview of what happened, including timeline, regulatory responses, value chain actors and responses (Section 3.1), livelihood impacts on rural communities (Section 3.2), environmental impacts (Section 3.3), and an analysis of the actual scale of the mukula trade despite government regulations and the informality in policymaking driven by various political economic factors (Section 3.4). Before concluding, a discussion (Section 4) will focus on the most relevant findings and a few possible ways forwards for the mukula value chain and the broader Zambian timber sector.



Photo: A focus group discussion in Zambia. Credit: CIFOR, 2018.



2

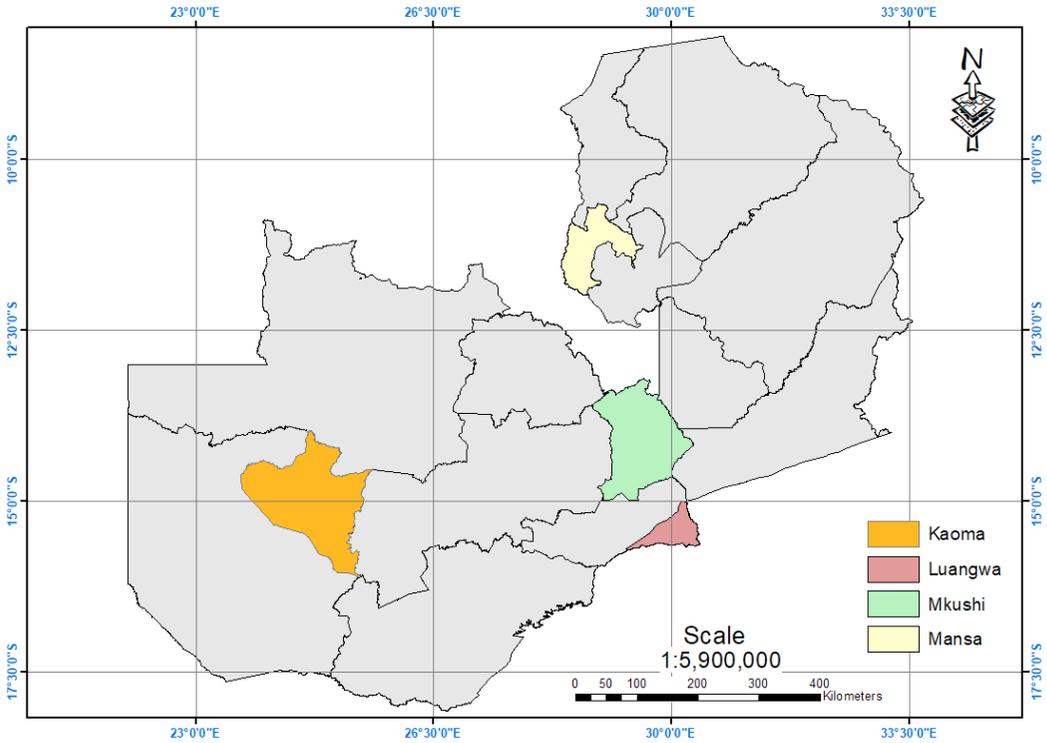
Methods

2.1 Approach, techniques and tools

Fieldwork for this study took place between 2016 and 2017. First we conducted an extensive literature review which included published as well as unpublished or 'grey' literature, mostly reports produced for and by the GRZ by its various partners and agencies. Then, for six weeks in May 2016, we carried out a brief scoping study based on open-ended interviews and follow-up discussions and phone calls to gain a better understanding of the mukula timber value chain in Zambia including the roles of the various people involved from production, conveyance and trade. The targeted interviewees were identified among rural communities, timber harvesters, government and private sector officials, brokers and intermediaries, and companies buying and eventually shipping timber out of the country. To conduct this research and assess the validity of our initial hypotheses, four provinces (Western, Lusaka, Luapula and Central) were chosen where mukula was being (or had been) actively harvested and traded, with and without concessions. In each province, one district was selected based on present or past activity around mukula harvesting and trade as per FD

records. This led to the selection of four districts: Kaoma (Western), Luangwa (Lusaka), Mansa (Luapula) and Mkushi (Central) (Figure 1).

Figure 1. The four study districts



After a review of the findings and observations from the pilot study, three questionnaires were developed, tested and administered in selected villages within the four districts. Each questionnaire targeted a different group of people deemed to be part of the value chain: operators (one-to-one surveys and semi-structured interviews with local men and women who cut mukula for sale to Chinese and/or non-Chinese buyers, local and urban brokers and intermediaries, local Chinese and non-Chinese buyers and traders); ordinary villagers (focus group discussions or FDGs with an interview guide to obtain generalised views of the community) and selected knowledgeable people as key informants (one-to-one interviews with provincial forestry officers or PFOs, district forestry officers or DFOs, local chiefs, headmen and women, civil society organisations or CSOs, and so on). In addition, consultative meetings were held with selected PFOs and DFOs after the fieldwork was completed, in order to triangulate and validate data.

The three questionnaires focused on three main analytical lenses used to approach the research questions, as follows:

1. To gain an understanding of the nodes of the value chain, and the related livelihoods impacts, questions pertaining to the Value Chain Analysis (VCA) were asked (regarding, for example, past and current income and activities, changes over time, relations with buyers, sellers, local elites, government officials and other intervening operators, rules of access and origin of capital).
2. To better understand the interlinkages between the nodes, or why and how the chain works as it does, questions aiming at clarifying the local and national political economy dynamics were asked (such as how various processes should take place according to the law, how they actually took place, and the possible reasons why discrepancies between the two were observed).
3. To broadly assess the environmental impacts of the chain, notably in production areas, relevant questions were asked (including how trees are chosen, how far from rivers, what diameters, height of cut and post-harvesting operations).

For the purpose of this study, an ‘operation’ is defined as the group of actions that occur from the locating of the merchantable mukula trees to their harvesting, transport to the loading bay, debarking and, lastly, their loading on a truck or container that brings the logs to the next step along the chain – in general, the involvement of intermediaries, brokers or warehouse owners. The study specifically concentrated on the informal commercial timber harvesting operations that occur either inside or outside forest concessions in the four selected districts. Lastly, where possible and/or feasible, field observations and informal, open-ended interviews in each village were conducted to triangulate – for greater validity (elaboration or confirmation) – and to complement the data collected from the questionnaires (Bryman 2012).

We visited each selected district at least three times. We introduced the project to PFOs at provincial level, and then to the DFOs in the selected districts where the team worked with local chiefs to obtain the list of villages and households. These were used to set a randomised sample which, considering the resources available, covered a minimum of 20 per cent of the total number of villages. As for the operators along the value chain, in particular brokers and buyers in urban settings who, given the sensitivity of the issue, were not easy to trace and/or interview, a snowball approach was used. In the second stage, we carried out interviews with operators and key informants, and conducted focus group discussions. Finally, we met with DFOs and PFOs as part of the triangulation, especially to comprehend the political economy of the production and trade of mukula.

Since Mukula is almost entirely exported, a few parts of the value chain are missing from our field assessments, notably those that lie outside the Zambian borders. To understand these missing links, we made use of the available literature, data from Chinese customs

and interviews with Chinese operators in Zambia who are directly related to at least the first importers in China.

Table 2 shows a summary of the total number of harvesters and key informants interviewed and the total number of FDGs conducted in each of the districts, in addition to validation meetings with PFOs, DFOs and licencing officers. In total, 175 cutters were interviewed and 267 operations assessed, producing about 31,500 logs (avg. 0.2m³/log) over a five year period (2012–2016), or an average of about 135 logs per operation.

Table 2. Summary of surveys and consultative meetings conducted

	District									Total
	Mansa	Kaoma	Mkushi	Luangwa	Lusaka	Kabwe	Chipata	Choma	Chinsali	
Timber harvesters	36	36	47	56						175
Intermediaries/ brokers										11
Buyers										21
Key informants	14	19	12	14						59
FGDs	15	8	14	15						52**
DFOs*	2	1	1	1	2	1				8
PFOs	1				1	1	1	1	1	6

* And Licencing officers

** The focus group discussions involved a total of 494 participants

We conducted three FGDs in each selected village, using the following protocol to organise the participants: one group with local leadership (both those with knowledge of the trade and those without), one group with women (both those with knowledge of the trade and those without), and one group with resident youth (mixed in gender, both with and without knowledge of the trade). In total, we held 52 focus group discussions across 29 villages in the 4 districts, with a total of 494 participants. About 40% of participants were adult women, 29% were adult men, and 31% were youth groups (gender unspecified). The higher proportion of women is first because women make up a higher percentage of the population in the villages under study, and second because they are more willing to participate in discussions about forestry matters (as they typically are using a broader array of resources vis-à-vis their male counterparts).

2.2 Limitations

Two main limitations characterise this study. First, reliable information was hard to come by. It should be noted that our study was carried out in a period of extreme cycles of intimidation and clamping down on operators across the country, in parallel with the typical political dynamics occurring before, during and after presidential elections (which took place in August 2016). If the interest of the presidency in the mukula trade and its environmental impacts could be interpreted as a good sign (as for instance illustrated by the most recent presidential visit to the DRC/Zambia border in April 2017), it yet also signalled to the entire hierarchy that things have reached a critical point and that change, one way or another, is inevitable to bring normalcy to the trade. All this has impacted how people react to requests for interviews on that very issue and how they decide to answer certain questions. We ought thus to treat with caution some of the replies from key informants, especially FD officials at all levels.

Similarly, interviews with intermediaries and buyers (Chinese and non-Chinese) were difficult to set up and, even where possible, interviewees were highly suspicious and reluctant to be interviewed or to go on the record. Such suspicions only intensified during the fieldwork as, from the initial months of 2016 to the first quarter of 2017, the status of mukula timber trade remained tense with government clamping down on it. As expected, it was also difficult to identify and talk to Chinese traders as most indicated that they could not speak English. This problem was at least partly palliated by having two speakers of standard Mandarin in the team who could also understand quite a lot of local Chinese dialects, in addition to a lot of triangulation efforts and in-depth informal discussions with key informants.

Second, because of the same intimidation and pressures, it became very difficult to reach out to traders and final buyers in Zambia, both Chinese and non-Chinese (the former more so than the latter). As indicated earlier, multiple approaches were used, from direct contact in markets, offices or households, to phone calls and conversations on social media. A larger number of interviews would have provided more qualification to the information gathered on those nodes of the chain. This is especially true on one of the last nodes present on the Zambian territory – when buyers have to get access to paperwork to export their timber. While it makes sense for interviewees not to release much information on their contacts within the government hierarchy, it renders the description of the value chain and its political economic dynamics somehow incomplete. Results clearly indicate that the FD is not the only institution that matters when it comes to get access to decisional power and/or paperwork. While we did get an indication of a few other places and people through which one can bypass the FD, due to ethical considerations (undercover research was not used in this study), we had to limit ourselves to the information gathered.



Photo: Mukula timber debarking, Zambia. Credit: CIFOR, 2018.



3

Results

The complex dynamics, technical decisions and political connections that contribute to the mukula story in Zambia can only be fully understood if various layers of information are first assessed individually. The following sections, in line with the three major questions that underpinned this study, attempt to peel away one layer at a time, before gluing them together in the discussion to provide a coherent and hopefully nuanced understanding of what is happening on the ground, why it is happening, who contributes to each layer and what can realistically be done to improve the situation. This section is organised as follows: an overview of what happened, including timeline, people involved and regulatory responses, under the analytical lenses of resource governance, informality and elite capture in policymaking (Section 3.1); livelihood impacts on rural communities (Section 3.2); environmental impacts (Section 3.3); and a final section in which quantitative data is used to gauge the scope of mukula harvesting, trade and revenue losses (Section 3.4).

3.1 Overview: regulatory changes and value chain responses

This section provides an overview of the shifting regulatory landscape of the mukula trade – constantly oscillating between legal and illegal, leaving ample space for informality – and how the value chain responded to the changes with shifting roles and power dynamics among the key players.

3.1.1 The mukula regulatory timeline and the ‘ban-and-lift’ cycle

We first examine the regulatory landscape and the important changes that have occurred since the trade picked up speed around 2010. We identify five stages (Figure 2) that will be explained in greater detail below: (1) inception (2010–2013); (2) general logging ban on commercial species (issued in the beginning of 2013 and lifted at the end of same year); (3) mukula specific ban (2014–2015); (4) mukula ban lifted (Oct 2015); and (5) ongoing ban-and-lift cycle (2015–present). Throughout this period, bans (on production, conveyance or export) were the preferred measure used by the Forestry Department, possibly due to constrained capacity and budget. Indeed, as early as 2005 a ban had already been placed also on mukwa – one of the most harvested species – for fear of overexploitation.

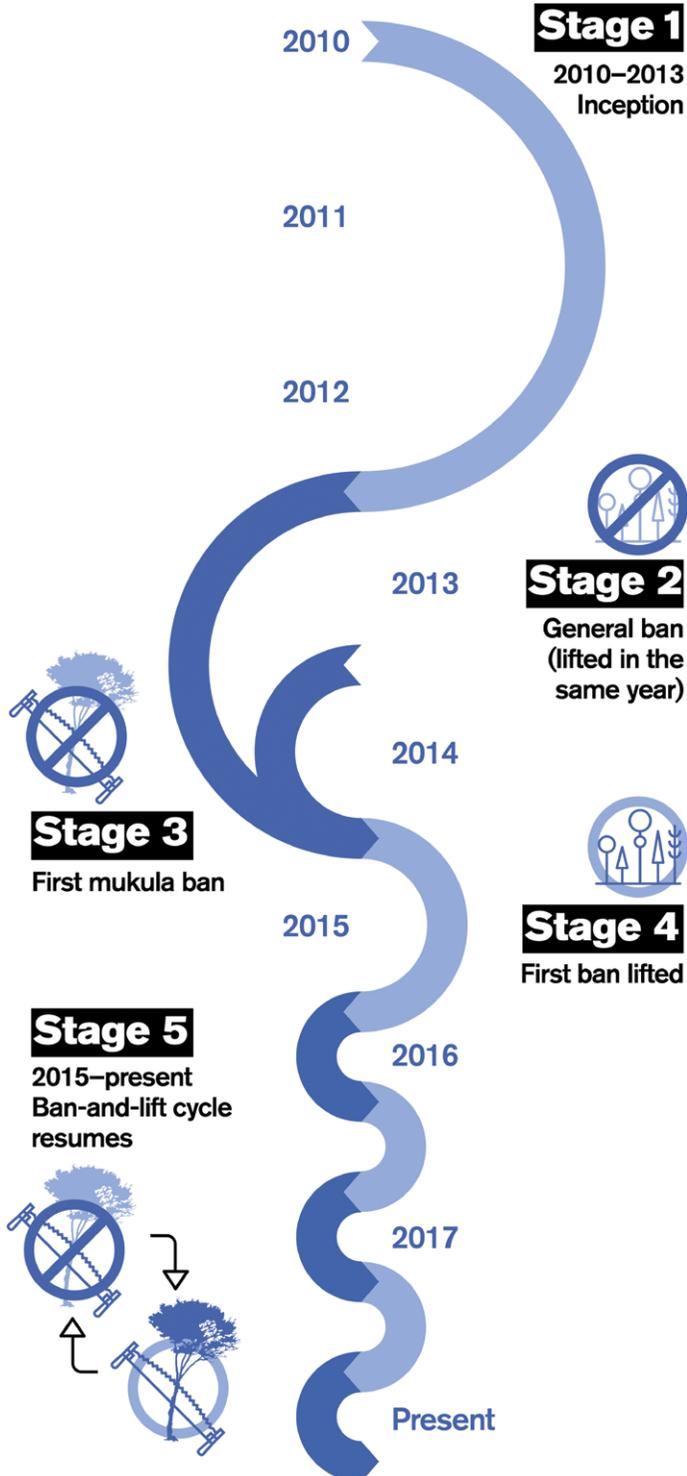
Stage 1: Inception (2010–2013)

Throughout this period, mukula neither fell under a specific regulation nor was it explicitly listed as a commercial species. It thus legally fell under the general ‘other’ category. In some instances, it seems that mukula was treated as falling under other *Pterocarpus* (such as *P. angolensis* or mukwa), adding to the look-alike problem mentioned already, though we found no evidence that this was the collective understanding of the enforcement agencies on the ground. Hence, although the situation on the ground remained very unclear as to what rule applied to what species, legally, mukula was not covered by the general ban imposed in June 2013 (see Stage 2).

