“An analysis of multi-stakeholder interactions in the sugar industry using a social complexity framework”

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An analysis of multi-stakeholder interactions in the sugar industry using a social complexity framework

Abstract

This study examines social complexity in the sugar industry. The sugar industry is complex, characterized by multiple stakeholders each with their own objectives. This study focuses on the interrelationships between the stakeholders by analyzing social complexity. The qualitative research approach was employed. Twenty-three in-depth, unstructured interviews were conducted with various stakeholders to collect data on the challenges that exist. The diverse goals of the stakeholders were found to be characteristic of a purposeful system, as is the case with social systems, but were identified as a potential source of conflict. Although the mill is a corporate shareholder entity, local interactions were found to be important in shaping the future. Critical factors, such as haulier inefficiencies, cane supply and cane quality, were found to have significant implications for the sustainability of the mill area.

Keywords: social complexity, stakeholders, relationships, goals, objectives, sugar industry.
JEL Classification: M10.

Introduction

The sugar industry can be considered complex due to the multiple interactions that have to occur between diverse stakeholders to produce a range of products, including raw and refined sugar, and molasses. The main stakeholders at the local level are the growers who grow the sugar cane, the hauliers who are responsible for transporting cane to the millers, and the millers who process the cane. An alternative approach to enhancing performance in the value chain, which focuses on the interrelationships between the people behind the sugar cane, is explored in this paper. Traditional value chain analysis may emphasize the activities required to put forward a product, but may neglect developing or nurturing the inter-relations between the diverse stakeholders who are critical in jointly crafting the future.

Relevant research is thus required to identify the multi-faceted problems faced by the stakeholders in the sugar industry. Social complexity theory will be used as a framework to map out the challenges that arise from multiple stakeholder interactions in the sugar industry. The main aim of this research is therefore to better understand the complex interactions of the agents in a mill area in a developing country context, through the lens of social complexity. The identity of the particular mill will not be revealed, and will be referred to in this paper as the mill. The mill is owned by a corporate shareholder entity and is reliant on hundreds of growers in the area who run independent operations to produce the cane. The mill area is therefore characterized by complexity, which stems from a mixture of technical complexity and the multiple interactions of diverse stakeholders.

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1. Social complexity

The sugar industry can be considered a system, and using Anderson's (1999) definition of a system, is as a result of interconnected components functioning together. Complexity is an underlying feature of human social systems (Stevenson, 2012). Complexity theory has evolved from a number of theories, and essentially centres on the idea that a system is complex due to the whole being different from the sum of the parts, and emerging from interactions between the parts (Klijn, 2008; Eoyang, 2004). Eoyang (2004) illustrates complexity through the use of a metaphor of a tapestry as being an outcome of the relationship between the strands of the different colours. The notions of uncertainty and unpredictability are taken as a given in complexity theory, and provide a contrasting view to the reductionist perspective which emphasises order and stability (Marion & Uhl-Bien, 2001). Organizations can no longer be comprehended in a mechanistic way, where assumptions and solutions about the whole are based on an analysis of the individual parts (Stevenson, 2012). The notion of a rational actor also comes into question due to disregarding complexity arising from dynamic systems comprising multiple agents (Levy, 2000). Levy (2000) emphasizes that the field of management can benefit from complexity theory by understanding how effective learning and self-organization can result in new forms occurring.

Complex systems exhibit a number of characteristics, including self-organization, emergence and non-linearity (Klijn, 2008). Self-organization in complex systems derives from the constant interplay between structure and diversity in the system, which respectively gives rise to identity and unpredictability (Eoyang, 2004). Non-linear interactions between agents result in self-organization (Anderson, 1999). Order in a complex system arises spontaneously,

