



Greening a Brazilian cotton seed processing company

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From challenges to strategic opportunities

Adriano Alves Teixeira

Industrial Engineering and Management,

UNESP – Univ Estadual Paulista (Sao Paulo State University), Bauru, Brazil

Vinicius Fernando Bello

University Center “Toledo”, Araçatuba, Brazil

Talita Borges Teixeira and Charbel José Chiappetta Jabbour

Industrial Engineering and Management,

UNESP – Univ Estadual Paulista (Sao Paulo State University),

Bauru, Brazil, and

Jorge Henrique Caldeira de Oliveira

Management, University of Sao Paulo, Ribeirao Preto, Brazil

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Abstract

Purpose – This paper aims to shed light on a current and important theme that has been gaining increasing importance for governments, society and companies: the greening of agricultural companies in developing countries. The research objective is to classify a Brazilian cotton seed processing company in the evolutionary stages of environmental management: reactive, preventive or proactive.

Design/methodology/approach – A case study was conducted in a Brazilian cotton seed processing company.

Findings – The main results are: the studied company is positioned in the preventive stage of environmental management; this company is investing in operational green practices; environmental management in this company is motivated by various factors aiming at an increased competitive advantage. Finally, it can be concluded that this company is looking for green opportunities towards the proactive environmental management stage.

Originality/value – This paper explores a scarce theme: green issues in the cotton seed processing industry.

Keywords Agricultural management, Cottonseed processing, Green management, Environmental management, Brazil, Agriculture

Paper type Case study

1. Introduction

Over recent decades, concerns about the environment in which we live have become more latent. This concern stemmed from the discovery that our natural resources are finite, from the growing occurrence of unprecedented natural catastrophes and from the growing awareness of society, organizations and governments that something must be done to guarantee environmental sustainability (Teixeira *et al.*, 2011).

According to Jabbour and Santos (2006) some historical milestones can be cited on behalf of environmental concerns: the Club of Rome’s “growth limits,” the United Nations report “Our Common Future”; Agenda 21; ratification of the Kyoto Protocol and the reports on climate change published by the International Panel on Climate Change (IPCC).



For Teixeira *et al.* (2011), evolution of the environmental variable in organizations can be analyzed by their practices, that is, the company can choose, in accordance with its “environmental” motivations, to be environmentally reactive or proactive. Jabbour and Santos (2006) call this evolution the stages of environmental management and they classify them as reactive, preventive and proactive.

Thus, green organizational practices are seen to interfere in a positive or negative manner in the development of business environmental management, and in this context, needing greater explanation regarding which practices are being used, their intensity and the reasons that led to using these practices.

Since oil is one of the major pollutant residues and hard to control, a study in the cotton seed processing and vegetable oil industry was elaborated.

Therefore, the motivating questions for this study are: what is the evolutionary stage of environmental management at a Brazilian cotton seed processing company?

The objectives of this can thus be listed as:

- systematize the main environmental practice of the company studied;
- correlate the use of these practices with the motivational factors proposed by Teixeira *et al.* (2011) that lead companies to adopt these practices; and
- classify the case study company in the evolutionary stages of environmental management proposed by Jabbour and Santos (2006).

Besides this introduction, this paper presents the theoretical foundation in Section 2. In Section 3, the methodology adopted is introduced, followed by Section 4 with the characterization of the company that is the object of this study and the research results and, finally, in Section 5, the final remarks.

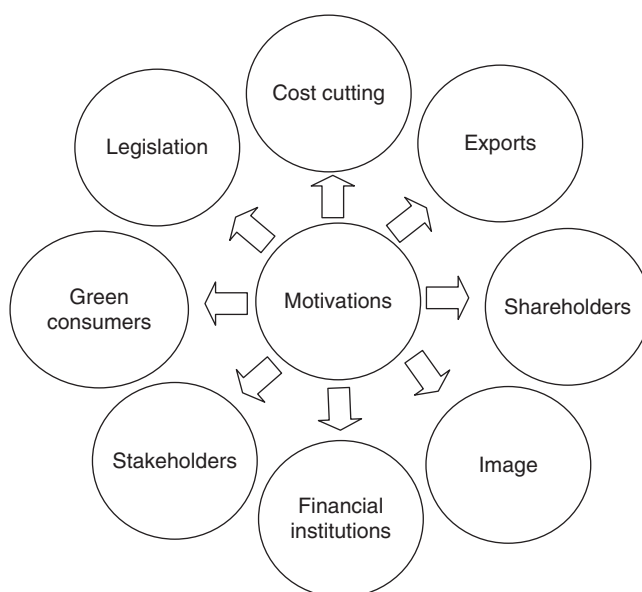
2. Conceptual background

The conceptual background encompasses environmental management at organizations with the verification of their motivations and the environmental management practices adopted to minimize environmental impacts.