Stage 2: General log ban on all commercial species (2013)

In June 2013, a general ban on logging of all commercial species was imposed. It was justified as a response to widespread corruption, malpractice and mismanagement in the timber industry; in addition, the Government of the Republic of Zambia (GRZ) desired to protect the Zambian forests against depletion and wanted to take stock of the resource availability for better future planning. At the time of writing, the recommended stock assessment of the timber resources has still not been completed. The general log ban in

Figure 2. The 'ban-and-lift' cycle through different stages



fact lasted only a few months. It was lifted in October 2013 due to the need to honour the existing concessions that had been signed and the movement of timber that was in transit at the time of the ban.

Importantly, in 2013, a ministerial statement declared that foreigners should not be allowed in timber production and trade – a clear response to the Chinese that were roaming the country in search of mukula. Over the years, the issue of Chinese nationals being involved in the Zambian timber business has always been central, but with varying political connotations. Responses ranged from a declared willingness to keep them out of the timber business altogether to an invitation to at least “establish factories right in the areas where they cut the timber so that they create jobs for the surrounding communities” (National Assembly of Zambia, 2016).

Stage 3: The first mukula ban (July 2014–April 2015)

In early 2014, the government specifically banned the logging of mukula. Later in the year, in November 2014, the government constituted a ‘Taskforce Against Illegal Logging and Trading in Mukula Tree’. Drawing its members from 10 institutions (including the Forestry Department, Zambia Police, Drug Enforcement Commission, Anti-Corruption Commission and Zambia Environmental Management Agency or ZEMA) meant that virtually every relevant government body in the country was on board. And yet the taskforce remained extremely centralised. It found its way into news and was discussed in political circles (such as in the National Assembly of Zambia 2014), but it did little to set up decentralised and effective teams of people working together towards solving the issue at hand.

Interviews indicate that each of the 10 institutions, through the seating of their heads on the central taskforce, sent the signal that ‘something had to be done about mukula’ down the state machine to their respective provincial and district levels. Interviews further indicate that a Joint Operations Committee (JOC), present at district and provincial levels, also existed, involving various security agencies and with the mandate to specifically control the (illegal) movement of mukula logs. As it happened, especially at the district level, the police became a prominent player in enforcement and in the criminalisation (and often imprisonment) of the rural populations, as well as in the collection of hefty informal payments from anyone caught harvesting, processing or transporting mukula. Even when impounded, though, the “mukula trees [were] later auctioned and often bought by the people from whom it [was] initially confiscated” (National Assembly of Zambia 2016).

Stage 4: The first ban is lifted (October 2015)

Eventually, the mukula ban was lifted under the auspices of the newly enunciated National Forestry Policy of 2014, which led to the Forests Act of 2015. This did not alter the harvesting trends, however. Also in 2015, an official delegation was sent by the Ministry of Lands, Natural Resources and Environmental Protection (the Ministry henceforward) to China to try and sell the tens of thousands of mukula logs (between 70 and 100 thousand according to key informants), which had been impounded within the national territory. After the delegation returned, and while the taskforce was taking shape on the ground, the Permanent Secretary of the Ministry wrote to the Inspector-General of Police to authorise the Zambia Forests and Forestry Industries Corporation (ZAFFICO), a parastatal, to auction and move mukula logs within the country in preparation for export to China. This arrangement caught the FD in a quandary, as its roles and responsibilities (notably auctions) were bypassed through the use of ZAFFICO, a shortcut suggested by the FD's own Permanent Secretary.

Stage 5: Ongoing ban-and-lift cycle (2015–current)

After 2015, bans and lifts alternated in quick succession. At the beginning of 2016, a 'mukula timber harvesting and movement ban' was again issued, then lifted in July 2016, and then reinstated at the beginning of 2017. This not only made it difficult to research but, most importantly, posed huge problems to the people engaged in the value chain, both government officials – notably decentralised ones – and the private sector.

Also, in June 2016, a suspension of the issuance, and cancellation of, renewal of forest concession licences was issued. The registered timber merchants with the FD, holders of a timber merchant permit and all concession licences issued under the repealed Forest Act of 1973 were allowed to export timber until their expiry date. The ministry indicated that potential areas for future concession licences would be done in line with regulation 4 (2) of the Forest (Concession Licence) Regulations of 2016, and eventually gave the advice accordingly in August 2016.

More recently, another ban was adopted in June 2017, which prohibits the export of sawlogs of any species. Nevertheless, findings indicate that the Minister, in consultation with the Director of Forests, may issue export permits for any timber if that is deemed necessary in the interest of the Republic. As explained below, this also seems to have been the case when the Minister authorised ZAFFICO (in 2014) to export mukula as logs or cants (unfinished logs to be further processed) on a special permit. As recently as December 2017, various government agencies continued to issue conflicting statements regarding the fate of newly confiscated mukula, whether they can be exported by ZAFFICO under the 2014 special permit or whether mukula will be auctioned off domestically while exports remain prohibited (Lusaka Times 2017; Lusaka Times 2017).

3.1.2 The bans' ambiguous legal status

The chaos in the mukula market caused by unpredictable policymaking was made worse by the fact that most bans were never supported by the necessary statutory instruments; they were legally invalid, as they could not be held in the court of justice. In each instance, they were only ever disseminated through ministerial press statements or radio broadcasts. This quick turnover of informal messages dressed with formality (introduced by a minister during a press conference) created widespread legal ambiguity on the ground, with lower-level government staff tasked with enforcement unsure about the reasons behind the top-level decisions and how they should go about implementing them. When we asked a DFO about the timing and the way in which bans were communicated from the central government to districts, for instance, the interviewee said that she was not sure but that she read it in the newspaper and possibly later received a phone call from a colleague explaining what they were supposed to do. Many DFOs told a similar story, indicating that the absence of statutory instruments was palliated through widespread use of mouth-to-ear messages. Some interviewees indicated that this legal ambiguity was partly intentional, to enable national elites connected to power to continue profiting from the mukula trade.

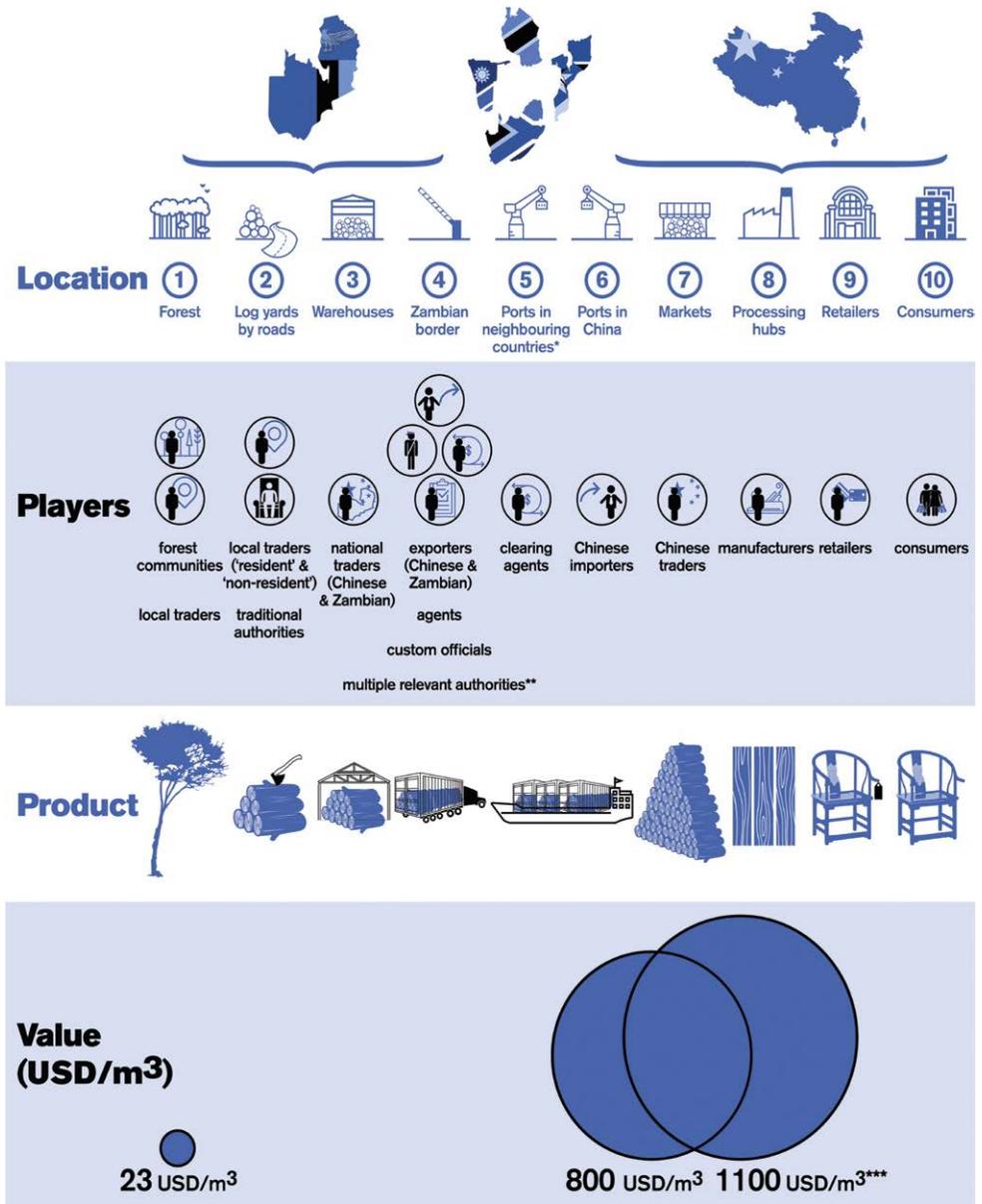
The legally ambiguous regulations have had clear implications for management of Zambia's forests: while the mukula harvest craze continued across Zambia, the flow of information and instructions through the hierarchy (from the top political layers of government, to PFOs and then finally to DFOs) was unclear and inconsistent. This led to misinterpretation of the fast-changing regulatory signals by FD officials who in turn had to provide guidance to operators along the value chain.

How the operators reacted to such changes and contradicting messages, and how their roles and configurations evolved, is the subject of the next section.

3.1.3 The mukula value chain: operators and their responses

Results indicate that at least fifteen 'types' of operators (Figure 3, Players section) exist along ten stages from production to transport, to processing and export of mukula, starting from the Zambian forests to the final Chinese market (Figure 3, Location section).

Figure 3. The mukula value chain: location, players, product and value



* Namibia, Mozambique, South Africa and Tanzania

** Forest Department, Zambian Bureau of Standards, Zambian Revenue Authority, Ministry of Agriculture

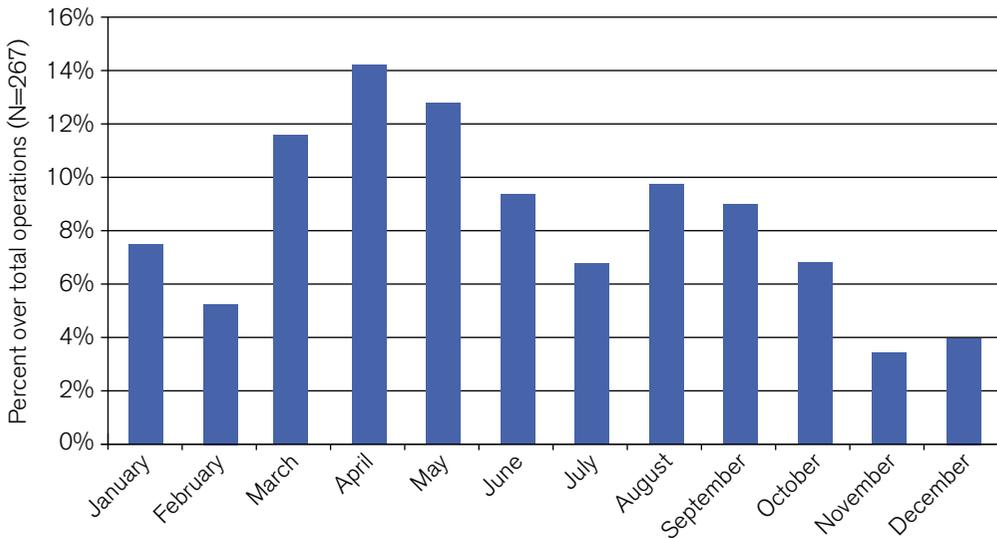
*** This figure was obtained outside of the main body of research and it has not been triangulated with Chinese importers in mainland China

Once trees have been harvested and transported (generally by hand, ox-drawn or very occasionally with tractors) to loading bays by local cutters, they are debarked and loaded onto trucks or containers for transport to warehouses or some other temporary storage facilities. After that, they are roughly processed into 'squared logs' and 'cants'. Then they are either stored in some registered processing facilities before export, or brought directly to the Lusaka market from where they are traded and exported. The characterisation of the modus operandi of each group, and the push-and-pull forces that shape interactions among them, are discussed in the following sub-sections.

3.1.3.1 Cutters

Local communities supply the vast majority of people engaged in cutting mukula. Typically, they are farmers who took up logging as an additional livelihood activity, entering the forest for months at a time to supply timber as specified by buyers. Cutters on average work in teams of five, most commonly using basic tools such as axes found in households or, less frequently, chainsaws. Logging operations generally follow a seasonal pattern linked to rainy and dry seasons, as cutters prefer to camp in the forest during the drier months of the year (broadly March to October, with peaks in April and May; see Figure 4)³.

Figure 4. Seasonal variation of reported operations (N=267)



Findings show that the mukula trade transformed the rural timber harvesting landscape, attracting many new cutters, including women, in a short period of time. Indeed, a large majority of interviewed cutters (84%) entered the logging business in or after 2012 (Figure 5), claiming that mukula was the primary focus of their new activity (Figure

³Zambia's rainy season generally runs from mid-October to mid-April.

6). Prior to the mukula trade, the number of farmers engaged in logging was smaller, focusing mainly on mukwa and African rosewood.