rather than from a central source or master plan (Klijn, 2008; Mukherjee, 2008; Escobar, 2003). The parts in a complex system are intertwined, such that emergent patterns cannot be attributed to any individual part (Eoyang, 2004; Klijn, 2008). Emergence is thus when macro-behavior arises due to the dynamic interactions of multiple agents who follow local rules as opposed to top-down commands (Escobar, 2003). It is furthermore important to note that changes in social systems have unpredictable outcomes due to the complex nature of such systems (Duek, Brodjonegoro & Rusli, 2010). When a small change can fundamentally alter the behavior of the system, and the whole differs from the sum of the components, then this is known as non-linear behavior (Anderson, 1999). Complexity theory, although used in the biological and physical sciences, can be applied in social systems where non-linearity and complex interactions are present (Levy, 2000). The nature of being social entails ever-present and defining interactions that cause stability and change (Marion & Uhl-Bien, 2001).

Social complexity often presents itself in the form of wicked problems, characterized by stakeholders being unable to precisely define the problem, and having no real way of determining success or having any straightforward solutions on hand (Barry & Fourie, 2001; Australian Government, 2007). Wicked problems exist because each stakeholder holds a different view of the problem, with no one perspective of the problem being right or wrong (Australian Government, 2007). This is indicative of the mental models that each stakeholder possesses, which is essentially their perspective as to how they view the world. The behavior of agents (individuals, groups or partnerships between groups) is determined by their schema, which leads to an action based on the perception of the environment (Anderson, 1999). There may be shared schemata between agents, and agent behavior is dependent on other agents' behavior in the system due to the interconnectivity (Anderson, 1999).

Social complexity derives from the dynamic interactions of agents who are committed to achieving a particular goal. Parellada (2002) observes that social organizations exist to fulfil a certain objective, and that such systems contain and transmit ideas, values, culture and concepts (these may or may not be common) which influence the dynamics in the system. Duek et al. (2010) highlight that social systems are characterized by purposeful individuals, who make decisions about their own and the purpose of others. These agents are, however, heterogeneous, autonomous individuals who are purposeful in nature, and strive to fulfil their own objectives (Bogg & Geyer, 2007).

Wicked problems are often characterized by internally conflicting goals, with conflict arising due to the inherently independent nature of the agents (Heylighen, Cilliers & Gershenson, 2007). This point is taken further by Heylighen et al. (2007) in noting the selfish behavior of agents by arguing that they are independent beings whose aim is to accomplish a particular goal through acting on the environment and other agents. Anderson (1999) thus draws attention to how agents improve their own fitness function or payoff, which is dependent on the decisions of other agents.

Agents in a social system are confined by social conventions and norms (Rzevski, 2011). In order to reach a preferred state, agents in dynamic, social systems are able to respond and evolve in response to the actions of other agents through engaging in learning, collaborating with other agents, developing relevant identities and redefining power relations (Potgieter et al., 2007). Agents in purposeful systems are therefore able to learn and adapt (Duek et al., 2010).

A working definition for social complexity will now be proposed, which is based on the work of other authors (Duek et al., 2010; Parellada, 2002; Heylighen et al., 2007; Rzevski, 2011; Cicmil & Marshall, 2005; Austin, 2010; Conklin, 2006; Australian Government, 2007). Social complexity arises when multiple, heterogeneous agents who are bound together in a purposeful system, draw on their own mental models to interpret and find a balance between achieving their own goals and objectives, with that of the common goal responsible for creating the interdependence between the agents. The mental models will allow the agents to place into perspective, (1) how they define success, (2) which goals to pursue, (3) their own organisational structure and processes, and, (4) what they attribute the causes of the problem to, the severity of the problem and ways to address it. The constructs of power, norms and conventions will, however, limit the freedom that each agent in the system has, and uncertainty and unpredictability in the system derive from this constant tension that agents display as they need to have an individual identity and still achieve success for the system as a whole. Figure 1 below presents a conceptual model of social complexity, based on the working definition.