2.1 Organizational environmental management and its motivations

Jabbour and Santos (2006) consider environmental management to be the consistent set of adaptations or isolated actions, carried out in an organizational context, altering structure, responsibilities, guidelines, administrative practices and operational aspects to confront the inherent complexity of inserting the environmental variable, achieving previously established expectations and goals through the mitigation of negative effects caused by business activities, especially in terms of product and process development.

According to Barbieri (2004), companies should stop being problems and become solutions involving the environment. Business owners and administrators should have a new posture that considers the environment in their decisions aimed at expanding the planet's support capacity. Therefore, companies should have a management system that fits their environmental aspects, seeking to integrate them to traditional management systems aimed at providing for an evolution of their environmental management (Sanches, 2000). Teixeira *et al.* (2011) underscores that there are several motivations (Figure 1) that lead companies to adopt an environmental management system (EMS) and that these motivations evolve over time and the environmental practices adopted can also evolve.



Source: Teixeira *et al.* (2011, p. 42)

Figure 1.
Motivations for
corporate environmental
management

Awareness transforms the understanding of professionals so there is sensitivity that favors proactivity for action on behalf of social-environmental sustainability. In reality, it becomes indispensable for organizations to know environmental practices that direct them toward environmental proactivity, thus enabling better environmental, social and financial results.

2.2 Environmental management practices

Specialized literature shows that organizations can find themselves in different stages of environmental development (Maimon, 1994; Sanches, 2000; Corazza, 2003; Barbieri, 2004; Jabbour and Santos, 2006) and that these taxonomies reflect the motivations that led the company to practice environmental management (Teixeira *et al.*, 2011).

Jabbour and Santos (2006) classify the evolutionary stages of environmental management as reactive, preventive and proactive. These stages have a close relationship with the motivating factors for environmental management (Figure 1), since they interfere in the environmental practices adopted by organizations.

Thus, when the company is obliged to institute environmental practices to meet external demands (imposed by laws, financial institutions and insurance companies and environmentalist groups), it is positioned in the reactive stage, such as controlling pollution at outlets using filters, installing effluent treatment stations, etc. which does not drive the company to continuous improvement in processes and products, thus making its environmental management hostage to practices that merely aim to meet required demands (Teixeira *et al.*, 2011).

When a company tries to avoid environmental problems based on eco-efficient initiatives, it is positioned in the preventive stage of environmental management. Thus, the company focusses on reduction of pollution and in the best use of environmental inputs and raw materials.

From the moment the company begins to notice the opportunities that can be offered, such as meeting the growing market of green consumers, the external market (exports), cost reductions through improvements in eco-efficiency, valuation of the company's image, etc. and the possible gains that will be obtained stemming from these measures, the company begins to execute those practices mentioned above as well as practices that begin to take on a proactive nature, with better use and conservation of inputs used in processes, adoption of cleaner technologies, programs that are found throughout the departments and that educate employees with information and responsibilities, monitor operations and quickly detect and solve problems. The environmental issues begin to incorporate company strategies because they are seen as essential for conquering new markets and for ensuring a competitive advantage (Teixeira *et al.*, 2011). The company is in the proactive stage of green management.

Therefore, the integrated and holistic use of these practices tends to make organizations more productive and competitive, improving the quality of their products while also preserving the environment.

3. Research methodology

This study is qualitative, based on a Brazilian case study. A case study is applied to evaluate or describe dynamic situations (Martins, 2008). With regard to data collection, Voss *et al.* (2002) underscore that interviews are the main source in a case study and they should be comprised of personal observations, informal conversations, participations in meetings and events, analysis of filing sources, among others. According to Yin (2001), multiple sources of evidence contribute toward increasing the benefits of qualitative data, their reliability and their conclusions.

In this sense, an interview script was elaborated stemming from questions suggested when raising theoretical references and it served as a guide for conducting field research. Also in this context, aimed at providing greater reliability to information, data collection was complemented, considering:

- personal observations; and
- analysis of documents.

The interview was conducted with the person in charge of the sector that administers environmental management and lasted approximately four hours.

In order to choose the company studied, the possible impact of its activities on the environment, whether it had concerns about the environment and whether it had a declared and implemented environmental structure were taken into account.

