



Sugarcane outgrower schemes in Mozambique: findings from the field

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Abstract Agro-industries have been widely acknowledged as a way to kick-start agricultural development in developing regions. A number of pro-poor organizations promote production models that include the engagement of smallholder farmers as potential enablers for employment generation, economic development and livelihood improvements. Initiatives such as this appear in Sub-Saharan Africa with a focus on food and bioenergy crops. However, the large-scale production of cash crops, such as sugarcane, also raises concerns. A critical aspect is the impact of land-use on food security, particularly if local communities are constrained in cultivating traditional crops. In this paper, we explore the relationship between a sugarcane mill and smallholder farmers in Maputo province, Mozambique. Our main goal was to investigate some key characteristics of sugarcane outgrower schemes and the implications for sustainable local development. We also complemented local findings with lessons learnt from other regions, such as Brazil. In August 2015, a field assessment examined the interplay between the sugarcane industry and local communities in southern Mozambique. We interviewed three smallholders' associations of sugarcane producers in Xinavane, together with researchers, non-governmental organizations and agricultural government bodies. Our assessment finds that the impacts of sugarcane remain somewhat unclear. Government bodies and some of the consulted NGOs claim benefits, both on income and local food production. However, these benefits are less evident to farmers. While they acknowledge labour and social services as opportunities brought by the sugar mill, progress on capacity building and irrigated areas for food production fall short of expectations. Moreover, there is also tension as to the sugarcane outgrower contract. Incomplete information seems to undermine trust from farmers who become increasingly sceptical of their contracts with the sugarcane mill, especially the payment system. Transparency, coupled with more effective food production strategies, are decisive to ensure sustainable agro-industrial development along with a poverty reduction.

Key words Rural development, sugar, food security, bioenergy

INTRODUCTION

The sugarcane industry has maintained its foothold in rural Mozambique for decades. In spite of the industry being near collapse during the civil war, in the years following independence in 1975, the 1992 peace accord gave new strength to the sugar sector. Thanks to a combination of government initiatives and foreign investment, the sugar industry has seen a gradual recovery. In 2013, national sugar output was 380,000 t, 17% above the so-called golden years of the colonial period (Cepagri 2013; Kegode 2015).

Over the last decade, a significant development has been the engagement of smallholders in outgrower schemes as an alternative to the traditional plantation model to produce sugarcane. A set of European Union (EU) measures to strengthen the Mozambican sugarcane industry against looming reforms in the European sugar market underpinned this process (EC 2011). The EU, as well as local stakeholders, believe that through sugarcane, smallholders can improve their livelihoods by accessing infrastructure, employment opportunities and social services. Moreover, sugarcane contracts should also allow small farmers to improve their incomes, increase food production and thereby curb poverty.

Nevertheless, the overall impact of sugarcane production under smallholder outgrower schemes remains unclear. In spite of tangible progress, such as on employment and social services, outgrower schemes seem to fall short on other important aspects that are necessary for sustainable rural development (O'Laughlin and Ngove 2013).



In this study, our main goal was to investigate some key characteristics of sugarcane outgrower schemes, such as access to infrastructure for food production (i.e. irrigation), capacity building, cane-payment system and land-tenure security, and its implications on local development.

AGRO-INDUSTRY: A MODEL FOR RURAL DEVELOPMENT

The process of adding value to agricultural raw materials through manufacturing operations in agro-industries has been known for a long time as an efficient strategy to promote rural development (da Silva *et al.* 2009). The advantage of agro-industries over other strategies and models to promote growth and development lies primarily on its multifaceted nature. A number of linkages are established upward and downward in the transformation unit (i.e. agro-industry), thus accounting for farmers' production, input suppliers, distribution networks, commercialization support, etc. Therefore, the value addition is closely followed by job creation and broader business opportunities at local and regional level, together with high potential to reduce rural poverty (Delgado 1999; Dorward *et al.* 1998). Moreover, agro-industrial units also function as a hub for a number of secondary and tertiary auxiliary sectors that are positively affected by industrial inflow and outflow of products (da Silva *et al.* 2009).

