



Incomplete Intermediary Coordination and its Effects on Productivity of Sugarcane in Tanzania

By Donald Mmari

Key Messages

- Successful economic reforms require institutional settings that promote essential complementarity among market and non-market institutions.
- The choice of technology and production organization in the domestic sugar industry must change to cope with evolution in the global sugar industry.
- While vertical coordination by intermediary organizations is necessary to reduce transaction costs and to promote market linkages, these are not sufficient for mediating constraints to productivity and efficiency in the absence of horizontal coordination.

This paper examines production and market arrangements in the sugar value chain in Tanzania, an industry that involves a significant number of smallholders producing sugarcane for monopsonic processors. The study followed an exploratory approach, including the triangulation of data through interviews with key institutions such as the Sugar Board of Tanzania (SBT), milling companies, intermediary organizations of outgrowers, and those providing major services to Tanzania's cane growers. Interviews were also carried out with individual growers and farmer groups, and observations were made of operations in cane fields and sugar mills. Secondary data were collected from report files obtained from sugar milling companies, outgrower intermediary organizations, the SBT, and international organizations, notably the FAO and the International Sugar Organization (ISO). Relevant literature provided additional information, and a field visit was also made to the neighbouring country of Malawi to obtain a contrasting view of that country's organizational

arrangements and their outcomes. A detailed analysis of processing costs and distribution of proceeds between them and outgrowers is limited by the difficulties of obtaining detailed revenue and cost data from sugar mills.

The key proposition underpinning this study is that raising productivity among cane outgrowers in Tanzania is limited by the industry's characteristics of production and incomplete intermediary organization. While the existing intermediary organizations have to some extent helped in reducing transaction costs and uncertainties, such transaction cost-reducing functions are necessary but not sufficient for raising productivity and for enhancing efficiency under the current environment of global competition. Horizontal coordination to enable economies of scale and professional production management is crucial for raising productivity at the primary production level.

Findings

Outgrowers contributed a significant share of sugarcane production, but institutional barriers limit further growth

Between 1995/96 and 2008/09, outgrowers in Kilombero increased their share of cane production from 30% to 44% of total cane processed in 2009 by the Kilombero Sugar Company. In Mtibwa, however, the share of outgrowers' cane declined from 57% to 49% by 2009. By 2013 the share declined slightly in Kilombero but remained significant at 39%. In Mtibwa, however, it declined alarmingly fast to 19% by 2013. Different elements of institutional arrangements explain this dramatic decline of outgrower shares in Mtibwa.

The commercial transaction relations between sugar mills and outgrowers are governed by Cane Supply Agreements (CSAs). The CSAs replaced annual cycles of precarious pre-harvest negotiations regarding the prices, quantity, and quality of cane, and provided more stable market relations, detailing a method of price determination that takes into account the relative costs of production between growers and sugar processors. Nevertheless, the implementation of CSAs in Mtibwa, which commenced in 2009, three years after Kilombero's adoption, was met with many obstacles, which included a lower price of cane compared to Kilombero, delayed payments to growers, unfavourable allocation of daily cane delivery from outgrowers, and limited outgrower support services. For example, during the 2009/10 crop season, just after the CSA was signed, cane prices in Kilombero were Tshs 45,344 per tonne, while Mtibwa growers fetched Tshs 38,650 per tonne. As a result, cane output from outgrowers in Mtibwa has declined dramatically, yield rates have remained low, and cane fields are deteriorating rapidly, exposing the mill to the risk of excess capacity unless the company fully replaces lost output from its own estates.

Sugar production data shows a similar differentiated trend. Following privatization of sugar mills that, Kilombero doubled sugar production between 2000/01 and 2011/12, while production in Mtibwa remained almost stagnant. This difference suggests fundamental differences in investment, management systems, and outgrower operation strategies between the two firms, which have a direct bearing on institutional arrangements and growth potential for outgrowers.

