Sustainable Practices Incorporated in the Brazilian Industrial Operations

This research aimed to analyze what are the sustainable practices adopted in the Brazilian industrial operations. This is a descriptive study that made use of a questionnaire answered by 50 industrial companies. There were few practices implemented with systemic vision of jail and go beyond the reaction and prevention, but that may be considered proactive and protagonists of a cleaner value chain. So practices incorporated as part of a greater integration of sustainable innovation strategy. The results serve as a measure which enables evidence at what level Brazilian companies replace polluting production processes, wasteful, unhealthy and dangerous with more clean and resource-sparing.
Keywords: Sustainability. Sustainable practices. Sustainable innovation.

1 INTRODUCTION

Sustainable innovation as a competitive factor and value creation for the companies need to consider its effects on society and the environment. It should also incorporate aspects of the organizational environment. From this perspective, it should join the economic well-being, social equity and environmental protection. The logic of production should incorporate the optimization of resources used in production processes, reduction of waste and the preservation of life and natural resources, especially water, soil, air, fauna and flora.

To reverse the current stage of degradation of the environment innovation is seen as a potential alternative, either through innovation in products, processes, business and management structures. To move towards a sustainable system of production and consumption, innovation models must take into account the requirements of sustainable development (Carvalho; Barbieri, 2012). As Kemp and Arundel (1998) environmental innovation consists of a new or modified processes, techniques, systems and products to prevent or reduce environmental damage and can be classified into six types of technologies: a) pollution control (end of pipe); b) technologies clean up (to remedy damages that have already occurred); c) waste management technologies; d) recycling technologies; e) clean technologies related to production processes; f) cleaner products or products that have little impact throughout its life cycle.

Technologies a, b, c and d are environmental innovations by industry, consisting of equipment manufacturers, facilities and products to solve environmental problems generated by other companies as well as service companies in consulting, transportation, storage, etc. In general, innovations are considered to solve environmental problems created by products and processes and as such have a corrective function. The e and f are preventive technology innovations, or alter or replace products and processes with the intention of preventing the occurrence of adverse environmental impacts or reduce its intensity. Only the technology category f make mention of the life cycle, ie, reinforce the need to reduce impacts on all levels of the chain.

Sustainable innovations are often also defined as eco-innovations. Eco-innovation is the production, assimilation or exploitation of a product, production process, service or management or business method that is developed or adopted in the

organization, and that results in its entire life cycle in a reduction of environmental risks, pollution and other negative effects of the use of resources (including energy use) compared to relevant alternatives (Kemp; Pearson, 2008).

Another concept of sustainable innovation given by Barbieri (2010) reiterates that it is the introduction (production, assimilation and exploitation), production processes, new management or business methods or significantly improved, that bring economic, social and environmental benefits, compared to relevant alternatives. This assessment of economic, social and environmental benefits should take into account the whole life cycle.

However, the incorporation of sustainability practices in the supply chain faces barriers such as: increased management costs; greater effort to coordinate in a more complex environment; insufficient or non-existent communication in jail. On the other hand, the main factors that stimulate the internalization of sustainability are focused management systems in environmental and social practices; monitoring, evaluation, communication and implementation of sanction models to suppliers, in order to promote improved social and environmental performance before the risk of losing a contract for unsatisfactory performance; the formation of social and environmental concerns to the purchasing department and its suppliers; communication about sustainability throughout the chain; the integration of sustainability objectives in company policies, such as additional targets for social and environmental performance of the procurement team (Carvalho; Barbieri, 2012).

To encourage users to innovate and profit from their creativity, companies use two forms of management: management mechanisms and ownership models (Parmentier, Gandia, 2013). Above all, it should balance the interests of competing and complementary and stakeholders, including society and the natural environment, to increase the likelihood of sustainable competitive position, and therefore the company's success in the long run. This is achieved through an integrated approach to organizational design, emphasizing innovation, supply chain operations, related to the customer, human capital, financial, market, social and environmental performance (Edgeman; Eskildsen, 2013).