Because of product characteristics, which are often perishable and produced in bulk quantities, many agro-industrial initiatives are located in rural areas, close to the production site, where most of the socioeconomic spillovers can be retained. The growing awareness of such benefits has propelled incentives for rural-oriented industries as a pro-poor strategy in many developing regions, particularly in Africa. Sugar industries feature in the economies of many African countries as an agent for job creation and a catalyst for foreign investment (Hassan 2008). In Mozambique, sugar has been a major domestic and export product since the colonial period. Despite the industry downfall after independence in 1975 and the following years of civil war, soon after the peace accord, signed in 1992, sugar became a main target of the national recovery programme (Buur *et al.* 2011). By that time, the Mozambican experience had shown that sugarcane-producing zones, around sugar mills, develop in a manner that is relatively more prosperous than in other regions. Moreover, the sugar industry provides quasi-urban social services, such as health and sanitation, education and transportation infrastructure (Buur *et al.* 2012).

SMALLHOLDER-BASED SUGARCANE PRODUCTION: THE CASE OF XINAVANE

Historically, large-scale plantations have been the predominant model for sugarcane development and production in Mozambique. This model is characterized by high investments in irrigation infrastructure, land preparation and crop management (e.g. harvesting). When combined with the processing stage, plantation models require economies of scale that favour vertical integration with large producing areas close to the processing unit (Benfica *et al.* 2002).

In 2013, large-scale sugarcane estates (i.e. plantations) under the management of four sugar mills accounted for 80% of Mozambique sugarcane production. These sugarcane mills are located in the southern province of Maputo (Maragra and Xinavane), and in the central province of Sofala (Mafambisse and Marromeu; Fig. 1).

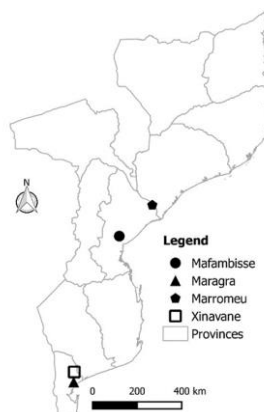


Fig. 1. Location of sugarcane mills in Mozambique.



According to the last Mozambican sugar balance report (Cepagri, 2013), the national sugar production was about 380,000 t from 46,000 ha of sugarcane (Table 1). Among the sugarcane mills, Xinavane features for its relatively high agricultural and industrial productivity, i.e. sugarcane and sugar yields, thus contributing just under 50% of the total sugar output for the country (Table 1).

Table 1. Sugarcane mill and production parameters in Mozambique in 2013 (Cepagri 2013).

Parameter	Marromeu	Mafambisse	Xinavane	Maragra	Total
Cane area (ha)	12,367	9,152	15,855	8,775	46,149
Milled cane (t)	470,076	557,864	1,460,373	677,797	3,166,110
Sugar (t)	51,448	65,251	184,418	82,010	383,127
Molasses (t)	17,331	20,750	55,015	24,412	117,508
Cane yield (t/ha)	38	61	92	77	67.0*
Sugar yield (ts/tc)	0.109	0.117	0.126	0.121	0.118

*average; tc: tonnes of cane; ts: tonnes of sugar.

Xinavane is also conspicuous for its leading role in the promotion of smallholder arrangements for sugarcane production. In spite of modest contribution of smallholder farmers to sugarcane production, i.e. $\approx 7\%$, this production model is gaining ground as sugar estates seek opportunities to expand their cultivated area and attract foreign investment. Contract arrangements between smallholder farmers' associations and the sugar mill define the conditions for sugarcane production, including payments, loans and access to infrastructure (Benfica *et al.* 2002). Initiating smallholder sugarcane production was largely pushed by the EU initiative of Accompanying Measures for Sugar Protocol Countries (AMSP) (Roseboom 2007). The AMSP accounts for a number of measures aimed to support ACP (African, Caribbean and Pacific) countries against the looming impacts of recent reforms in the EU sugar regime and quota system. The quota system caps EU beet sugar production, thus enabling producers in developing countries to export around 3.5 Mt of sugar per year to the European market (EC 2013a). Nevertheless, in 2013 the EU, as part of a long-running reform to the Common Agricultural Policy (CAP), decided to abolish the cap on EU beet sugar production in 2017 (Fairtrade, 2015). As part of a campaign for "trade instead of aid", the EU sugar regime reform came after a successful complaint lodged by Brazil, Thailand and Australia (the world largest exporters) at the WTO (Roseboom 2007). While many developing countries will continue to benefit from duty-free access to the EU markets, the abolition of beet-sugar caps means a less competitive environment for ACP sugar producers. Lifting the cap will also increase the domestic production of beet sugar, with a consequential downward pressure on prices, thus reducing margins, which may push out less competitive ACP sugar producers (Fairtrade 2015). In addition, there are indications of the EU shrinking sugar imports (EC 2013b).

