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Abstract

In critical agrarian studies, the connections between large-scale agricultural investments and outgrower schemes are strong, but evidence on which model produces improved livelihood outcomes remain relatively weak. This paper examines livelihood impacts in two differently structured outgrower schemes under Zambia Sugar Plc – ZaSPlc, a subsidiary of Illovo Sugar Plc. The first scheme centrally controls land through an integrated company, renting out sugarcane plots to smallholders whilst acting as an intermediary. The second scheme amalgamates individual smallholder plots of land to form a contiguous block-farm managed by a ZaSPlc intermediary, integrating smallholders as shareholders. We identify the former scheme as producing greater livelihood impacts across financial capital and other dynamics but emphasise that these remain low quality and fail to produce significant path-changing gains for households. Analysis of livelihood groups and strategies, livelihood contributions of LaSAIs and sugarcane uptake, and livelihood response pathways reflect causes and consequences of differences in the evolution, operation, and integration of outgrower schemes. One outcome is the production of narrow as opposed to broad-based livelihoods. Livelihood diversification away from sugarcane schemes are forged within land-based and agrarian activities and show that smallholders do not always switch to profit-maximising strategies. Our findings show that greater attention must be paid to the role of institutional arrangements and local conditions in unfolding outcomes for land and water relations, and how emerging relationships shape inclusivity of an agricultural investment. Thus, outgrower arrangements that ensure commodity production alongside alternative farmer activities that boost livelihoods are thus strengthened for this purpose.

Key words: large-scale agricultural investment, land, livelihoods, outgrower schemes, sugarcane, Zambia

1. Introduction

In critical agrarian studies, the connection between large-scale agricultural investments (LaSAIs) and outgrower schemes is strong, but evidence on which model produces improved livelihood outcomes remain relatively weak. Relatively little research is available on the livelihood implications and outcomes of different models of agricultural commercialisation (Hall et al. 2017; Cotula et al. 2005; Smalley 2013). Precisely that LaSAIs and outgrower schemes have been resituated as important forms of land control (Vicol 2017; Peluso and Lund

2011) means that institutional and contractual arrangements are central in delivering expected livelihood outcomes. Outgrower schemes have gained prominence in policy debate partly in relation to land-use, commercial development and social justice, with contractual arrangements presented as alternatives to outright purchases and land-grabs; and also as avenues through which smallholders can access market opportunities (Cotula et al. 2009; Vicol 2017; Hall et al. 2017). However, a narrow focus on the micro-functioning of firms and companies (e.g. transaction costs including economic bargaining) in mainstream approaches often neglects the socio-economic and environmental dynamics facing outgrower schemes, and the local livelihoods and activities that smallholder farmers enter into as response pathways (Birthal et al. 2005). Rapid value-chain expansion in commodities such as sugarcane that create complex contexts within which smallholders can pursue their livelihoods is a key area of research need (Singh et al. 2016). Previous research has reported negative impacts of LaSAIs, for example through land enclosures (Oberlack et al. 2016; Bottazzi et al. 2016; Borras et al. 2011; Peluso and Lund 2011). However, how LaSAIs contributes to the re-organising socio-economic and environmental land-scape and how livelihood outcomes differ between differently structured outgrower schemes remains less explored (Pritchard et al. 2017; Vicol 2017).

This study examines how LaSAI processes impact upon local patterns of livelihoods in unfolding outgrower schemes. It considers how local livelihood outcomes differ between two differently structured schemes to explore causes and consequences of the differences in evolution, operation and integration of the two models. Specific objectives include: 1) to explore livelihood groups and strategies among smallholders on the Zambian ‘sugarbelt’; 2) to explore and understand livelihood contributions of LaSAIs and sugarcane expansion among smallholders; 3) to examine how sugarcane uptake shapes livelihood and response pathways for smallholders; and 4) to explore trends, hazards, and seasonal aspects related to sugarcane uptake and how they shape sugarcane-based livelihoods on the sugarbelt. The paper seeks to provide an improved understanding of livelihood dynamics under different outgrower structures and offer new insights into household decisions and response pathways. It seeks enhanced knowledge on local development prospects as they relate to corporate agriculture in rural Zambia, advancing critical discussion into land use, commercial agricultural development, and social justice.

2. Large-scale Agricultural Investments and Outgrower Schemes: Re-engaging Livelihood Perspectives

The rise of 'land-grabs' in the past decade sparked negative publicity of LaSAIs about control of local resources and their impacts on livelihoods (Borras et al. 2011). Contemporary LaSAIs have been driven by new actors, frontiers and mechanisms of resource access (Peluso and Lund 2011). Drivers have largely taken a global dimension – of the converging *'food*-fuel-*feed'* crises (Hall 2011). Skyrocketing food crop prices alongside an emerging biofuel complex ignited a surging demand for productive land (Borras et al. 2011). Combined, these factors have ignited a 'scramble for land and water' largely with a focus on sub-Saharan Africa (Oxfam 2011). National states – under the guise of water-energy-food security – are actively supporting agribusiness capital expansion (McMichael 2012). Diversity in processes and organisation means LaSAIs produce different outcomes for local communities who find themselves integrated in differently structured outgrower schemes and contractual arrangements (Oya 2011).

The onset of LaSAIs reinforced debates on the merits of outgrower schemes as means of integrating smallholders into commodity value-chains (Oya 2011). While there exist diverse defining features for outgrower schemes, coordination arrangements such as those where smallholder incorporation into commercial value-chains is shaped by a core processing estate have been lauded as being pro-poor, and best alternative to outright purchases (World Bank 2011), but remain controversial on livelihoods outcomes (Borras and Franco 2013). Rather than a focus on institutional, social and economic processes of resource control (Borras and Franco 2010; 2012; Hall 2011), recent studies have suggested the need to integrate sustainable livelihood approaches (SLA) in the land-grab debate (Vicol 2017). For instance, Scoones (2009) called for new priorities to re-energise livelihoods perspectives whilst Zoomers and Otsuki (2017) called for the revision and incorporation of livelihood analyses in land investments, arguing SLA can help explain differential responses and outcomes. Included also are international development actors and civil society organisations concerned with socially responsible investments for local communities (FAO 2012). Within this perspective, efforts such as those by Zoomers (2008) examine how livelihoods cope under new scarcities and land-grabbing while others focus on the inclusiveness of LaSAIs and business models (Di-Matteo et al. 2016; Vicol 2017). Equally featuring are reflections on the interaction of actors within value-chains and local livelihoods (Challies and Murray 2011) and how investment crops shape resource access for rural households (Nhantumbo and Salomão 2010). However, how LaSAIs play out in different outgrower schemes continue to receive peripheral attention in the land-grab literature.

In Zambia, the promotion of LaSAIs in national policies continues to reshape social and institutional relations and models for integrating smallholders but implications on what local people can do is poorly understood (Matenga 2017; Hall et al. 2017). Rural livelihoods have come under pressure from LaSAIs particularly in the post-2000 (Lay et al. 2018). In the sugar sub-sector, this coincided with the entry of the multinational corporation Illovo Sugar Plc (Illovo, a multinational company and a subsidiary of Associated British Foods, operating in five other countries in sub-Saharan Africa) which took over Zambia Sugar Plc (ZaSPlc, a former parastatal). The entry of Illovo has seen Zambia expand its area under sugarcane cultivation directly and indirectly through commercial farmers, companies and outgrower schemes. Expansion of outgrower schemes has been shaped by state policies that promote LaSAIs for rural development and employment creation (GRZ 2016), alongside international finance such as those under the EU's Accompanying Measures for Sugar Protocol countries (AMSP) (Palerm et al. 2010). State-donor-agribusiness relations have been key in facilitating growth and expansion of both the sugar sub-sector and in advancing the merits of integrating smallholders as outgrowers for agriculture and rural development.

One variant of outgrower schemes linked to ZaSPlc is the state-driven Kaleya Smallholder Company Limited (KASCOL), a nucleus-estate scheme integrating a private company and smallholders since the 1980s. In this variant, KASCOL owns all land on which smallholders directly cultivate sugarcane, and subsistence crops around their dwelling land. The other variant is the ZaSPlc-driven Magobbo outgrower block-farming model, which has been promoted by the company in the post-2000. In this route of outgrowing, the term outgrower is somewhat of a misnomer in that ZaSPlc takes controls, through its intermediary Nanga Farms, of land management and marketing of the crop, integrating former land owners as shareholders (Hall et al. 2017). Different outgrowing structures linked to ZaSPlc mean local livelihood responses and outcomes for outgrowers vary, and evaluating these differences is a central focus for this paper.