Figure 5. Start date in logging reported by interviewed cutters (bars = total per year, line = cumulative percentage)

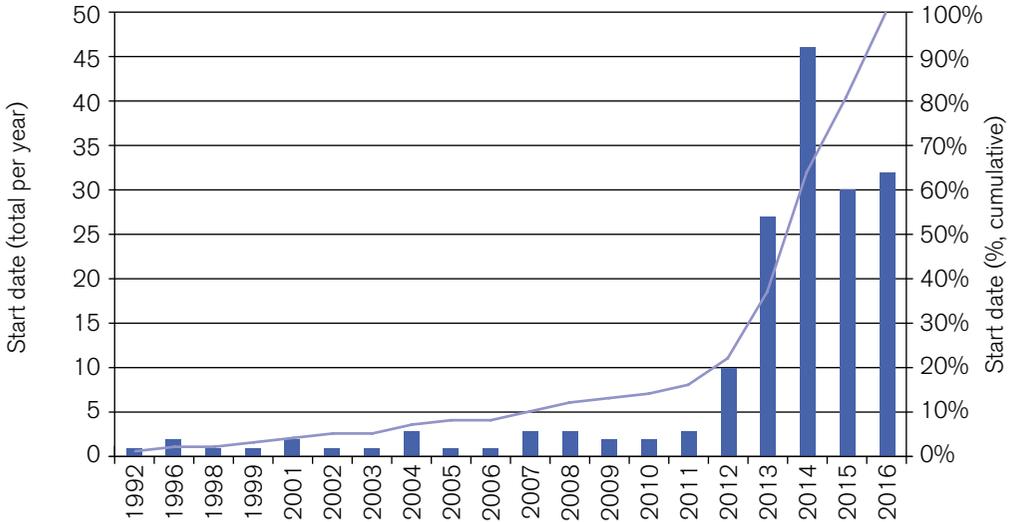
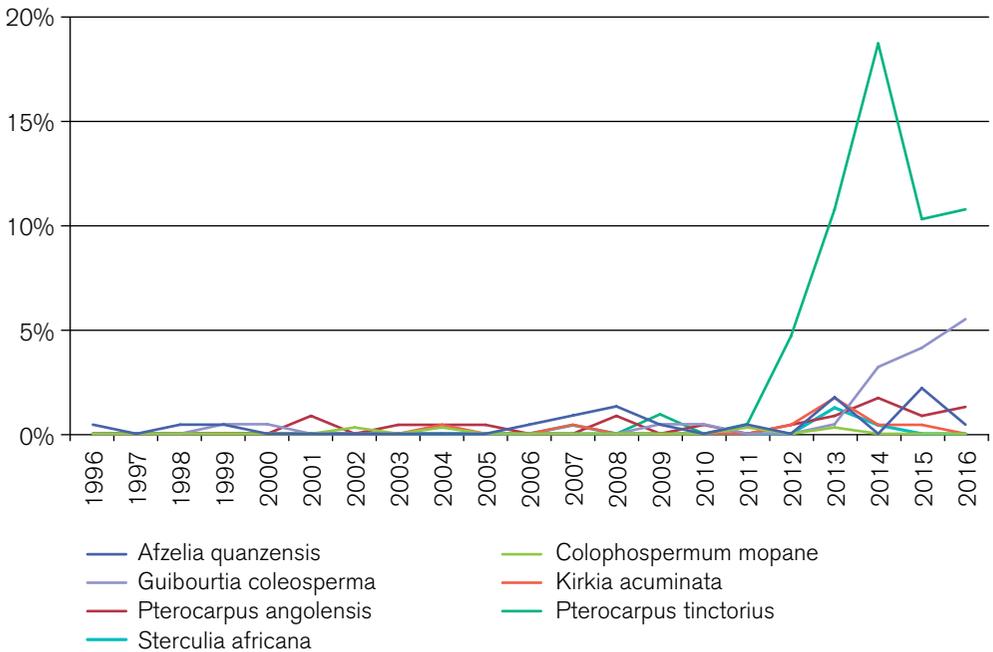


Figure 6. Species of focus and start date reported by interviewed cutters



When cutters sell mukula logs to traders, the price is determined by the latter. Our interviews with cutters and smallholders indicate that they have limited negotiating power. In reported operations between 2012 and 2016 (N=59, which includes only operations occurring outside logging concessions), the selling price for a debarked log measuring between 2.5 and 3.0 metres in length ranged from US\$2 to US\$10. The annual average price per log paid to cutters increased from US\$4.1 in 2012 to US\$5.4 in 2016, with variations across districts (largely contingent on the varying enforcement efforts, strength of police operations, and the presence of traders and buyers with established local networks).

As price-takers, cutters also engage in opportunistic behaviours. These often take the form of violating oral agreements with financiers (usually exclusive off-take arrangements) in an effort to maximise income. Always searching for the best prices, they may cheat on oral agreements and sell to the buyers with the highest offer when the opportunity arises. Such opportunistic behaviours can be interpreted as exercising agency and influencing value chain configurations. Nevertheless, it also creates an unstable environment for the mukula trade, precluding stable trading relationships and deterring long-term thinking on the part of investors.

Cutters' responses to the regulatory changes

The peaks in both graphs (Figure 5 and 6) around 2014 coincide with the heightened political attention, the first mukula ban and the implementation of the cross-departmental taskforce (see Figure 2). Interviews indicate that these regulatory changes sent a wave of panic through the rural populations as they witnessed arrest and punishment of fellow villagers by police officers at the behest of FD. Stricter enforcement in the forests, coupled with unabating demand for mukula, seem to have led to two results: 1) changes in value chain configurations, especially financier and trading patterns; and 2) increased involvement of traditional authorities (elaborated in Section 3.1.2.3).

Value chain configurations – particularly financing and trading patterns – changed significantly. Cutters largely perceived the changes resulting from stricter law enforcement by both FD officials and chiefs negatively, in particular those selling to buyers without proper concessions who feared being arrested by FD officials or being sanctioned by the chief. While cutters were certainly aware of the danger of the mukula trade, and often fearful of the consequences, they did not stop their harvesting activities; new cutters were also still entering into the business (Figure 5). If anything, activities took place more clandestinely, with quicker operations, night transportation, or more laundering through available paperwork (using photocopies, for example, instead of original papers). This had direct consequences on the amounts of bribes asked along the road, with negative social and environmental impacts as discussed below.

While we explain the new trading patterns below (Section 3.1.3.3), it is important to shed light on the role of financiers here, as they serve as a key bridge among cutters

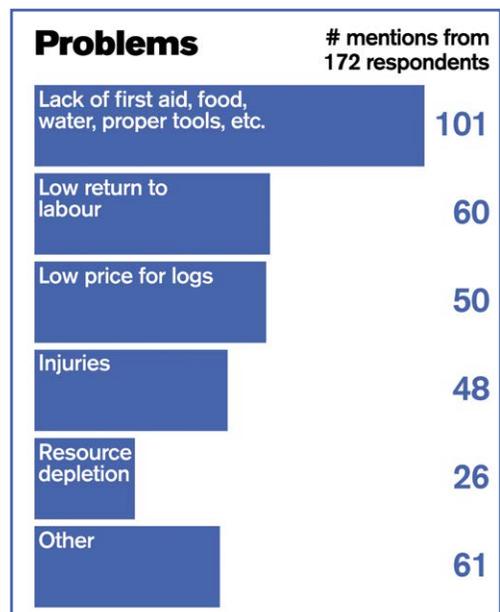
and the world outside the village. Financiers channel funding to cutters who generally lack all the resources necessary to conduct an operation, including food rations and tools such as chainsaws. In the initial years of the mukula boom before the regulatory changes occurred (around 2014), Chinese buyers often played this role. In that period, relations between cutters and the Chinese buyers were more direct and spatially close, making intermediaries or middlemen traders largely unnecessary. When the political and regulatory landscape changed, the Chinese buyers had to vacate the forests and Zambian players assumed the role of financiers. These new financiers were (in the order of likelihood of occurrence): fellow cutters with more capital; traditional local authorities; local or external (non-Chinese) traders; and urban businesspeople (Chinese and non-Chinese) generally based in Lusaka. In the wake of these changes, the pre-financing landscape evolved. Initially Chinese buyers would provide cash advances to conduct operations, but after they withdrew from rural areas they did not provide cash advances to the traders they used as in-betweens. As a result, traders started pre-financing many of the cutters to conduct operations.

Regulatory changes and the decreasing profitability of cutters

Over the years, the ban-and-lift cycle significantly influenced cutters' profitability. Lower profitability neither deterred new entrants nor decreased the volume of harvested mukula, however. The regulations thus cut into primary producers' profit margins without achieving their environmental objectives. We demonstrate the change in profitability through qualitative results offering insights into the perceptions of cutters, and quantitative results gathered from household surveys. Despite the difficult working conditions and the low pay, cutters still considered the mukula trade to be a highly attractive source of income, attesting to the limited availability of alternative sustainable livelihoods options among forest-dependent communities in Zambia.

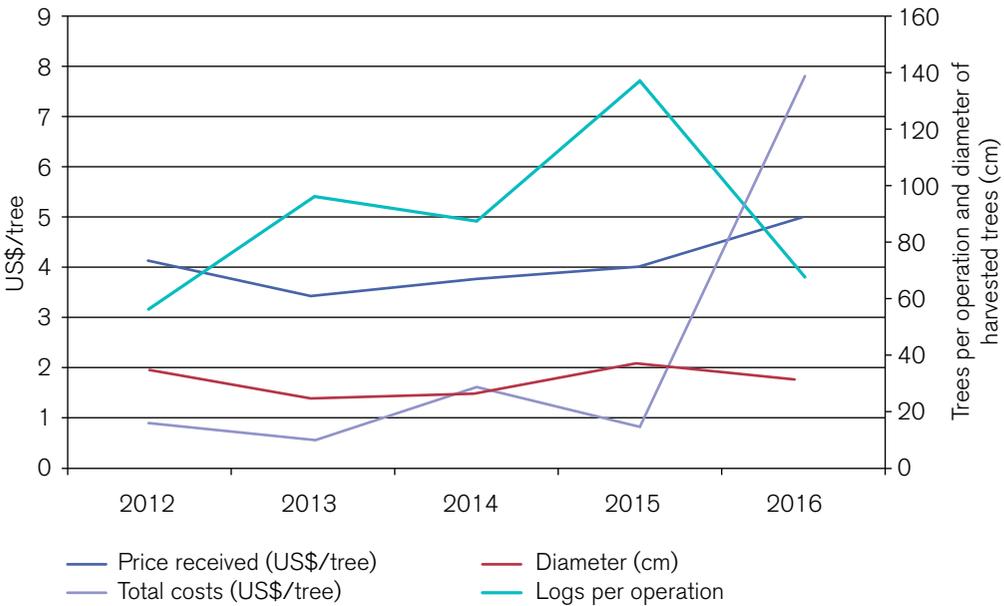
Interviews reveal cutters' sense of exploitation over the low return to labour for the logs they sell, listing this as one of their biggest problems (35% of interviewees). Other problems that they face in conducting commercial timber harvest mainly relate to the harsh conditions of operations and the adverse health impacts.

Figure 7. Main problems encountered by harvesters (N=346).



Another source of cutters' discontent is the (perceived) lower prices after the regulations drove Chinese traders out of the forests. Some interviewees indicated that, "when [they] could deal directly with Chinese buyers, the prices were higher". This could certainly have been the case in some regions due to the local characteristics of the value chain – for example, the presence of a strong direct Chinese demand that was wiped out over time as a result of the ban-and-lift cycle and other regulatory or political changes. Nevertheless, it seems that interviewees were rather implicitly referring to lower profitability as a result of the ban. Even though the average price paid per log rose slightly, the costs involved in harvesting ballooned after the ban. Put simply, after the ban, things got a lot harder for the cutters, including the distance they had to walk to get the same number of requested trees, the hours of labour that such longer distances required in searching, locating, cutting and transporting the trees to the closest loading bay, and other costs (such as getting food for a team of workers spending longer times away from home in locations increasingly further away). There were also greater risks of being caught and sanctioned than before. We can show overall decreasing profitability through plotting the average price received by harvesters against a few of the above variables over time (Figure 8).

Figure 8. Decreased profitability of operations over time (2012–2016, N=59)



These developments may also be interpreted along the lines of the political decisions taken over the years, as well as the capacity of operators (both cutters and traders) to adapt to the changes that those decisions brought about. For example, clampdown operations conducted initially in 2013/2014 may explain the decrease in the dimensions of harvested mukula, because cutters had to conduct operations much faster to avoid

being caught, thus targeting smaller trees which could be transported to the loading bays in a shorter time. Of course, the same trend could also partly be explained by the rarefaction of large diameters in the initial years of the mukula rush, as reported by some interviewees, and by the FD's 2013 decision to decrease the legal minimum diameters applied to mukula, from 40 cm to 30 cm, which clearly clashes with the official narrative in those years about wanting to halt all operations in order to take stock of a dwindling and unsustainably harvested species.

Eventually, after an increase in 2014 and 2015, the average dimensions of harvested trees incurred a further decrease in 2016. At the same time, the price per log paid to cutters has been slightly increasing since 2013 (Figure 8). Again, this may simply be explained by dwindling resource faced with constant or growing demand naturally fetching higher prices. It may also partly be explained by an increased competition among a growing number of traders, which intensified after the 2013 ministerial decision excluding most Chinese buyers from rural areas. Also, largely as a consequence of the heightened media and political attention that mukula has brought about, communities and individual cutters might have been able to convert increased available information into improved negotiating power vis-à-vis traders, though not sufficient to cover for their increased costs. In fact, data indicate that on a per-tree basis (the standard unit of measure used by harvesters) their profits were negative in 2016.

Despite the decreasing profitability, the mukula trade has remained a crucial source of income for cutters. Notwithstanding low or even negative return to labour and prevailing tough conditions of work, it fulfils crucial immediate cash needs. Quantitatively, results indicate that on average across the period considered cutters earned about US\$773 per year exclusively from the mukula business.

Box 1. Annual average income derived from mukula harvesting (cutters, 2012–2016)

To determine the annual income from mukula, we ignore the decreasing trend for now. Also, for the purpose of comparing the annual income from mukula with the Zambian average income, the cost of food and payments to chiefs should not be considered (because in general they would be borne by the traders or buyers): across the entire surveyed period, an average profit of US\$4.1 per tree, or about US\$23 per cubic metre, was obtained. Given the current average production rate per person and per day of about 0.3 cubic metres (roughly two average logs cut, transported and debarked per day), such profit translates into about US\$7.6 per day per person. On average, interviewees spend about 101 days in the forest per year to conduct their operations, so the total average profit is about US\$773 per year.

This value is higher than the average gross national income per capita of Zambia's low-income populations, which was roughly US\$600 in 2016 (World Bank 2017). Another way to look at the importance of the mukula business is to consider the amount of money paid for a person to clear and de-stump one hectare of forest for agriculture purposes. According to the Indaba Agricultural Policy Research Institute (IAPRI), land clearing costs vary from US\$16 to US\$24 per hectare, depending on the province (Central, Luapula, Lusaka, and Western)⁴. Using one hectare as a unit of measure and the mukula density per hectare (9 individuals of merchantable mukula per hectare, suggested by the PFOs), a cutter could make US\$90 per hectare through mukula production as compared with an average of US\$20 for ordinary clearing of the same hectare of other kinds of forest. Although these are only hypothetical comparisons (average rural incomes are difficult to estimate with available data), they indicate that mukula harvesting remains a profitable business when compared to alternative regular employment (when that is available at all in rural areas), or self-employment in agriculture.

3.1.3.2 Traditional Authorities

The role of traditional authorities (TAs, including chiefs and some village leaders) in the mukula trade is three-fold: i) they control *formal* access rights to mukula, an authority given by the Forests Act of 2015; ii) they control *informal* access rights, drawing on traditional authority among rural populations as the custodians of customary land; and iii) they act as financiers, traders and mobilisers of cutters from local communities. We discuss these roles in greater detail below.

TAs derive their power over the mukula trade from Zambia's land tenure system. According to the Lands Act of 1995 (3(1)), TAs are resource custodians of customary land, which accounts for approximately 94% of the national territory (Mbewe 2007). TAs contend that land and associated resources, such as trees, are their traditional preserves – a view often concurred with or acquiesced in by local communities as a part of their social contract with the TAs that also includes obligations to the communities. However, the mukula trade has delivered significant financial benefit to the TAs. When their interests were threatened, they frequently responded by exercising power in ways that contradicted with the interests and wellbeing of the communities.

First, formally, the Forests Act requires companies to obtain letters of consent (LoC) from chiefs in their concession licence applications. These LoCs allow would-be companies, in principle, to operate in the chiefs' customary areas while still being subject to the principal Forests Act. This initial contact with such companies often gives TAs insider knowledge on the timber market and value chain, enabling them to negotiate monetary and other rewards/benefits with investors. While this is not a legal requirement, it is a customary expectation placed on investors. This is particularly so in the case of mukula, as both

⁴ See: www.iapri.org.zm/news/item/396-2015-rual

parties are aware of the fluid legal situation concerning this species as well as the high profitability of the trade.