In Mozambique, AMSP measures are a welcome help to strengthen the local sugar sector, particularly after 2017. In order to become eligible for support, Mozambique implemented a national strategy outlined by the Sugar Action Plan (2006-2010), which sketch a number of initiatives to overhaul the sector and make Mozambican sugar competitive in the world's market (EC 2011). The basic assumption underpinning the action plan is an increase in sugar output and a decrease in production costs. The strategy goes further to ensure a larger role for rural development by promoting inclusive economic growth and poverty reduction through three key intervention areas. (1) the expansion of sugarcane production under smallholder outgrower schemes; (2) the promotion of capacity building, such as training programs and skills development among farmers' associations and the Mozambican workforce; and (3) the provision of social services and basic infrastructure (e.g. schools and clinics) in sugar-producing areas (EC 2011).

Since the implementation of AMSP measures, the integration of smallholder farmers with the sugar industry has gained popularity in Mozambique. Xinavane is leading the initiatives as it deals with 19 smallholders' associations out of a total of 25. Xinavane also has, by far, the largest area under smallholders' arrangements. Tongaat Hulett, the South African agroindustrial group behind the Xinavane management, estimates that in 2016 smallholders will account for 28% of the supplied cane, in an area of approximately 5,500 ha.

Although the model proposed by the Sugar Action Plan served as a platform for sugarcane mills, particularly Xinavane, to expand its production area and unlock significant flows of international funds, it remains uncertain to what extent smallholder farmers have benefited from it. Local assessments raise concerns as to unintended impacts on health and access to land (O'Laughlin and Ngove 2013). In this paper, we aim to provide some more clarity to this discussion.



METHODOLOGICAL APPROACH

In August 2015, we assessed the relationship between smallholders' associations and sugarcane production in the region of Xinavane (Maputo province), guided by a semi-structured questionnaire. We interviewed three associations affiliated to the Xinavane sugarcane mill, i.e. Macuvulana, Chichuco and Macuvulana 2. For the interviews, we used a number of exploratory questions to determine the main characteristics of the contractual accord for sugarcane supply among local farmers. Key aspects accounted for: (1) the sugarcane supply and payment characteristics; (2) the training and capacity building experience as proposed by the Mozambican Sugar Action Plan; and (3) access to irrigation infrastructure for food production (i.e. traditional farming systems). In the group meetings were 10-20 association members who were free to voice their opinion on the proposed subjects. However, community leaders, such as the president of the association, were often the most active during the discussion. Therefore, the conclusions from each discussion topic reflect the general group opinion, rather than individual answers to a list of questions. To balance our analysis, we also consulted other stakeholders. This stage included scientists from the Technical University of Mozambique and Eduardo Mondlane University, non-governmental organizations (i.e. Kulima and Gwevhane), agricultural organizations (Cepagri) and the private sector (Greenlight). The approach with stakeholders was similar to that with farmers. Although we interviewed no more than two people per organization, interviewees have an in-depth knowledge of the local farming systems and challenges brought by sugarcane production. With these stakeholders, we complemented regular discussion points (presented above) with broader topics on the interplay of farmers, sugar mill and policies and resulting consequences for the opportunities and limitations that surface when smallholder farmers engage in sugarcane outgrower contracts.