The ways that smallholders are incorporated in models of agriculture commercialisation determines gains and possibilities for local participants, financial or natural capital-based. In rural Zambia, the expansion in sugarcane reorganises land tenure relations in outgrower schemes which in turn shapes what smallholders engage into for their livelihoods, as alternative pathways. These possibilities differ according to institutional arrangement, land access and control in outgrower schemes, which shapes livelihood response pathways. Dorward et al. (2009) framework shows livelihoods are dynamic. Households *"hang in"* (when assets are held

and activities are engaged in to maintain livelihood levels), *"step up"* (when current activities are engaged in, with investments in assets to expand these activities, in order to increase production and income), and *"step out"* (when existing activities are engaged in accumulating assets which can then provide a 'launch pad' for moving into different activities leading to higher and/or more stable returns). This is relevant in understanding local groups of livelihoods, their activities and exploring processes of rural differentiation (Pritchard et al. 2017). Local responses are contingent on how actors conceive future exigencies in relation to present circumstances/actions which permits scholars to connect household decisions within the wider environment (Tittonell 2014).

Examining temporal trajectories of livelihoods and outcomes allows a better understanding of assets as dynamic and as part of a wider livelihood transformation in the context of household decision-making (Pritchard et al. 2017). This view is relevant because incorporation of smallholders into commercial value-chains on advantageous terms means smallholders can expand their capabilities and engage into diverse activities that facilitate local accumulation and boost resilience (Ellis 2000). Integration into outgrower schemes can allow smallholders to hold onto activities that maintain current livelihood levels. The opposite could mean being excluded and squeezed out, which can possibly lead to less resilient livelihoods.

In this paper we focus on how LaSAIs contribute to local patterns of livelihoods in sugarcane outgrower schemes. We explore how capabilities across alternative activities (as strategies and response pathways) are created aside sugarcane, and how new risks and vulnerabilities emerge for growers. Rural livelihoods also relate to the wider social and institutional context (e.g. trends, hazards and seasonal aspects) (Zoomers and Otsuki 2017). Thus, we consider household strategies and activities in their wider context, asking: what combination of assets lead to what outcomes among farmers cultivating sugarcane and how does the wider context (e.g. policy, agro-ecological) shape livelihood activities? What sort of activities and strategies do households enter into in response to sugarcane uptake and expansion? Thus, we explore factors that shape vulnerabilities (i.e. trends, seasonality and hazards) within broader transforming structures and processes (i.e. institutions, policies) (Ellis 2000). In so doing, we present outcomes of LaSAIs and livelihoods as dependent upon structure and organisation of outgrower schemes as well as ability to benefit from resources, and enter into activities of welfare value.

3. Description of the Study Area

The past decade saw rapid expansion in foreign LaSAIs in Zambia, driven by the neoliberal policies in the 1990s which emphasised private-sector-driven agriculture (GRZ 2017). Throughout this period national policies exploited land and water abundancy as part of the national agenda for diversification and investment promotion (GRZ 2017, p25). One sector which has received policy attention and attracted LaSAIs is the sugar sub-sector. The entry of Illovo in 2001 led to an intensified financialisation and agribusiness expansion in sugarcane production and in Mazabuka district – the focus of this study. Dubbed Zambia's 'Sugarbelt', Mazabuka district locates in southern province of Zambia (Figure 1). The district has an estimated population of 221,893, and 67% of these live in the rural areas (CSO 2014). The dominant economic activity is agriculture, but this suffers diverse challenges such as variable rainfall patterns, droughts and pressure from expanding industrial agriculture.

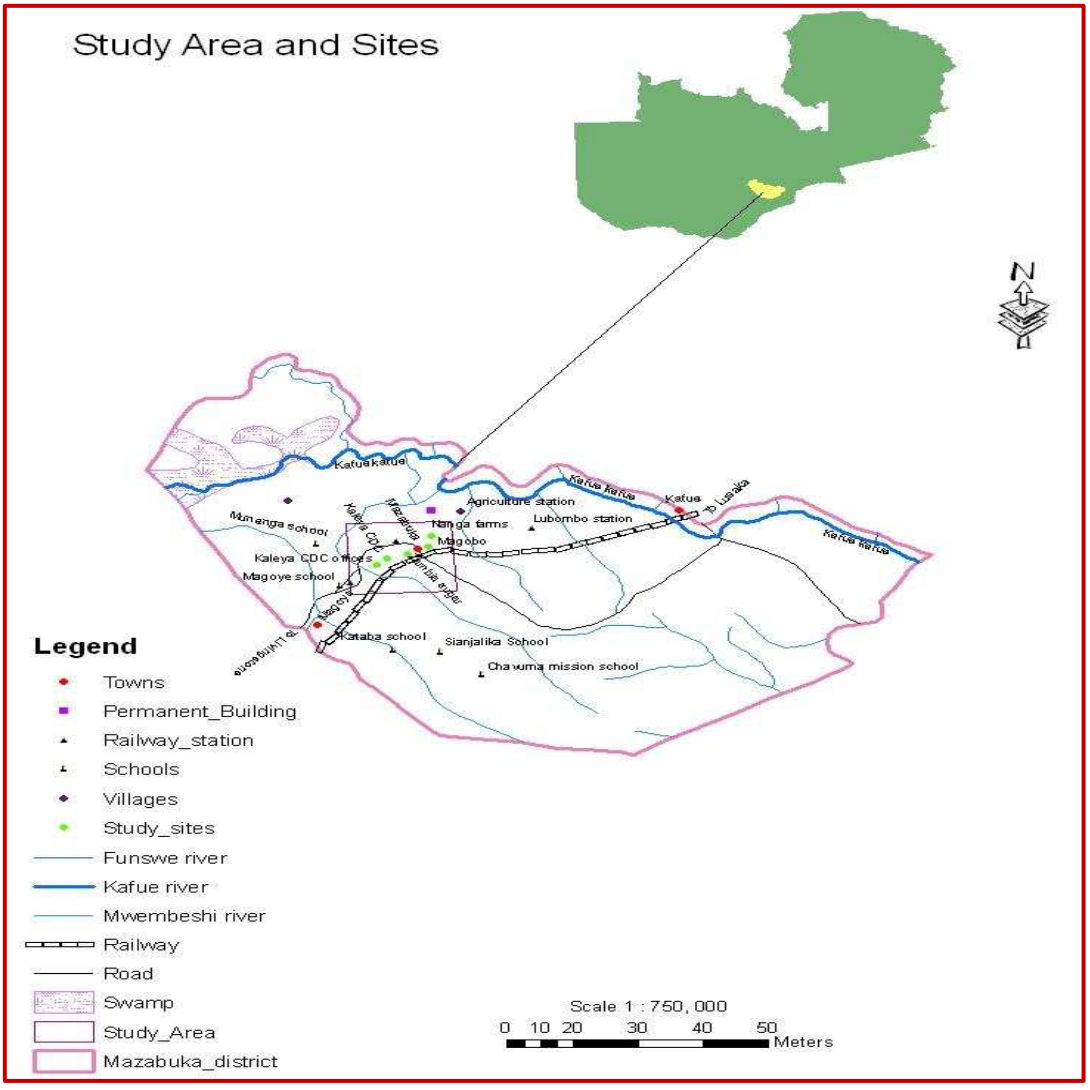

Figure 1: Study area and sites (Drawn using ArcMap)

Landholding patterns in the province mix private and customary land ownership, the latter being dominant among smallholders. Land and water availability, mediated by regional accessibility have enticed sugarcane productivity. Other commercial crops such as wheat and coffee also exist but are seldom small-scale (Kalinda 2014). Cropping patterns in staple crops such as maize have historically been influenced by rainfall, but rainfall variability pushes smallholders into alternative cropping pathways that use irrigation. Sugarcane has historically been a minor crop in Mazabuka and among smallholders until recently and alongside ZaSPlc expansion. Poor rainfall patterns, challenges of inputs and poor soils in some rural areas alongside possibilities of accessing ZaSPlc-linked irrigation water catalysed sugarcane uptake among villagers – 141% increase (n=225) between 2009 and 2015 (ZaSPlc 2016). This means farm and non-farm livelihood activities interact with outgrower schemes in myriad ways.