Innovation is a responsibility of business leadership and human capital. Advances through the company's co-creation activities with their customers (Hoffmann, 2012) and society (Edgeman; Eskildsen 2012). Their advance occurs from a variety of strategies and actions favorable sustainable innovation. Read the 3Rs: reduce, reuse and recycle. Or 10Rs: refuse, rethink, reduce, reuse, repair, recycle, reintegrate, respect, take responsibility and reintegrate. More complex areas and targeted can strategically meet 10Rs models that include business innovation, support for innovation, insights for innovation, exploration of innovation, expertise and innovative technologies, preparation for innovation, design innovation, in products and services and systemic change integration (Edgeman; Eskildsen, 2013).

Lobler (2012) highlights that innovation has been recognized as a factor that is critical to the success and longevity of organizations. Rennings (1998, p. 13) notes that "research should be complemented by case studies, analyzing the success

and failure interrelated with technological eco-innovation, institutional and social." In this sense, the objective of this study is to analyze what are the sustainable practices adopted in the Brazilian industrial operations. The specific objectives are to: a) Describe the stage of adoption of environmental practices; b) identify the practices adopted in full level and those that are not adopted by the companies surveyed; c) assessing the types of technologies associated with the adoption of sustainable practices.

Following is the introduction, a theoretical foundation that deals with sustainable innovation is described. Then it describes the methodological approach followed to prepare this work. Soon after, they are described and analyzed the data collected in the surveyed companies. In sequence to present the conclusions and references consulted to prepare this study.

2 SUSTAINABLE INNOVATION

It can identify the similarity in environmental definitions of innovation, eco-innovation and green innovation, environmental innovation and are therefore considered synonymous with sustainable innovation, ie sustainable innovation should be understood as the introduction of new technical and organizational procedures within industrial production, leading to greater protection of the environment (Sobreira; Souza, 2015).

Sustainable innovation is something that is only achieved when the innovation in a company is regular, systematic and systemic. Sustainable innovation is part of the cultural fabric of the company. It is central to the strategy and contributes to the financial security of the company. So innovation for sustainability is specifically geared to environmental and societal considerations. It consists of a subset of portfolio of business innovation. It includes equity, ecology and economy to business strategy, from the perspective of 3P (people, planet, profit). Results in the implementation of cradle to cradle products in service design and analysis of philosophy of the product life cycle. (Edgeman; Eskildsen, 2013).

Sustainable innovations are also set to innovations with an emphasis on sustainable development, resulting in their entire life cycle, risk reduction environmental, pollution and other negative impacts of resource use, compared with existing alternatives. (Rennings, 1998; Arundel; Kemp, 2009). The greening of the innovation cycle is to focus on development "[...] services and technological innovations, organizational structures, institutions and user practices, appropriate to a world where greater value is attributed to substantially lower carbon emissions and reduction of environmental impacts in general "(Foxon; Andersen, 2009, p. 3).

Reid and Miedzinski (2008) point out that eco-innovation can be considered in relation to all types of innovations that take the least amount of resources and energy in the extraction phase material, manufacturing, distribution, reuse and recycling and disposal. But this case leads to the fading of the resources from the perspective of the product life cycle or

service. Freeman (1996) warns that with increasing concentrations of the "greenhouse effect", more attention has been paid to institutional change (economic incentives and sanctions) and less attention to technical change. However, the reversal of most of the risks to the environment depends not only on regulatory methods, economic incentives and other institutional changes, but also of continuous technological change. Some technical innovations with renewable sources of energy can make a big difference to the future prospects.

Currently, environmental management is a strategic value for companies, since it is characterized by gains in cost reduction, productivity and competitiveness (Maçaneiro; Cunha, 2014). According to Porter and Van der Linde (1995) the competitiveness of organizations lies in the trade off between regulatory compliance and the income derived from it, which are often correlated, so that

The report, commonly known as "Our Common Future" (WCED 1987) provides a definition of sustainability, the business prospect that is well captured by the phrase: Lean, green, ethics and real (Edgeman and Eskildsen 2012), where:

- Lean refers predominantly to the conservation of non-environmental resources;

- Green is associated with conservation of non-renewable natural resources, the wise use of renewable resources and minimize the environmental impact;

- Is related to the ethical and practical commitment to equity and social justice, community involvement and contribution and positive regard for the treatment of human capital of the company, and

- Real means lean, green and ethical practice with concomitant results that include financial, social, and environmental results.

