

The Environmental Quality in Companies of the Agricultural, Manufacturing and Service Sectors in the South of Brazil

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Abstract

This article presents the results of researches done in companies of the agricultural, manufacturing, and service sectors in Rio Grande do Sul State, located in southern Brazil.

The research was aimed at identifying the priorities and actions developed to improve the environmental quality of the respective products, processes and services employed in the environmental management of each sector.

In the agricultural sector, a company that cultivates organic products was studied. Although such a company had reduced the impact on the environment, the emphasis was the improvement in the quality of the product, aiming at the differentiation of such product and the obtainance of a better price in the market.

In the manufacturing sector, a company which produces agricultural implementation machinery was investigated, which focused its actions upon the improvement of the productive process. Techniques for a cleaner production were implemented, which resulted in the reduction of the use of raw material and generation of residues and, consequently, the reduction of the production costs.

In the service sector, a company that collects solid residues for a town was analyzed. The improvement of the environmental quality in the services offered by this company is focused

on the search of the citizen awareness for the generation of less garbage and the selection of residues, so that the recycling of such residues could be used.

In the research, the case study methodology, which allowed the description of the three experiences of companies that excelled in their respective sectors.

The obtained results demonstrate that the actions developed by those companies had different focus, but obtained meaningful improvements in the environmental quality of their products, processes and services.

1. Introduction

The concern with the quality of products, processes and services is present in all companies which wish to be competitive but not all competitive companies present environmental quality.

The word quality acquired many meanings throughout the years due to the historical moment and environment which their authors were in. From the 50s on, the notion of quality, together with the concern with project conformity, started to meet the clients' needs.

With the appearance of the Total Quality Management (TQM), the companies started to focus the notion of quality on the client and search for continuous improvement. Because the quality in products, processes and services has become a requirement in the market, the need for qualifying certificates which stated the quality was needed. It was necessary to show the clients that standards existed and that the companies showed control over their produced items, but many companies did not have control over their waste products and were not concerned with the environmental impact originated from their production processes.

The environmental quality concept arised as an extension of the quality concept. It was not enough for the company to show quality within its quarters. It was important to reduce the environmental impact resulting from the production processes and from the products and services offered.

Several factors contributed for the growth and the popularization of the environmental quality concern in the companies. The pro-ecology concept professed by the consumers led the companies to take the notion of environmental protection as a business opportunity. More and more restrictive legislation and heavy competition of a globalized economy led the companies to reduce the emissions as a way to meet the legislation and reduce the waste of raw material and energy.

Rio Grande do Sul State is located in Southern Brazil and is considered one of the most industrialized states in the country. In this state, the environmentalist is Non Governmental Organization (NGO) exert a heavy pressure on the Government and upon the companies in favor of the environment. In Porto Alegre, capital of the State is located the Clean Technology National Center which educates and helps companies to reduce the environmental impact. A great number of these companies exports their products to demanding markets such as the European Community and the United States. This way, many are the reasons that lead the companies in this State to invest on the environmental protection in their production processes, products and services.

With an area of 282,000 Km² and a population of 10 million people, Rio Grande do Sul State has its IGP distributed among the agricultural sector with 15 %, the manufacturing sector with 25 % and the service sector with 60 %. In order to identify the measures used to improve the environmental quality of the processes, products and services in the three sectors of the economy, a research was performed in the three cases. The cases analyzed are companies that had an outstanding performance in the Brazilian scenario and for their concern with the reduction of the environmental impact.

Three cases are studied in this paper, starting with the ecological co-operative Coolmeia of the agricultural sector, AGCO do Brazil operating in the manufacturing sector and the DMLU - Municipal Department of Garbage Collection, operating in the service sector. Correlation between the cases are analyzed and the author's final comments are also made.

2. Agricultural sector – Coolmeia Ecological Co-operative Ltd.

Coolmeia Ecological Co-operative Ltd. was founded in 1978 and aims at the social recognition for being an organization that offers society quality of life, food, services,

technology and knowledge. Coolmeia is located in the city of Porto Alegre and has 820 members distributed in three categories: operational (employees), consumers and producers. Coolmeia has a restaurant, a bakery and a market which represents a revenue U\$ 700,000 a year. The co-operative also organizes a weekly fair where the members sell directly to the consumers.