The sugar sub-sector is monopolistic with ZaSPlc producing more than 420,000 tons of sugar – commanding 92% market share – with the closest competitors (Kafue Sugar and Kasama Sugar Plc) nibbling on the balance 8%. Smallholder production share remains low (12%) compared to commercial farmers (28%) and the ZaSPlc's in-house production (60%) (Figure 2). This structure enables ZaSPlc to exert considerable influence across production, market and commercial channels in the district and the institutional structures shaping smallholder outgrower schemes.

4. Research Methodology

4.1. Case Study Selection

Selection of case studies considered the evolution, operation and integration of outgrower schemes to provide insights into their structure and organisation. Selected case studies emerged in different time periods and are differently structured, allowing analyses into comparative dynamics of the schemes linked to a LaSAI (Figure 2).

The first scheme is the pioneering Kaleya Smallholders Company Limited (KASCOL) project formed in the 1980s. While the total land currently under cultivation at KASCOL between the 160 participating smallholders and the core estate by the company is 2,400ha, company records obtained during fieldwork show that the smallholder component occupies just over 1000ha. Here all land belongs to KASCOL, and smallholders are tenants running a 14-year renewable lease. Credit assistance from ZaSPlc allowed smallholders to acquire 19.5% shareholding in KASCOL.

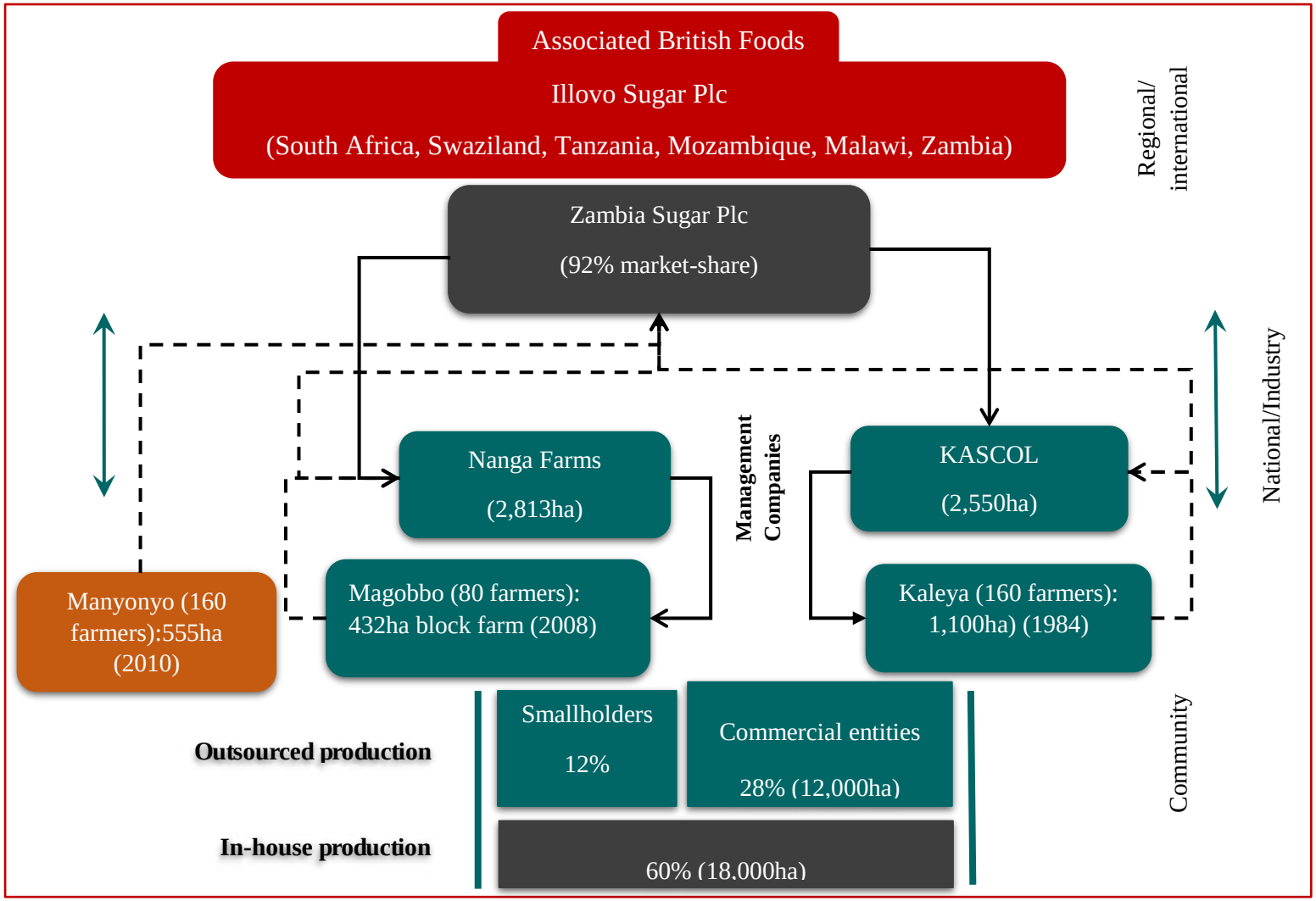

Figure 2: Structure of outgrower schemes on the Zambian 'Sugarbelt'

While ZaSPlc previously held 25% in KASCOL, this was donated to its brainchild Mazabuka Sugarcane Growers Trust (MSGT), a non-governmental body established to help in the development of smallholder sugarcane outgrower schemes. To facilitate smallholder production, KASCOL provides inputs as well as extension, procurement, marketing and wider commercial services to farmers at a cost. Farmers produce sugarcane on average 7.5ha sugarcane plots and utilise an additional half-hectare as dwelling land for subsistence production. Smallholder sugarcane production runs side-by-side with KASCOL's which runs a single cane supply agreement with ZaSPlc. That all costs incurred by the intermediary are deducted before final payment is due to growers means risks associated with sugarcane growing ultimately accrue to smallholders.

Magobbo Sugarcane Project (Magobbo) commenced operations in 2008 with international funding from the EU (60%) while MSGT together with a local commercial bank covered the balance. This donor-agribusiness funding agreement was crucial in actualising the project and in drawing ZaSPlc into the governance, financial and commercial control over Magobbo. This outgrower variant does not conform to standard narratives of outgrower schemes. ZaSPlc runs a sugarcane supply agreement and produces sugarcane on behalf of farmers through its subsidiary Nanga Farms. Thus, contrary to Kaleya, no household directly produces sugarcane in Magobbo. Instead, individual smallholder plots of land (average 4ha) have been amalgamated to create a single block-farm, with farmers (mainly urban elites, retired civil servants and smallholders) acting as lessors and receiving a share of profits made on the block-farm. Through Nanga Farms, ZaSPlc currently runs a 20-year lease though few farmers are aware of this period. This consolidation of individual smallholder plots of land into a single contiguous block-farm sets Magobbo apart in the history of outgrower schemes in Zambia. This coordination arguably enables investments in capital equipment, joint services such as land preparation, irrigation canals, input supply (e.g. fertiliser and chemicals), labour organisation, harvesting/haulage services, ensuring economic viability, productivity and efficiency (Matenga 2017). In Magobbo, the centralised management foisted on *'viability'* of the scheme re-situates the role of smallholders – as interested observers. Thus, as with Kaleya, contractual requirements transfer all production risks (crop failures, under production) to smallholders from firms and companies. This arrangement is crucial for smallholder economic gains as sugarcane is highly sensitive and vulnerable crop to diseases, rainfall and weather variability.

4.2. Data Collection and Analysis

We used key informant interviews, surveys, in-depth household interviews, focus group discussions as well as detailed observations and field notes (Table 1) to collect quantitative and qualitative data around outgrower schemes and livelihood dynamics between 2015 and 2016. A mixture of growers and non-growers were purposively selected, allowing for a cross section of views and perspectives. This study explores dynamics in two rural communities as *"critical vantage points"* to consider the implications of sugarcane expansion on local development and livelihoods (Neves and Du Toit 2013, p96). Thus, qualitative insights were crucial in highlighting local narratives, views and perspectives about the impacts of LaSAIs across the different schemes.