Second, informally, TAs also exercise their traditional authority to decide who gets access to the mukula trees, enabling them to secure and maximise financial benefits. Especially in the early days of the mukula boom, TAs fought off external players who wanted to engage with cutters directly in their jurisdictions once the links with potential financiers were established. They did so by barring their community members from trading with buyers other than those they had approved – both Chinese (initially) and Zambians (after the 2013 ministerial declaration). This behaviour was still prevalent at the time of this study, particularly in areas with a large number of potential financiers and buyers. It created tensions with the resident population, as they felt constrained by the monopolies established by some of the TAs, which suppressed the price and deprived them of other buyers. Even when TAs are not directly engaged in the business, however, they may establish local taxes that cutters must pay. Many cutters mentioned corollary regulations under the local chiefs' responsibility, such as a stumpage fee to be paid before or after operations were conducted. These customary regulations are perceived by cutters as having both positive and negative impacts on harvesting operations. For instance, payments to the chief can be positive ("harvesters are protected in cases when the buyer does not pay, because the matter can be taken to the chief") or negative ("chief benefits more because he also gets money from buyer" and "we feel crooked because [payments] do not happen [in other chiefdoms]").

Third, TAs have sometimes started to play the role of traders and mobilisers themselves. In some instances, they mobilised teams of cutters as requested by external traders and buyers, sometimes selecting their kin or village leaders as the cutters. In many ways, the mukula trade gave TAs the opportunity to reinforce their power over local resource access. Nevertheless, our research shows that abuse of such power can reduce their legitimacy in the eyes of the local community. In addition to the aforementioned creation of monopolies, some chiefs extorted money and/or mukula logs from cutters in exchange for allowing them to continue harvesting. Other chiefs confiscated mukula logs from their subjects in the name of law enforcement and then resold the same for personal gains.

Ultimately, regulatory changes and the ban-and-lift cycle have created more spaces for such rent-seeking behaviours by the TAs. Of all the political statements and formal and informal regulations issued over the past decade regarding mukula, the 2013 ministerial declaration was arguably the one that most helped TAs to establish themselves in the mukula business. The declaration came with heavy political connotations – and indeed racist undertones against the Chinese – and helped those TAs who had inside knowledge about timber trading, as they found themselves in the privileged position of sole negotiators between cutters and mukula buyers, supplying timber to the Chinese buyers who had been forced to move away from the forest.

3.1.3.3 Traders

Another group that greatly benefited from the political changes were what we will here loosely refer to as ‘traders’, ranging from brokers using investors’ money to intermediaries using their own capital. These are predominantly Zambians, though very occasionally also of other nationalities such as South African. The function of traders from the start of the mukula rush to this day has been to serve as the bridge between cutters and ultimate buyers, closing the spatial gap created by the 2013 declaration, navigating the legal gaps created by the ban-and-lift cycle, and satisfying the demand for mukula. In this section, we first describe the two groups that fall under the category of traders (resident and non-resident traders), then detail the costs incurred by the traders in transporting the timber to the buyer.

Characterisation of traders

Resident traders are the group that is geographically closest to cutters and technically closer to brokers; they rarely engage their own funds or add value to the resource. They generally start as cutters, then become lead cutters and may be a headman, relative to a headman or a chief himself. TAs often select a resident trader to run their businesses. As members of the local community, they possess sound knowledge of available resources. What sets resident traders apart from cutters is their knowledge of the financial resources that can fund the harvesting operations, as well as their entrepreneurial acumen and skills. They use these to mobilise cutters, form teams of operators and negotiate the latter’s terms of engagement. They also engage and work with non-resident traders, who at times are the direct funders of harvesting operations. By carefully balancing such roles, resident traders maintain their niche in the value chain, in particular supporting TAs in their efforts to keep at bay any external actors seeking to engage directly with the cutters.

When resident traders cannot maintain a direct relation with a buyer, non-resident traders form the next link in the chain. As people from outside the chiefdoms where mukula is harvested, non-resident traders maintain contact with the funders or external businesspeople (mostly Chinese, but also Zambian) who provide money and equipment such as chainsaws for the operations. Non-resident traders also participate in negotiating the terms of engagement with cutters and watch over, as well as supervise, harvesting operations. Interviewees indicate that, in some cases, long-term engagement in the value chain has allowed some non-resident traders to accumulate so much knowledge and financial resources as to become funders and/or investors of operations themselves. The non-resident traders we interviewed were largely Zambians, aged between 34 and 43 years.

Key informants' interviews reveal that at least initially a large number of non-resident traders were government officials who had previously occupied key positions along the connection linking cutters to Chinese buyers, providing the necessary paperwork, for example, used to launder timber. As Chinese buyers moved away from the forest, officials who had inside knowledge about the mukula business seized the opportunity and filled the gap.

Later on, however, as demand increased, non-resident traders included a growing number of professionals not necessarily connected with power. Interviews indicate that these traders come from different walks of life. Some used to work at village level as agents or interpreters for Chinese nationals, helping them to obtain logs from local communities. Others used to work in established logging companies but decided to set up their own mukula trading business. And yet others had (and still maintain) general trading/hardware businesses, to which they added a timber component. In all cases, these non-resident traders use their private capital to finance the buying and selling of mukula logs to timber exporters (most final buyers and exporters generally provide no cash advance to traders). Non-resident traders thus seized the mukula opportunity and invested their available capital, reportedly to "make a fortune out of the good market of the timber when it presented itself".

Costs incurred by the traders

Both resident and non-resident traders were hit hard by the ban-and-lift cycle, especially in terms of increasing costs of informal payments (including bribes). This is largely due to their position along the chain, given that they have to interact daily with a large number of people and players, from harvesting to export areas, and with contacts to be maintained with many institutions for the smooth transportation and delivery of timber. This has impacted the prices that they are prepared to pay to cutters.

According to traders, bribes collected along transport corridors had high impacts on profit margins (even when the ban was first lifted in 2015, and because in reality the trading had never actually stopped). Amounts asked have varied according to location, number of roadblocks, destination of the container, familiarity of the trader with state officials (which includes Forestry Department, Zambia Police, Anti-Corruption Commission, Office of the Vice-President, and Drug Enforcement), and the level of completeness of the documentation traders show to authorities at checkpoints. Different kinds of officials, it seems, base requests for money on different legal arguments. For example, officials from the Anti-Corruption Commission may cite "unlawful possession" as the crime, while the police may use the Zambia Environment Management Act citing "biodiversity loss."

Examples illustrate how such payments can impact traders' profits. First, a container transporting about 400 logs along a well-established route of about 620 km leading to a border crossing in the eastern part of the country would be required to pay bribes between US\$6,500 and US\$10,900 in order to move from the harvesting site to its destination in the next transit country. This corresponds to between US\$11 and US\$18 per km (or between US\$16 and US\$27 per log, or between US\$90 and US\$150/m³). Second, to avoid delays during inland movements of logs that would eventually result in lower profits, traders reported resorting to bribing their way through checkpoints en route to the cities where warehouses are located. Payments would range between US\$310 to US\$1,500 for a 30-tonne truckload of mukula logs, depending on the number of checkpoints. As our interviews show, traders agree to pay at checkpoints to avoid delays in supplying logs to buyers, who pass the costs they incur due to delays back on to traders.

Although one of the most expensive and unpredictable items in their cost structure, payments at checkpoints are just one among several taxes (both formal and informal) paid by traders. Other payments include: i) production and conveyance fees as formal taxes to government (paid more to decrease bribes due at checkpoints than to show the legal origin of the timber); ii) payments to the TAs to be permitted operating in the chiefdom; iii) Council levies in the production areas; iv) payment for transportation of logs to loading bays in readiness for movement of logs in containers on articulated trucks to timber warehouses (largely owned by Chinese nationals); v) phytosanitary inspection; vi) clearing and forwarding agent fees (for traders that link up with their Chinese counterpart at the point of export); and, lastly, vii) custom-clearing fees. While some of these costs are always incurred by traders, others are more likely to be paid by the buyers that ultimately export the timber (such as clearing and forwarding or custom-clearing fees).

3.1.3.4 Buyers and exporters

Mukula buyers encountered during fieldwork or referred to by cutters, key informants and intermediaries are mostly Chinese nationals. In rare instances, a non-Chinese (usually Zambian) national would run a company that would also cover transport and export to China. The predominant position of Chinese buyers can be explained through high entry barriers: in addition to the financial clouts to running such a risky business, good market connections with China are essential. Interviews indicate that most Chinese run their business with a mix of collaboration and competition, which is sometimes very fierce. Some are specifically focused on mukula trade, while others trade in all sorts of timber; some have been in Zambia for more than a decade, while others arrived recently specifically to profit from the mukula trade.

Zambians and other nationals are entrepreneurs in the same mould as the Chinese, with two key differences. First, they do not seem to have the same availability of capital to invest in large-scale buying operations. Second, they only rarely have direct contacts and the necessary knowledge of the Chinese market to ship timber directly to China. The majority sell their produce to Chinese while still on Zambian territory.

Since the 2013 declaration that saw most Chinese leave the forests, buyers usually reside in urban areas, where they stay in close contact with Zambian traders who have access to mukula production areas, wielding strong influence on the nature of the trade.

Reportedly, both groups increased competition to access the resource in the wake of the initial boom in mukula, pushing mukula prices up. Increased competition also caused more information to trickle down to village level, giving harvesters better information on prices, which they used in their negotiations with traders. Overtime, informal payments also increased. For example, reportedly at district level (following the Local Government Act) the initial charges paid to District Councils per truckload of mukula increased from US\$1,000 to US\$1,500 to, more recently, US\$3,200.

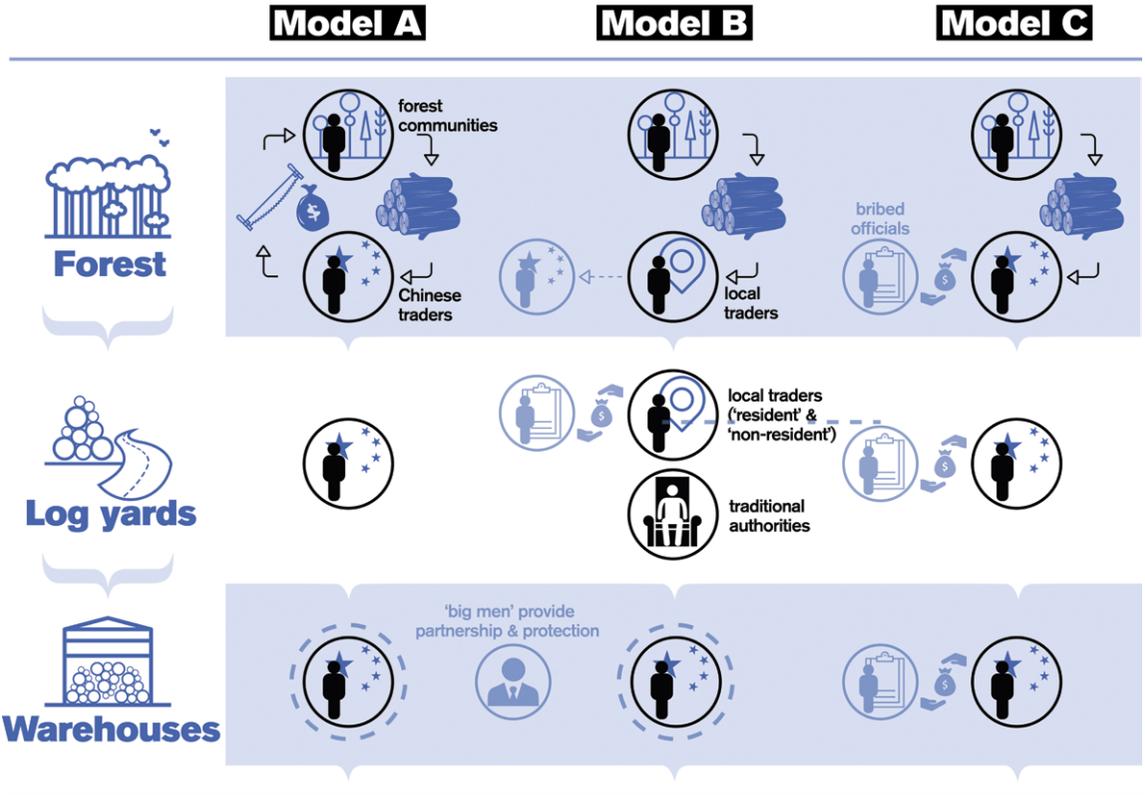
Exactly how many Chinese buyers are currently involved with buying mukula in Zambia is difficult to ascertain from the interviews. According to one interviewee, as of 2016, there were “between 10 and 100 Chinese mukula traders” in Zambia. Another interviewee told us that, “all Chinese timber businessmen are more or less involved [in the mukula trade]”.

Chinese buyers are not a homogenous group. While some (a minority) have had abundant experience in timber businesses in Zambia and across Africa, many others heard about the fortunes that could be made with mukula and joined the trade only recently. Stories also abound of Chinese arriving straight from China with money to invest in the mukula business, only to end up penniless because they proved unable to navigate the political landscape.

Overall, buyers seemed to believe that the mukula trade represents only a short-term business opportunity, with supplies lasting just a few more years. Buyers also complained about the current business climate, which one called “too complex and [with] difficult politics”. As a result, many plan to use their large profits as initial investment in different future business ventures.

At present, three major business models seem to exist for mukula production and trade (Figure 9).

Figure 9. The three prevalent business models in mukula production and trade



More prevalent before 2013 when Chinese buyers were freely allowed to roam the forest as traders. Now not seen as much. Direct relationship between villagers and the Chinese, which was relatively stable, and involved forward financing from the Chinese (equipment, finance and technology) in exchange for mukula logs.

Most prevalent model now. Chinese buyers stay in Lusaka/big towns, and source from Zambian traders. Relatively stable relationship between Zambian traders & forest communities; however, no forward financing.

Currently in operation, but relatively few cases were recorded. Chinese buyers still roam in the forests, but with less stable relationships and no papers whatsoever.

In the first model, Chinese investors participate all along the value chain, with various types of 'papers' that make their engagement legal. In this arrangement, Chinese nationals have direct access to the forest, make agreements with local chiefs, supply the local people with equipment, funds and technology, and ultimately purchase logs from them. This model was lucrative for the Chinese investors because middlemen (local suppliers) could be avoided, profits were higher and timber resources could be better secured. On the flip side, buyers would have to deal with all paperwork themselves, and once the resource was finished in one area, new negotiations would have to take place with another chief and a number of harvesters and villagers in another location. Thus, only a tiny minority of large companies could reportedly do this, because it also involved

maintaining stable political connections with highly placed individuals. This model has been disappearing over the years because of the political pressures described above.

The second model has buyers participating at a distance from the harvesting places, such as from the capital, Lusaka, or other big towns, using traders who deliver the timber and (at least some of) the necessary paperwork already completed. Local partners could sometimes be forestry department officials who would approach Chinese buyers and propose to do mukula trade together. According to the traders we interviewed, at an early stage in the Zambian mukula rush, traders were largely state or party officials. Characteristic of this model is that the relationships with suppliers are relatively stable over time, just like the political connections that guarantee delivery of the necessary paperwork. The suppliers, according to the buyers interviewed, would buy from local chiefs, or they could also be local chiefs themselves. In this model, the final buyer only needs to handle the export permit. This is the model most frequently used by companies operating at present.