To consolidate this definition, innovation plays an important role. To Rennings (1998) environmental innovation can be technological, organizational, social and institutional. Environmental technological innovation is to avoid or repair damage technologies in the end-of-pipe processes or in cleaner production techniques throughout the production stage. The organizational environmental innovation aims at the introduction of new services and environmental measures in management. Social environmental innovation is changing habits, values and behavior, with the interest of a sustainable lifestyle. Finally, the institutional environmental innovation consolidates the foundations for a sustainability policy, through responses and initiatives of the institutions to the problems of environmental order.

Andersen (2006, 2008) describes the main types of eco-innovations and highlights their different roles in a ecologized market.

a) Eco-innovations add-on: are handling technology resources and services in relation to pollution, improving environmental performance and are developed by the environmental sector.

b) Eco-innovations integrated: they are the processes and cleaner technology products than similar. They contribute to solutions to environmental problems within the company or in other organizations such as government agencies and families, so they are integrated.

c) Eco-innovations alternative product: are the new technological trajectories that represent radical innovations, which are not "clean" than similar products, but offer better environmental solutions for existing products. The environmental dimension is in production / product design, such as renewable energy technologies.

d) Eco-innovations macroorganizacionais: are the organizational structures that require new solutions for an eco-efficient way of organizing society. It means new ways of organizing production and consumption in a more systemic level, requiring new functional interactions between organizations. They are organizational innovations, but could include technical innovations that emphasize the importance of the space dimension to the eco-innovation and the need for organizational and institutional change.

e) Eco-innovations of general purpose: those general-purpose technologies that deeply affect the economy and the innovation process, contributing to a host of other technological innovations and setting the techno-economic paradigm dominant.

Kemp and Foxon (2007) present a taxonomy of eco-innovation reiterating that eco-innovation is not limited to new or improved environmental technologies, but is embedded in the

notion that each product or service and environmentally improved each organizational change to the environment are considered as an eco-innovation. Consisting of:

a) Environmental Technologies: Are pollution control technologies; clean production process; waste management equipment; environmental monitoring and instrumentation; Green energy technology, water supply and noise and vibration control.

b) organizational innovations for the environment: It is the introduction of organizational methods and management systems to deal with environmental issues in products and production. Examples are more efficient operations of the processes and changes in production facilities, environmental management and audit systems, value chain management, among others.

c) Innovations in products and services that offer environmental benefits: new or environmentally improved products and environmentally beneficial services. Examples: service management of solid and hazardous waste, water management, environmental consulting, engineering and testing and analysis services.

d) System of green innovations: Alternative systems of production and consumption that are more environment-friendly than the existing environment. Involves a series of changes in production technologies, knowledge, organization,

institutions and infrastructure and, possibly, changes in consumer behavior. Examples: organic farming and energy system based on renewable energy.

e) general purpose technologies: They are important part of the technological scenario, in that it gives its name to an era. They are not labeled as completely green technologies, but with certain configurations and types of environmental uses. Examples: Biotechnology and Information and Communication Technologies (ICTs).

For OECD (2009) eco-innovation is generally the same as other types of innovation, but with two significant differences: a) is the innovation results in a reducing environmental impact, if such effect is intentional or not; and b) the scope of eco-innovation may go beyond the conventional organizational boundaries of the innovating organization and involve broader social arrangements that trigger changes in the existing socio-cultural norms and institutional structures.

3 METHODOLOGY

This research is descriptive and qualitative approach. It consists of a survey that was implemented with the use of a questionnaire. The data collection instrument was sent to 6,472 affiliates the Federation of Industries of the State of Santa Catarina (FIESC). The questionnaire comprises questions scalar 5 points. Presented alternatives related environmental, social and economic practices. It was inserted into google docs and the link sent by e-mail companies. There were 7 cases of e-mails that have returned (not valid). Initially (within 10 days) there was return of only 15 completed questionnaires. It was sent new email for the companies surveyed giving a new term and the return rate has increased to 50 responses, which corresponds to 0.23% of the sample.

