Sustainable Practices as Dynamic Capabilities on Sugarcane Industry in Brazil

Authors

Luciana Oranges Cezarino
Federal University of Uberlândia – Brazil
lcezarino@gmail.com

Lara Bartocci Liboni Amui
University of São Paulo – Brazil

Adriana Cristina Ferreira Caldana
University of São Paulo – Brazil

Marlon Fernandes Rodrigues Alves
University of São Paulo – Brazil

ABSTRACT

The aim of this paper is to analyze the development of changes in operations management towards sustainability by a case study. The results show that Balbo company, Brazilian sugarcane industry, has developed new ways to change and adapt in a disturbing environment was able to built dynamics capabilities.

Key-words: sustainability, dynamics capabilities, sugarcane industry.

Sustainability Paradigm and Dynamic Capabilities

Environmental concerns have increased the awareness of the limitations of the modern conception of nature and its disastrous consequences.

Corporate sustainability consists of ensuring long-term economic viability and, at the same time, contributing to the socio-economic development of communities, the health of the environment and the stability of society (Ethos, 2009). The concept of corporate sustainability involves sustainable economic growth that is aligned with social development and environmental conservation.

Consequently, a new development strategy emerges embodying political, economic, social, technological, and environmental dimensions. This new paradigm of a sustainable development implies the need for profound changes in the current production systems, human society organisation, and utilisation of natural resources essential to human life and other living beings (Belico et. al, 2000).

Therefore, the paradigm of sustainability implies the need for changes in the current production systems, including human society organization and utilization of

natural resources essential to human life and other living beings (Liboni; Cezarino, 2014).

"Sustainability needs to be in the core of the business and bring innovation; it should not be an artifact for the employees to 'feel good once a year'" (Werbach, 2010, p. 67). Success will depend on the capacity to find innovative solutions that address global issues and, simultaneously, fulfill stakeholder needs. Companies that are unable to develop the capacity to innovate will have difficulties in remaining viable in current market conditions (Esty et al., 2006). The development of sustainable strategies will therefore become essential for the survival of both corporations and the planet.

Private businesses are genuinely interested in sustainable development because it represents a good strategic option, transforming this value in a dynamic capacity.

Helfat et al. (2007, p. 4) define dynamic capacities as "the capacity of an organisation to purposefully create, extend, and modify its resource base".

The main theorists on dynamic capacities (Eisenhardt & Martin, 2000; Teece, Pisano & Shuen, 1997) support the idea that performance and competitive advantage result from the reconfiguration of the resources in congruence with the environment and whose organizational processes are the origin point. This capacity of reconfiguration has been increasingly more desirable in unstable and complex dynamic environments. This complexity occurs with instability, evolution, and fluctuation everywhere, especially in the organizations arena.

The basic pillar of the new sustainability paradigm is the systemic view. This vision allows for flexible ideas because it is based on a multidisciplinary approach that seeks to establish a dynamic and harmonious balance through the combination of the natural and behavioral sciences (Belico; Silveira, 2000). The systemic approach should guide the development of corporate strategies.

This paper aims to analyze, in a systemic approach, the organizational practices in a Brazilian industry that transformed sustainability into a dynamic capability.

This study is part of an international project called *Global Organisational Learning and Development Network* (*GOLDEN*)[1], carried out in partnership with universities of other countries such as Università Commerciale Luigi Bocconi (Italy), University of Minnesota (USA), London City University (England), Tsinghua School of Economics and Management (China), University of Technology Sydney (Australia), and University of São Paulo (Brazil). The project's members are responsible for creating a platform of cooperation and sharing knowledge about how organisations modify (and learn to modify) their business models involving corporative sustainability.

The GOLDEN's group of Brazilian researchers seek to compare and evaluate companies of the same sector and summarise their dynamic capacity of integrating sustainability into their business models. As a start point, the sugar and ethanol industry was chosen as study focus because it is an important sector for the Brazilian economy in terms of generation of wealth and employment, in addition to being a clean energy matrix and a reference in terms of sustainability.

Methodology

[1] For further information: *goldenforsustainability.com*

This study followed a qualitative systemic approach to better understand how the organization changed towards a sustainable strategy as a dynamic capability.

The study consisted of a case involving a sugar, ethanol, energy company by collecting both primary and secondary data, including personal interviews with executive directors and intermediate managers. The sugar and ethanol energy sector was chosen because it is a strategic sector for the country. The Brazilian sugar and energy sector summed US$ 43.4 billion in the 2013/2014 crop year, an increase of 44 percent in relation to the 2008/09 crop. This figure is higher than the GNP of more than 100 countries.
(NOVACANA, 2014).