Multilevel interviews (national, district and industry):		n=25
Sugarcane/Contract participants		
	Kaleya (N=160)	Magobbo (N=80)
Household survey	80	70
Key informant interviews	8	8
In-depth household interviews	6	6
Focus group discussions	5	5
Non-sugarcane/Contract participants (Magobbo)		
Household survey	30	
Focus group discussion	1	

Table 1: Data collection

Questionnaires with contract and non-contract farmers were informed by scoping exercise and were crucial in collecting data on livelihood and farming strategies and in generating an initial asset profile for growers (Kaleya, n=80; Magobbo contract farmers, n=70; Magobbo non-contract farmers, n=30). A 3-4-kilometre radius deployed in the study could only locate non-contract participants in Magobbo, with a significant number of non-cane growers located beyond the radius, raising logistical challenges. A preliminary list of productive and non-productive assets was first generated based on documentary studies, and then validated through initial questionnaires, group discussions and interviews. This list of household assets was used to understand what sort of assets are acquired by smallholders and implications on livelihood activities. Households were asked questions related to: financial sources; land-use dynamics; livelihood activities within and outside schemes; risk strategies; challenges and opportunities associated with sugarcane uptake. A mixture of household members allowed to be present during surveys helped collect detailed insights into household activities and decisions.

Interviews with key community actors focussed on trends and dynamics in the sugar sub-sector, including wider implications of sugarcane expansion on local development

(Kaleya, n=8; Magobbo, n=8). Focus groups were conducted across gender, age, and farmer associations, focusing on livelihood dynamics, experiences and differentiated impacts of sugarcane expansion. Group discussions asked about wider community water and land use dynamics and aspects of scheme governance and membership. Discussions also focused on community wellbeing, challenges and sugarcane experiences (e.g. production, crop knowledge). Eleven group discussions were held (Kaleya, n=5; Magobbo contract participants, n=5; Magobbo non- contract participants, n=1) with 6-10 participants.

To explore livelihood groups, activities and dynamics, a participatory wealth ranking with community and association/committee leaders was conducted, enabling identification of three household categories: poor, medium and better-off from which we sampled households for interviews. In-depth household interviews across the three categories outlined livelihood strategies, land-use changes, labour and income dynamics, and response pathways (Kaleya, n=6; Magobbo, n=6). Livelihood impacts considered diversity and ability to induce a mix of agriculture and non-agriculture activities and how desirable these might be in the context of household welfare. In-depth household interviews took an oral history style within study themes.

Quantitative data from household questionnaires were analysed using SPSS to generate statistical summaries that can validate and confirm qualitative data. Qualitative data from different sources were sorted and coded in Nvivo based on broad themes and objectives and subjected to thematic analysis (Kumar 2005; Bazeley 2007). Central to this analysis was the need to maintain local narratives and experiences to account for causes and consequences of the differences between the two schemes.

5. Results

5.1 Livelihood Groups and Strategies

This section addresses objective one by drawing on in-depth household interviews, surveys, group discussions, detailed observations and fieldnotes to outline livelihood strategies pursued by households in addition to sugarcane. In Mazabuka, smallholders make up much of the agrarian landscape, and inclusion in outgrower schemes is encouraged in national policies for economic and political reasons. Participants are not homogenous, and contract participation differently impacts local patterns of wealth and livelihood assets. Mean ages for smallholders were 40 years (Magobbo non outgrowers), 57 years (Magobbo outgrowers), and 54 years

(Kaleya outgrowers). Most households were male-headed, married and had agriculture as their main source of income (Table 2).

		Magobbo non-cane contract participants (n=31)	Magobbo contract participants (n=70)	Kaleya contract participants (n=80)
Marital status of head of household	Single	3%	9%	8%
	Married	81%	74%	63%
	Divorced/separated	3%	7%	8%
	Widowed	13%	10%	21%
Mean age		40	57	54
Sex head of household	Male	77%	76%	65%
	Female	23%	24%	35%
Mean household size		6	9	10
Main income sources	Agriculture	26%	100%	100%
	Business	29%	Nil	Nil
	Other	45%	Nil	Nil

Table 2: Participants background information

Socio-economic categories and livelihood groups were drawn from an adapted success/wealth ranking. To construct locally relevant socio-economic categories, focus groups with community key informants and scheme leaders were asked to define wealth groups and then use what we call a proportional pilling of stones representing households to divide the population into three wealth categories, on which we conducted household interviews.

Most households cluster around poor (50%, n=40) or medium (38%, n=30) category in Magobbo and around medium (45%, n=72) and better-off (40%, n=64) in Kaleya. Group discussions and household interviews showed that 'living well' relates to four key elements: 1) land-ownership 2) investment activities 3) length in sugarcane production, and 4) institutional arrangements and the extent to which smallholders participate in sugarcane production. Across our cases, lack of land and capital for investments was identified in interviews and focus groups as being crucial in determining wellbeing. In Kaleya, smallholders emphasised inadequate investment resources. Whilst smallholders made land purchases and exploit customary land in Chief Mwanachingwala, farmers in Magobbo in contrast faced acute land challenges as explained by Chief Naluama: *"expansion is very difficult because we are surrounded by big commercial farms"* (D4:27.11.16)[1].

[1] For brevity sake we show only the interview code and date. See supplementary materials

In Magobbo, poor households were landless and lacked requisite resources to rent or purchase alternative productive land, while the medium accessed average 0-3ha of land outside the scheme. Community data revealed sugarcane targeted prime land, displacing smallholder agriculture. In response to these enclosures, most farmers were searching for alternative production land away from the sugarcane schemes. Short-term and informal rental markets away from the scheme sometimes as far as 10 kilometres were common, permitting farmers to fluctuate between moving in and out of production.

In Kaleya, the poor and medium category acquired pieces of land but made little or no new investments and largely invested and produced on their dwelling land (0.5ha). However, these averaged 3ha in Kaleya acquired through relatives, traditional authorities or as outright purchases compared to lower hectares in Magobbo often accessed through in rental markets. Across the cases, the better-off took risks by investing in land and non-farm activities (e.g. property development and other businesses), which requires some level of investments. This category possessed productive assets, and could diversify to accumulate, investing in alternative land for livestock and crop production, attending to prior wealth/asset acquisition.

Across our cases, respondents emphasised food insecurity, lower incomes, influence from friends, family pressures, including risk strategies against floods/droughts as key drivers to sugarcane uptake. In Magobbo, less emphasised as driver to sugarcane uptake was availability of land (26%, n=18), compared to 65% (n=52) in Kaleya.

However attractive financially sugarcane appears to be, there are hidden costs as well as risks. In both cases, survey data revealed a striking low degree of income diversification among growers with most households heavily reliant on sugarcane. Income calendars revealed a clear seasonality pattern, peaking during harvest (as plantation jobs open) and after sugarcane payments. Low and unpredictable sugarcane incomes and prices pushed farmers into the traditional lending system – Kaloba – which charged 100% interest. In Magobbo, Kaloba was cited for indebtedness among growers, but non-cane growers seized the opportunity as lenders: *"*sugarcane farmers borrow money from me whenever my children send me cash*"* (SDM9:18.01.16). While plantations offer wage opportunities, a consistent theme in group discussions with women and youths revealed difficulties in finding jobs. Unequal access to jobs on the plantations/estates among women and youths entrenched inequalities, some of which relate to the industry's reliance on migrant labour. In Kaleya, contractual arrangements enable the farmer association (KASFA) to run a sugarcane cutting contract from KASCOL for

its members/dependants, enhancing absorption of labour. More widely, one district official bemoaned low labour absorption in schemes: *"outgrower schemes are creating jobs* but there is still high levels of unemployment and poverty out there*"* (D8:26.06.15).

Sugarcane income analysis from household questionnaires showed Kaleya growers were relatively better-off than their Magobbo counterparts (Table 3). However, Kaleya faces enormous service charges from KASCOL, averaging 36,017 Kwacha per season per household compared to Magobbo's 9,075 in the same period. However, poor expenditure patterns reported in group discussions force farmers (poor and medium) to explore Kaloba, which results in indebtedness.