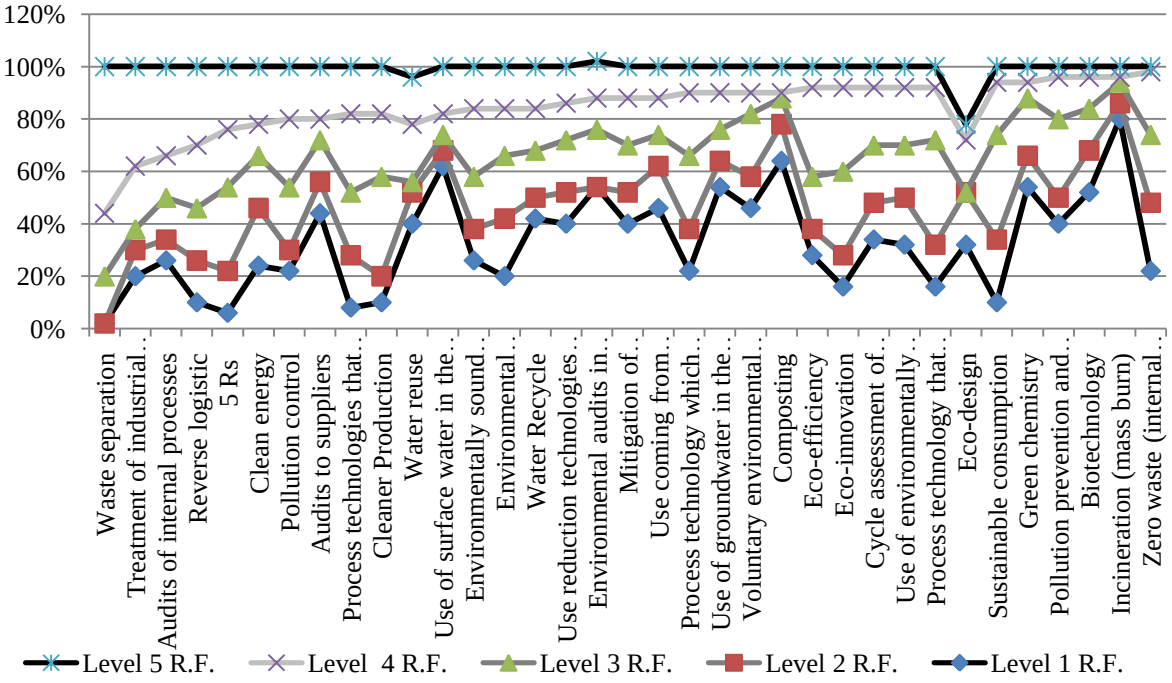
As the number of returns is very representative, it was decided to make a descriptive analysis of the profile of sustainable practices in industry. Data were tabulated in tables and was made an analysis of how innovative are mapped industrial practices.

Armed with this tab, the practices were analyzed with full adoption and practices not adopted in the companies surveyed. It was later performed an analysis of the level of innovation of these practices in light of the assumptions suggested by Kemp and Arundel (1998).

4 PRESENTATION AND ANALYSIS

This section presents the stage of adoption of the description of the sustainable practices adopted by surveyed industrial companies.

Figure 1: Adoption stage of environmental practices



Source: Research Data

Figure 1 shows that 54% of the surveyed research have an advanced stage of adoption of reverse logistics practice. Only 10% of companies surveyed do not adopt this practice and 26% are in the early stage of any use of reverse logistics (level 2). Cleaner production is a present practice of fullness in 18% of the companies surveyed and level 4 in another 24% of companies. This shows that most of the companies surveyed emphasize the continuous application of an integrated preventive environmental strategy to processes, products and services to increase overall efficiency and reduce risks to people and the environment.

