SHORT NON-REFEREED PAPER

MILLER-GROWER FRAGMENTATION: A CORE CHALLENGE IN THE SOUTH AFRICAN SUGARCANE PRODUCTION AND SUPPLY SYSTEMS

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Abstract

From a systems thinking perspective, this paper reviews the collaboration regime of the South African sugar industry. It is based on the outcome of seven case studies, the comprehensive analysis of two milling areas and the deep knowledge of experienced industry stakeholders. Because miller-grower fragmentation surfaced as a main challenge, the paper aims at providing a holistic understanding of this phenomenon. It outlines the impacts of the fragmentation and its causes, which comprise hard, soft and structural issues. However, in contrast to other studies, it places a particular focus on soft issues.

Keywords: sugarcane supply chain, systems methodologies, miller-grower fragmentation, soft issues, holistic approach

Introduction

The Free Dictionary defines fragmentation as disintegrated norms, regulating behaviour, thought, and social relationships. Although relationships and operations in the South African sugar industry are generally good, there remains a significant degree of fragmentation between growers and millers. The South African sugar industry, like other supply chains, features a significant amount of complexity. Multiple stakeholders with diverse personalities, perspectives and partially conflicting aims are interdependent and interact with each other (Perry and Wynne, 2004; Bodhanya, 2011). This leads to several inefficiencies (Le Gal et al., 2008; Wynne, 2009; Giles et al., 2009).

The complexity materialises in (a) 'hard' issues, which refer to technical and operational aspects such as mill efficiency, transport optimisation and sugarcane quality, and in (b) 'soft' issues such as goals, values, perceptions, relationships, communication, leadership and behavioural aspects (Gerwel *et al*., 2011). Soft issues play an important role in the interactions between miller, grower and haulier (Todd and Forber, 2005; Bezuidenhout et al., 2012).

Although a large amount of research has been done in the sugar industry, investigations have concentrated largely on hard aspects. Attempts to date to optimise the sugarcane supply chain

by improving its constituent parts have paid little attention to soft issues (Higgins and Muchow, 2003; Gerwel et al., 2011). Around the world when integrated sugarcane supply chains are investigated, a distinct fragmentation between millers and growers often emerges (Milford, 2002; Kroes and McFadden, 2004; Lejars et al., 2008; Sartorius and Kirsten, 2007). Shortcomings can arise from the effects of complexity, hence the degree of complexity and its impacts on sugarcane supply chains require better understanding (Higgins et al., 2007; Bezuidenhout, 2010). This indicates the need for a holistic view that considers hard and soft interactions.

This short paper provides a brief summary of miller-grower fragmentation issues in the South African sugar industry. The paper uses a systems thinking approach and aims to create a platform for discussion and exploring solutions. It outlines the impacts of miller-grower fragmentation and highlights the factors that cause and support fragmentation. No claim is made that this summary is exhaustive.

Methodology

A holistic systems thinking approach was followed to explore miller-grower fragmentation. This was primarily based on an in-depth qualitative analysis of the Felixton and Umfolozi mill area, where systems methodologies were applied (Hildbrand, 2013). As part of the analysis six workshops and 88 interviews with different stakeholders, including millers, growers, hauliers and industry representatives were conducted (see Table 1). In addition, the outcomes of a series of seven complex systems case studies were consulted (Bezuidenhout et al., 2012; Bezuidenhout, 2008). These results were synthesised with a comprehensive literature review by Bezuidenhout and Baier (2011), and the insights of experienced industry stakeholders were solicited. Direct quotes made by stakeholders substantiate the findings. More information and additional quotes are available in Hildbrand (2013).

Table 1: Overview of all stakeholders interviewed in Umfolozi and Felixton, including industry representatives.