Most of the producers are small farmers that possess lots of up to 20 hectares and produce under the counseling of the Co-operative technicians. The main produces are rice, beans, wheat, pop corn, mate tea, honey, teas, seasonings, flowers, several types of fruit, tree seedlings, tomatoes and vegetables in general. Part of these products are industrialized or processed by the associate members in their properties: products such as juice, yogurt, cheese, pasta, tomato sauce, jelly, dehydrated tea, and honey products.

Coolmeia co-operative has an environmental quality label for products industrialized by the associate producers. The associate consumers are an important source of information on the quality of the products and of suggestions for the improvement of the quality of the products bought in the co-operative quarter as well as in the weekly fair. Coolmeia encourages the members and visitors to visit the associate producer properties, which allows the consumers to obtain better knowledge of the consumer needs and expectations.

The producers' concern with the environmental quality begins with the purchase of the seeds. Most of the seeds used are bought from conventional suppliers and pass through the Cooperative quality control. The goal is to obtain seeds from specialized producers only, the ones that produce seeds without pesticides.

The producers' lots are not self-sufficient and, some other agricultural insumes are purchased from third parties.

The associate members use mostly family workforce. The production is organized with the objective of reducing the need for machinery and equipments. The producers organize themselves so that the machinery can be used collectively. With these and other measures it is possible to reduce significantly the environmental impact of the production process.

The productivity is on average 30% lower than the conventional crops. On the other hand, these properties are highly energy-efficient in the production cost due to the proper use of the organic matter and the absence of the use of industrialized agricultural insumes.

The price of the products is higher than the conventional agriculture for many reasons: intensive use of workforce during the production process, lower production scale, higher losses during production due to the fact that pesticides are not used, lower efficiency in the logistics and consuming demands higher than offer. The profit margin is equal or higher than that of the conventional products.

Coolmeia, along with other organizations, is building a Net of Credibility for the Ecologically Correct Agriculture. In this net all the other links of the production and consuming chain, as well as NGOs, technicians related to the production, industrialization and commercialization activities of the organic products. This net will provide a certificate of quality based on the principle of the partnership and participation, that is to say, based on confidence and credibility between the links, each one will inspect the quality of the suppliers' products and provide his client with all the necessary information.

The Coolmeia experience has become outstanding in the Brazilian scenario, despite some difficulties, it has already won the confidence of its consumers.

3. Manufacturing sector – AGCO of Brazil Ltd.

AGCO of Brazil Industry and Commerce Ltd. is a company that produces agricultural implementation and is located in the town of Canoas, Rio Grande do Sul State. This company was founded in 1996 and has 711 employees. The annual production is about 8,000 tractors, sold in the internal and external market, which corresponds to a revenue of \$ 150 million dollars.

AGCO of Brazil was the company selected for the manufacturing sector company because it has become outstanding in the search for environmental quality in its products and processes. This company already has the ISO 9000 and ISO 14000 certificates, and it has also implanted the Cleaner Production techniques and uses several quality and productivity tools.

The use of cleaner production techniques, with the cooperation of the Cleaner Technologies National Center has helped the company to detect the main impacts, and the implemented of its Environmental Management System (EMS), following the ISO 14000.

Several important measures were detected and corrective measures performed in the activities which gave economical return and are going to be described.

Metal parts coating – the pressure applied on the painting machinery followed the paint producer's instructions. Some experiments were performed and it was checked that a reduction on the pressure did not alter the painting quality. It was detected that the adjustment of the painting pistol nozzle was the same for all metal pieces, disregarding the size of the piece to be painted. This would cause a great waste of paint for pieces measuring just few centimeters. The waste of paint meant waste of raw material and high incidence of dry paint waste which would constitute the environment passive of the company or would imply high costs with burning. The simple adjustment of the pressure and regulation of the pistol nozzle resulted in environmental and economic gains. The paint saved would allow the painting of 1,600 tractors/year, besides the reduction of 8 tons of dry paint waste.

