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Cleaner Production as a Corporate Sustainability Tool: An Exploratory Discussion

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Abstract

This study brings form an exploratory discussion on the CP as a corporate sustainability tool, describing some subjects like sustainable development and cleaner production. These subjects were investigated in studies conducted by several researchers and institutions from Brazil and abroad. Thus, it was considering the three aspects of corporate sustainability, corporate social responsibility (improving quality of life), eco-efficiency (optimizing natural resources usage and reduction of pollutant burden considering the life cycle of products) and competitive position. Thus, it is possible to associate CP as a tool to assist the promotion of corporate sustainability, hence this tool allows continuously search for the environmental efficiency of operations through optimizing of natural resources usage and eliminating waste, improving the environment working by the elimination or minimization of risk to employees and community, and change the consciousness of employees facing the environmental problem, while allowing economic gains with the elimination of waste and risks, as well as increased productivity. Thus, Cleaner Production can be considered a ‘win-win’ strategy, can protect the environment, the consumer and the worker while also improving industrial efficiency, profitability and competitiveness.

Keywords: *Sustainable Development, corporate sustainability, Cleaner Production.*

1 Introduction

The concept of sustainable development was presented by the World Commission on Environmental Development in April 1987, the UN General Assembly, through the report "Our Common Future", also known as the Brundtland Report, "as development which meets the needs of the present without compromising the ability of future generations to meet their own needs (UNITED NATIONS, 2008).

This development model emphasizes the evolution of human society from the point of responsible economy, according to environmental and natural processes. In this perspective, the limitations of economic, social and environmental resources are considered in order to contribute not only to the welfare of present and future generations, but can also be applied locally, regionally, nationally, based on the political will (GLAVIC; LUKMAN, 2006).

The inclusion of the sustainable development concept within the corporate environment was defined by the World Business Council for Sustainable Development (WBCSD), as to achieve of the balance between the three dimensions

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that drive corporate sustainability, which are: economic, environmental and social. These elements have been influencing all constituent organizations of a supply chain.

Thus, it can be observed that there is sustainable development requirement that the business sector to adopt a socio-environmental protection policy in line with economic development. In this context, business can be able to make fundamental changes in new goals in order to increase the quality while lowering costs (PEREIRA, 2003). Furthermore, the entrepreneur also wants to avoid the penalties such as heavy fines resulting from violation of the law, strengthening the idea which his company can be socially and environmentally correct and responsible, due to this will be a competitive advantage in the global market.

It is noteworthy that the companies are considered members of society should be involved, therefore, not only by offering quality products or services, but also with convincing answers to the social and environmental problems in the community where it operates.

Besides that, the entrepreneur also wants to avoid the penalties of the law and heavy fines resulting from violation of the law, reinforcing the idea that the company should be socially and environmentally correct and responsible, thus it will be a competitive advantage on the global market.

In addition, considering the competition from regional and global markets, the social and environment credibility is an important factor of competitiveness, which can be strengthened through institutional image among stakeholders (ROBLES JR; BONELI, 2006).

This attitude is also relevant in response to a global scenario of environmental crisis, for example, high levels of greenhouse gases emissions, global warming, deforestation, eutrophication; acidification and desertification soil, high consumption of natural resources, not respecting the carrying capacity of Earth Planet. As a result, companies should recognize environmental management as one of the highest priorities and recognize it as an essential factor for sustainable development.

According to this aspects, the Cleaner Production (CP), which aims to improve the efficiency of production processes and services, is considered a favorable approach to the companies operate in a preventive manner in relation to their environmental aspects, reduction of their risks on employees and community and the pursuit of sustainability. This occurs through the minimization of impacts associated with minimization of cost and optimization of process, raw materials and energy.

CP is seen as a preventive, integrative and continuous strategy, applied to services, processes and products, which seeks a reduction of risks to being human and nature. Thus, the Cleaner Production can be regarded as a modern solution to the environmental issues, since involving the concepts of reducing losses and increasing competitiveness, changing production processes (PEREIRA, 2003).

Thus, this study brings form an exploratory discussion on the CP as a corporate sustainability tool, describing some subjects like sustainable development and cleaner production. These subjects were investigated in studies conducted by several researchers and institutions from Brazil and abroad.

It is important to remember that an exploratory survey aims to provide greater familiarity with the problem in order to make it explicit or build hypotheses, covering studies from literature (GIL, 1991).