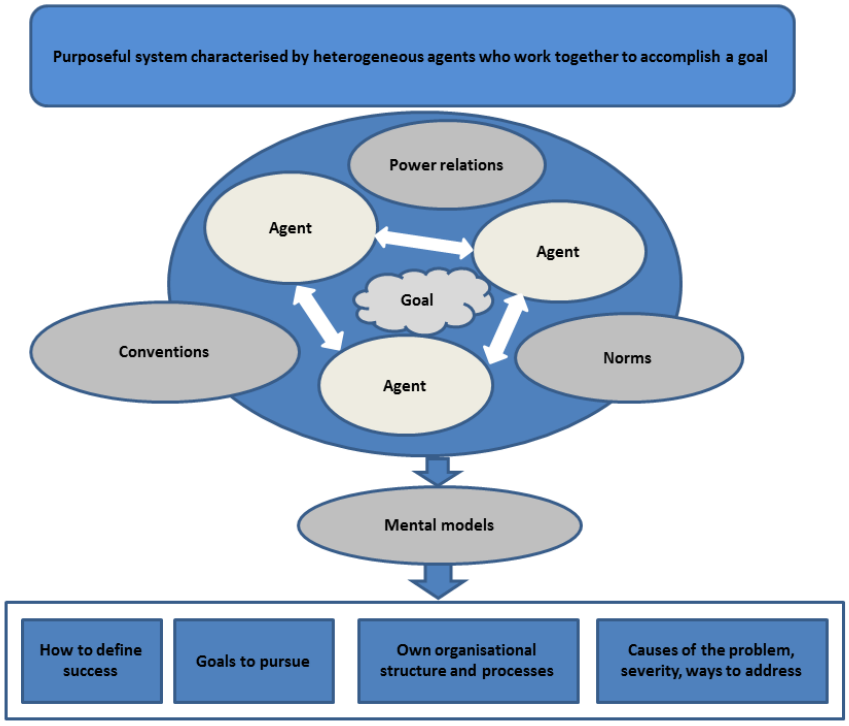

Fig. 1. Conceptual model of social complexity

2. Research method

An exploratory research design was used, with the qualitative research approach found to be most appropriate. This approach was applicable for discovering and comprehending little-known phenomena (Creswell, 1994). Semi-structured, in-depth interviews were used to gather data to allow for the emergence of rich descriptions and stakeholder perspectives. Purposive sampling was used. Two rounds of interviews were conducted with various stakeholder groups to gain a rich understanding of the context.

Stakeholders in the mill area were first approached to be involved in the research and had an opportunity to better understand what the research entails. The research was performed in the natural environment, and therefore involved site visits to the mill area. Ethical clearance to conduct the study was obtained. Participants were presented with an informed consent form and assured about confidentiality. Each interview lasted approximately an hour, and was digitally recorded and transcribed.

The fieldwork commenced in July 2010. This round of fieldwork was used to gain a basic understanding of the context. A total of 12 interviews were conducted, which comprised six growers, three representatives from the mill, one haulier, one representative from the national sugar association, and one representative from the local miller-grower body. The questions centred on determining the goals of the various stakeholders and whether they were considered compatible or competitive, how communication and trust were viewed, how challenges were dealt with, and difficulties that were recently faced. The second round of interviews was conducted with 11 respondents and was held in October 2010. These stakeholders included eight growers and three representatives from the mill. The emphasis of the interviews was on the respondents' views of leadership, communication, transparency, and power relations in the milling area, the working relationships between the stakeholders, and issues pertaining to competitiveness in the mill area.

The interview data were analyzed to enable findings. The transcripts from the interviews were carefully studied and analyzed using thematic analysis. After engaging in analysis, a workshop was organized to present preliminary findings to the stakeholders. This was a way of ensuring member checking.

3. Results

3.1. Multiple stakeholders with divergent goals. The main stakeholders in the mill area found to be most influential in the system were the growers, miller and hauliers. Hauliers were perceived to be quite significant as their actions affected growers and the miller considerably, but were however considered to be outside the system. Respondents expressed the view that the hauliers were not of real consequence as there were only two permanent entities in the sugar industry: the growers and miller.