4. Results

4.1 Company description

This study was conducted with the Brazilian company located in the northwest of the state of São Paulo. At present, the company is working in the cottonseed oil process and its byproducts, such as bundled linter, ground and mulched hulls, meal and stock. Daily co-processing totals approximately 700 tons. Its products are recognized nationally and internationally, which reflects its philosophy of producing with quality while respecting and preserving the environment. The products processed by the company are characterized as:

- semi-refined cottonseed oil: obtained from mechanical extraction and solvent, the raw oil is neutralized, washed and dried, then commercialized to the food,

vegetable oil manufacturing, refined oil, insecticide, paint, cosmetic and lubricant industries;

- cotton meal: used as an ingredient in rations for confined animals and dairy cows;
- cotton linter: obtained from the delinting process (process for removing linter, which is the residue of fibers in cotton seeds, which is harmful for the planting of these seeds) and it is used in the pulp industry. It can also be used to make paper currency, explosives, films, shoe insoles, air filters, engine gaskets, cold cuts and sausages, ice creams, electronic circuit boards, artificial fibers, etc.;
- ground cotton hull: hull byproduct used as a component in animal rations;
- ground and mulched cotton hulls: used for animal rations and also as an alternative energy source in the boiler burning process; and
- stock: byproduct from the raw oil refining process, used for making soap for household use and the extraction of fatty acids.

4.2 Environmental management

Due to its commitment with preservation and the environment, the company has an EMS implemented and which consists of: action plans, definition of responsibilities, resource deadlines and approval for reaching the environmental objectives and goals drawn up in the Environmental Performance Report.

In order to achieve its objectives, the company has formalized its environmental policy and shows it prominently in several areas of the company as well as on its corporate web site.

It has the participation of employees, family members and the local community in orientation programs and training to make them aware of the importance of sustainable initiatives, trying to involve and relate with several stakeholders.

External and internal audits are conducted periodically to verify conformity with its EMS and for indicating continuous improvements in its processes and products.

The declared objectives of its EMS are:

- develop its activities aimed at preserving the environment, preventing pollution and using natural resources consciously;
- correctly dispose of waste produced, aimed at reducing, reusing and recycling materials;
- respect the laws and regulations related to the environment, to the standards established by industry and other applicable requirements;
- maintain the EMS using creativity and promoting its improvement; and
- promote environmental training seeking the involvement of all employees.

The analysis of environmental and corporate reports, strategic and environmental planning documents, among others, that gave origin to eight topics that didactically express the company's environmental processes/practices as shown below:

- *Optimization of electric energy consumption*: in the search for reducing energy consumption and environmental impacts at factory installations, it is common to use daily consumption to compare those indexes achieved. Power consumption meters were installed in specific locations for monitoring; and; employees were

trained and engaged to make them aware of the rational use of electric energy at company installations.

- *Optimization of water consumption:* since water is fundamental for industrial processes and human consumption and due to the possibility of future scarcity, it must be used in moderation. In this sense, the company seeks means to control losses and waste reducing the quantity of effluents and water consumption. For example, in the case studied, 100 percent of the water is reused in the laboratory extraction sector and in the mulching refrigeration system, thus reducing consumption. The source used by the company is underground, thus the volume captured daily is monitored to ensure it is in compliance with the limits established.
- *Reforestation of riparian vegetation:* the company has a permanent preservation area of 30,000 square meters and together employees and children of the local community it has been conducting a riparian vegetation recovery project planting native species of the region. In the rural area and surrounding the company, reforestation was carried out planting rubber trees, a rapid-growth species, acting as a natural repellent against insects and that can be used in latex extraction in the future.
- *Selective collection:* the company conducts the selective collection of trash, providing collectors installed in factory installations, facilitating recycling and the reuse of materials while also reducing the quantity of accumulated garbage and expenses on maintenance and cleaning in industry installations. All the work is conducted with employee participation.
- *Use of recyclables:* the company has the four Rs project, which provides: waste reduction, reuse of manufactured products, it avoids the use of disposable materials in its production process, recycling of materials used for manufacturing new products and rethinking of consumption habits aimed at mitigating their consequences.
- *Control of smoke emissions:* the company tries to reduce smoke emissions and particulates from the boiler in the production sector and smoke emissions in its power generators and diesel-powered vehicles to avoid air pollution. The boilers are equipped with equipment that guarantees efficiency in terms of the quality of emitted smoke, according to the norms required by law. Another study conducted is the awareness of black smoke emissions from the service providing vehicle fleet.
- *Toxic and inflammable:* aimed at promoting employee safety and meeting specific laws that regulate storage and disposal of hazardous waste and its packaging and also to provide the correct disposal of waste to avoid damage to the environment the company built boxes and containment dikes and adapted sites for stocking and storing these products. Training is held by the SEESMT (Specialized Service in Safety Engineering and Occupational Medicine) as well as the contracting of a specific company that is responsible for washing all cloths used in its processes and the correct disposal of waste generated.
- *Employee safety:* the concern with employee well being is an essential factor in the organization. There is a daily meeting of the daily safety dialogue (DDS) addressing topics like: use of personal protection equipment, emergency training