Kaleya (n=77)			
	2013	2014	2015
Production (tons)	795.143	835.481	754
Farmer prices (ZMK)	106.558	109.987	124.104
Gross annual income	77,337	83,605	85,778
	Average deductions: ZMK 36,017		
Net annual income	41,320	47,588	49,761
Estimated monthly incomes	3,443	3,966	4,147
Magobbo (n=65)			
Production (tons)	Unknown but farmers own average 4.2ha in the scheme		
Farmer prices	Unknown		
Gross annual incomes	48,083	33,288	38,345
	Average deductions: ZMK9,075		
Net annual income	39,008	24,213	29,270
Estimated monthly incomes	3,250	2,018	2,439

Table 3: Estimated incomes (Extracted from household questionnaires)

The survey results reveal crop production is a very important livelihood activity among 95% (n=76 in Kaleya) and 67% (n=47 in Magobbo) of farmers (e.g. Maize and vegetable production). Interestingly, 84% (n=67) and 90% (n=72) in Kaleya considered livestock rearing and petty trading as generally playing a less important role to their livelihoods respectively compared to 34% (n=24) and 41% (n=29) in Magobbo. District interviews reveal that land conversion to sugarcane induced a general shift away from livestock, highlighting incompatibilities with pre-existing livelihood strategies. Officials explained that farmers in the region defined agriculture in terms of sugarcane production, *"challenging efforts for diversification"* (D13:16.01.16).

In Kaleya, the more socio-economically advantaged households were more likely to cultivate larger land areas, diversify crops for consumption and income generation including

maize, vegetables, groundnuts, sweet potatoes, cotton, sunflower, tobacco, pumpkins, beans, cassava, and cowpeas. On the contrary the poor and medium households focused on maize, vegetables, groundnuts, sweet potatoes for consumption. Group discussions and household interviews related this to labour competition, and lack of requisite resources (e.g. inputs such as fertiliser, chemicals and irrigation water) at household level. In Magobbo, shifting and fragmenting land-holding due to sugarcane expansion and the lack of resources to either rent or purchase land reinforced these challenges. Land access outside the schemes in both communities showed the importance of not only independent household production and natural capital, but also highlight land constraints associated with sugarcane growing. Where possible, this resulted in a narrow focus on subsistence production mainly around maize, pumpkins, groundnuts and vegetables.

Surveys showed household land allocation patterns before and after sugarcane uptake revealed changing importance of crop production to current livelihoods (Figure 3). Across our case studies, cropping calendars revealed land allocation to crops and their importance to livelihoods generally reduced with the uptake of sugarcane (including cash crops such as cotton and sunflower), with very little diversification.

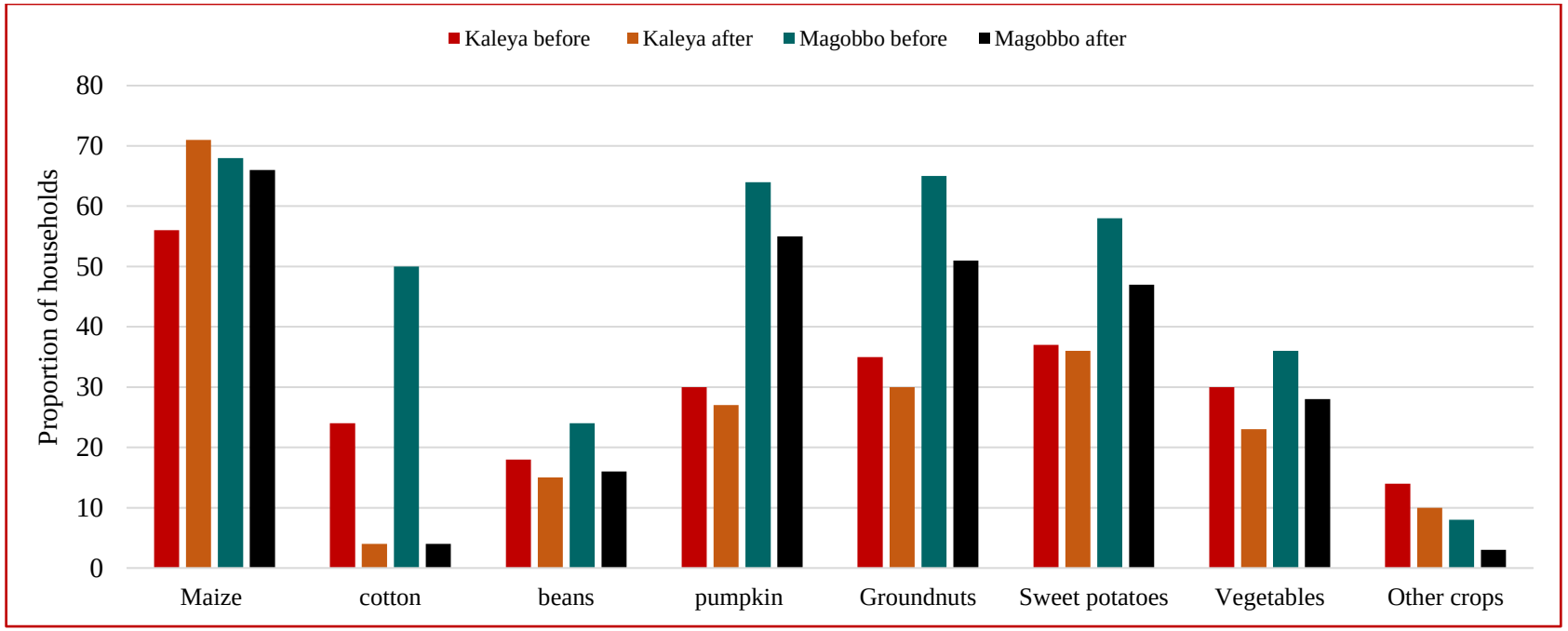

Figure 3: Land allocation before and after sugarcane uptake drawn from surveys

Maize was crucial in food provisioning and was second to sugarcane in terms of land allocation. A significant drop in land allocated to cash crop cotton was recorded in Magobbo from 71% (n=50) to 6% (n=4) compared to Kaleya, from 30% (n=24) to 5% (n=4). The general trend in southern province and within the period of LaSAIs is that the number of households growing cotton sharply declined from 18% in 2005 to 6% in 2007, and from 15% to 11% as a share of national production in the same period (FAOSTAT 2017). For smallholders, cropping patterns for cotton competes with maize for land and labour while sugarcane was seen to constrain both.

5.2 Sugarcane and Livelihood Contributions

The second objective addresses livelihood contributions of LaSAIs and sugarcane expansion among outgrowers. Across both cases, focus group discussions, surveys and interviews made no claims of immediate household-use of sugarcane or direct enhancement in physical assets. Unlike other crops such as Jatropha curcas with multiple household uses (e.g. as boundary fence), we find no claims of household use of material properties of sugarcane. A consistent theme among farmers however was that financial capital from sugarcane helped make improvements in other assets including access to social services and food.

Upfront physical infrastructure investment is crucial for successful sugarcane production. In case study areas, infrastructure such as bulk-water supply systems and canals as provided and maintained by intermediaries shifts bargaining power in favour of companies, excluding growers from key production processes. In practice, sugarcane related production assets (e.g. mini-dams, canals, sprayers etc.) were not directly transferable to other activities of livelihood and welfare value. This also hindered household investment in on-farm range of infrastructure, which limited household level of physical asset accumulation and opportunities for deriving livelihoods. In Magobbo, smallholders lacked access to necessary water for crop production and other uses on dwelling land, with some resorting to shallow wells or boreholes away from their dwelling lands. In Kaleya, KASCOL supplies households with tapped water, which they can then use for home gardening but faces challenges of rationing. Smallholders can also use water canals for washing and other uses but faces strict rules from KASCOL.

Kaleya generally exhibited high levels of asset acquisition. However, survey data highlighted divergences in assets, falling on productive, and peaking on non-productive assets. For instance, only 14% (n=11), and 28% (n=22) of the participants had cattle or alternative private water sources (combined) for production in Kaleya compared to 29% (n=20), and 14%

(n=10) in Magobbo (Figure 4). A few better-off farmers acquired productive assets for diversification but seldom sugarcane-specific.

In Magobbo, shareholding together with lack of necessary equipment limits farmer involvement in various key processes of sugarcane production. This raised challenges of knowledge translation as one Magobbo farmer remarked: *"we are sugarcane farmers but don't* know *much about the crop"* (SDM2:06.2015). Lack of participation in production was cited by scheme leaders as reducing sugarcane incomes: *"we must free Nanga Farms of some works,* e.g. cane cutting and haulage to enhance incomes for *our members"* (SDM3:06.15). In contrast, farmer involvement in production in Kaleya enhanced income disbursements and crop knowledge within farm-level spaces. However, the centrality of intermediaries in smallholder outgrower schemes means capabilities and skills (human capital) among farmers remain poor. Some of this relates to low education levels and asymmetrical information flow within the scheme set-up and the industry as highlighted by events missing from farmer programs such as farmer trainings (e.g. on pricing, marketing and commercial aspects) (X7:15.06.15).