While the profit margins of the second model are generally lower than of the first, business generally is easier. For Chinese buyers, it can be an advantage not having to maintain direct relations with harvesters and navigate the local politics. Chinese companies have their local partner/agent representing them in purchasing, getting documents and exporting. But not all mukula timber delivered to these buyers and eventually bought by them comes with all the correct paperwork. In such cases, all interviewees indicated that they were still able to get the missing documentation to legalise the consignment (while admitting that the process is always complicated and full of imponderables). Such difficulties also apply when they want to export teak and more common species (such as mukwa) because of reported reasons such as corruption and government inefficiency. Yet, Chinese interviewees agree, “we have adapted to work in this system.”

The third model is a variant of the previous two. The most significant difference is the complete lack of official documents. After being supplied timber, buyers bribe their way through all related government departments and eventually export the timber. An additional difference is that, while buyers in the previous two models would establish stable and possibly long-term relations with power in order to get their documents, the buyers in this model declare that it is not compulsory “to work with a certain group of politicians who control the papers.” In other words, they prefer to bribe the ‘lower levels of the pyramid’ – those closer to operations on the ground – and get away with it. Information collected in the sampled districts seems to indicate that a few companies using this model are likely to still maintain direct contacts with cutters (in effect bypassing most local traders), as in the pre-2013 ministerial statement period; evidence, however, is not comprehensive.

Across the three business structures described above, both traders and buyers were relatively forthcoming in describing their business model. This included information on the costs incurred along the value chain, though they were very reticent to discuss profits. Yet informal discussions held with key informants provided some information on how much traders would receive for their deliveries on mainland China or other ports of export. For example, containers delivered to Guangzhou would fetch on average about US\$700–800/m³, which would further increase to US\$1,000–1,100/m³ when bought by specialised carvers (Figure 8).

3.2 Socio-economic impacts on rural livelihoods

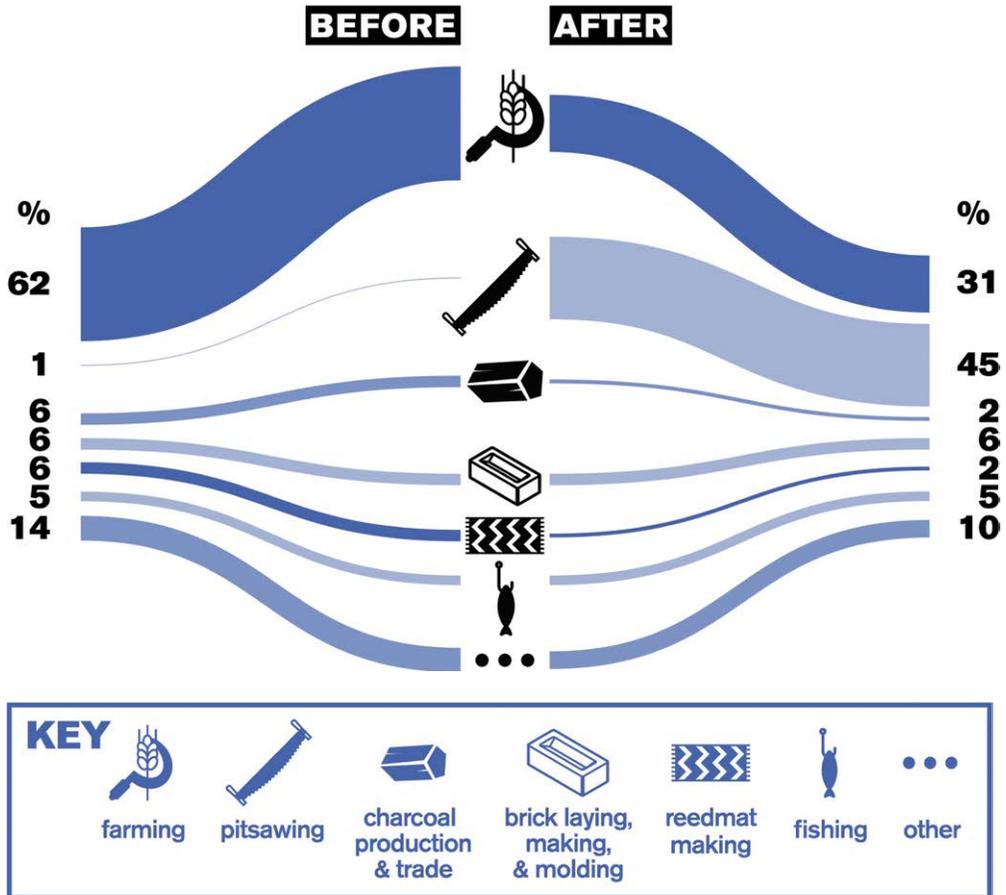
Rural community members and cutters attributed significant livelihood benefits to the mukula trade, despite the decreasing profitability and risks of prosecution. This section presents: i) the background of these farmers-turned-loggers; ii) their ability to meet basic needs such as food and education; iii) linkages between logging and farming; iv) spending patterns of their income from mukula to meet basic needs as well as purchase assets; and v) unclear spill over of the benefits at the community level.

First, cutters are on average 33 years old ($\sigma=12.3$) and have families composed of about six members ($\sigma=2.8$). Timber cutting is largely men's work (51%), with significant support from the male youth (39%). To a minor extent, women are also involved (10%). For example, in all villages surveyed in one district, women had organised into groups who would go to the forest to cut mukula and then bring it back for selling on the road. Reportedly, they did that because of the high number of readily available buyers that came to and through the village. Five percent of interviewees reported that the role of women has decreased over time because the resource "was becoming too scarce and they had to travel too long a distance to reach it". About 87% of interviewed harvesters originate from the area (village or chiefdom) where operations occur. Those (13%) who moved to the area in recent times did it largely (75%) because they had heard about the thriving timber business.

Second, in terms of fulfilment of basic needs, between May 2015 and April 2016, about 78% of interviewees reported experiencing an average of about 3 months during which they did not have enough food to meet family needs. Similarly, about 77% of interviewees reported not having had enough money to pay for school fees. In addition to food and school fees, other important items that could not be procured were fertilisers (30%) and medicines (30%), followed by clothes and toiletries (21%).

Unsurprisingly, once the demand for mukula increased and people realised that money could be made, there was a wave of entry into the cutting business. Without exception, all interviewees indicated that the need for additional income was their reason for entry. In some places, peculiar environmental conditions such as long-lasting droughts also contributed to push people to look for alternative employments, as mentioned by about 12% of key informants. Overall, once started, cutting replaced farming as the most important source of income carried out by cutters (Figure 10).

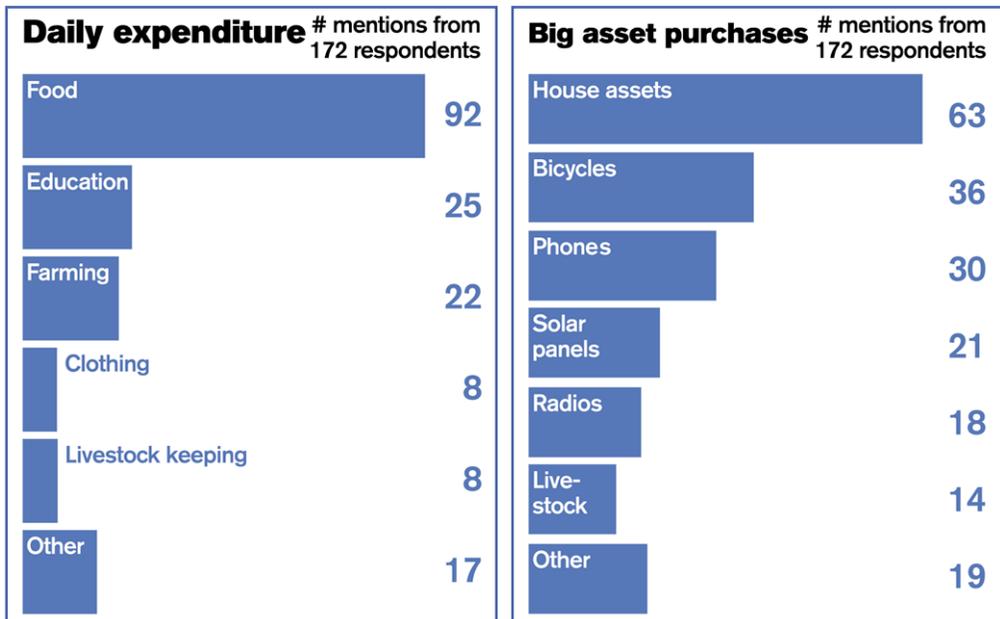
Figure 10. Activities before and after starting timber business



Third, in terms of off-farm linkages, the impacts on farming as a result of farmers' engagement in cutting are varied. While the need for ready cash was the prime 'push' factor leading farmers to engage in cutting, the latter is not considered a long-term career choice, and rarely led farmers to completely abandon their farms. Indeed, only a tiny minority of farmers (1%) completely abandoned farming. This corroborates information collected from cutters and FGDs reporting that only a few cutters upgraded their activities over time. That said, about 43% of farmers (notably those with larger families) declared reducing the time spent on the farm, while about 57% of farmers declared neither abandoning nor reducing farming. This could indicate a substitution effect on the farm, as available family members cover for the time that the cutters spend in the forest. This is corroborated by FGDs, which reported that in many cases women had to take up farming activities that were previously done by men. Alternative strategies were also available for farmers to adopt. For example, among the farmers-turned-cutters who tried to find alternatives to meet the family needs (51% of interviewees), many declared having spent more time farming their own fields (33%), but also other's fields (19%). Both activities could also be seen as covering for the time that household members spent in the forest.

Fourth, a large majority of the money earned in the forest is spent to buy food and pay for education, which also constitute the major expenses incurred by women, as reported in FGDs. In addition, cutters also invest money into the farm – hiring labour, purchasing tools and fertilisers, or even diversifying activities (such as investing in livestock) (Figure 11).

Figure 11. Use of the money earned from cutting timber and assets bought (N=201)



About 79% of interviewees also bought what they defined as an asset (one or more) with money earned from timber harvesting. On top of the list were house-related assets (29%), such as beds, mattresses or iron sheets for the roof, followed by bicycles (16%), phones (14%), solar panels (10%), radio sets (8%) and livestock (6%).

Fifth, although in about 20% of FGDs (with a majority of FGDs conducted with women) the general opinion was that mukula trade was boosting the local business environment, in about 40% of FGDs it was indicated that benefits from mukula trade tend to accrue only to the households of the individual cutters, with unclear community-level benefits. Our findings did not identify any direct material contribution made to communities by mukula buyers. It was noted by TAs that the agreements between TAs and buyers did not generally specify the issue of corporate social responsibility to the community. Yet the nature of the agreement was rarely disclosed to the community members by the TAs, making it difficult to corroborate their statements. For example, a few villagers complained that repairs of roads, school classrooms and even clinic infrastructure improvement were supposedly promised to the TA but never materialised although the buyer was allowed to continue its operation. Given the crucial role that TAs play in allowing buyers to operate within the chieftom, the lack of tangible community benefits could be partially attributed to (at best) the lack of active negotiation by the TAs on behalf of the communities or (at worst) the taking of investors' token for personal enrichment by the TAs. It is also noteworthy that the legal ambiguity of the mukula trade, as well as its short-term business model, are not the only causes of the lack of community benefits. Even in the traditional logging concession model, the Zambian regulations are silent on the detailed requirements of companies' obligations toward communities.

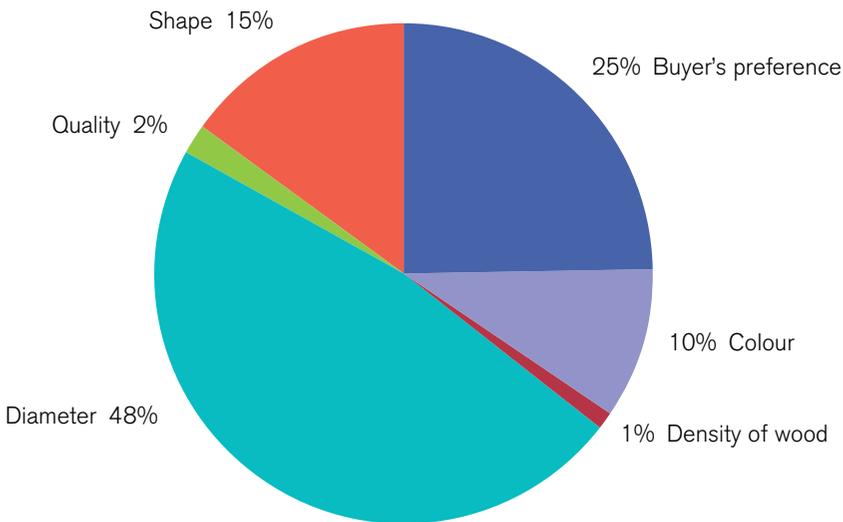
On a final note, the increasing scarcity of mukula could potentially contribute to inter-community conflicts. Over time, cutters spend an increasing amount of time away from their farms and families in search for a very diffuse and scarce resource, potentially stepping into neighbouring chieftaincies, thus increasing the likelihood of local conflicts. As already discussed above, both tendencies have indeed been already detected, with most women retiring from the mukula cutting business (because of the longer distance) and a few conflicts arising among TAs for control of territory.

3.3 Environmental impacts

It is difficult to assess the long-term environmental impacts of current mukula harvesting operations, and further research is definitely needed on this front. This is largely a result of the speed at which the mukula value chain has been developing, its recent developments, the limited or confusing botanical knowledge about mukula, and the spatial and financial limitations of this study. Still, we did test several variables which could indicate potential environmental problems linked to the speed and scale of operations over the past 5–7 years.

Interviewees reported operations from 2012 to 2016, with an expected majority of them (51%) in 2016 because they were easier to recollect. Over the years, mukula and African rosewood represented about 98% of interviewees' total harvest. But while cutting of African rosewood is generally linked to the presence of a concession, mukula is not. When asked about what regulations exist specifically pertaining to the cutting of mukula, cutters listed several specifications, such as diameter, colour or shape of the trees. Those specifications varied greatly among respondents (Figure 12), and in several cases were not in line with the legally established limits.

Figure 12. Top criteria for the selection of trees



Consider the case of harvesting diameters mentioned by cutters. Answers varied between >15cm, or >30cm over-bark, or even >50cm. The legal limit to harvest mukula is set (since 2013) at 30cm top diameter over-bark (it was 40 cm previously). Thus, in some cases operations might reflect illegal harvesting and negative environmental impacts, and in other cases they might reflect a sub-optimal utilisation of available resources per hectare. None of this is conducive to sustainable management aimed at by the law.

About 25% of respondents indicated buyers' preferences as the top criterion for the choice of trees to cut. This again has important environmental ramifications. While the legal framework may still be followed, it could also lead to the adoption of purely financial criteria – that is, maximisation of profits disregarding any regulations – and thus harmful environmental impacts.

Awareness of other environmental regulations is low. Only 6% of cutters declare that they harvest trees at the legally established distance of 50m or more from a river. Just 4% of cutters seem to be aware that there exists a legally established buffer zone around rivers, and these declare it to be anywhere between 2m and 40m (all short of the legal minimum limit of 50m). About 90% of cutters do not seem to be aware that such limit (and thus regulation) exists.

The best known, and reportedly most respected, environmental criterion is the maximum height at which trees can be cut, that is, the height of the stump to be left on the ground after cutting. Whereas the legally established maximum is 30cm, about 18% of respondents indicated a cutting height >30 cm. Again, this may point to a sub-optimal utilisation of available resources.

About 82% of cutters conducted no post-harvest waste removal or clean-up of the cutting area, as mandated by the law to avoid fires and help regeneration.

These data only point to potential negative environmental impacts; this project did not assess long-term environmental conditions on harvesting sites. That said, it is troubling that, in addition to operators not generally knowing or respecting the most basic environmental regulations, nobody seems to officially monitor harvesting activities. Indeed, the only 'verification' reportedly conducted is the one at the loading bay on the log's diameter and length. This is done for payment purposes, and clearly not to check whether environmental criteria – or the origin of the log, for that matter – have been considered.