and simulations are conducted at the company aimed at guaranteeing employee safety and integrity. The fire and emergency brigade organizes bimonthly simulations encompassing emergency situations for the participation of employees and brigade members, always seeking the continuous improvement of actions.

Thus, the company's EMS is dynamic, planned, executed, verified and corrected periodically aimed at continuous improvements.

The company is concerned with and acts at establishing and maintaining reliable relationships with its employees and stakeholders without leaving aside environmental issues, always seeking to integrate the three basic dimensions of sustainability: economic, social and environmental.

The company values excellence in its employees through training and awareness. It instituted the sharing of information and knowledge through the valuation of teamwork, and the involvement, motivation and dedication of its workforce.

Within this context, it can be concluded that from the data presented, the company positions itself in the preventive stage, based on eco-efficiency, but with a tendency to achieve the most evolved characteristics of environmental management where the competitive advantages stemming from best environmental practices are valued.

5. Final remarks

This paper presents a research that aimed at analyzing environmental management at a vegetable oil industrial organization, a product considered highly pollutant.

A literature review was conducted on themes like environmental management and its motivations, environmental practices/actions and their relationships to the stage in which the company finds itself in relation to its environmental management.

The case study methodology was used to carry out the objectives of this study and guide the relationships between the revised concepts.

After data analysis, it was possible to affirm that:

- As in the research by Teixeira *et al.* (2011), a close relationship was verified between the motivations that led the company to adopt an EMS and its practices, in other words, as the company became aware that it could obtain a competitive advantage by exploiting benefits generated by proactive environmental management, the better its environmental practices became, even being included in top management agendas. This enabled the company in this case study to be classified in the intermediate stage (preventive), but with good tendencies to soon achieve the final stage (environmental proactivity).
- It was also ascertained, as affirmed by González-Benito and González-Benito (2006) that operational environmental practices (those that refer to product design in which environmentally correct product development projects are made and a design process that seeks to adjust production processes aimed at reducing environmental impacts) are the most responsible for improved environmental performance in the organization.

The importance of this study is in the fact that it provided knowledge of the environmental practices at a company in the vegetable oil manufacturing sector, still not well treated in the literature, thus contributing with additional empirical evidence about environmental practices and their motivations, as well as confirm that operational environmental practices, proposed by González-Benito and González-Benito (2006), were more significant for improved environmental performance by the company.

In order to better understand the reviewed concepts, especially in relation to the adoption of environmental practices and their motivational elements, it is suggested that future studies advance, for example, using surveys involving companies of several sizes and segments.

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About the authors

Adriano Alves Teixeira has a Master Degree in Industrial Engineering (Green Management). He is a PhD student at the University of Sao Paulo (USP) Business School at Ribeirao Preto. He is researching on environmental management in Brazilian organizations. He has articles published in *International Journal of Production Economics*, *Journal of Cleaner Production*, and others.

Vinicius Fernando Bello is an engineer and junior researcher on green management and sustainable organizations.

Talita Borges Teixeira is Quality Manager at a Brazilian company. She is a researcher on green management, sustainability and quality management.

Charbel José Chiappetta Jabbour is an Associate Professor at the UNESP – The Sao Paulo State University at Bauru. He is also a visiting researcher and PhD supervisor at the USP Business School at Ribeirao Preto. He is a researcher on green management and sustainability. He has articles published in *International Journal of Production Economics*, *Journal of Cleaner Production*, and others. Charbel José Chiappetta Jabbour is the corresponding author and can be contacted at: prof.charbel@gmail.com

Jorge Henrique Caldeira de Oliveira is an Assistant Professor at the USP Business School at Ribeirao Preto. He is a researcher on marketing, green management and sustainability. He has articles published in *Equality, Diversity and Inclusion: An International Journal*, and in *Management of Environmental Quality: An International Journal*.