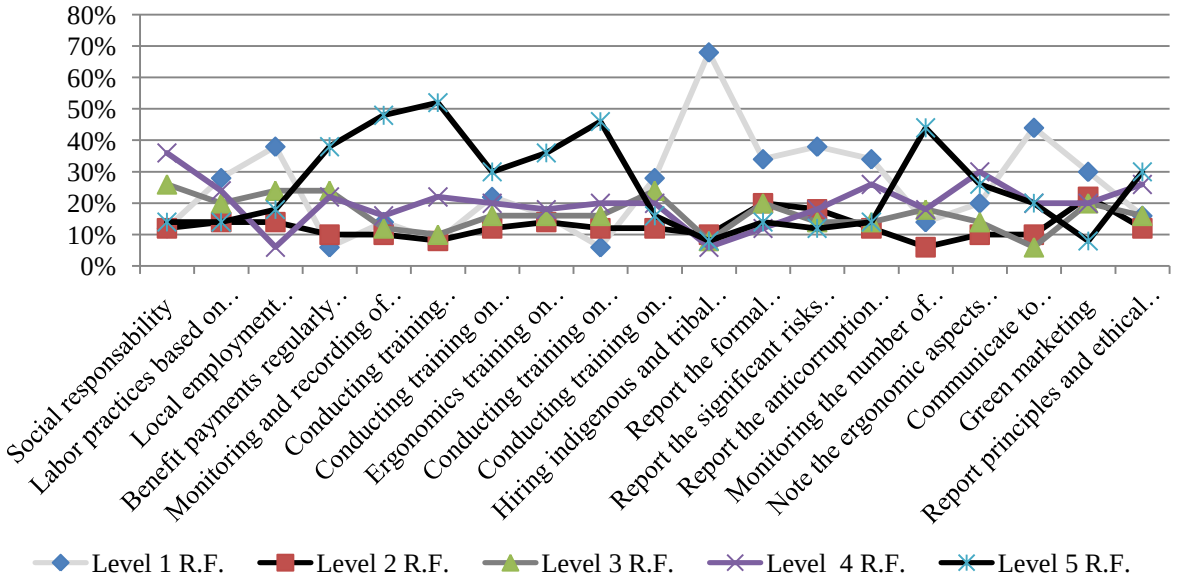
Among the practices adopted in full form by the researched companies stand out with level 5 waste separation adopted by 56% of companies, followed by the treatment of industrial effluents with 38%, audit internal processes 34% and reverse logistics with 30%. At level 4 there are the eco-efficiency practices with 34% adoption, with 32% eco-innovation and process technologies that reduce the level of waste to 30%.

Regarding the practices that are not adopted by the surveyed companies, incineration are (mass burn) in 80% of the surveyed cases, composting by 64%, use of surface water in the processes (62%), green chemistry (54%), use of groundwater in the processes (54%) and environmental audits in production processes and management of effluents and waste (54%). In Level 2 there are the zero waste practices (internal recycling) in 26% of cases surveyed, sustainable consumption by 24% of the companies surveyed, clean energy (22%) and environmental management system (22%).

There were some companies surveyed also mentioned other practices. Highlights include the recycling of electronic products, construction sprayers filling stations, hospital source material collection, box-washing stations, power

generator usage; 100% of the water used in the company is taken by tanker; environment designed to use sunlight and ventilation, use of recyclable material, about 90% of all the occupied waste is recyclable, environmental education program, waste sorting, motivation for employees and society in the recovery of the forests through distribution native plants, disposal-oriented design; environmental education, environmental preservation projects; protection of springs, batteries gatherings and cell phone batteries, and home appliances, pesticide packaging; garbage collection; recycling; use of recycled paper and waste separation; reusing water; cost waste management; water reuse; regulations on environmental agencies; conscious water consumption in the production process; eco-issue; environmental targets and timetables; collection dengue; prioritization in waste separation, recycling, use of engineering the remains of raw materials, minimum waste policy; education and lectures on responsible consumption and disposal of waste; use of avian beds for fertilizers; wood consumption from renewable sources only; proper disposal of materials; 6 sigma project with environmental stress, environmental education project with the local community, and partnerships; monitoring water consumption aimed at reducing the consumption of this resource. reuse of wastewater; recycling of industrial goods; reuse of water use; maintaining and improving the environment; sewage treatment system and monitoring of consumption