Stakeholder type	**Number of stakeholders**	
	Umfolozi	**Felixton**
LSG	21	15
Exceptionally LSG*	3	(3)**
SSG / Emerging grower	-	1
Haulier	2	1
Tram (UCOSP) representatives	1 and (4)***	-
Mill employees	10	8
Others****	4	11
Total	**41**	**36**
Industry representatives°	11	
Total number of interviews	**88**	

Comments:

* Deliver sugarcane to both mills, and have ownership in Umfolozi Sugar Mill

** One haulier, hauling for LSG, and one, hauling for SSGs only

*** Stakeholders in brackets play a role within UCOSP, but were indicated under another stakeholder type already

**** Extension officer, secretary, contractors, Cane Testing Service etc.

°: SASA, SASRI, SA CANEGROWERS

Description of miller-grower fragmentation

Miller-grower fragmentation at local and industry level is a crucial soft issue that seems to impair efficiency. Millers and growers perceive each other as competitors, rather than partners in a mutually appreciative and beneficial symbiosis that seeks to optimise the entire system. Fragmentation exhibits poor working relationships and inefficient interactions, with minimal trust and communication. For instance in Felixton mill area, a team spirit or shared vision appeared to be very limited and even in Umfolozi, a partly grower owned mill, improvements in this regard seem needed.

Fragmentation prohibits the mill areas from realising higher potentials. It compromises, for example, the adoption of beneficial transport improvement opportunities (Giles *et al*., 2006). It further translates into technical and operational shortcomings. For instance, changes to mill group board (MGB) rules that would improve cane quality and consistency via the introduction of incentives, are often compromised by miller-grower disagreements.

Reasons for miller-grower fragmentation

Fragmentation arises largely from a range of underlying soft issues and some structural and hard matters, including:

- A deeply rooted mind-set of ‘miller against grower’
- An insular view
- Deficient systemic commitment
- Insufficient transparency and approachability
- Trust and communication deficits
- Living in a comfort zone/apathy
- Incompatible values
- Inefficient dispute resolutions and the absence of an arbitrator
- Industry structures
- A payment system that does not always support the correct incentives
- Conflicts over operational matters.

Figure 1 outlines the issues that contribute to fragmentation. The core stumbling blocks are discussed further.

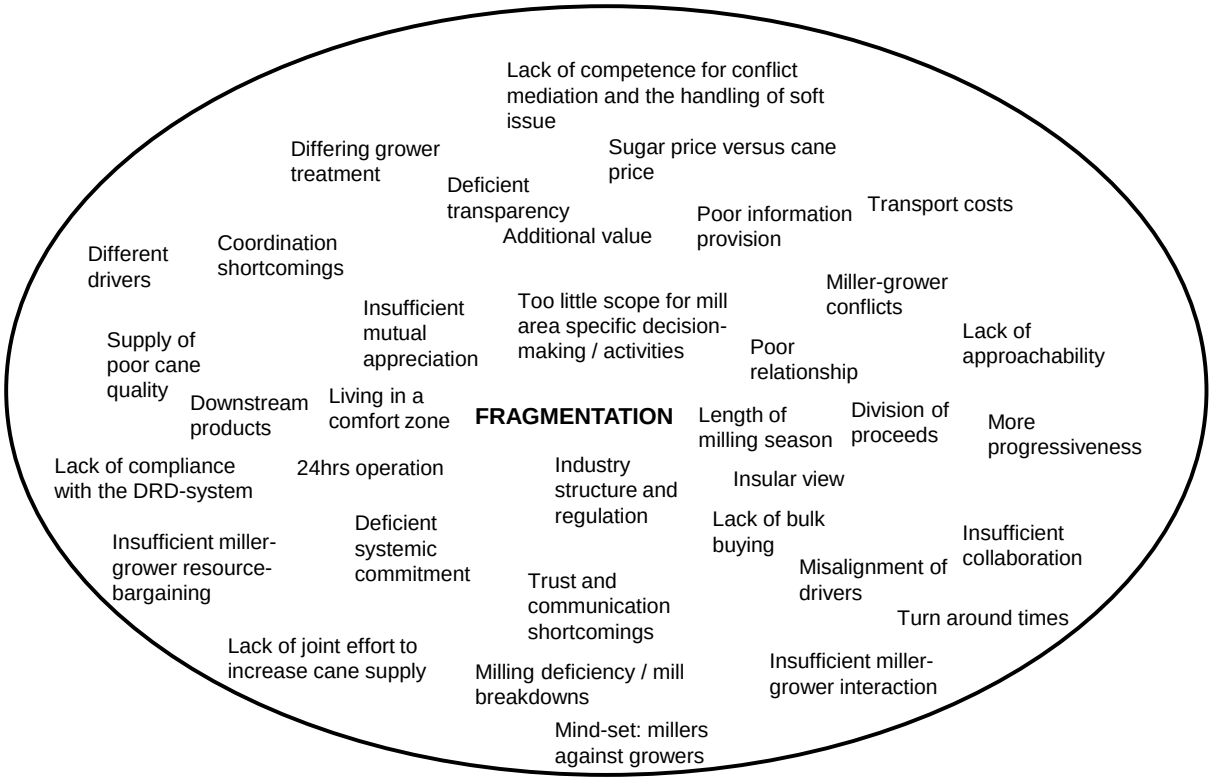

Figure 1: Issues that lead to complexity and fragmentation in sugarcane supply chains.