In Kaleya, household labour was crucial in determining productivity and so was their health and capabilities. Here, and where insufficient labour existed, the better-off households hired extra labour while the poor and medium households increased their working hours. However, intra-household disputes for instance around inheritance, control of the sugarcane field and income negatively affected labour productivity. In Magobbo, shareholding permits family members to work on the plantations. However, restricting number of workers per household to one means employment challenges persist.

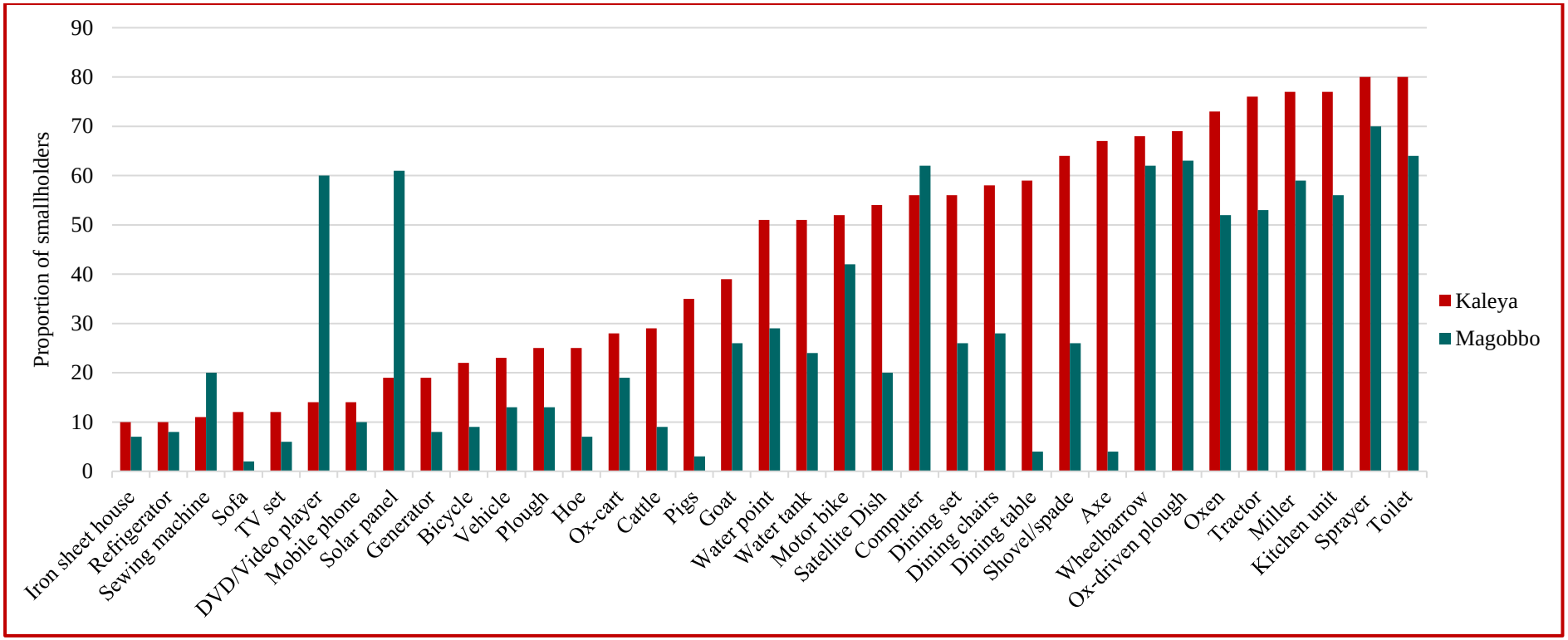

Figure 4: Asset profile for sugarcane cultivators (survey data).

Group discussions and surveys explored community social organisations and access, and what sort of resources and opportunities were shared. Analysis revealed low levels of social organisations and networks in both communities, with smallholders lacking wider socio-economic support. One frequently mentioned association among women was a community level micro-finance organisation for savings, Own Savings for Assets and Wealth Creation (OSAWE). Group discussions revealed that regular payments (about 200 Kwacha/month), competing financial demands and the seasonality of sugarcane incomes discouraged women participation. Others cited governance and lack of trust in groups as discouraging participation. More widely, in Magobbo, group discussions revealed a degenerating pattern in social networks as land-holding became fragmented and livelihood strategies more isolated. Community-level support systems however remain high-trust, enhancing coping strategies such as informal borrowing, borrowing food, assistance from neighbours, and friends. In Kaleya, similar patterns were observed, but clear divides were reported between 'successors' (new farmers that take over sugarcane plots through inheritance e.g. when original farmer dies) and 'original farmers,' affecting social cohesion, support and cooperation.

5.3 Livelihood Dynamics and Response Pathways

This section addresses objective three by drawing on group discussions and household interviews to explore livelihood dynamics and response pathways for different smallholders. Pathways were considered in terms of new investments in land, social expenditure such as those on education and health including crop and income diversification that took place without compromising household material well-being (Pritchard et al. 2017). Drawing on local definitions as summarised in Table 4 and in relation to the perceptions on all smallholders belonging to the scheme (Kaleya, N=160; Magobbo, N=80), we consider the extent to which outgrower households were hanging-in, stepping-up, and stepping-out (Table 4). We find that the main driver for household decision-making mediating farmer responses to sugarcane expansion included the flexibility of ownership, access and utilisation of natural capital such as land and water. Although varied across seasons, timing, duration, division of labour, analysis showed how response pathways revolved around coping and adaptive strategies, predominantly food security, diversification and supplementary income as stressors.

Kaleya			
	Hanging in	Stepping up	Stepping out
Land holding outside schemes[2]	Yes	Yes	Yes
Investments	No, face investment challenges	Attempt to make investments although often falling	Make relatively larger land investments/development
Cropping patterns	Staple maize, vegetables for consumption	Maize, vegetables, sweet potatoes, groundnuts for consumption and sale (limited)	Maize and other crops for consumption alongside cash crops (cotton, sunflower)
Production dynamics	Poor farm and labour management/organisation	Good farm and labour management/organisation	*'Exceptional'* farm and labour management/organisation
Income sources	Sugarcane, labouring, selling household assets	Sugarcane, petty trading, remittances, crop/livestock sales, renting out property. Engage in low value non-farm activities	Sugarcane fields within Kaleya and in other schemes in the district; renting out property, hiring extra fields, salaries from professional work, strong remittances, trading and crop sales including livestock. High value non-farm activities
Employ farm labour	No, rely on family labour	Yes, during peak periods	Yes, through-out production period
% of community households	15%	Majority	10%
Magobbo			
Land holding outside schemes	No, landless	Yes (0-3ha)	Yes (3-20ha)
Investments	No, lack resources to rent alternative production land	Attempt to make investments within agriculture but always failing	Yes, beyond agriculture
Cropping patterns	Sugarcane and staple maize	Maize, groundnuts and sweet potatoes	Maize, cowpeas, groundnuts, sweet potatoes, cotton
Production dynamics	Lack requisite inputs, no livestock	Limited access to inputs. Can own 5-10 cattle, goats, pigs, chickens and other livestock	Have requisite resources for production. Can own 10-30 cattle, goats, pigs, ducks, donkeys, chickens and other livestock
Income sources	Sugarcane	Sugarcane, petty trading, crop and livestock sales at limited scale	Sugarcane, trading, crop sales, livestock sales as well as incomes from professional work
Employ farm labour	No	No	Yes.

[2] Precise estimates were difficult to get as land holding increasingly locates away from schemes

% of community households	Majority	38%	13%

Table 4: Livelihood groups and activities drawn from wealth ranking and various sources

In Kaleya, households *'hanging-in'* generally made no new livelihood investments within or outside the schemes, and were described as always having 'old model assets' with little market value (15%, n=24). They were the landless who cultivated fewer crops and worked on their dwelling land (0.5ha) (Kaleya), or relied on land rental markets or sharecropping (Magobbo:49%, n=39). In Kaleya, a few that acquired extra land (averaging 3ha) lacked requisite resources for investments. Across the cases, the lack of access to financial services meant that this group of farmers exploited Kaloba. Poor expenditure decisions led to low education levels, poor planning and food insecurity. Selling household assets, engaging in piece-works (labouring) and borrowing were common risk strategies. This group of households worked less on their sugarcane farms, experienced poor cane yields and often received warning letters from KASCOL (SDK3:19.01.16). In Magobbo on the contrary, these mostly worked on the plantation to supplement their incomes (weeding, spraying, irrigation etc.), including the new labour regime for women that engaged in precarious and poor-paying estate jobs.