- Re-use of wood containers – The company used to receive several products from suppliers in wood containers which were once dismantled and donated. Eventually the pieces and accessories were packaged by AGCO of Brazil also in wooden boxes, to be sent to their clients. After an analysis of the possibility of re-use of the received wooden crates, it was realized that most of them could be re-used. This measure resulted in an economy of 22 tons of wood a year.
- Adjustment of cutting of steel bars – The steel bars, before being used were cut around 20 cm in each tip. When questioned about the reason for such measure, technicians told it was the supplier's instructions. After contact with the steel bar supplier, it was found that the steel bars production process had been changed and that such cut was no longer needed. This resulted in the elimination of 4,200 cut operation/year and an economy of 33 tons of steel bars/year.

The search for improvement in the environment quality is part of the company's policy. Besides the results achieved with the cleaner production and the EMS, the AGCO of Brazil encourages its employees to take part in the Grand Environment Prize and Safety, which

occurs twice a year. The prize is offered to the company department that excels in the development of environmental quality measures.

The company also informs clients through booklets and courses about the environmental care that should be taken in dealing and in the storage of their products. From its suppliers the company requires the environmental permission granted by the government and the adoption of measures that tend to improve the environmental quality of the products supplied by the Company.

The environmental quality processes are checked through indicators of residue producer, water and energy consume. For every type of residue there is a specific indicator and an improvement goal, with their specific action plan.

AGCO of Brazil integrated the quality system with the environment management, forming one single system. The company has already won several regional and international prizes related to their environmental performance.

4. Service sector – Municipal Department of Garbage Collection

The Municipal Department of Garbage Collection (MDGC) from Porto Alegre City Hall was selected to be an organization which, through the alternative reductions of garbage and for its better destination promotes the environmental quality in the city of Porto Alegre, Brazil. The MDGC is an autonomous department created in 1975 with 2,100 employees and managing a budget of around 40 million dollars.

The city of Porto Alegre with its 1.3 million inhabitants produces around 1,300 tons of residues. The average per capita, considering only the solid waste, is of 0.6 Kg a day and 1.0 Kg a day if considered the other residues.

From 1989 on, the MDGC chose to use the garbage as a way to rescue the citizenship. Motivated by the social and environmental issues, the department organized in several parts of the city 8 storehouses to do the recycling of the dry waste collected in the city. With the implementation of the selective collection service, the MDGC started to receive the waste separately: organic and non-organic.

Although the selective collection costs 2 times more than the conventional one, the MDGC collects around 40 tons a day of selective collection and reaches 100% of the city area.

In order to make such system a successful one, it is important to implement an educational program in the environmental area because the citizen has a double role, not only that one of the reduction of the garbage amount, but also that of properly separating the garbage, contributing for higher efficiency in the recycling performed in the recycling stations.

The MDGC initiated a pilot program of environmental education in 1990 in three districts of the city. The environment educational program in the neighborhoods is done at every house door, being delivered leaflets and the population being informed of its advantages. In companies and condominiums, the work is done through lectures in loco and in schools, through lectures to teachers so that they become multipliers of this process.

The environment educational work is based on the three R's: reduce, re-use and recycle. The work of searching for alternatives to reduce and re-use the residues is directed to companies and to the population. The recycling job is organized throughout the eight recycling houses. These houses were created between 1989 and 1996, with the objective of reintegrating outcasts back to society. They came through the organization of groups of waste paper collectors, drug addicts, unemployed citizens and women.

Environmental awareness of the people that work in the recycling houses increased, as well as the number of people that work in them. In 1996 there was an average of 30 people in each house. In the year 2000 storage recycling houses are offering work for 150 people, with an average monthly income of U\$ 130 per worker.