The future of mukula harvesting looks doubtful. When asked whether they think that, in five years' time, they will be able to keep harvesting at the current rate, about 68% of cutters replied negatively, citing current depletion trends observed. This was corroborated by about 95% of the key informants who seriously questioned the sustainability of mukula harvesting under the present arrangement and see the species or the look-alike ones "going extinct." Similar concerns about negative environmental impacts were raised in FGDs, with people in about 36% of the latter reporting that communities had noted a growing scarcity of mukula. In addition, FGDs also listed more community-related negative impacts, such as the destruction of local roads by trucks and other vehicles used to transport the trees and, more broadly, the loss of forestry resources.

Interestingly, among the 32% of cutters who replied that they will be able to maintain current harvesting levels in the future, about 78% declared so because they generally see young seedlings growing and are convinced about the future availability of commercially

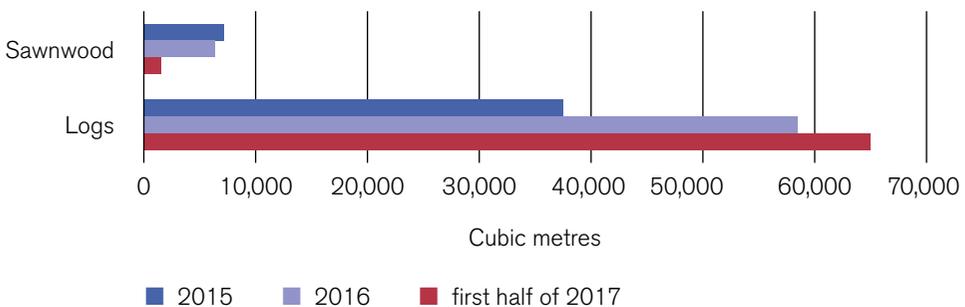
valuable trees. Given the very poor knowledge about mukula and whether it represents one or more species, in Zambia and beyond, further research is needed to understand whether a large number of seedlings can be linked to large numbers of future adult trees. Yet, if the regeneration patterns of mukwa (another *Pterocarpus*) can be used as a reference (Mojeremane and Uyapo Lumbile 2016), then survival prospects may also be poor for mukula.

3.4 The scale of harvesting, trade and revenue losses associated with mukula

This section presents three research findings that illustrate just how little adopted measures have achieved in curtailing the mukula trade over the years: i) the continued rise of export volumes to China; ii) the mis-declaration of products at the Zambian borders; and iii) the estimated mukula production volume at the national level and the associated informal payments.

First, Chinese customs data indicate a fast increase in logs import from Zambia despite the numerous mukula bans. Figure 13 shows that log exports to China continued to rise between 2015 and 2017. In fact, log imports during the first half of 2017 – the most recent data available at the time of writing – already exceeded the total number of logs in all of 2016. While we cannot ascertain the exact share of mukula logs within this data, interviews with stakeholders linked to the trade in China indicate that the vast majority, if not almost all, are mukula logs. There is a rising popularity of mukula in China.

Figure 13. Zambian timber imports reported by Chinese customs (source: China Customs)



Second, comparing Zambia and Chinese customs data reveals significant mis-declaration of products at the Zambian border, in particular of logs declared as sawnwood. This indicates the ineffectiveness of the log export ban. Figure 14 and Figure 15 compare export statistics for logs and sawnwood as declared by Zambia (to the FAO) with data from Chinese customs.

Figure 14. Log import and export statistics (2008–2016 FAOSTAT and Chinese Customs data)

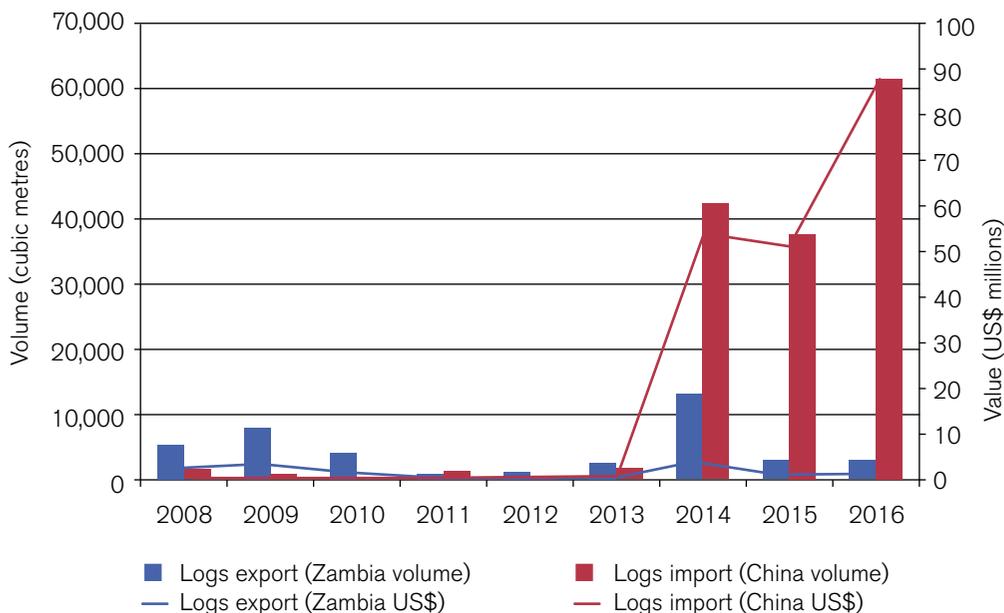
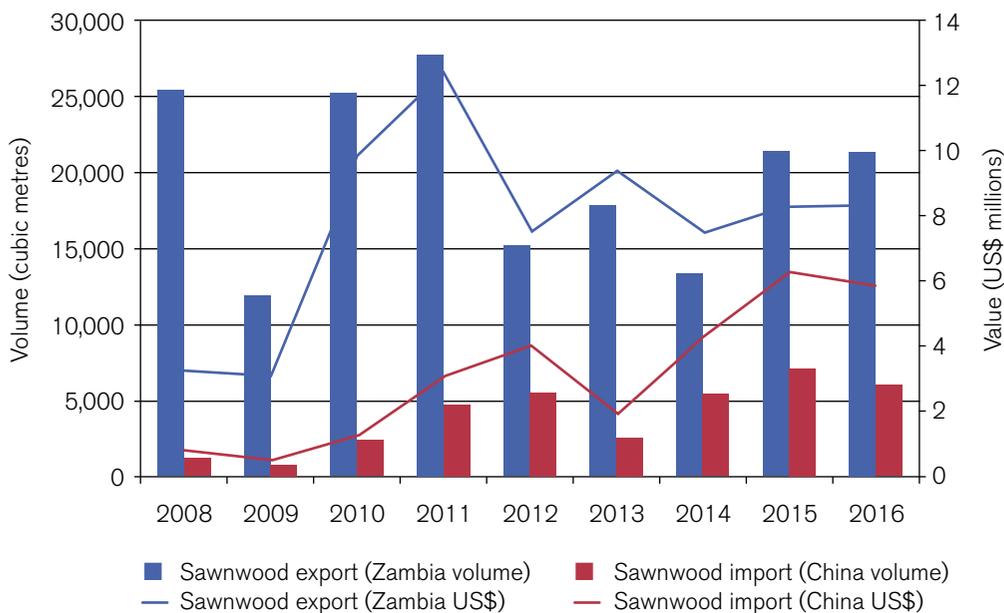


Figure 15. Sawnwood import and export statistics (2008–2016 FAOSTAT and Chinese Customs data)



The two figures illustrate important features of the evolution of the mukula value chain over recent years. First, what leaves Zambia reported as already made into sawnwood seems to arrive in China as (unsawn) logs. It seems clear that mukula, often declared as sawnwood at departure to comply with the legal framework that bans log exports, is in fact largely exported in the log form. Second, the 'mukula effect' is clearly visible starting with the 2014 declarations from the Chinese Customs for logs imported from Zambia, both in volume and value. For example, in 2016 Zambia declared to have exported about 3,000m³ for an approximate value of US\$900,000, while China declared imports of about 61,000m³ for an approximate value of US\$87 million. Loss from customs revenue is potentially significant. To start with, interviews reveal that the Zambia Revenue Authority (ZRA) in fact does not seem to have a clear classification for logs in their recording system (Harmonised System or HS, a multipurpose international product nomenclature developed by the World Customs Organisation). Instead, all declared mukula logs and sawnwood are charged export duties as 'planks,' thus not taking into account the potentially huge under-declaration of export volumes of logs. That such a big discrepancy occurred exactly in the year of the mukula ban and just after the 2013 ministerial declaration and the creation of the taskforce indicates that serious underreporting has been ongoing ever since.

Finally, we estimate the national annual production of mukula to be around 110,000m³, or approximately between 1,500 and 2,000 containers (assuming 300 to 400 logs per container). The extrapolation of national annual production based on the research findings rests on several assumptions (including chiefdom boundaries, time spent harvesting a mukula tree, and mukula coverage over the national territory), which are explained in detail in Annex 2. Although speculative, these numbers concur with the scale presented in recent publications and media coverage (Kibangula 2017; Lukumbuzya and Sianga 2017; Radio Okapi 2017).

The total estimated production allows us to estimate the amount of losses to the State coffers and informal payments made to officials to circumvent the regulations. The losses incurred by avoided production and conveyance fees could amount to about US\$3.2 million per year⁵, excluding export duties (which fluctuated frequently due to policy changes and public outcry by producers and processors during the course of the research). In addition, we estimate about US\$1.7 million⁶ as the cost of bribes paid annually on the roads and border points of Zambia based on the interview data.

⁵ Production fee (US\$26.9/m³) plus Conveyance fee (US\$1.9/m³) applied to the estimated production.

⁶ Average bribe paid per container (US\$933) times average number of containers passing through customs.

Despite the limitations of extrapolation, this exercise is useful for at least two reasons. First, it gives officials who are tasked with applying the law an indication of roughly how much revenue is lost as well as the dimensions of informal payments. It is worth mentioning that US\$3.2 million is close to double the average annual budget of the FD in recent years (US\$1.7 million; see Table 2). Second, it provides a clue as to the forest area that is being harvested each year – between about 90,000 and 150,000 hectares⁷.

⁷ Interviews with key informants, operators and FD staff indicate values of 7 stems/ha in high-stocked forests and 3–4 stems/ha in low-stocked ones.



Photo: Mukula timber debarking, Zambia. Credit: CIFOR, 2018.

4

Discussion



In Zambia, the legal framework governing timber harvesting is well conceived, and the procedure to follow from harvesting to export appears linear and easy to implement. Yet, in recent years, a multitude of events – some directly related to the forest sector, some external to it – has created a complex environment for state officials who are to apply the law and for private-sector operators who are subjected to it. This is particularly the case for the very valuable rosewood tree – commonly referred to as mukula – on which the interests of cutters, traders, buyers, exporters and ultimately consumers in China have been focussing over the past six to seven years. Yet we argue that the mukula case has only shed a brighter light on an issue that may apply to several other countries, notably in SSA, which has more to do with a pre-existing weak governance regime than with the Chinese entry into the specific value chain.

As we have shown, and as is the case across SSA with a few notable exceptions, District and Provincial Forest Officers, and the FD for which they work, have very limited means to carry out their mandate. This has tremendous repercussions for the flow of timber and information that constitutes the fundamental premise of the regulatory and management system. Once the government fails to understand what is really going on in the forests, the entire chain of (official) information is of

little use. DFOs only partly know and report the facts, PFOs only partly know and report them, and the FD only partly knows – and thus cannot report. As a consequence, and contrary to the goals of the Forests Act of 2015, forests are poorly administered, and the Republic knows very little about what is happening in its forests.

When the forests are subject to an exceptional development (in both speed and extent of operations) as is the case with mukula, such weaknesses are more exposed. But if corrective measures are not taken, the same story risks reproducing itself again and again every time a commodity is extracted and traded through a business model that current policies and regulations fail to understand and tackle. What's more, a significant number of people ostensibly responsible to apply such rules and regulations are tempted to personally profit from the system instead of fighting to correct it, contributing to the vicious cycle that ends when the commodity is depleted – only to restart on the next one.

While vested interests have proven resistant to change, it is important to understand that informality, across production, trading and policymaking alike, quickly becomes a *modus operandi* that ultimately pleases everybody. The evolution of the mukula value chain is the story of how markets and operators have adapted to specific conditions on the ground, single-mindedly proceeding towards their objectives – notably harvesting and trading of a valuable resource – without much consideration for existing regulations. Regulations, in theory, should frame and steer the operators' behaviour in the interests of all Zambians. In practice, however, the regulatory framework has been (ab)used by politicians and government officials alike, ultimately rendering it unclear and complex. This has made the business environment unpredictable, unnecessarily increasing costs for operators, especially local harvesters in rural areas, along the way.

Over time, the mukula value chain has assumed evolving contours – from partly legal to informal to tout-court illegal – and different groups of people and institutions have contributed to creating such status, with others bearing its negative consequences. In the next section, we discuss the role that national elites, politicians, government officials and TAs have had in shaping the mukula value chain. Then we discuss how informality has become the *modus operandi* for this resource. Lastly, we discuss some ways forward that could contribute to improved resource governance.

4.1 Political economy: why the policy-practice gap?

Large-scale estimated national production volumes, significant revenue losses in fee payments, widespread bribery – there is strong evidence that the various regulations deployed to control the mukula trade have failed to achieve their desired outcomes. To get at the reasons of such failure requires assessing the value chain against the background

of its strongly political nature, illustrated by an outspoken press and political class who have, over the years, openly debated the issues of power, politics and corruption connected to it (see examples in Kirimania 2016; National Assembly of Zambia 2016).

We argue that four factors in particular are driving the ineffective implementation of the regulatory system resulting in a huge gap between policies' aims and their results on the ground: i) rent-seeking behaviours at higher levels; ii) rent-seeking behaviours at lower levels by officials and TAs; iii) severely constrained capacity of the FD to monitor and enforce regulations on the ground; and iv) insufficient understanding by regulators of the market forces and operators' behaviours.

First, findings indicate rent-seeking behaviours at the national level by those connected to power. This is especially evident in the case related to the special authorisation granted to ZAFFICO to collect and auction impounded and illegally logged mukula. Reportedly, while mukula logging and trade was banned in the rest of the country, ZAFFICO was allowed to invite buyers from China. As a Government parastatal entirely owned by the GRZ and with 99% shares held by the Minister of Finance, ZAFFICO's strong and direct political links to power at the national level is undisputed. Such direct links may explain why a parastatal organisation with the official mission "to establish and sustainably manage forest plantations" was granted the privilege to auction, and get a direct source of revenues from, impounded mukula, thus bypassing the more natural choice of the FD and the Judiciary. The use of ZAFFICO can also certainly not be justified by its better performances or capacities to manage such a task. Findings indicate in fact that, notwithstanding many sales organised by ZAFFICO, the number of mukula logs that remained to be auctioned did not decrease proportionally to the number auctioned – indicating a lack of monitoring on the ground with newly harvested logs being added to already existing stocks. Exact numbers are hard to come by, however, and we could neither confirm nor deny these allegations. Yet, visits to several locations during fieldwork and interviews with residents indicated that timber indeed continued to be added to the stocks even after the special permission was granted to ZAFFICO, which did not have the capacity to monitor the deposits appropriately.

In such an environment, those connected to power (both elites and private operators, Chinese and Zambians) profited greatly. They benefited from the ongoing ambiguity of the mukula production and trade's legal status, despite auctions continuing to take place and stocks continually being 'refilled', as well as from mukula that kept being harvested and exported without passing from auction points. Arguably, the bans were a tool used by the government to put more genuine control measures in place to deal with a situation that was clearly out of control. Yet, results suggest that the bans overwhelmingly punished local harvesters who were left at the mercy of police forces clamping down on production areas, facilitating the abuse by the national political and economic elites and the value chain operators connected to them to profit from the unclear situation they helped create.