They (hauliers) are the step children of this family, because they live on the outside ... transport is outside (R6).

Interdependency between growers and the miller was highlighted by respondents who acknowledged that the mill would not exist without the growers, and that growers would have nowhere to take their cane if the mill were not around. Despite this symbiotic relationship, each entity was found to be pursuing its own goals due to its separate existence. These diverse goals as expressed by the respondents are mentioned below.

Growers aimed to grow the crop as cheaply as possible and obtain maximum production from their land, whereas others indicated that growers wanted the cane harvested and expected maximum returns. Growers wanted maximum sucrose and delivery to the mill within 24 hours. Grower goals were about profitability, sustainability and getting value for their crop, which entailed more than just sugar. The goal of hauliers was to deliver cane from the field to the mill, and ensure profitability and efficient utilization of their equipment. The goal of the millers was to extract maximum sucrose and to make as much money as possible. It was acknowledged that the mill was owned by a corporate that had to maximize profits and satisfy shareholders.

3.2. Being heard. Growers expressed a strong sense of wanting to be viewed as meaningful participants and to become more influential as a collective. The formation of a grower body by the mill-area growers, referred to as the Local Grower Initiative (LGI), allowed growers to respond as a collective to the miller and exert influence. This therefore permitted growers to be more united and able to speak with one voice to the miller. The corporate required such collective action from the growers to produce a more efficient relationship.

The biggest problem the corporate finds is that there is no one voice that is spoken by the growers and the hope is that the LGI will be the one voice that will come through (R4).

To become further organized, growers had to forge stronger ties amongst themselves and contribute in committee forums where strategic decisions were being made. There was a clear need to step out of, what many respondents referred to as a 'comfort zone'. The challenge, however, was to overcome the fact that there were many growers who were individuals and managers in charge of their own farms, and who were traditionally accustomed to working alone, according to their own success criteria.

Respondents indicated that growers have had to become professionals to exert their influence in the arena. This therefore resulted in a move away from the concept of being only a farmer to a well-rounded businessperson who is able to respond to decisions that are made in a boardroom, far away from the mill area. It was noted that some growers required professional assistance, to assist with finances and negotiations, but also general management.

There is a lot of negotiations, business management, organization ... and not every farmer has those skills (R5).

3.3. Power distance. Ground-level relations between the mill staff and growers were considered fairly satisfactory and characterised by trust, but the problem, however, arose with the corporate and hierarchical nature of the business, as it was argued that mill staff could not make high-level decisions.

Trust between the mill manager and growers is not that bad, but unfortunately the mill manager reports to his superiors and I think that is where the problems start occurring ... high up the ladder (R1).

Respondents reflected on the history between growers and millers, which started with growers being dominant many years ago, which was then followed by the phase of engineers, and finally the advent of external shareholders, by way of accountants and efficiencies, which is when the relationship between grower and miller started taking strain. The change from a family-oriented business to a shareholder entity was identified as the source of problems, as it was perceived that the miller lost touch with what was happening on the ground.

Respondents consequently articulated perceptions that were rife. These included the existence of a powerful miller who hid information from growers and who made huge profits for the sake of shareholders, while growers came off second-best as price takers. This was contrasted with the relatively simple operations of growers who were perhaps farming for the sake of achieving a particular lifestyle and making a comparatively modest profit. Major, strategic decisions concerned respondents as they wondered whether these were made with the mill in mind or for the corporate entity, which owned other sugar mills.

They are a huge company, they've got lots of sugar mills, so sometimes we don't understand them, but I'm sure they are making the right decisions in their minds (R7).

Respondents mentioned that current communication systems, such as SMS and email, and a Friday breakfast at the mill between the growers and the miller, and other informal gatherings like the golf

day organized by the miller, were noted to be of value in bringing stakeholders together.