Soft issues

The 'miller against grower' mind-set stems from the historical deeply embedded perception that one always wins at the cost of the other. This leads to miller-grower conflicts over operational matters and deficient mutual appreciation and collaboration. Some stakeholders argued that the situation was exacerbated when external shareholders, who apparently have little appreciation of the socio-economic conditions of the sugar industry, took over mill ownership and return on investment became the core focus. The following quotes come from our interviews:

"It is very difficult to respect the mill when they are stabbing a knife into your back."
"Going to always have a sort of an 'us' and 'them'"
"Growers and the millers they don't function together"

The behaviour of several stakeholders in the supply chain is guided by an insular view and/or a lack of commitment to optimising the system as a whole. Stakeholders focus primarily on their own operations and profit. Insufficient transparency, approachability, trust and communication support fragmentation. Poor transparency and a lack of approachability, for example, compromise trust and lead to communication deficits between parties. Even the mere perception that transparency, approachability and communication shortcomings exist, fortifies fragmentation.

"communication has always been an on-going issue"
"There isn't any transparency"
"Mistrust from the millers' side, and … mistrust from the growers' side"

In addition, several stakeholders still seem to live in a 'comfort zone', often perceived to be supported by the industry structures. For some stakeholders the return on their investment seems to be good enough to enable resistance to change. Uncertainties about land restitution have further contributed to apathy.

"It's a comfort zone"
"They really don't want to put any more effort into it at all"

Incompatible values sometimes cause fragmentation. Some stakeholders pursue the highest possible profits, while for some stakeholders other values are more important, such as quality of life. The fact that some feedback mechanisms fail to resonate with stakeholders' underlying value systems leads to the ineffectiveness of these mechanisms.

Although these soft issues largely contribute to fragmentation, the necessity to deal with them and the benefits thereof are not emphasised in the industry. The sugar industry seems to lack competence in dealing with soft issues. There appears to be insufficient people and structures to support conflict mediation and miller-grower communication and negotiation.

Structural issues
Although the industry operates on the basis of a miller-grower partnership, millers and growers are only partners on a proceeds sharing basis in a fixed ratio, rather than being true business partners where risk and reward are shared. This supports fragmentation, especially when the low income environment puts stress on the system. Nonetheless, the current sharing of proceeds has its merit, as it ensures that millers and growers stay in business.

Local agreements that promote business partnerships with consideration for risk and reward at mill area level are possible. Millers and growers could implement local incentives in the right place to help optimise their systems. These opportunities are insufficiently exploited. Politics at industry level impact on how millers and growers believe they can operate at the local mill level. There is scope for a new industry framework that encourages local miller-grower negotiation and mill area specific decision making, while securing the benefits of a socialised system.

"the industry has always been about two parties at war against each other; growers and millers"

Despite a common driver, namely the establishment of a profitable and sustainable industry, stakeholders' interests are not necessarily aligned. The objective of one group sometimes contradicts with the objectives of another. Most miller-grower conflicts are related to the current division of proceeds, which seems unable to distribute costs and benefits throughout the system in such a way that both millers and growers feel adequately incentivised and seek to improve the overall supply chain. A wide range of issues is fundamentally anchored in the misalignment concerning stakeholders' business imperatives.

Industry structure and its associated legislation fail to align the business imperatives of millers and growers and to establish incentives that support the optimisation of the entire supply chain at an industry level. This again emphasises the need for an industry framework that provides the space for localised agreements and supports the implementation of local solutions. Respective changes will nevertheless have to be well facilitated and accompanied by the handling of soft issues.

Hard issues

Hard issues contribute to fragmentation and soft issues. Miller-grower disputes arise around hard issues and amplify the existing tension. Overcoming hard issues is likely to require a process of conflict mediation on the soft issues first, combined with innovative win-win solutions.