The MDGC continues to provide raw material, dry garbage and technical assistance when needed, but the recycling houses obtained autonomy. In the beginning the recycling houses separated and traded the paper, glass, metal and plastic. In the last few years new values were added to these raw materials and performing operations such as packaging, separation of several kinds of plastic and also the production of recycled paper. The work developed by the MDGC and by several organizations that take part in the process allow today that a raw material used in a package is not taken to a landfill and there remains for

decades or even centuries. Such raw material is sent to storage houses where this raw material is separated and taken to a new production process. Besides the economical and environmental gain, (because this raw material is cheaper than the virgin raw material), several hundred-job opportunities were created for a population that could not obtain jobs in the normal job market. Therefore, the action improved the environmental standard of living of Porto Alegre and promoted the environmental awareness of its citizens.

5. Case Analysis

The three cases presented an improvement in the environmental quality, but under different focus. The associate members of the Coolmeia Cooperative are concerned with the improvement of the cultivation, but the focus is the improvement of product. The consumer that goes to the weekly fair seeks a product that is good for his/her health and is willing to pay higher prices for it. The environmental quality that needs to be shown is the product itself, because that is what the consumer is taking home.

In the AGCO of Brazil case, the measures improved the environmental quality of the production process. The reduction of the paint use and generation of dry paint or reusing the wooden crates and the better use of steel bars were not noticed by the client that bought the tractor. Therefore, the focus was the process, and the improvement in the environmental quality did not alter the final price but reduced the production process costs.

The MDGC case is different from the others because it is service company of the Public sector. That may be the reason why the selective collection was implemented – which has costs twice higher than the conventional collection. Porto Alegre selective garbage collection is said to be the best in Brazil. The quality is not in the product, nor in the process nor in the service delivered. The improvement of the environmental quality is due to several factors and the partnership made by the MDGC and other institutions to rescue the lost citizenship of outcast individuals and promote the increase in the environmental awareness of the city citizens. While cleaning and separating a package, the citizen is not thinking of what product this raw material is going to produce or how the recycling process is or how the service is. The citizen does not throw away the packaging because he knows that this is not good for the environment. And because this measure is helping the generation of income for the outcast.

The use of certificates and seals of quality occurs in many countries, especially the industrialized ones. In the cases analyzed, we found solution for different situations. While the AGCO of Brazil follows the international standards, the Coolmeia makes an effort to form the Ecological Agriculture Credibility Generation Network, which is a proposal that is differentiated from the system of quality certification like ISO and other organizations. The certificate obtained by the net will be of low cost, allowing the certification of all members to be certified, and will be certainly recognized by certain markets and other nets or organizations that accept the criteria used for the certification of the environmental quality. The MDGC, which does not make part of any net, is going through an audit and is seeking a quality certification for the services provided.

The three companies analyzed are considered big for the Brazilian standards, because they employ more than 500 people. Regardless from the sector where they operate, the three are concerned with criticisms and suggestions to improve the environmental quality. Coolmeia encourages people to visit their production places. AGCO of Brazil produces leaflets and promotes lectures for their employees so that they can use the product adequately and promote the maintainance of their tractors with the lowest impact possible. The MDGC gives lectures, visits schools and companies trying to call the attention for the improvement of the quality of living in the city area. The concern in receiving the feedback from the clients present in the three cases.

6. Final comments

The presented data cannot be generalized because they deal with companies belonging to the three sectors analyzed. Future investigations will confirm or not the analysis performed where it can be observed that the agricultural sector is more focused on the environmental quality of the product, while the manufacturing sector focuses its attention on the improvement of the process. The service sector is wider and, depending on the case to be analyzed can be more focused on a product, process or service or even in the rescue of the citizenship or increase in the environmental awareness of the citizens.

The quality implemented in the three companies analyzed began a process of sensibilization of the people involved. Besides the environmental gains, in the Coolmeia case and AGCO of

Brazil it resulted in economical gains and the MDGC earned political gains and national recognition for the service done.

The results achieved the objectives of searching for identification of the measures in order to improve the environmental quality in the agricultural, manufacturing and service sectors. We hope these measures encourage other companies that have not yet invested in the improvement of the environmental quality of their products, processes and services to walk in the same direction.

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