While local-level communication efforts were appreciated, respondents indicated that there was a lack of in-depth communication from all sides, particularly concerning strategic discussions. Respondents thus called for the development of a meaningful form of two-way communication.

The need for more ground-level interaction at the mill and the participation of influential players from the corporate headquarters to be part of strategic discussions was raised as a possible way to facilitate interactions and efficiency.

There are players that are influential, who aren't normally part of discussions (R1).

This was, however, not viewed as feasible due to the hierarchical nature of the business.

The corporate is huge. You can't expect one of the big bosses to be attending meetings here. That is why they have different tiers in their hierarchy to attend to those issues ... they just basically seeing how much sugar we're making. How much we can put on the world markets. They are strategic, not hands-on with the operations (R12).

3.4. Strengthening the mill area. Respondents expressed different views on how to strengthen the mill area and raised various problems and possible solutions to boost performance in the mill area.

Mill efficiency was considered largely acceptable, but some respondents reflected on whether the mill would cope with increased cane supply. Others, however, noted that the mill was old and required maintenance to prevent downtime. Growers highlighted that it would be useful to be informed of strategic information about the mill, as opposed to information that was considered filtered. The miller required accurate, updated information on cane delivery from growers. It was thus indicated that there should be communication coming to the mill but also leaving the mill.

Cane supply was considered a major problem by all respondents and was viewed as critical to the survival of the system. Increased cane supply, as explained, was linked to increased throughput and sugar. The fact that the mill had the capacity to crush a large amount of cane, but was unable to due to limited supply, was cited by many as a serious threat to profitability and sustainability of the mill.

This mill is under more serious threat with dwindling cane (R3).

Cane supply was attributed to various factors. Some growers who acquired cane farms could not successfully farm, certain growers sold their land due to fears related to legislation, while others were moving into other crops such as macadamias or bananas, or simply moving into other countries where the costs associated with farming were lower. Increased planting efforts and farm rehabilitation were mentioned as ways to improve cane supply.

Challenges relating to unreliable transport was mentioned by growers and the miller as a serious challenge, especially that it was perceived to be increasing the rift because of poor cane supply. Late delivery of cane negatively affects cane quality and the mill scheduling in respect of processing the cane. Respondents made mention of there being too many hauliers, many of whom were not performing adequately. A suggestion raised was that the miller absorbs the haulage function, thus leaving growers to place their cane on the loading zone, and spend more time focussing on farming. The introduction of a scheduling system was considered another possibility by some to address transport inefficiencies.

Cane quality appeared to be more of a difficulty from the perspective of the miller. Suggestions were made to have growers focus on farm management, such as training of labour and increased attention on base cutting and topping height of the ratoon. Growers, while acknowledging the importance of cane quality, however recommended that the miller use its power to purchase fertilizer to assist growers as they were faced with financial constraints. Growers pointed out that economics affects cane quality.

Responses thus largely centered on addressing transport, cane quality and cane supply as a means to bolster performance.

We talked about transport, we talked about improving yield, we talked about quality ... those things are strategic ... will make the biggest competitiveness difference (R4).

4. Discussion

Figure 2 depicts the social complexity in the mill area, as derived from the results, and will now be used as a basis for the discussion of the results.