The Balbo Group is located in the city of Sertãozinho, State of São Paulo. Data on the company were collected from reports, official site, and interviews with managers responsible for the strategic definitions.

1) The next stage consisted of using some elements of the Soft System Methodology (SSM) to understand the complexity of a company in the sugarcane industry. The SSM is a s*oft* methodology, which was developed from the observation that not all problems and situations faced by corporations are of a precise nature (Martinelli and Ventura, 2006, p. 163). This systemic method was "designed to assist in the resolution of soft issues, which are of complex nature and involve many human elements" (Martinelli; Ventura, 2006, p.163) . Some elements of the SSM were used to analyze, in a systemic approach, the information collected in the organization. The following steps were used in this analysis. The step of defining and structuring the situation by relating structure and process; the step of formulating root definitions of relevant systems to advance knowledge and identify their main elements, to this end, Checkland (1990) suggests the use of the mnemonic CATWOE (clients, actors, transformation process, *Weltanschaung*, owner, environmental constraints); and the step of building conceptual models, which include the ideal situations required for each of the previously formulated root definitions to achieve their expected outcomes.

A Case Study of Sugarcane Industry

The Balbo Group (established in 1946) currently has the capacity to mill 5 million of tons of sugarcane, which is supplied by more than 300 independent producers and by a specific Balbo Group company that owns lands. Balbo group operates these lands through partnerships. The Group has benefited from the production of electricity from the sugarcane waste in its unit for 14 years, allowing it to be self-sufficient in meeting the energy needs of its industrial activities. The Group produces sugar, organic sugar, ethanol, organic ethanol, biodegradable plastic and other sugarcane byproducts. The company's mission is to explore the sustainable agri-business potential of sugarcane and other agricultural products.

The group has strong sustainability practices related to production process and product innovation, being the world's largest organic agribusiness company.

Initially the group was concerned with the lack of integration and adaptation of sustainable practices in its corporate management model. Its sustainable practices

had to be more structured and linked to the corporate strategy. However, the organic strategies fulfilled this gap, addressing the sustainability issue as a corporate strategy.

The sustainability practices of the Balbo Group are diverse and involve processes and products. The group's strategy was to shift its organic strategies towards the creation of the trademark "Native", present in the market since 1996, but formally traded in 2000. Native is an important branch of the group as it allows the company to focus on higher aggregate-value products rather than producing commodities only. Native produces organic sugar, chocolates, coffees, cookies, juices, soya beverages, cereal bars, breakfast corn flakes, chocolate powders, among other organic food products.

The Native products also have the most restrictive environmental and production certifications, which makes the company to consolidate its project called "Cana Verde" involving the production of sugarcane without the presence of agrochemicals. The Native's suppliers have to be certified as organic, and with this strategy the company ends up developing a whole chain of suppliers within the parameters of sustainable agriculture.

Besides the aspects of healthy food and food security provided by organic products, studies carried out by EMBRAPA researchers[2] showed that biodiversity has increased in the cultivation areas involving Native products. In those areas operated by the Cana Verde project, one can find more than 339 species of the Brazilian fauna such as mammals, birds, reptiles and amphibians – this has only been possible thanks to the organic agriculture.

Unlike companies with environmentally or socially controversial activities and who base their sustainability actions in isolated projects, sustainability is a strategic pillar in Native and it is the core business of the company.

As previously mentioned, the Group's companies are self-sufficient in the production of electricity. Additional produced energy is supplied to the state's energy distribution company (Companhia Paulista de Força e Luz). The Balbo Group is a pioneer in Brazil in the co-production of electricity from sugarcane waste. It produces enough energy to supply the demand of a city with a population of 80,000. The Group plans to enlarge its energy co-production activities and has commercialized carbon credits from three harvests.

In-house technological research has allowed for the use of new products, such as biodegradable plastic and organic products. These products promote sustainability and are underpinned by the principles of using fewer natural resources and creating less environmental impact.

The solid and liquid organic effluents from industrial processes are recycled for agronomic applications. The global system of raw sugarcane production and harvest, established in 1987, is one of the most important applications of agronomic research and mechanization. By harvesting without crop burning, this new production system allowed for the optimization of the use of organic industrial waste as a source of nutrients and the practice of organic composting in rotating crop systems. These practices contributed to the Group being awarded the status of a large-scale organic sugarcane producer. According to major international certification agencies, the Group is the world's largest organic agri-business company.