RESULTS AND DISCUSSION

In spite of some significant differences in terms of size (area under sugarcane) and number of members, the assessed associations share some key similarities as to the per capita area of sugarcane and food production crops (Table 2). All associations abide by an outgrower contract in which farmers are paid based on their land contribution to the association, sugarcane productivity, sugar prices, production and investment cost (loans for land development – i.e. irrigation infrastructure, land preparation, etc.).

Table 2. Characteristics of the assessed smallholder farmers' associations in Maputo province, Mozambique.

Characteristic	Associations		
	Macuvulana	Chichuco	Macuvulana 2
Foundation year	2005	2009	2009
Number of members	189	104	102
Area under sugarcane (ha)	188	138	73
Irrigated area under food crops (ha)	2	0	4
Area under sugarcane (ha per capita)	1.0	1.3	0.7
Irrigated area under food crops (ha per capita)	0.01	0	0.04

An appealing aspect of the sugar mill is its capacity to offer job opportunities and promote quasi-urban social services. Crop management in the Xinavane region, as well as in other sugarcane producing estates in Mozambique, remains labour intensive. This characteristic drives local job opportunities, particularly during the harvest season (i.e. temporary labour) when it is common to find people from outside regions and provinces working in the cane fields. The associations acknowledge this opportunity as many of its members seek and find employment at the sugarcane mill. Xinavane also pushes the development of social services and infrastructure related to the construction of a health clinic and four schools, rehabilitation of a hospital and the provision of clean water and electricity to these facilities.

Access to irrigation, claimed as pivotal to the overall sustainability of outgrower schemes, falls short on expectations. Xinavane publicly supports food production areas equivalent to 10% or more of the sugarcane areas under smallholders. However, the area planted with food crops ranged from zero to 5% for the associations we assessed. In addition, from 2008 to 2012 on the area allocated for expansion into sugarcane (i.e. 3,500 ha) smallholders have only set aside 3% of the cultivated area for food production.

When engaged with the production of sugarcane, smallholders enter a specific process outlined by a carefully designed series of steps. In the first years, the sugarcane mill is responsible for all crop management. This is a necessary stage for



farmers to build capacity (i.e. knowledge, capital and infrastructure) and gradually gain independence, thus eventually being able to operate their fields and become responsible for crop development and commercialization. However, little if no progress was observed. Except for Macuvulana, a senior association (created in 2005), that has managed to control a few modest activities, in part due to its relatively well-developed infrastructure including storage facilities, tractor, plough and irrigation equipment, other associations remain completely dependent on Xinavane for farming operations on their fields.

The reasons for the apparent insufficient development of food crops and capacity building remains unclear. What was evident across all associations is that this is not their main concern. The cane-payment system, together with land-use rights, are often the first complaints vocalized by farmers. At Xinavane, payments are based on production and sugar content. This method is common in many sugar-producing regions of the world including African countries, such as South Africa, Mauritius and Tanzania (Cepagri 2014). Payments also take into account deductions associated with investment capital for land development and infrastructure, and payments vary with the international sugar price. This is where most of the uncertainty seems to arise. Smallholders have very little knowledge of the ever-fluctuating sugar market, nor are they properly informed as to the investment capital necessary to transform a cluster of small and disjointed crop fields into a well-equipped and contiguous area for sugarcane production. Furthermore, some of the investment load is on the associations that bear this through loans, the details of which the farmers are not fully aware. This lack of information fuels distrust and farmers become increasingly convinced that they are receiving an unfair payment from the sugar mill. Because of contractual obligations and the long-term nature of the business (e.g. sugarcane life cycle, 6-8 years), associations cannot default their contracts at any time, thus increasing insecurity related to land-use rights, which leads further unsettle among farmers.

While the sugar mill significantly improved employment, access to infrastructure and social services (e.g. clean water and health), these services remain insufficient to promote sustainable rural development among local associations. Further steps are necessary to push farmers up the development ladder (Fig. 2), underpinned by clearer and transparent rules behind payments, costs and loans, proper capacity building together with the enforcement of land-use rights and the expansion of food production areas with irrigation.