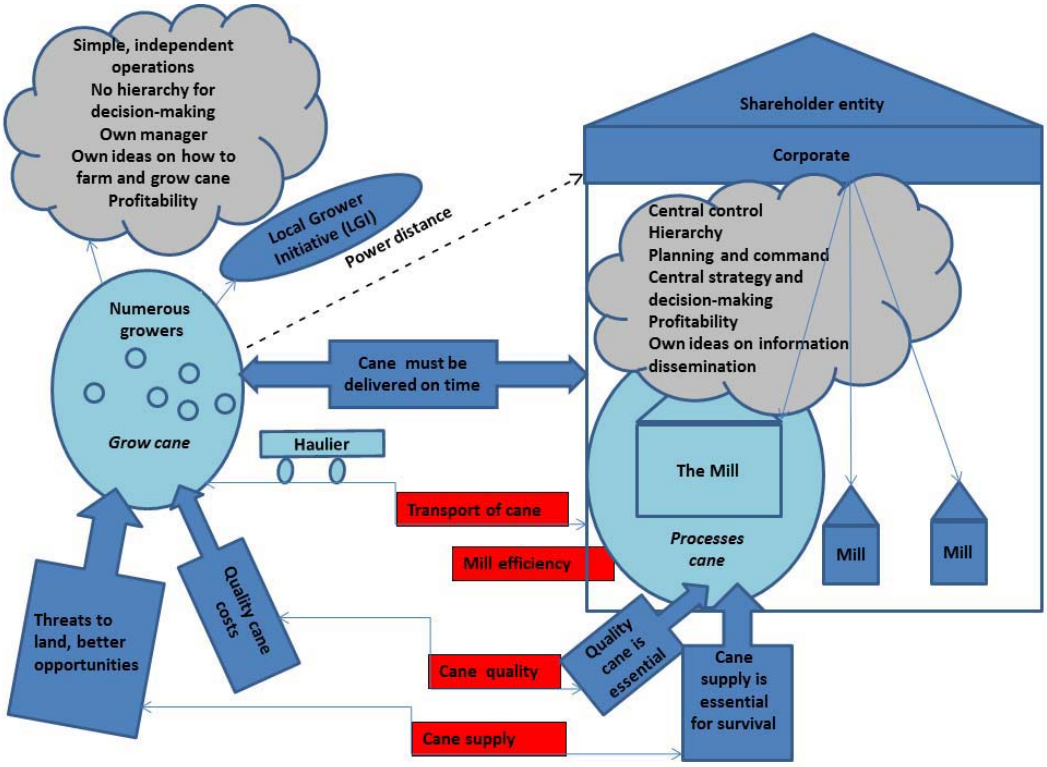

Fig. 2. Social complexity in the mill area

Social complexity in the mill area derives from the presence of major players, which were found to comprise growers, the miller and hauliers. These agents displayed commitment to attaining a higher-level goal, i.e., combining efforts to produce sugar. The results however revealed that the presence of hauliers was found to be impacting heavily on the system, and causing strain to the growers and the miller. Marion and Uhl-Bien (2001) argue that if there are too many interacting agents, then difficulties can arise with respect to achieving a common identity and order. The presence of the hauliers poses an insurmountable challenge to the system, and may require re-examining their role in the system. Anderson (1999) argues that connections between agents can be altered, in that agents can enter or leave the system, and that new agents can arise through grouping thriving aspects of agents. The emergence of the grower body (LGI) is an example of a new agent that has altered the mill area.

Growers and the miller are thus the main stakeholders who display an immense amount of interdependence, as illustrated in Figure 2. This corresponds with Homer-Dixon's (2011) view that complex systems exhibit a high degree of connectivity of the parts. Wynne (2009) notes that a healthy relationship between millers and growers contributes to the wellbeing of the sugar industry, and recommends a closer working relationship, collaboration and internal harmony as a way of strengthening the value chain.

In line with the recommendation of Ashmos, Duchon and McDaniel (2000), it is useful to identify how conflict arises from the attainment of multiple objectives and goals. Growers and the miller were found to pursue their own objectives, which is a characteristic of social complexity. Wynne (2009) highlights that a disjointed approach in the sugar industry has negative implications for adapting to a competitive environment, and that the downfall of one party will see failure for the other as well. Rzevski (2011) however points to a noteworthy characteristic of social systems as that of intelligence, and defines this as the ability of agents to articulate and work towards goals, especially when uncertainty prevails. Rzevski (2011) further notes that intelligence allows for choices to be made by the agents, and that emergent intelligence should be strived for as this is about agents being given the space to get together to decide on how to achieve the most worthy common goals. It is evident that both growers and the miller strive for profitability, maximum sucrose and efficient delivery of the cane to the mill. Such compatibility of goals and consideration as to how to jointly achieve this could allow the agents to better handle the complexity.