As a predecessor to its Cana Verde Project, in 1986, the Group implemented a reforestation program using native Brazilian species. The main objectives of the program were the creation and integration of islands of biodiversity in agricultural

[2] EMBRAPA: Brazilian Agricultural Research Corporation, connected to the Ministry of Agriculture.

areas, the protection of water resources and the improvement of conditions for wildlife.

Dust caused by heavy vehicle and machinery traffic is another concern of the Cana Verde project. All internal tracks and roads are watered before receiving more traffic. The majority of these routes are already covered with grass. As an additional result of organic practices and reforestation, streams have formed naturally within agricultural areas. This process would have been unimaginable during the time of traditional agricultural practices. Because the soil is covered by organic waste, rainwater does not completely evaporate and is able to infiltrate the soil, thereby feeding these extremely clean local streams that are part of the effort to recreate the elements of nature. The environmental monitoring of agricultural areas requires evidence-based knowledge of land use and land cover. The company mapped land use and land cover using satellite images and field work. A geographical information system (GIS) was developed for the collation and management of agricultural and environmental data, including land use and land cover.

Important environmental actions taken by the company include landscape and habitat diversification; the creation of new areas of native vegetation; the protection, maintenance and enrichment of existing forest areas; the development of ecological corridors; wildlife management; improvement of water quality and availability as well as accessibility to fauna; abandonment of sugarcane burning and fire practices (harvesting raw sugarcane); the total cessation of the use of agrochemicals (chemical inputs); the exclusive use of organic fertilization (pesticides and other chemical substances are no longer used); biological control of pests; soil management; erosion control; the increased capacity for water to infiltrate the soil; the increased availability of water in several sub-basins; the banning of wood harvesting or collection; enforcement of hunting bans; the installation of physical barriers to control unauthorized access to preserved areas; and environmental education for employees.

Through the Cana Verde project, the Group has greatly reduced its use of manpower in the fields, as machines conduct 90% of the harvest. No new rural workers will be employed, and the remaining workers will be trained and reallocated to other jobs within the company. The growth of mechanization has increased the demand for qualified employees, and the company has invested in professional development, qualification and training. However, the demand exceeds the in-house process of developing internal talent. Thus far, 100 employees from the agricultural sector have been trained to undertake jobs in other areas within the company.

Therefore, considering all mentioned above, the Group understood that sustainability could add market value to sugar and ethanol, which are considered to be commodities of low aggregate value. The sustainable processes were implemented as a way to improve productivity and quickly respond to the social demand for engagement with environmental regulations and concerns.

By analyzing the system it was possible to comprehend the root definitions, the CATWOE, presented below.

C (clients of the system): the focus of the analysis is sustainability; therefore, all stakeholders are considered to be clients of the system: the municipalities that use the electricity that is co-produced by the company and the Companhia Paulista de Força e Luz, which distributes the energy; employees; cooperatives that trade sugar and ethanol; companies that buy sugarcane byproducts (e.g., Natura buys organic ethanol); sugarcane producers; the government; and the local community.

A (actors of the system): the main actors concerned with sustainability practices are the directors of the company, especially the president, who makes most of the decisions on the topic;

T (transformation of the system): the basic transformation process of the analyzed system is the creation of processes and products that promote sustainability. The main objectives of these sustainability practices are adding market value.

W (*Weltanschaung* – shared vision): the shared vision is represented by the company strategic decision of implementing many sustainability practices, which helped to integrate sustainability into the management model by constructing a dynamic capability towards sustainability.

O (owners of the system): the owners of the company;

E (environmental constraints of the system): the company has a strong focus on financial returns, around which the system is organized. The president of the company is the chief financial officer, and any discussion about sustainability involves how it can reduce legal actions or generate higher profits. However this does not restrict the capacity of the company on turning the sustainability into a dynamic strategy, which creates market value and effective environmental gains.

Considering these constraints, the creation of a functional sector responsible for the development and management of sustainability practices would be an important initiative. The creation of this sector would foster a continuous debate about sustainability within an organized framework that is integrated into the business strategy. The company could invest resources and efforts in the development of mechanisms, such as sustainability indicators (e.g., Global Reporting Initiative – GRI) and social balance, to assist in the management and control of sustainability practices.

However, despite the ideal situations above, the company succeeded in transforming the role of the sustainability as a dynamic capacity in the, allowing the organization to intentionally reconfigure its resources according to the environmental changes.

The deterioration of the sugar market conditions and the society's growing pressure for a less harmful model of agribusiness to the environment were the most important drivers towards sustainability.