2 Sustainable Development and Business

The term Sustainable Development - SD was released in April 1987 by the World Commission on Environmental Development, an independent body linked to the governments and the UN system during the UN General Assembly, through the Brundtland Report as "development which meets the needs of the present without compromising the ability of future generations to meet their own needs" (UNITED NATIONS, 1987).

In line with Robles Jr e Boneli (2006), there are two concepts in SD by UN: the first *needs*, which can vary from society to society, but that must be met to ensure the basic conditions of life for all without distinction. The second concept is the *limitation*, which recognizes the need to develop technology solutions which conserve the limited resources currently available and allowing renew them for future generations.

In addition, the Center for Applied Policy Research claims the SD is the maintenance of economic growth while generating the absolute minimum of pollution, repairing the environmental damage of the past, using less non-renewable resources, producing less waste and understanding the opportunity to live in a pleasant and healthy environment for the entire population (CAP 2003).

The inclusion of the sustainable development concept in the corporate world was defined by the World Business Council for Sustainable Development - WBCSD, as the balance between three areas/dimensions that drive sustainability: economic, environment and social.

Almeida (2002) defines that a sustainable organization is one that seeks continuously and permanently the eco-efficiency in all its actions and decisions, in all its processes and products, i.e. to produce more and better with fewer resource and to manufacture better and quality products with less pollution and less natural resources usage and social responsibility.

Coral (2002) ensures that for a company to be considered sustainable, it is necessary that it meets the criteria of being economically viable, being in the competitive position, producing environmental friendly as well as contributing to the social development of the region and the country where it operates.

In accordance with Cramer and Stevels (2001) a sustainable business leads to lower costs, strengthen the market position, create new markets and avoid criticism from external stakeholders, as well as increase the chance of business survival in the long term.

In line with that, Hart and Milstein (2004, p. 68-69) believe that "sustainable development challenges companies to operate in a transparent and responsible approach, hence there is a well-informed and active base of stakeholders. Thus, Kuhndt (2004) argues that the policy and strategy of companies coupling with the process of decision making must be integrated with economic, social and environmental issues. To this, the author shows some business actions applied in their different corporate levels (strategic, tactical and operational).

The strategic level includes a macro view of the company regarding the sustainability issue, i.e. the company should be positioned in the market, expressing the way that sustainability will influence its business decision. At the tactical level, the company begins to define the set of products and services to be offered to the market in line with the strategic vision. Next, the operational level, the mechanisms / tools are defined in order to put into practice the entire portfolio of products and services defined the tactical level. However, the changes of

decisions on these three levels should happen naturally so that the sustainability issue can permeate the entire company (KUHNDT, 2004).

In addition, some managerial and operational mechanisms are suggested in the literature. For example, Jappur (2004) recommends that an organization toward sustainability should use some methods that help it in this process, namely: Corporate Social Responsibility, Corporate Governance, Eco-efficiency, Life Cycle Assessment; Zero Emission; certifiable Management Systems, Cleaner Production and Corporate Sustainability Reporting. For the author, the application of a method does not preclude the use of other concomitantly. It is also emphasized in this study, the indication of Cleaner Production as a sustainable tool. This tool is also quoted by PHILIPPINE COUNCIL FOR SUSTAINABLE DEVELOPMENT (2008) which suggests that the CP is inserted between two dimensions of sustainability - economy and nature (environmental).

It also emphasizes that CP is a continuous improvement concept that optimizing the efficiency, profitability and competitiveness while protecting the environment, consumer and worker (ALMEIDA; GIANNETTI, 2006).

Nevertheless, business initiatives, such as the simple adoption of one or another tool or mechanism does not mean that the company reached the corporate sustainability. Thus, each initiative implemented should be seen as a continuous learning process.

3 Cleaner Production

3.1 Brief History of CP

In 1994, United Nations Industrial Development Organization - UNIDO and United Nations Environment Programme - UNEP jointly initiated the Global Programme of Cleaner Production Centres, aiming to promote, coordinate and facilitate the activities of the Cleaner Production in each country through building local capacity to implement the CP and training of professionals who could apply the concepts or even be adjusted to local conditions (UNIDO, 2002; UNEP).

A total of 25 centres was established in the following countries since 1995: Brazil, China, Costa Rica, Czech Republic, El Salvador, Ethiopia, Guatemala, Hungary, Korea, Lebanon, Mexico, Morocco, Mozambique, Nicaragua, Slovak Republic, South Africa, Tanzania, Tunisia, Uganda, Vietnam and Zimbabwe. According to Navratil and Luken (2007), it was invested over US\$ 17 million for training centers, with a turnover of US\$ 4 million annually.