Another characteristic of social complexity is the inability of agents to precisely define the problem facing the system, its attributes and solutions. This is due to the existence of the diverse mental models held by the heterogeneous agents who display bounded rationality. The problem as perceived by

stakeholders was attributed to different causes, depending on the particular stakeholder group. The results identified cane supply, cane quality, mill efficiency, and unreliable transport to be most pressing, as indicated in Figure 2. Barry and Fourie (2001) contend that rather than dwelling on efforts to define a problem, we should rather reflect on, analyze and formulate a response to the situation.

Different solutions were proposed depending on the stakeholder's perspective, with respondents viewing certain factors as more serious, e.g., mill efficiency, which was considered acceptable by some respondents, but a cause for concern by those who were anticipating the future. Cilliers (2000) draws attention to how complex systems can organize towards being critically sensitive, a term used to describe the ability of a system to respond to certain issues which are critical to its survival. Figure 2 reveals that the timely transport of cane is an objective equally desired by growers and the miller, as both parties stand to win or lose. Reliable cane supply is an objective that is essential to the survival of the mill and is in part dependent on the decision of growers to continue in cane farming and make a success of their land. The miller also places emphasis on quality cane, but requires the cooperation of the grower who would have to choose to financially invest to accomplish this goal. Mill efficiency is in the domain of the miller but does not dramatically affect the system at present. Agents can form their own insights into what they desire and how they will behave (Teisman & Kleijn, 2008).

When there is no agreement about the origins of the problem or on how to address the problem, the best response is for multiple organizations to work together, and take action at various levels as the problem overlaps more than one organization (Australian Government, 2007). The need for emergent leadership in complex social systems is critical, and comprises an agent who takes initiative in motivating other agents to deal with difficult duties and requirements which are necessary to see the system accomplish its goals (Rzevski, 2011). Growers and the miller would therefore need to find a way to address the problems associated with transport and cane supply. This should ideally be achieved through self-organization. Self-organization is present where there is autonomy to make decisions and accomplish goals (Rzevski, 2011).

Rzevski (2011) does however note that social conventions and norms pose a limitation to the amount of freedom that agents in a social system have. The corporate has structures in place, particularly as a result of the hierarchical nature, and holds a particular view about how business is conducted. Local-level interactions at the mill were found to be satisfactory, but the role of the centralized structure presented a barrier. Local and present interactions shape the future and are derived from how agents communicate, and not necessarily from intentions and strategies of managers (Rodgers, 2010). This corresponds with the view of Cicmil and Marshall (2005) who note that a simplistic view of communication and team cohesion are inadequate due to the existence of ambiguity, unpredictability and power differences.

One of the main differences, as indicated in Figure 2, between the growers and miller was that the miller was a corporate, shareholder entity with clearly defined parameters for success. Growers, on the other hand, were dispersed and solely responsible for how they defined success. Power relations in the mill area were found to be a source of conflict due to the corporate nature of the mill. Concerns were expressed about the goals of the company in relation to the other mills that the business owns. This produced a clear distinction in how business between the miller and growers was conducted and caused tension due to different expectations. In complex systems, the ways in which power and differences are managed become integral (Stacey as cited by Levy, 2000).

It is critical to consider how each organization deals with its mission, values, culture, and processes related to resources, structures and decision-making (Austin, 2010). Agent diversity, which tends to be overlooked, is a source of strength for complex systems (Heylighen et al., 2007; Stevenson, 2012). Growers and the miller can, therefore, capitalize on best practice in their own domains. Effective functioning in the grower-miller social context requires agents to have a strong identity, form relationships and share information (Stevenson, 2012). A strong identity derives from a view of the self in relation to others and their sense of purpose, and serves to create relevance for what we are and do. Relationships entail meaningful connections, defined by mutual respect, authenticity and trust. Information sharing serves a connective function in the social context and is a necessity for learning about self and others, and when inhibited by the inability to share and communicate, leads to an identity crisis. The growers' need to be viewed in a meaningful way through being heard and engaging in strategic discussions can be understood in light of these three critical concepts. Stevenson (2012), however, points out that the values of the group that holds the power will determine what is acceptable in terms of knowledge transmission. The structure of the corporate thus places limitations on how much information and interaction can be achieved.