Intermediary organizations are crucial for reducing transaction costs and enhancing market linkages for fragmented smallholders

The importance of producer organizations in fostering the collective interests of smallholders, particularly access to markets and credit, is acknowledged in the agricultural and rural development literature. In developing countries, organizations engaged in agricultural and rural development tend to be multipurpose grassroots organizations combining economic and social functions in different degrees, and are therefore hybrid in nature. Hybrid organizations facilitate key investment and operational decisions under market conditions in which total hierarchy risks inflexibility and weakened incentives to producers.

Producer organizations for cane growers are crucial intermediaries in this respect, since the nature of the product and technology in Tanzania has necessitated site-specific investments in sugar processing. Principal activities of these organizations, commonly known as outgrower associations, are to negotiate the terms of business between outgrowers and millers, and to provide essential agricultural services to their outgrowers. In recent years following privatization, these services expanded in scope into areas like cane harvesting, loan brokerage and administration, and extension support. The formation of these intermediary institutions has enabled outgrowers to negotiate and transact collectively with sugar millers through CSA, reducing transaction costs to both parties. The associations also negotiate with CRDB Bank and National Microfinance Bank to extend loans to its members, using CSA to provide the banks with assurance of repayment, thus reducing individual grower's efforts and costs of loan application process.

Absence of horizontal coordination is a critical constraint to productivity and efficiency

While outgrower intermediaries have proved to be important vehicles for vertical coordination, reducing transaction costs and brokering access to essential agricultural services, they fall short of mediating uncertainty related to the timing and reliability of supply. The sustainability of the current production system, given contemporary global market developments, is therefore at risk. A crucial element is the difficulty of transforming outgrower production through horizontal coordination. Horizontal coordination in this case refers to the linking of transformation activities at the farm level to promote uniform application of best practices, shared managerial

and technical services, and collective investment in common infrastructure, all intended to raise productivity and increase efficiency.

Production activities at farm level have remained fragmented. The majority of cane outgrowers in Kilombero and Mtibwa are small, many of them operating on no more than two hectares. These represent 79% and 66% of outgrowers in Kilombero and Mtibwa, respectively. There are very few large outgrowers at the other extreme, growing cane on 50 or more hectares, with these representing less than 3% of outgrowers. Land ownership is based on traditional customary rights, which grant landholders the right of use of land in accordance to their preferences and needs. The practice of cane husbandry, while organized through the associations, is still influenced by independent growers' choices, where the majority intercrop cane, paddy, and maize.

Although some outgrowers farm on more than one parcel of land, they also have a tendency to switch between crops, especially between paddy and cane. This practice prevents growers from undertaking innovative cane growing practices with potential advantages of economies of scale in common services and joint operations. In addition, very few of their members use fertilizers at present, and then usually only when credit is provided for that purpose. Even when credit is made available, some outgrowers are reluctant to apply fertilizer on account of its high cost. These associations are not capable of holding large stocks of fertilizer or subsidizing their members, so that farmers have to depend on private stockists. In addition, there are variations in the level of effort put into the routine maintenance of fields, making yields and cane output uneven within the same geographical areas. All outgrower cane production is rain-fed, so that the variability of weather from year to year also leads to variability in output.

The Dwangwa sugar industry in Malawi provides an illustrative example of a system combining vertical and horizontal coordination. Under this system, smallholders' lands were pooled into blocks of 40 hectares and registered under titles held by the Dwangwa Cane Growers Trust (DCGT). At the same time Dwangwa Cane Growers Limited (DCGL), a company owned by growers and managed by a team of professionals, carries out the daily management of field operations. The company provides labour and machinery for activities that benefit from economies of scale, such as land preparation, fertilizing, and weeding young cane. The subsequent