In Brazil, the Center, called the National Center for Clean Technology - CNTL, was installed in July 1995 in the National Service of Industrial Learning of Rio Grande do Sul (CNTL, 2003). In 1999, It was implemented the Brazilian Network for Cleaner Production in order to promote sustainable development in micro and small enterprises from Brazil. Currently, the Network is comprised of seven state nucleus (MG, BA, SC, MG, RJ, CE and PE) and eleven Regional Centres in SEBRAE (DF, AM, AP, MS, PA, ES, AL, RJ, RN, PI and SE). This network has completed a decade of operations in Brazil and CP implemented in more than 300 companies, providing improvements in environmental performance and economic gains.

3.2 Concepts, Opportunities levels and Barriers of Cleaner Production

In reference to UNIDO (2002), CP is a preventive, integrated strategy that is applied to the entire production cycle in order to: increase productivity by ensuring a more efficient use of raw materials, energy and water; promote better

environmental performance through reduction at source of waste and emissions and reduce the environmental impact of products throughout their life cycle by the design of environmentally friendly but cost-effective products.

According to UNEP, CP is the continuous application of an integrated environmental strategy to processes, products and services to increase efficiency and reduce risks to humans and the environment. Cleaner production can be applied to processes used throughout the industry, the products and the various services provided to society. The following are the characteristics of the CP potential application.

Potencial application	Characteristics
Process	- Conservation of raw materials, water and energy; - Eliminating toxic and dangerous materials, and - Reduction of the quantity and toxicity of all emissions and wastes at source during the productive
Products	- Reducing environmental health and safety impacts throughout the product life cycle
Service	- Incorporation of environmental concerns in planning and delivery of services

Table 1. Characteristics of the CP potential applications. Source: (UNEP).

CP can be adopted in any sector and size of activity from a technical, economic and environmental analysis of the production process, aiming to identify opportunities that provide improved efficiency without additional cost to the company (WEIHS; WEISSEL, 2005; SILVA; MEDEIROS, 2006).

Concerning Glavic and Lukman (2006), CP includes both a condition for achieving environmental improvements in process and product development, and a contribution to a more sustainable world.

It is noteworthy some key elements which form the concept of CP, which are: Strategy, Prevention, Integration and Risk Reduction. Thus, one can consider CP as an Environmental Management Tool applied from a preventative and integrative, both for services and for processes and products in order to reduce risks to environment and humans (Fig.1):

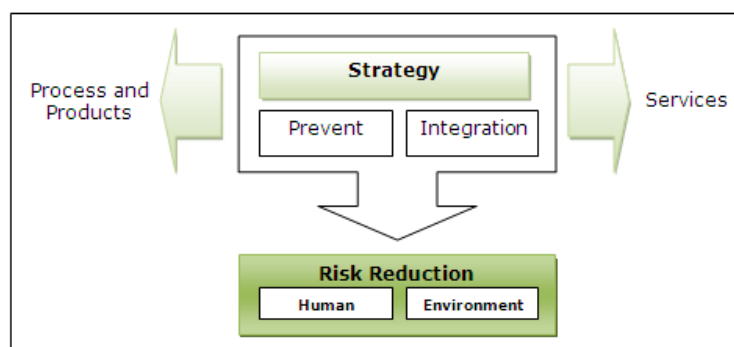


Fig. 1. Conceptual representation of CP.

The opportunities for improvement based on the CP program can be developed on three levels, namely: Level 1 - Source reduction; Level 2 – Internal Recycling and Level 3 – External Recycling (CNTL, 2003; SEBRAE, 2005) (Fig. 2). The first level is marked by reduction at source, through measures to optimize resource usage while preventing the generation of pollutants in both product changes and process

changes (good operation practices, input material changes and Technological Changes). Pollutants that cannot be avoided should be reintegrated into the production process (internal recycling). Only after seeking the solutions for eliminating or reducing in the source and internal recycling is that third level can be used (level 3) (CNTL, 2003; SEBRAE, 2005).