The miller can be thought of as individualistic, portraying a clear sense of competitiveness and exhibiting classical hierarchical and centralized decision-making. Growers by contrast, due to their sheer numbers, have a simple structure with decision-making and accountability lodged with the individual grower-cum-manager. This difference contributes to increased social complexity in the mill area, and corresponds to the two network types (hierarchies and meshworks) as noted by Escobar (2003). At the one extreme is a hierarchy, which is how the miller can be viewed, characterized by centralized control, clear planning and standardization, and specific rules and behavior. The growers, on the other hand, can be compared to meshworks, which operate under decentralized decision-making, heterogeneity, variety and no one single goal.

Austin (2010) argues that collaborations between partners need to be characterized by learning and the ability to do so in the partner's territory. This is clearly evident in how growers have demonstrated increased organization through the development of the grower body (LGI), efforts to increase involvement by growers, and awareness of the need for professionnalization. However, growers will have to overcome the independent attitude that they have traditionally been operating under to achieve individual competitiveness. Rzevski (2011) therefore proposes emergent creativity, which is viewed as agents being proactive in reviewing goals, reformulating aims and objectives, predicting trends and paving the way for new prospects. The strategic use of the LGI and other committees could allow growers to revisit their goals and formulate a response as a collective to interact strategically with the miller.

In applying the social complexity lens to examine the interrelationships in the study context, Figure 1 can now be enhanced. What may be seldom emphasized in social complexity theory is that agents are not equal, and furthermore, that the agent with the most power dictates how business will be conducted. Another consideration is how other agents in turn respond to such displays of power, often requiring a fundamental change in operations and organizational structures to compete. Key differences in organizational culture, decision-making and value systems play a particularly critical role in social complexity. Apart from pursuing their own goals, individual agents have the desire to be recognized and to exert influence. A final characteristic for consideration in the social complexity theory is the need for agents, as a collective, to have a common identity which will allow for the goal to be accomplished. This may necessitate collaboration amongst agents who most stand to gain or lose, to create a new group of agents or attempt to expel an agent who is causing strain to the system. The need for collaboration to focus on addressing problems that will ensure survival ultimately supersedes the inherent diversity and competition that agents naturally portray.

Conclusion

The aim of this research was to use social complexity theory as a lens to understand the complex interactions of agents in a mill area in the sugar industry. This research found interrelationships between stakeholders to be critical in producing outcomes. The results revealed that complex interactions in the mill area arose due to the existence of multiple stakeholders with divergent goals. Another finding was that agents had the desire to be recognized and to become influential; however, power dynamics limited interactions due to agents having fundamentally different ways of conducting business. Stakeholders were also found to view the causes of the problems and solutions in the mill area differently due to their own mental models and perspectives.

It is clear that growers and the miller, while being cognisant of their own goals and objectives, will need each other to address haulier inefficiencies and deficiencies in cane supply, which currently pose a threat to survival. This will not be an easy task due to the purposeful nature of the agents and structural differences, and will require firm leadership from both parties. The local-level interactions between growers and the miller, and not the corporate, will be pivotal. The corporate will have to consider the high-level goals of the organization in relation to the mill goals, and perhaps allow more autonomy, which could assist stakeholders to better manage the unique complexities facing the area. This can allow for the connections and differences to be nurtured. As Gharajedaghi and Ackoff (1984) argued, less emphasis must be placed on individual actions, and more on effectively managing how the parts in a system interact.

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