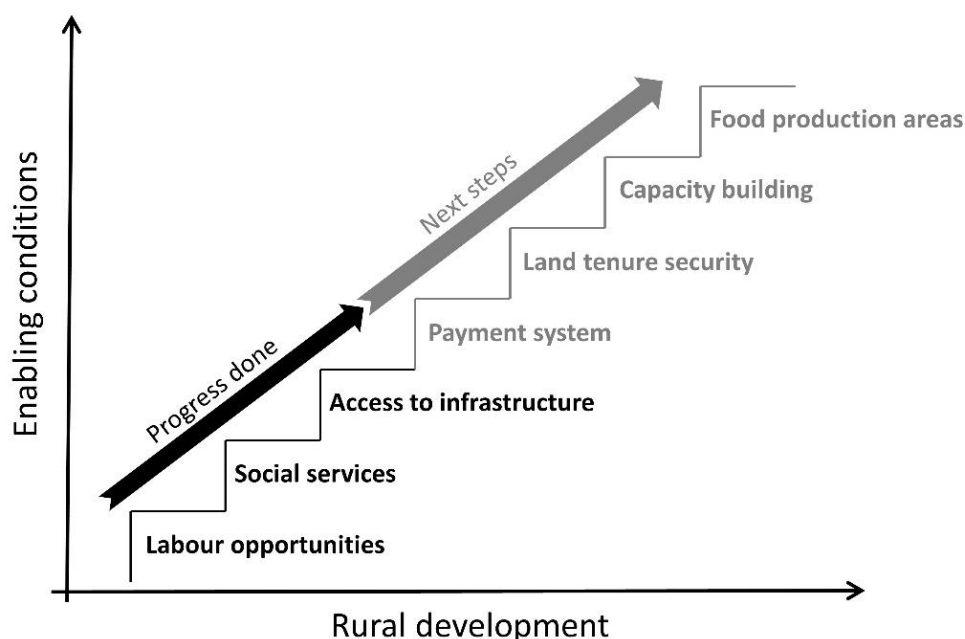


Fig. 2. Development ladder diagram for smallholders' associations under sugarcane outgrower contracts in Xinavane, Mozambique.



CONCLUSIONS

In Mozambique, sugarcane has for many years encouraged rural development through employment, access to agricultural infrastructure (e.g. irrigation), and social and health services. Over the last decade, part of the traditional plantation model for sugarcane expansion has been replaced by smallholder outgrower schemes, a process facilitated by rural associations, particularly in the Xinavane region. This initiative has support from the EU and is part of a large task to help ACP countries overcome recent reforms in the European sugar market.

In the Xinavane region, our findings raise awareness on two main aspects. First, there has been tangible progress made by the sugar mill in affording local communities with employment opportunities, access to electricity, potable water, schools and health clinics. Second, despite these achievements, smallholders in outgrower schemes remain poorly supported by irrigation infrastructure and unaware of their contract conditions, including loans, costs and sugar prices. This fuels distrust and conflict that hampers the sustainability of outgrowers' schemes in the region.

The correct approach to improve the relationship between smallholders and the sugar mill is not clear, and requires further investigation. Nevertheless, our assessment favours a significant review of the current contract and cane-payment system model. A simpler format, less dependent on the fluctuations of the sugar market, while remaining flexible towards food crop production is preferable. In future research, we plan to expand our analysis to investigate further on alternatives, as well as implementation strategies.

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Petites exploitations cannières au Mozambique: les résultats sur le terrain