Households *'stepping-up'* accessed land away from the scheme but made limited investments due to lack of requisite resources (Kaleya:75%, n=120). They attempt to expand, diversify production and invest in complementary assets such as hammer-mills, petty trading, property and livestock albeit but at a limited scale. Limited diversity in crop production meant that households focused largely on subsistence (Magobbo:38%, n=30). Keeping debts to the minimum, these were described as having a medium level of *'modern* assets*'* including education and food access.

Households *'*stepping-out*'* engaged in diverse livelihood activities (e.g. property development, grocery stores, transportation) as well as acquired complementary assets (e.g. hammer-mills) (Kaleya:10%, n=16; Magobbo:13%, n=10). Land access enabled rearing of livestock (e.g. cattle, goats, poultry) including production of diverse crops for consumption and sale (e.g. tobacco and cotton). Diverse incomes sources allowed households to limit their debts. Requisite resources enabled land-based investments including drilling boreholes necessary for expanding crop production. This also included social expenditure (education) as well as possibilities of hiring extra labour for production. In terms of scheme/plantation opportunities, these households worked in somewhat specialised areas such as maintenance and light duties. In Kaleya, group discussions described these as *'*good planners*'* with *'*latest household assets*'* (SDK2:13.11.15).

5.4 Sugarcane-based Livelihoods in the Wider Context

The final objective considers factors challenging the achievement of livelihood goals alongside major trends, hazards and seasonal elements that shape outcomes. Through group discussions, seasonal calendars and household interviews, sugar-based livelihoods on the 'sugarbelt' were located within their wider perspective.

Several factors were cited as preventing the achievement of livelihood goals. A recurring theme in group discussions revolved around restrictions of what farmers could do within schemes which was largely production related and access to ecosystem services (70%, n=56; 76%, n=53 in Kaleya and Magobbo respectively). Land scarcity was widely emphasised in Magobbo where most farmers (90%, n=63) reported regrets over a lost opportunity of livestock rearing: *"I would choose another business that can give me flexibility on the land to rear animals"* (Magobbo 2016). In Kaleya, smallholders emphasised *"lack of title deeds to the sugarcane plots"* and dwelling land which they said affected the level of investments farmers made within the scheme, corroborated by the area Chief. Farmers also emphasised water scarcity (100%, n=80) as well as sugarcane price fluctuation (60%, n=48) compared to 46% (n=32) and 50% (n=35) in Kaleya and Magobbo respectively (Table 5).

Barrier	Farmer perceptions	Kaleya	Magobbo	Illustrative Quotes
Water	Sugarcane heightens water politics, affecting crop production, and livestock	100% (n=80)	46% (n=32)	*"Farmers are deprived of water and restricted on usage"* (Kaleya)
Land	Sugarcane leads to loss of land, affecting diversification	50% (n=40)	90% (n=63)	*"Sugarcane took away our land. Now we have to rent sometimes* 9-*10 kilometres away"* (Magobbo)
Labour	Sugarcane is labour intensive	5% (n=4)	11% (n=8)	*"Lack of family manpower contributes to low tonnages"* (Kaleya)
Eco-systems services	Sugarcane affects eco-system services	70% (n=56)	76% (n=53)	*"Firewood is difficult to access unless sanctioned by the company"* (Magobbo)
Family disputes	Sugarcane heightens family claims to land; affects investment, production and expenditure	5% (n=4)	16% (n=11)	*"It is all about waiting for somebody to die to inherit sugarcane plots…families are disintegrated"* (KASCOL Officer)
Sugarcane prices	Sugarcane brings market fluctuations which is risky for household welfare	60% (n=48)	50% (n=35)	*"Unlike other crops, cane prices fluctuate very much"* (Magobbo)
Transparency and support	Limited farmer representation affects scheme governance, transparency and information access	5% (n=4)	86% (n=60)	"*There are always unclear deductions especially fertiliser"* (Kaleya farmer 2015) *"No one stands for us during financial transactions"* (Magobbo)

Table 5: Barriers to achieving livelihood goals (Questionnaire and household interview data)

Farmers described the seasons 2013-2015 as generally poor, pointing to costs of production as it relates to weather patterns (rainfall, floods), pests and diseases and price declines. However, analysis showed how integration into sugar value-chains brought new livelihood challenges for smallholders.

a. Trends

One consistent theme in local assessment was that LaSAIs exerted pressure on land resources around schemes, and on the larger proportion of smallholder production. In surveys, most sugarcane growers reported reduced access to land (78%, n=62 and 70%, n=49) and eco-system services (51%, n=41; 33%, n=23) in Kaleya and Magobbo respectively. Meanwhile, data showed how smallholder agriculture suffered from unpredicted, variable, low and occasionally intense rainfall patterns. Disruptions to farming patterns increased risks of maize dependence and rain-fed agriculture which again drove sugarcane uptake among 65% (n=52) and 90% (n=63) of farmers in Kaleya and Magobbo respectively. While water shortages affected yields and increased costs of production, low and fluctuating prices eroded farmer incomes. Sugar companies and firms related trends in price fluctuations to regional economic challenges such as access to secure regional and international markets such as the EU – the former reportedly affected being affected by competition from countries such as Brazil (SDKa:14.11.15).

b. Hazards

Sugarcane companies and smallholders revealed serious water deficits in schemes. Low and variable rainfall patterns recently experienced in Zambia led to a serious electricity shortage, inducing a growth decline of about 3% in 2015. Subsequent fuel subsidies and emergency annual electricity import bill of about $660 million (equivalent to 3.2% GDP) sent shivers among policy makers about the risks of hydro power (IMF 2016). A resulting reliance on irrigation in schemes increased the costs of production further while entrenching water politics. One farmer representative in Kaleya confirmed: *"we have a problem of water allocation and distribution between smallholder and estate fields"* (SK1:06.16) as corroborated by one KASCOL officer (SDK3:19.01.16). Water shortages increased susceptibility of sugarcane to pests and diseases (e.g. yellow aphids, beetles, smut-logging), further lowering yields and incomes. A lack of expert knowledge on sugarcane compounded these challenges and increased smallholder reliance on intermediaries. This was compounded by regional volatilities of currencies (Mbulo 2015). In Magobbo, knowledge gaps among smallholders produced mistrusts in the buyer-grower relationships as one representative at ZaSPlc remarked:

"[Farmers] doubted the narrative that the decline in yields 2014/2015 season was due to *yellow aphids and challenges of water"* (ZaSPlc2:06.2015). In some households, this resulted in the loss of livestock, which again affected risk strategies.

c. Seasonality

Seasonal calendars show that maize and other subsistence production paralleled sugarcane cropping, the latter mixing rainfall and irrigation water. However, rainfall period induced livestock diseases that result in losses and is also peak for livestock and/or asset sales, as farmers respond to increasing food prices, food and labour shortages. For some farmers, food shortages were immediately replaced by – as a coping strategy – consumption of new crops before maturity – green consumption – at peak in February and March, which again affects overall harvests. In both cases, poor harvests and rushed "green consumption" widened the gap between subsistence/maize production and consumption as it relates to the next planting season.

Sugarcane requires considerable labour input throughout its cultivation cycle. In Kaleya, farmers reported that only three months after harvest were relatively free from sugarcane related activities with others arguing that in practice it was only *"*one month before land preparation begins all over again*"* (Kaleya 2015). Kaleya calendars revealed labour intensity and shortages between August and February. For maize and other crops, this period is also the time for land preparation (e.g. land ploughing), sowing and weeding whilst the same period demands irrigation, weeding, smut-cane removal and slashing/clearing of irrigation canals for sugarcane. Labour shortages limited the capacity to cultivate larger farmlands and diversify livelihood activities. However, household interviews showed that the social-economically advantaged households were more likely to hire extra labour, thereby cultivating large farmlands. Low incomes, labour shortages as well as tight management requirements for sugarcane compel poor and to some extent medium households to spend more time and labour on sugarcane in comparison to better-off households, producing narrow farming and livelihood strategies.