Second, rent-seeking trickled down to lower-level officials and traditional authorities. Given the chaotic situation implemented around them, a nationwide system of informal payments to enforcement officials on the road was made even more profitable (at an estimated US\$1.7 million pocketed annually, see above).

Conversely, results indicate that the ban-and-lift cycle created an additional layer of complexity for enforcement officials at the local level trying to correctly do their jobs. Because the bans did not curb demand, and because the taskforce was ultimately not very effective in consistently halting operations in the forests, operations continued. Illegal stockpiling of timber thus continued despite the bans. Once the ban was lifted, the licenced producers, or those with access to power who could provide official paperwork, would mop up the illegal timber and claim that the timber had recently (and thus legally) been cut. This kept honest officials in a legal quandary, as they could never be sure what rule would apply. Interviews indicate that the ban-and-lift, cut-and-stockpile cycles, left FD officials with two options. The first option was to accept the illegally cut timber and allow the (newly) licenced producers to launder it. This enabled them to generate revenues for themselves through bribes. The second option was to confiscate the timber and follow the processes of disposing of illegal produce through the courts of law. Taking this course of action may not generate as much revenue for government, and possibly less revenues and more local social hassles for themselves.

Which of the two options officers decided to take depends on many factors, such as which people are involved, and the pressures exerted on them. As reported by interviewees, in situations where mopping up of timber cut during the ban phase occurs, officers are called by the powers-that-be for “strategic and innovative” thinking with regards to weighing revenue generation. Such thinking, we learned, tends to lead to the legalisation of the timber through conveyance permits. Most PFOs and DFOs agreed that this may not be the “most legal” way of proceeding, and that such timber should simply be impounded and auctioned, but “external forces” – and indeed personal benefits – at times sway the decision. Interviewees cited cases where staff transfers were influenced by “non-professional judgement, as mukula trade has brought in silent but vicious timber wars” which the government seems to be fighting also by engaging military wings as part of the forest law-enforcement operations, as some opinions were expressed that “the forestry and police officers have been compromised.”

The highly political game and interests around timber laundering not only facilitate personal enrichment among government officials, but also harm the interests of cutters in rural areas who do not have the resources and connection to obtain the right papers. Put bluntly, they are exploited by the system. Ironically, during the stockpiling phase, cutters harvest in areas that are later – once the ban is lifted – allocated to legal producers (such as concession areas), who then take legal ownership of the timber, leaving the original cutters empty-handed.

Third, the policy-practice gap ultimately comes down to the constrained capacity of the FD on the ground. While the description above points to a complex set of interactions that may occur along the mukula value chain, the reality on the ground in terms of harvesting operations is in a sense much simpler. In fact, what the FD and other interviewed officials call a “constrained capacity to fulfil their mandate” can be translated to a quasi-total absence of monitoring and verification of forest activities. About 97% of the cutters interviewed had never had any type of official document for conducting operations. In addition, when asked whether there existed one or more regulations concerning harvesting that their operations should follow, about 60% of the respondents thought that operations did not have any regulation to follow. Overall, a large majority of cutters (85%) asked permission neither to access the harvesting area nor to cut the trees.

Fourth, and finally, across the entire period assessed in this document, and even after accounting for the powerful vested interests described above, regulators seemed to lack sufficient understanding of the pull-and-push forces behind the value chain. On the one hand, adopted regulations were regularly overpowered by the global market forces, as evidenced by the fact that exports of mukula continued largely in the form of logs, as per preference of the Chinese furniture-makers, contrary to the national export regulations requiring pre-processing into planks. On the other hand, the technical and regulatory modifications were adopted as if the primary producers of mukula were a few well-established, easy-to-regulate, professional logging companies, and not tens of thousands of villagers yearning for higher incomes. After all, the disconnect between policy and practice may in fact only be the reflection of an even wider – and historical – disconnect between policy makers and forest-dependent communities. The Forests Act of 2015 represents a major step forward, but until it is fully implemented on the ground, misunderstanding and failure to acknowledge the agency of rural producers will continue to hamper effective policy implementation as well as efforts aimed at reducing negative environmental impacts.

4.2 The normalisation of informality and its long-term costs

The mukula value chain and the roles of its various agents morphed several times, pushed and pulled along the way by the shifting political priorities, an ever-changing policy landscape and a constant market pressure to supply a growing demand from China. Concerning the role of Chinese buyers in the mukula trade, over time, buyers and exporters adopted at least three different business models to guarantee their supply of raw materials (see Figure 9). The impacts of these models used by Chinese and their business partners, however, need to be discussed within the context of the aforementioned politicised and dysfunctional governance framework surrounding

the mukula trade. In particular, the ban-and-lift strategy adopted by the government, in conjunction with a ministerial statement steeped with heavy political connotations and ethnic undertones against foreigners exploiting Zambia's forests, resulted in the 'normalisation of informality' along the value chain, with spillovers into tout-court illegality. While this has proven a lucrative system for some, it has taken away potential financial wealth from rural Zambians, deterred long-term sustainable investment and likely caused negative environmental impacts.

Taken together, the different business models have over time created a 'formal system of informal acts'. There are certain known procedures and behaviours (including, of course, sums of money that go with those) with which actors have to comply if licences, permits or any other requested paperwork are to be obtained. Over time, such normalisation of informality, as put by one Chinese buyer, has rendered the system "less chaotic than it was before". In a way, it also made the system less prone to predatory behaviours by state officials, because everyone knows the cost involved with this or that act (for instance, how much per roadblock along a certain corridor, or how much is due to this or that clearing agent per container).

Broadly speaking, Chinese operators' overall perception of the mukula value chain extends beyond timber, as part of a more generalised view of 'doing business' in Zambia and beyond. "Nothing [here] is completely formal" seems the dominant view among Chinese interviewees. Whatever the tree species, somewhere along the chain there is always a request for bribes from public officials in order to "get things done." Clearly, for Chinese buyers, this modus operandi is a major obstacle to long-lasting and sustainable business. With regards to mukula, buyers complain in particular about the ever-changing and never-transparent policies such as 'ban-lift-ban-lift'.

Consequently, most operators still prefer to invest their money in 'simple' trading – buying and selling of mukula – than to invest in longer-term engagement, such as for example through the management of a forest concession. One example of a large Chinese company that set up a processing facility in Lusaka is telling in this regard. At the time of our interviews in 2016, the company had reportedly invested in the facility with the aim of long-term business. But discussions with key informants indicated that it still preferred to stock its logyard with logs, and export mukula as logs, instead of processing them. In fact, according to our most recent information emerging from the latest consultations in 2017, the company appears to have since closed its operations.

The unstable business environment also has repercussions at the community level. When formal, long-term engagement through logging concessions is lacking and 'simple' trading is the preferred option, the de facto custodians of the land – TAs and local elites – assume a very important role. Regarding the dynamics of access and sanction at the village level, results often indicate contestation for authority – and collusion where it serves certain actors' interest – among the state, the chief, and traders and

cutters. In most sampled villages, TAs and local elites have successfully captured the sudden opportunity for wealth creation through mukula, heightening the intra-community tension as ordinary villagers felt they gained disproportionately little benefit. In particular, the influence of the chief in shaping the norms of local resource access, largely to the disadvantage and dismay of his 'subjects' (local villagers), seems to go beyond the remits of – and indeed contradicts with the intention of – the Forests Act of 2015 and related regulations. As a result, in most sampled villages, the social contract between the traditional authorities and villagers is increasingly threatened. Although opportunities indeed arise out of the new emphasis on community forestry in the Forests Act of 2015, this research casts a cautionary light on potential elite capture and inequitable distribution of wealth among community members where safeguards are deficient at the community level.

4.3 Resource governance in Zambia: a way forward?

The highly political nature of the regulatory and technical decisions taken on mukula (such as ministerial declarations, the ban-and-lift cycle and special authorisation to ZAFFICO) deserve much attention when discussing possible ways to improve the social, economic and environmental impacts of the mukula value chain (and the timber sector more broadly). Several approaches taken to improve resource governance have been unsuccessful. Forced 'legalisation' with easy-to-adopt but impossible-to-apply decisions has not worked. Similarly, the forced 'formalisation' of value chain agents may not necessarily be the optimal solution in a system where connections to power count much more than contributions to the rural economy. In fact, the risk in such a system, as documented by our findings, is further criminalisation of the lower levels of the production pyramid – the cutters and smallholders, and their families.

Our results ring alarm bells, as they indicate that the status quo carries enormous risks to the environment, rural livelihoods, and ultimately Zambia's long-term development plans. These risks are not limited to mukula and similar species; they extend to the entire timber sector in Zambia.

It seems evident that discussions about possible ways forward must address the central question of how the forest sector should be managed. This is because, once mukula will be depleted (as it has been the case for other *Pterocarpus* in other parts of sub-Saharan Africa), the same political and technical schemes and the same vested interests will be applied to another species, reproducing a vicious cycle that consumes resources unsustainably. In this vicious cycle, there can be short-term increases in income for individual loggers and their households, but no sustained benefits shared by the wider communities and among or people whose customary land is entrusted to the president.

Along this line, the Forests Act of 2015 holds the seeds of potential solutions. In particular, it makes room for decentralised forest management with a monitoring role given to forest communities. We believe that this is a step in the right direction, considering the current regime in Zambia. Informal/illegal cutters today are prevented from increasing their revenues by a fortified wall erected by local elites, chiefs, traders with close ties to chiefs, and powerful politicians. This wall – layers of authority originating with elites and intermediaries – stymies the communities' entrepreneurial potential at birth. It allows the more fortunate or well-connected to increase their own profits without much thought to the long-term consequences of such behaviour.

In theory, the mukula example indicates that community forests with functional, independent governance structures could shorten the value chain, connect more directly to buyers (Chinese and non-Chinese) and increase the benefits flowing back to the communities. All this can be accomplished while also diversifying the number of species in community forests. In the ideal scenario, the benefits would be used to fulfil the immediate needs of the community, with possible extensions into rehabilitating the forests that provided the benefits in the first place. Benefits would be not just financial but could also take the form of technology transfer from buyers/investors willing to locally increase the value addition. This in turn could lead to job creation – an explicit goal of at least some of the members of the political establishment (as in National Assembly of Zambia 2016).

Concrete policy and technical options for such a scenario are not difficult to imagine. There is no shortage of ideas for business models at the scale of the community that may produce the intended results in Zambia (see for instance Blomley *et al.* 2008 and Karsenty *et al.* 2010). Prior to this, however, serious discussion is required on how vested interests and corrupt behaviours influence the current (mal-)functioning of the chain. The discussion should focus on how value chains, such as the one that developed around mukula, could be better integrated into the country's formal economy to produce longer-term, more equitable benefits for all Zambians – not just short-term crumbs for the masses (who have no alternative but to accept the *modus operandi*), with all the juicy profits going to more powerful actors including national elites who set the rules of the game as they please.

A serious and honest discussion must thus reckon with the problems within the Zambian political system and structures. This is particularly called for in light of the tendency within the country – and indeed beyond Zambia – to put the blame on 'outside' actors (including Chinese buyers). It is instructive to consider, for example, that about 53% of key informants expressed a belief that inadequate human and other resources in the FD hampered the ability of the institution to deliver on its mandate. At the same time, interviewees complained that ZAFFICO received preference in some of the FD mandates such as timber auctions. Furthermore, they grumbled that the work needed to manage

and monitor the forests is too much to be handled by the few officers available. What this indicates, among other things, is that the prevalent mode of thinking is still taking place in silos – within the FD as well as other government institutions that the FD is meant to work with. Over the years, all of these institutions have been affected by issues of power, and by stiff mandates resulting in weak to non-existent collaboration (Elyachar 2013). This is one of the reasons why, within just a few years, a complex but perfectly functioning ‘bribing-machine’ has been deployed over the national territory, with state officials creatively using the powers of their own agencies to syphon revenues away from the same hands that could instead help improve capacities and increase the means of their agencies.

While this issue illustrates the wider problem of personal gain vs. wider social benefits, it is also at the core of the debate about formalisation and impacts of value chains such as that of mukula. Within a fiendishly complex system of multiple political, cultural, historical, financial and other layers, the equation that farmers-turned-loggers try to solve each day is simple – calculating the costs and benefits of what they are doing. In its essence, their thinking does not discriminate between a cost (or benefit) that may have a negative moral connotation or other nonmonetary impact. In other words, in a system dominated by corruption, a bribe is a cost just like a formal tax, both of which stand in the way of increased income for the people. Formalisation generally involves integration into a system whereby taxes are paid to a formal structure in return for certain services, such as a quick and efficient way of relating cutters with buyers, or custom clearance procedures that allow the resource to reach the final client in the shortest time possible. Crucially, however, in the eyes of operators, if taxes are simply added to a basket of costs where the amounts of bribes remain unchanged and unchecked, they will never consider formalisation as an option.

Failure to make formalisation work for everybody leads to severe environmental pressures. Given the lack of monitoring and the unreliability of national statistics, the total area of forest degraded by uncontrolled logging is unknown. We estimate that for the search of mukula alone, between about 90,000 and 150,000 hectares of forests may have been affected. In addition, interviews reveal that in many cases even legalised logging does not always conform to government regulations, further contributing in unknown dimensions to forest degradation in Zambia. For example, findings from REDD+ preparedness studies indicate that holders of harvesting licences, who by law are obliged to prepare plans of operations and annual work plans, rarely do so and yet get away with it (Leventon, Kabala *et al.* 2014). Also, even though it is a requirement that Concession licence applicants obtain decision letters from the ZEMA determining whether the proper environmental conditions are met, the FD nonetheless issues licences to applicants before the ZEMA has issued its decision.

That state institutions such as the FD, the Police, Drug Enforcement Commission and others have joined forces but still failed to stop so widely open and broad a trade speaks volumes about the lack of effective official connectivity between the state's centre and periphery. In a way, such connectivity does exist to maintain the extensive informal networks allowing the trade to continue and allowing state officials to use their powers for personal gains. At times, the state machine clamps down on some of its members, and indeed the law enforcement officers, particularly from the FD and the Zambia Police Service, are occasionally being apprehended for forest crimes. But such occurrences seem to have less to do with real enforcement than with the elimination of 'unwanted' or 'reactionary' nodes along the informal connectivity networks; "Either with us, or against us," they seem to say.

For the Zambian situation to improve in any meaningful way, a serious attempt to clean such a political quagmire must be undertaken. If it is, then, from a policy and legal perspective, and arguably as a means of last resort, Zambia will have to translate into practice the recently approved National Forestry Policy and the Forests Act, which contain provisions for Community Forest Management (CFM), Joint Forest Management (JFM) and Private Forest Management (PFM) to supplement the FD's lack of capacity to manage Zambia's protected forest estate. Participation of communities, traditional authorities and NGOs in the management of forests seems the most viable pathway for enhanced capacity to manage, monitor and enforce the principles of sustainable forest management.

In parallel to this longer-term pathway, one short-term option in the hands of the Zambian government to reduce current negative environmental impacts is to get a better understanding of which species may fall under the general term 'mukula' and proceed to the listing of such species under the Convention on International Trade in Endangered Species (CITES). As shown in other countries, including neighbouring DRC in recent years (De Muelenaere 2013), such a measure would not completely eliminate the potential for Zambian elites to control the issuance of papers to extract rent. Nevertheless, it will send a signal of much stricter due-diligence requirements, and possible prosecution, to the market, possibly leading to decreased demand, with immediate benefits for the environment. Decreased demand would also impact rural livelihoods, as farmers would see their incomes reduced. It is thus crucial to put all such measures together on the discussion table, with the aim of balancing potential short-term negative livelihoods impacts with long-term improved solutions brought about by effective implementation of the Forests Act.