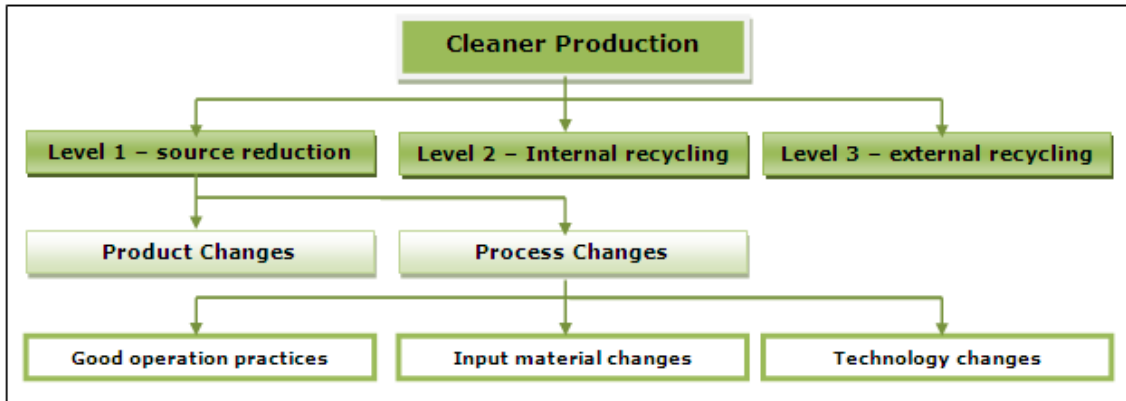


Fig. 2. Opportunity levels of CP. Source: CNTL (2003).

It is essential that the CP implementing process, it will be overcome the barriers that arise. The biggest obstacles occur due to resistance to change; the misconception (lack of information about the technique and the importance given to the natural environment), the absence of national policies that support the CP activities beyond little interaction between companies and universities, research centers, in attempt to development of joint actions of CP; economic barriers (incorrect allocation of environmental costs and investments and low investment capacity) and barriers related to the role of the deployment team (ARAÚJO, 2002; PEREIRA, 2003; MASERA ET AL, 2004; SHI; PENG; ZHONG, 2007; STONE, 2006, CAMPOS; RABELO; SANTOS, 2005, CICCOSZI; CHECKENYA; RODRIGUEZ, 2003).

4 Cleaner Production as a Corporate Sustainability Tool

This section shows some initial perspectives of the framework of CP as a corporate sustainability tool. Initially it is worth remembering the three aspects of corporate sustainability, corporate social responsibility (improving quality of life), eco-efficiency (optimizing natural resources usage and reduction of pollutant burden considering the life cycle of products) and competitive position.

Thus, it is possible to associate CP as a tool to assist the promotion of corporate sustainability, hence this tool allows continuously search for the environmental efficiency of operations through optimizing of natural resources usage and eliminating waste, improving the environment working by the elimination or minimization of risk to employees and community, and change the consciousness of employees facing the environmental problem, while allowing economic gains with the elimination of waste and risks, as well as increased productivity.

For UNIDO (2002) CP is still considered a management, economic, and environmental and quality tool as can be seen below:

Tool	Description
Management	It involves rethinking and reorganizing the way activities are carried out inside an enterprise. For CP to

	be implemented successfully and sustainably, the concept must have the support of middle and top management; this reinforces its function as a management tool.
Economic	Waste is considered a product with negative economic value. Each step to reduce the consumption of raw materials and energy and prevent or reduce the generation of waste, can increase productivity and bring financial benefits to an enterprise.
Environmental	it solves the waste problem at its source.
Quality	the systematic avoidance of waste and pollutants reduces process losses and increases process efficiency and product quality. The continuous attention and focus on the organization and management of activities in an enterprise brings the added benefit of an improvement in the quality of products, and a reduction in the rate of rejects.

Table 2. Some Characteristics of the CP.

According to UNIDO and The Danish Environmental Protection Agency (2007) there are some reasons to invest in Cleaner Production, named: improvements to product and processes; savings on raw materials and energy, thus reducing production costs; increased competitiveness through the use of new and improved technologies; reduced concerns over environmental legislation; reduced liability associated with the treatment, storage and disposal of hazardous wastes; improved health, safety and morale of employees; improved company image and reduced costs of end-of-pipe solutions. In addition they claims that Cleaner Production can reduce or eliminate the need to trade off environmental protection against economic growth, occupational safety against productivity, and consumer safety against competition in international markets. Setting goals across a range of sustainability issues leads to 'win-win' situations that benefit everyone.

Thus, Cleaner Production can be considered a 'win-win' strategy, can protect the environment, the consumer and the worker while also improving industrial efficiency, profitability and competitiveness.

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