maintenance activities are serviced by outgrowers themselves, but the management of DCGL actively ensures that such activities are carried out as scheduled. The fields are clearly marked with identification tags on each block, so that outgrowers can identify the boundaries of their plots. The DCGL keeps detailed operational data for each plot and provides extension services on a regular basis. These costs are not charged directly to outgrowers on an activity-by-activity basis. Rather, they are financed through a management fee of 20% that the company retains against cane proceeds. The DCGL purchases inputs, including fertilizer and chemicals, under a special arrangement that benefits the growers because of discounts on large volumes. The DCGL also manages all harvesting activities, including scheduling, cutting, loading, and hauling. This coordination system has brought the productivity of outgrower cane into a range comparable with the productivity of cane grown on estates, and it also releases labour time for outgrowers, which can be spent on producing food on distant plots. In addition to cane proceeds, these growers are also entitled to dividends from the company's profits. Under this arrangement, economies of scale were also achieved from massive investment in irrigation infrastructure, both pivot and furrow. Such an irrigation infrastructure is expensive for individual farmers to develop and maintain.

The DCGT obtained a long-term development loan from the African Development Bank (AfDB) on behalf of outgrowers, with a guarantee from the Government of Malawi. The loan was used to construct block farms and to procure irrigation infrastructure and farm machinery. While this arrangement created long-term debt for the cane growers, the rate of interest is low, and the growers were able to finance the otherwise prohibitively expensive infrastructure required for enhancing productivity and competitiveness in cane production. As of 2009, 85% of 1,073 hectares harvested by outgrowers in Dwangwa were under irrigation.

In Tanzania, by contrast, outgrower intermediaries have little control over the field activities of outgrowers, and all outgrower cane is rain-fed. Combining these factors, economies of scale in production are difficult to achieve, and unit costs of harvesting and transporting increase as machinery and trucks have to cover a larger land area containing scattered plots with uneven levels of outputs. Outgrowers' productivity in Kilombero and Mtibwa, measured by cane yield per hectare, lags far behind Dwangwa, attributed largely to differences in production management systems.

Table 1 below presents differences in average yield rates for outgrowers in tonnes per hectare (TCH), showing that cane yields in Dwangwa are much higher than those from the counterpart outgrowers in Kilombero and Mtibwa. While other factors such as agro-ecological conditions and cane variety contribute to this difference, it is difficult to refute the contribution to productivity made by differences in cane husbandry and economies of scale from key infrastructure and essential services.

Table 1: Average yield rates by different outgrowers in 2009/10

Location	Farming type	Yield (TCH)
Dwangwa	Pivot irrigated	140
	Furrow irrigated	115
	Rain fed	70
Kilombero	Rain fed	37
Mtibwa	Rain fed	25

Sources: MOA, ROA, KCGA, & DCGL.

Conclusion and Recommendations

In the current global sugar industry context, where competitiveness is replacing preferential and compartmentalized markets, increases in productivity and production efficiency are crucial. This study has revealed that while vertical coordination of Tanzanian cane growers through intermediary organizations has enhanced market linkages and reduced transaction costs, horizontal coordination remains very weak. As a result productivity is very low relative to its potential, and sugar production efficiency is also low.

Thus, two policy recommendations are made. First, even as these intermediary organizations have enhanced market-based solutions to eliminate major constraints, the involvement of the state beyond its regulatory functions is critical for stimulating sustainable high productivity increases for outgrowers. This calls for state intervention, such as the design of special incentives for agricultural finance to address credit market failures.. Financing of common infrastructure and equipment for productivity-enhancing farming practice requires a different approach beyond market solutions alone, including brokering long-term agricultural finance for transforming the farming practices of outgrowers.

Second, given the difficulty of achieving horizontal coordination under the current regime for land use and tenure, the state may have to consider reforms in land use planning and regulatory frameworks to enable block-farming development, to investment substantially in sensitizing growers, and to strengthen intermediary organizations so that cynicism towards horizontal coordination is reduced.



REPOA

157 Mgombani Street, Regent Estate
P. O. Box 33223 | Dar es Salaam | Tanzania
Tel: + 255 22 2700083 | Cell: +255 75 409 1677 | Fax: + 255 22 2705738
Website: www.repoa.or.tz | Email: repoa@repoa.or.tz