The seasonality of sugarcane, which coincides with subsistence production, produced crucial trade-offs for the poor and medium households such as finding waged employment whilst maintaining subsistence production. Across the cases, seasonality exacerbated labour shortages while waged employment suffered low wages alongside high variability in food prices. Once again, this entrenched sugarcane dependence and poor coping mechanisms. To

one farmer, *"*it *is the same life and same problems being encountered"* each year (Magobbo 2015).

6. Discussion: Outgrowers and Livelihood Dynamics

This paper has sought to demonstrate how LaSAIs and outgrower arrangements impact local livelihoods in differently structured outgrower schemes in rural Zambia. Insights presented point to the causes and consequences of differences in the evolution, operation, and integration of outgrower schemes in unfolding social and agrarian relations and livelihood outcomes. The study shows outgrowers that link smallholder production to other livelihood options are effective in labour absorption and promoting diversified and sustainable livelihoods but quality remains low. Dynamics in livelihood groups and strategies, livelihood contributions of LaSAIs and sugarcane uptake, and livelihood response pathways emerging across our case studies point to narrow farming and livelihood strategies around sugarcane as opposed to diverse and broad-based livelihoods that boost resilience. Livelihood diversification efforts away from sugarcane but within agriculture shows that smallholders will not always switch to alternative high-paying strategies. For significant path-changing gains for poor households, research must delve into the way local resources have been controlled and accessed in outgrower arrangements and how local conditions shape investment outcomes.

While the evidence of increased incomes brings optimism around outgrower arrangements (Barrett et al. 2012), our case shows a focus on financial capital challenges wider assertions about delivery of livelihoods. There are clear 'losers and winners' among different farmer groups and between schemes, with diverse hierarchies of gains that exclude the poorest households. This is as much the result of processes associated with the structure and organisation of outgrower schemes as it is the way in which contract farming insinuates itself into local livelihood landscapes (Vicol 2017, p164). Different institutional arrangements spread gains unevenly, accompanied by restrictive spread of benefits to local participants (White 1997). This is evident in income calculations, deductions and sucrose-based payments. Differences in the outgrowing models means local collective actions and farmer collaborations around production and bargaining processes remain limited (Rutten et al. 2017). Infrastructure, productivity, knowledge spill overs and transfer from agribusinesses to smallholders thus remain limited (Kleemann and Thiete 2015). This is more striking in shareholding variant of outgrowing than where an integrated company which allows shareholding, production and alternative pathways for local accumulation.

Households linked to other livelihood options such as land and water resources beyond schemes generally registered improved livelihoods. However, diversification away from the schemes but within agriculture across the schemes can be interpreted as a strategy to deflect the overtures of corporate agriculture and processes related to outgrowing models. The materiality of sugarcane means smallholders face poor labour organisation and crucial trade-offs which limit sugarcane production and challenges crop production. This in part is because household labour cannot easily be shifted (Hall et al. 2017). With reference to sugarcane, smallholders cannot restrict production to a proportion of their land and allocate the rest to other crops as is the case with for instance raspberries (Challies and Murray 2011), making access to alternative production resources crucial. Sugarcane monocropping which restricts crop and livestock production within its proximity adds to local adaptation challenges. These fears confirm inconsistencies in the views that present LaSAIs pre-eminently as development force (Borras and Franco 2012). Meanwhile household adjustments between and among different livelihood capitals remain problematic. Contrasting experiences in Jatropha (Achten et al. 2010), sugarcane as capital intensive crop makes it even more difficult for smallholders to limit initial investments and control start-up risks. The resulting centralised processing set-ups render production not only large-scale but also limit pathways for gains among smallholders particularly in shareholding variant (Dubb et al. 2015).

Across our cases, low sugarcane returns, restricted access to natural capital around plantations and inadequate institutional support increasingly pushes farmers away from sugarcane schemes, and lose their position as farmers (Dubb 2015). Whether land is owned by intermediaries or held under rental arrangements, tight control by firms means systematic alienation of farmers from downstream value creation/capture (Vicol 2017). Whilst attempts exist to produce smallholder efficiencies (e.g. Magobbo), evidence shows there are clear new configurations of market power and control in production spaces (Cohen 2013). Through diverse patterns of land control, our study confirms clear processes of capital accumulation by firms which is inconsistent with inclusive development outcomes (Anseeuw et al. 2012).

Processes of agrarian differentiation as they relate to income sources and resilience become apparent as better-off households respond to opportunities away from sugarcane schemes. Livelihood strategies and pathways are thus both constitutive features and a consequence of pre-existing inequalities that interlinks with land-based relations and agrarian dynamics – a spring-board for upward social mobility (Neves and Du Toit 2013; Pritchard et al. 2017). Across our case studies, growers need access to land as a platform for hanging-in,

stepping-up and stepping-out, particularly that households rarely exit agriculture. Previous studies talk about how smallholders affected by LaSAIs switch to wage employment on the investment farm or choose options that offer the higher pay-off (Dessy et al. 2012). Our study shows otherwise. Farmers prioritise ownership of land and flexibility of cultivation of that land, which is the basis for building food production and security (hanging-in), engaging in other income generating activities such as livestock rearing (stepping-up) whose value feeds into other livelihood activities (stepping-out). Decisions about investments and pathways are more complex, with the socio-economic and natural environment playing a crucial role in unfolding livelihoods (Hall et al. 2017).

Local livelihoods and pathways speak to consequences of sugarcane expansion and resulting models of commercialisation that determine resource control on the one hand as well as shape livelihood strategies and responses on the other. Here, mechanisms for ownership, securing and strengthening land rights are crucial as insecurity of tenure is not always about land titles. Any successful livelihood outcomes would demand that promoters and policy actors consider not only the dynamics at the production space (e.g. natural capital) but also the institutional structures and local conditions that mediate farmer integration and their role on emerging livelihoods (Hall et al. 2017).

7. Conclusion

A central question surrounding models of agricultural commercialisation is whether different outgrower schemes deliver what is expected of them. This study provides critical perspectives to LaSAIs and outgrower schemes, and problematises claims about local agriculture and rural livelihoods. In recent years, the growth of LaSAIs in Zambia ignited debates about outgrower schemes, and their role in shaping rural livelihoods. While introducing diverse production systems, LaSAI control of land and water resources and influence on commercial aspects increasingly disconnects smallholders from agriculture and local resources, entrenching unequal rural livelihood landscapes. For sugarcane, and where access to land and water within and outside schemes exist, positive outcomes for livelihoods can be realised, as we have seen in Kaleya. Participation in production enables higher incomes, and improved labour absorption which can be combined with other options for building livelihoods. In contrast, in our Magobbo case, incorporation of smallholders as shareholders and creation of a block-farm allows smallholders to receive dividends, but farmers cannot influence efficiency and profitability of operations. Employment effects between the two cases were different, with Magobbo labour regimes exhibiting uneven integration across women and youths compared to their male

counterparts. One outcome has been a lack of sufficient flexibility to combine labour, farming and other livelihood options. Relationships around local resources have not only been exclusionary for smallholders but also entangling, challenging pro-poor narratives that often accompany value-chain expansion (Vicol 2017).

This paper has shown that dynamics in livelihood groups and strategies, livelihood contributions of LaSAIs and sugarcane uptake, and livelihood response pathways reflect causes and consequences of differences in the evolution, operation, and integration of outgrower schemes. Farmers carry both risks and benefits associated with sugar value-chains, but emerging contractual arrangements mean that wider "win-win" narratives associated with outgrowers remain inconsistent. This study confirms sugarcane has not produced significant path-changing gains for poor farmers (Vicol 2017). Instead, it underscores the view that there exist diverse ways and processes to land control which do not necessarily involve expulsion of smallholders (Peluso and Lund 2011). Adequate smallholder access to land and water resources at production space as well as within the value-chain is needed for LaSAIs to adequately transform grower livelihoods in unfolding outgrower schemes. Outgrower designs require striking a balance between resources that feed into commodity production and those that build subsistence and boost resilience. Beyond the specificities of the commodity sugar, and the models covered, our findings engage in ongoing debates about the social relations of agrarian change in Africa. Understanding local specificities of evolution, operation and integration of outgrower schemes is a vital step towards creating nuanced and sustainable policy frameworks for rural development.

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