Conclusions

Miller-grower fragmentation challenges the South African sugar industry. It arises largely from economics and soft issues, yet structural and hard issues also play a critical role. There is a need to better incorporate soft issues into decision making, and to increase the capacity of the sugar industry to deal with this. For instance, the employment of staff particularly skilled in conflict resolution, the facilitation of miller-grower negotiations and the development of holistic approaches could be considered.

In order to handle fragmentation all its causes have to be taken into consideration, and further research and dialogue should explore respective possibilities. However, fragmentation appears to be mitigated in instances where the different business imperatives are aligned, where transparency exists and where decisions are made in the best interests of the mill area. The creation of an industry framework that supports local miller-grower interaction, local solutions and an incentive system, which aligns the drivers' of both parties to grow the pie, seems promising. In addition, means that support a mindset change that leads to an increased commitment to the system as a whole and seeks holistic solutions should be explored and implemented.

REFERENCES

Bezuidenhout CN (2008). A farmers market at the local sugar mill: Lean versus agile. *Proc S Afr Sug Technol Ass* 81: 68-71.

Bezuidenhout CN (2010). Review of sugarcane material handling from an integrated supply chain perspective. *Proc S Afr Sug Technol Ass* 83: 63-66.

Bezuidenhout CN and Baier TJA (2011). An evaluation of the literature on integrated sugarcane production systems: A scientometrical approach. *Outlook on Agriculture,* 40(1)**:** 79-88.

Bezuidenhout CN, Bodhanya S and Brenchley L (2012). An analysis of collaboration in a sugarcane production and processing supply chain. *British Food Journal* 114(6)**:** 880-895.

Bodhanya S (2011). The application of a concept model to illustrate the tragedy of the commons in the sugar cane supply chain. *Alternation* 18(1): 70-87.

Gerwel CN, Hildbrand S, Bodhanya SA and Bezuidenhout CN (2011). Systemic approaches to understand the complexities at the Umfolozi and Felixton mill areas. *Proc S Afr Sug Technol Ass* 84: 177-181.

Giles RC, Dines GR, Lyne PWL and Bezuidenhout CN (2006). The complexities of introducing the FREDD vehicle scheduling system into the Darnall mill area. *Proc S Afr Sug Technol Ass* 80: 66-70.

Giles RC, Lyne PWL, Venter R, van Niekerk JF and Dines GR (2009). Vehicle scheduling project sucess at South African and Swaziland sugar mills. *Proc S Afr Sug Technol Ass* 82: 151-163.

Higgins AJ and Muchow RC (2003). Assessing the potential benefits of alternative cane supply arrangements in the Australian sugar industry. *Agricultural Systems* 76**:** 623-638.

Higgins A, Thorburn P, Archer A and Jakku E (2007). Opportunities for value chain research in sugar industries. *Agricultural Systems* 94: 611-621.

Hildbrand S (2013). Systemic approaches to improvement in sugarcane production and supply: Umfolozi and Felixton mill areas. PhD Thesis, Graduate School of Business and Leadership, University of KwaZulu-Natal, South Africa. 266 pp.

Kroes S and McFadden J (2004). A proposed cane payment formula for Fiji. *Pros Aust Soc Sug Cane Technol* 26: 1-12.

Le Gal PY, Lyne PWL, Meyer E and Soler LG (2008). Impact of sugarcane supply scheduling on mill sugar production: A South African case study. *Agricultural Systems* 96: 64-74.

Lejars C, Le Gal PY and Auzouz S (2008). A decision support approach for cane supply management within a sugar mill area. *Computers and Electronics in Agriculture* 60(2): 239-249.

Milford B (2002). The state of value chains in the Australian sugar industry. *CRC Sugar Occasional Publication* No. 22.

Perry IW and Wynne AT (2004). The Sugar Logistic Improvement Programme (SLIP): An initiative to improve supply chain efficiencies in the South African sugar industry. *Proc S Afr Sug Technol Ass* 78: 69-80.

Sartorius K and Kirsten J (2007). A framework to facilitate institutional arrangements for smallholder supply in developing countries: An agribusiness perspective. *Food Policy* 32(5-6): 640-655.

Todd M and Forber G (2005). Cane payment systems. *Int Sug J* 07(1277): 294-298.

Wynne AT (2009). The South African sugar industry in the 2010s: A look into the future using scenario planning. *Proc S Afr Sug Technol Ass* 82: 83-92.