5

Conclusion

In Zambia, the Forests Act No. 4 of 2015 and related regulations govern the forest sector and clearly establish how timber should be accessed, harvested, processed and traded. Notwithstanding clear rules, roles and responsibilities established in theory, the value chain that has developed around highly valuable trees found in the Zambian forests – sold mainly on the Chinese market under the general name of rosewood and known in Zambia as ‘mukula’ – illustrates how dysfunctional, conflicting and politically charged the management of the Zambian forests is in practice. The value chain, ultimately, is dominated by powerful vested interests that place personal gain and interest over the environmental and socio-economic consequences of their actions.

The mukula value chain – almost entirely driven by high Chinese demand – has benefited a variety of actors, Chinese and Zambian alike. In the initial years of the trade, from around 2010 to 2012, Chinese nationals managed all operations except cutting, which has always been conducted by Zambian farmers-turned-loggers. In more recent years, as various bans and other government responses tried to regulate the trade, Chinese intermediaries have still maintained the upper hand on export and trade with China, although trading within Zambia has been taken over by Zambians. At first, these Zambians were traders with facility of entry into established political connections that guaranteed access to much-needed paperwork; later, many more established traders and businesspersons with money to invest and make the necessary informal payments also joined. Overall, the rural population has seized on the great (short-term) opportunity for profit by participating in harvesting operations across the national territory. Profits were then often used to pay for basic needs such as food, education and health, and to acquire various assets. At the top of the list were house-related assets such as beds, mattresses and iron sheeting for roofs, followed by bicycles, phones and solar panels. Our findings indicate that rural community members and cutters attributed significant livelihood benefits and business opportunities to the mukula trade, despite decreasing profitability over the years and risks of criminalisation and prosecution.

We estimate that in recent years mukula production over the national territory could have amounted to about 1 10,000m³ per annum, with revenue losses in production and conveyance fees of about US\$3.2 million per annum, and about US\$1.7 million paid in bribes to state officials along the national roads to allow for mukula to pass through and eventually be exported to China. The scale of estimated lost revenue and informal payments is remarkable, considering that FD's annual average budget has been US\$ 1.7 million in the past few years. Unfortunately, these numbers cannot be corroborated by or compared with national statistics (which remain secretive and incomplete). It is remarkable, also, that log export remains banned in Zambia despite all evidence pointing to a substantial quantity of logs leaving the country. As we have shown, a broad comparison with Chinese import data indicates that in 2016 Zambia declared to have exported only about 3,000m³ of logs (approximate value: US\$900,000) while China declared log imports of about 61,000 m³ (approximate value: US\$87 million). If anything, these numbers call for a much stronger effort for data collection and monitoring on the part of the FD and the Zambian government in general; otherwise, there is no way of knowing what and how much is being extracted from Zambian forests, or the extent of the environmental and financial losses the state is incurring.

Our report has also shown that the mukula value chain provides huge profit margins for all operators along the value chain – the unfortunate exception being the cutters. While cutters receive an average price of about US\$23/m³, manufacturers in China pay about US\$1,000–1,100 to importers, who in turn pay about US\$700–800/m³ to (largely) Chinese exporters based in Zambia. These differences may partly be the result of bribes (estimated from US\$90–150/m³) that traders and exporters have to pay to officials along the way. We should not forget, however, that the product in question receives zero value addition from the forest to traders to manufacturers in China, whose hefty profits thus do not trickle down to rural Zambian in any equitable manner. If anything, things are made worse by the rent-seeking behaviour of economic and political elites at all levels in the midst of Zambia's ban-and-lift cycles.

While cutters, traders, buyers and elites have profited as much as possible from the short-term bonanza that is the mukula business, state officials have taken full advantage of a fluid legal framework that allows them to institutionalise informality and illegality as legitimate ways of timber production and export. Avarice appears to have left little space for environmental concerns regarding the sustainability of mukula production – or any other species for that matter. And yet results point towards potential negative environmental impacts directly linked to the evolution of the chain over the years, irrespective of the policy decisions taken in the name of better management. Importantly, these concerns must not be linked only to mukula or look-alike species but also to the broader impacts on the delicate miombo ecosystem and its structure, soil and fauna when deprived of a locally abundant species or group of species.

The mukula trade is a case study for how, once a profitable commodity is found, rent-seeking behaviours from elites at all geographical scales occurs. All levels of authority flock to the commodity and try to assert control over it. In the case of Zambia, these included a number of government departments, local and national politicians, traditional authorities and some chiefs. In the initial chaotic phases, with ineffective bans being the only official measures taken, most operators earn handsome profits while the environment is a collateral casualty. Later on, when more stringent and arguably more effective measures are adopted (such as the taskforce and local police operations, in the case of Zambia), the number of people with access to the necessary power to bypass regulations is reduced, power distribution tend to become more uneven, and the most vulnerable layers of the value chain are penalised. Environmental concerns remain peripheral at best.

While the fluid legal framework may allow power to maintain the upper hand on a direct and private source of revenue, ultimately benefiting large parts of the political elites, it also constitutes a strong barrier to conducting sustainable business. Because many operations in the timber export value chain, and in particular the organisation of shipments, need to be arranged well in advance, a larger number of 'insecure' or 'unclear' elements or events in the chain generally render business riskier. These insecure elements are not insurmountable barriers to doing business, as demonstrated by our results, but they increase the number of buyers and traders who hesitate before making any medium- to long-term investment. It is this positive investment, however, that is badly needed for a well-managed, sustainable and efficient Zambian forest sector.

One possible solution that could bring some order into the mukula trade in Zambia is more research to clarify the botanical characteristics of what goes under the name 'mukula', followed if possible by listing the species in the Convention on International Trade in Endangered Species (CITES). While this is an urgently needed step, the business structures underpinning this market have already proven how easily they can move away from targeted species and countries, preying instead on lesser known species or new geographies altogether. The recent documented cases of 'mukula' harvesting in DRC, Malawi and other countries show this well. In addition to more integrated regional solutions, it is clear that given the long history of failures with the conventional business model of logging concessions, the Zambian government must step up its ambition to the task of protecting the Zambian forests and people's long-term livelihoods. The innovative measures included in the Forests Act of 2015, including community, joint and private forest management, need to be tested and implemented.

More broadly, and surely beyond the Zambian case documented here, findings reveal a situation that, at least in sub-Saharan Africa, is moving from exceptional to normal, in which existing national laws are not sufficient instruments to rein in fast-spreading, spatially disconnected and financially intensive business models. While the Zambian forests were emptied of mukula and the Zambian government was still deliberating

potential countermeasures, buyers and traders had already started storming the forests of Malawi, DRC, Mozambique and perhaps Tanzania, with containers of logged mukula leaving from Mombasa, Dar es Salaam, Beira, Durban and Walvis Bay.

Domestic solutions are bound to fail where similar commodities can be grabbed before even national laws realise that something is wrong in the national forests. International agencies (such as INTERPOL), laws, regulations (such as those of Customs) and conventions (such as CITES) exist that can and do help in the effort. But, as our documentation reveals, what is necessary first and foremost is a better regional, supra-national integration of sub-Saharan countries where those commodities can be found and harvested. In this sense, regional bodies such as economic communities (for example, the Southern African Development Community) may be good platforms to begin discussing these issues. Unless that is done, countries will continue trying to perfect their own laws, only to find that implementation is useless because the resource is already gone.

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Annex 1: The role of the Forestry Department in the Forests Act of 2015

A licence is needed to harvest timber for commercial purposes. Such a licence must specify the physical location of the trees to be harvested, the tree species, the estimated volume (in theory, after an inventory has been carried out), and also the revenues to be paid, including offences, penalties and forfeitures (van Hensbergen and Njovu 2015; Lukumbuza and Sianga 2017). The FD can issue two types of licences. The first is a *sawmill licence*, which authorises a sawmill owner to process timber using a sawmilling device or any other wood processing equipment for a period not exceeding five years⁸. The second is a *forest concession licence*, which authorises a citizen to cut, fell or process timber from a specified forest area for a period not exceeding five years.⁹ A forest concession licence is issued to persons, companies, community groups or cooperatives that are involved in primary harvesting/extraction of trees from the natural forest.

Licences are issued by the FD in three forms depending on the clients' production capacity: (1) large-scale forest concession licences, which allow the licensee to harvest/extract timber from a designated forest area ranging from 201 to 400m³ per month; (2) medium-scale forest concession licences ranging from 101 to 200m³ per month; and (3) small-scale forest concession licences ranging from 20 to 100m³ per month.

Before 2015, timber sawmilling and concession licences covered areas of 5,000ha and 10,000ha, but these have since been reduced to 1,000ha and 7,000ha, respectively. Sawmillers are expected to pay a minimum of about US\$52 for their licence, whereas commercial concessionaires may pay up to about US\$1,000 as part of their application (depending on the type of concession licence). The application process for these licences involves several steps, as outlined in Table 3.

⁸ Forests Act, 2015 Section 52. (1) (a)

⁹ Forests Act, 2015 Section 52. (1) (b)

Table 3. Application process/requirements for licences

Forest Concession	Timber sawmilling
1. Applicant makes inquiries for potential concession areas at the respective District Forestry Office	1. Applicant obtains an application form from the District or Provincial Forestry Office, completes the form and submits it
2. Applicant obtains consent from Traditional and Local Authority in writing	2. The Provincial Forestry Office undertakes a comprehensive assessment of the processing facility, and submits it to the Timber Licensing Committee
3. Applicant requests District Forestry Officer to carry out a forest inventory in the identified Forest	3. Approved applicants will be issued with the sawmilling licence and sign the contract at the Provincial Forestry Office
4. Forest Inventory Report confirms availability of timber trees for the category of the concession	
5. Applicant makes formal application to the Department, attaching all relevant supporting documents through the District Forestry Office	
6. Director of Forestry will within thirty (30) days arrange for screening of the application by the Timber Licensing Committee	
7. Approved application will be conveyed to the Provincial Forestry Officer for issuance of the licence and signing of the contract	

District Councils and chiefs should all play a role in recommending forest licence applications, after consultation with headmen/women and the population. Once attributed by the FD, licences' provisions and conditions should be under the daily control of the DFO, and indeed they must report harvested volumes to DFOs monthly. Districts then report monthly, quarterly and annually to provinces and the PFOs, with the latter reporting to the FD in Lusaka which, for the purpose of planning, monitoring and managing the forest, should receive annual comprehensive reports on the status of the forest and harvesting operations.

Once harvesting commences, a forest officer must be physically present in the harvesting area and hammer-mark both the stump and the log with the distinctive forest hammer assigned to each DFO. In order to move the log, a conveyance permit is required, released by the DFO, typically valid for two weeks and allowing the owner of the timber to transport it to its next processing destination.

In cases where timber is to be exported, the Forest (Timber Export) Regulations of 2015 (GRZ 2015) are used. Among other things, the regulations specify the type of timber that may be exported, provide restrictions on the use of species of timber, and control quantities of timber to be exported. According to these regulations, a concession licence owner or merchant wishing to export timber has to apply to the Director of Forestry for a forest produce export permit.¹⁰ The regulations also specify that timber to be exported has to undergo clearance by a forest officer, to be inspected by a forest officer, police officer or inspector prior to export, and to be semi-processed. Round logs cannot be exported. The exporter must obtain a Customs Export Declaration, which has to be authorised by four agencies, namely the Zambia Bureau of Standards, Plant Quarantine and Phytosanitary Services, Zambia Revenue Authority and the FD. Export must be carried out by a registered trader (it could be the same holder of the harvesting licence), or by a registered merchant, who must have a Certificate of Agreement with the latter. Again, all timber must be hammer-marked before export.

¹⁰Forests Act, 2015 Section 53. (1) (c).

Annex 2: Methods for estimating national annual production of mukula

To estimate the total annual production of mukula, we have to adopt several assumptions, as official production data are either incomplete, non-existent or unavailable. Interviews with Customs and other state officials indicate that such statistics, though admittedly incomplete, should be available, but repeated attempts at obtaining them during this research proved fruitless. What's more, interviews with cutters, traders and buyers suggest that most of their produce is either incompletely recorded in the documents or entirely unrecorded through various means. Among the latter, the continuum ranges from declarations such as, "We do not have any licences; instead we just pay all the related people, from police to customs" to various other means such as 'informal clearance' at Custom points, use of the same documents photocopied multiple times, use of fake documents, or use of 'government special permits' which are used as passe-partout but unrecorded in public databases.

As already reported in the estimation of average annual income from mukula, average production rate per person and per day is about 0.3 m³ and operators spend about 101 days in the forest per year to conduct their operations. This led to an annual average production per operator of about 34 m³ in sampled villages. The first assumption thus concerns the average number of active cutters present in the area. TAs, key informants and participants in FGDs were explicitly asked to express their opinion as to how many operators were present, active and focussing on mukula in the selected villages. In general, as operations are conducted well beyond the village 'borders', with teams of people roaming the chiefdom's territory, it is difficult for people to estimate such numbers. In addition, double counting may occur, as one village may also report on operators that were already mentioned in another village within the same chiefdom. We tried to avoid double counting as much as possible by asking whether the operators mentioned were all from the village or were 'external' people. All in all, the reported average number was

about 20 operators. From interviews with operators, we also know that only about 40% of operators are cutters, the rest being people searching for trees, transporting, debarking and loading/unloading carts.

When compared to the average population found in sampled chiefdoms (about 11,523 inhabitants), these numbers indicate that about 0.07% of the total population was actively engaged in harvesting mukula. In order to link such percentage to the total population that could potentially harvest mukula across Zambia, and hence estimate the total national production, a second assumption is needed on the distribution of mukula across the national territory. As official data are not available, we assume that the aerial distribution of mukula and all the potential look-alikes considered in this assessment is similar to that of mukwa, common in savannah woodlands throughout southern Africa in areas where annual rainfall exceeds 500mm (Desmet, Shackleton *et al.* 1996). This area also broadly corresponds to the area mentioned in Zambian parliamentary debates on the issue of illegal logging, notably of mukula in Western, Central, Eastern, North-Western, Lusaka and Luapula provinces (National Assembly of Zambia 2014). Altogether, those provinces have a total rural population of about 4.8 million (GRZ 2012). If our sample rate of 0.07% is applied to the rural population, the total estimated number of cutters active at any given time is about 3,300.

With these assumptions and calculations in mind, a gross estimate for the national annual production of mukula in recent years is around 113,000m³, or between 1,500 and 2,000 containers loaded with between 300 and 400 logs passing through border points. Although highly speculative, these numbers can be set in the context of recent media and other publications on the topic. For example, in one single border with Tanzania (out of several that interviewees declared using), custom officials recently estimated that about 60 containers of mukula per month in the dry season were passing through (Lukumbuzya and Sianga 2017). Also recently, about 500 trucks were impounded in one single operation in Zambia, allegedly coming from the DRC (Kibangula 2017) – but media reported that at least part of them contained timber harvested in Zambia and disguised as DRC timber.



Knowledge
Products

Research Report

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**Forests, natural resource
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Informal economic activities across much of sub-Saharan Africa provide crucial cash income and employment for both rural and urban populations. Governing the informal economy is recognised as a key policy challenge due to its contribution to local livelihoods and its common association with illegality, tax evasion and negative environmental impacts. In addition, because of the increasingly globalised trade in commodities, parts of the informal economy can also be supported by global sources of capital.

This report focuses on the international mukula (or rosewood) trade in Zambia, interrogating the role of global capital (in particular that of Chinese origin) and its impacts on rural livelihoods and the environment. We find that rural villagers are increasingly forging direct links with foreign investors, producing innovative business models that accelerate the rate of small-scale production and extraction of resources.

This 'globalised' rural informal economy urgently calls for innovative policies, which maximise the benefits of global capital flowing directly to rural populations, while minimising the negative impacts associated with the environment, revenue losses and resource governance.

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