In view of this scenario, the Balbo Group has responded over the past 20 years by shifting its profit source towards higher aggregate-value products.

The balancing between sugar market dynamics, which is a commodity, and value-aggregate products (e.g. biodegradable plastic, natural wax, thermal-electric sources using sugarcane by-products, and the organic food business) has enabled the company to balance volume and profit margin in order to establish itself as one of the most competitive companies in the sector, with sustainability being the basis for this process.

Conclusions

Through the systemic approach, it was possible to understand the sustainability practices and initiatives at the Balbo Group.

Sustainable development is based on the idea of a network of interacting actors and elements that affect society as a whole. Companies have an important role

in this reality, by creating sustainability practices that enable the capacity of transforming sustainability in a dynamic strategy.

The Native branch and all the changes demanded by the company's new business were the source of development of dynamic capacities and adaptation of the company, which shifted from a stable commodity market to a dynamic, increasing market of organic food products.

In order to seek a more sustainable management model, the company has developed dynamic capacities within the economic sphere focusing on efficacy, reduction and reuse of solid wastes, and cogeneration of energy; within the social sphere, the rural workers are assisted with security and quality of life programs; and within the environmental sphere, the company, through the Cana Verde project, has environmental certifications and preserves protected areas by conciliating the respect for the environment with the production processes of all areas.

References

Belico, L.R. and Silveira, S. (2000), *Energia Elétrica para o Desenvolvimento Sustentável*. Editora da Universidade de São Paulo (EDUSP), São Paulo, SP.

Belico, L.R. et al. (2000) *Energia Elétrica para o Desenvolvimento Sustentável*. São Paulo: EDUSP.

Checkland, P. (1985), *System Thinking, System Practice*. John Wiley & Sons, Chichester.

Checkland, P. and Scholes, J. (1990), *Soft Systems Methodology in Action*, John Wiley & Sons, Toronto.

Ehnert, I. (2009) *Sustainable Human Resources Management*: A Conceptual and Exploratory Analysis from a Paradox Perspective. Springer.

Eisenhardt, K. M. & Martin, J. A. (2000) Dynamic capabilities: what are they? *Strategic Management Journal*, 21 (10-11), 1105–1121.

Elkington, J. (1994) Towards the sustainable corporation: win-win business strategies for sustainable development. *California Management Review*, 2, 90-100.

Elkington, J. (1997) *Cannibals with forks: the triple bottom line of 21st century business*. Oxford: Capstone.

Esty, D.C. and Winston, A.S. (2006), *Green to gold:* how smart companies use environmental strategy to innovate, create value, and build competitive advantage, Yale University Press, Nen Haven.

Ethos. (2009), "Ethos Instituto de Pesquisa Aplicada e Instituto Ethos de Responsabilidade Social", available at: http://www.ethos.com.br (accessed 20 November 2012).

Hémery, D.; Debeir, J.C. and Deléage, J.P. (1993), *Uma história da energia*, Edunb, Brasília.

Liboni, L. B. & Cezarino, L. O. (2014) Strategy for sustainability in a Brazilian sugarcane industry. *World Journal of Entrepreneurship, Management and Sustainable Development*, 10 (1), 2-12.

Marcovitch, J. (2006), *Para Mudar o Futuro*: mudanças climáticas, políticas públicas e estratégias empresariais, EDUSP e Editora Saraiva, São Paulo.

Martinelli, D.P. and Ventura, C.A.A. (2006), *Visão Sistêmica e Administração:* conceitos, metodologias e aplicações**,** Saraiva, São Paulo.

Mebratu, D. (1998) Sustainability and Sustainable Development: historical and conceptual review. *Environmental Impact Assessment Review*, 18, 493-520.

Novacana. (2014) *Setor sucroenergético brasileiro supera PIB de mais de 100 países*.http://www.novacana.com/n/etanol/marketing/sucroenergetico-supera- Avaiable in: http://www.novacana.com/n/etanol/marketing/sucroenergetico-supera-pib-100-paises-290514/

Sachs, I. (2002), *Caminhos para o desenvolvimento sustentável,* Garamond, Rio de Janeiro.

Teece, D. J.; Pisano, G. & Shuen, A. (1997) Dynamic capabilities and strategic management. *Strategic Management Journal*, 18 (7), 509-533.

Werbach, A.D.A.M. (2010), *Estratégia para a sustentabilidade:* uma nova forma de planejar sua estratégia empresarial, Elsevier, Rio de Janeiro.

Yin, R. (2011) *Applications of Case Study Research*. SAGE.