Résumé. Les industries agro-alimentaires ont été largement reconnues comme étant un moyen de relancer le développement agricole dans les régions en voie de développement. Un certain nombre d'organisations œuvrant pour les pauvres encouragent des modèles de production qui comprennent l'engagement des petits exploitants agricoles comme facilitateurs potentiels pour la création d'emplois, le développement économique et l'amélioration des moyens de subsistance. Des telles initiatives existent en Afrique subsaharienne où l'accent est mis sur les cultures alimentaires et bioénergétiques. Cependant, les cultures commerciales à grande échelle, comme la canne à sucre suscitent des préoccupations. Un aspect crucial est l'impact de l'utilisation des terres sur la sécurité alimentaire, en particulier les collectivités locales si elles sont limitées à des cultures traditionnelles. Cet article examine la relation entre les usiniers et les petits exploitants canniers dans la province de Maputo au Mozambique. L'objectif principal était d'étudier certaines caractéristiques majeures des petites exploitations cannières et leurs implications sur le développement durable au niveau local. Les résultats locaux ont été complétés avec les leçons tirées des autres pays, comme le Brésil. En août 2015, l'interaction entre l'industrie cannière et les collectivités locales a été évaluée sur le terrain dans le sud du Mozambique. Les membres de trois associations de petits exploitants canniers à Xinavane ont été interrogés, ainsi que des chercheurs, des organisations non gouvernementales et des organismes agricoles de l'état. L'évaluation a conclu que les impacts de l'industrie cannière restent toujours incertains. Les organismes d'état et certaines des ONG contactées sont d'avis qu'il y a des gains tant sur le revenu et que sur la production alimentaire au niveau locale. Toutefois, ces gains sont moins évidents chez les exploitants. Si la création d'emploi et les services sociaux se présentent comme des opportunités provenant de la sucrerie, les avancées sur la formation et les zones irriguées pour la production alimentaire restent toujours en attente. En plus, il y a aussi des tensions sur le contrat entre les petits exploitants canniers et l'usine. Les informations incomplètes sur ces contrats, surtout le système de paiement semblent saper la confiance des exploitants qui deviennent de plus en plus sceptiques. La transparence et des stratégies de production alimentaire plus efficaces, sont déterminantes pour assurer le développement durable de l'agro-industrie ainsi qu'une réduction de la pauvreté.

Mots-clés: Développement rural, sucre, sécurité alimentaire, bioénergie

Esquemas de producción de caña de azúcar en Mozambique: conclusiones de campo

Resumen. La agroindustria ha sido ampliamente reconocida como una manera de poner en marcha el desarrollo agrícola en las regiones en desarrollo. Un número de organizaciones en favor de los pobres promueven modelos de producción que incluyen la participación de pequeños agricultores como potenciales generadores de empleo, desarrollo económico y mejoras de medios de vida. Iniciativas como estas son notables en el África subsahariana con enfoque en el cultivo de alimentos y bioenergía. Sin embargo, la producción a gran escala de productos comerciales, como caña de azúcar, también plantea preocupaciones. Un aspecto crítico es el impacto del uso de la tierra en la seguridad alimentaria, particularmente si las comunidades locales se ven limitadas a cultivar plantaciones tradicionales. En este artículo, se explora la relación entre los ingenios azucareros y los pequeños agricultores de la provincia de Maputo, Mozambique. El principal objetivo fue investigar algunas características esenciales de los esquemas de producción de caña de azúcar y las implicaciones del desarrollo local sostenible. También fueron complementados los resultados locales con las enseñanzas extraídas en otras regiones, como Brasil. En agosto de 2015, una evaluación de campo examinó la interacción entre la industria de caña de azúcar y las comunidades locales en el sur de Mozambique. Fueron entrevistadas tres asociaciones de pequeños productores de caña de azúcar en Xinavane, junto con investigadores, organizaciones no gubernamentales y organismos agrícolas gubernamentales. El análisis concluyó que los impactos de la caña de azúcar aún continúan siendo poco claros. Organismos gubernamentales y algunas ONG consultadas afirman beneficios, tanto en ingresos económicos como en producción de alimentos. Sin embargo, estos beneficios son menos evidentes para los agricultores. Aun así, son reconocidos el trabajo y los servicios sociales como oportunidades generadas por los ingenios azucareros, el progreso en el desarrollo de capacidades y áreas de riego para la producción de alimento no son suficientes con respecto a las expectativas. Por otra parte, también existen problemas con los contratos ofrecidos a los pequeños agricultores de caña de azúcar. La información incompleta parece socavar la confianza de los agricultores que cada vez están más escépticos de sus contratos con los ingenios azucareros, especialmente con el sistema de pago. La transparencia, junto con estrategias más eficaces de producción de alimentos, son decisivas para garantizar el desarrollo agroindustrial sostenible junto con la reducción de la pobreza.

Palabras clave: Desarrollo rural, azúcar, seguridad alimenticia, bioenergía