Figure 2: Adoption stage of social practices



Source: Research Data

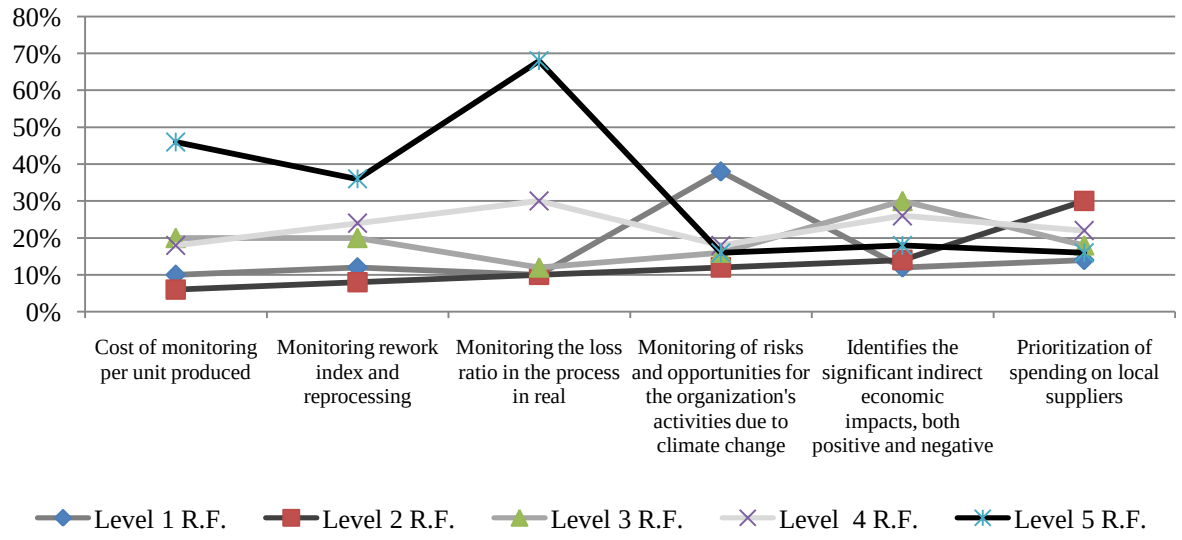
The Figure 2 shows that the adoption stage of social practices is at full level (level 5) for the practical realization of related health and safety training at work in 52% of companies surveyed. Monitoring and recording of injuries, the injury rate, the rate of occupational diseases, lost days, absenteeism and number of work-related fatalities for all workers (ie employees and contractors) is practical adopted by 48% of companies surveyed. And conducting training on accident prevention in the workplace by 46% of the cases. And still monitoring the number of complain and complaints of customers and suppliers in 44% of companies. At level 4 we highlight the social responsibility practices (36% of companies),

observation of ergonomic aspects in the processes (30%); communicate the anticorruption policies and procedures adopted by the organization (26%) and communicating principles and ethical values of the company, either in internal processes and in negotiations with stakeholders (customers, suppliers, society and shareholders) (26%).

Regarding the social practices that not adopted highlights are hiring indigenous and tribal employees (68%), communicate to stakeholders the sustainable performance via specific reports (sustainability report and social audit) in 44% of companies; report significant risks related to corruption identified based on risk assessments (38%) and local employment discriminating quotas (38%).

Other social practices mentioned by respondents are: supporting community volunteer program, fund social investments, volunteer program, community visit the company, several projects in communities, schools .., Junior Achievement, internal training, environmental education in public schools , organization of staff internally, accountability to community awards to outstanding employees, recycling, organization of the social framework for access to public policies for housing construction, hiring people with disabilities (PCDs), turnover rate, aid school donations the community, health and safety, voluntary actions, hiring and foreign practices, distribution of food baskets monthly; pause relaxation, extra-company leisure activities, integration of families, health at work, gymnastics, opened to the families of employees and the general community when there are lectures on safety, particularly in the Internal Week of Occupational Accident Prevention (SIPAT), benefits for attendance, support to social organizations, help the community, supporting employees and their families, volunteer group, social follow-up visits to children or employees (newborns) with guidance to parents, product donations to organizations, Program Athlete of the Future, Medical Assistance program in company with gynecologist, Youth and Adult Education in the company, providing service to community investment in a Amparo Foundation to Children and the Elderly, support local health, helps the local community, donation of products

Figure 3: Adoption stage of economic practices



Source: Research Data

As the Figure 3, 68% of the surveyed companies adopt in full stage monitoring the loss ratio in the process in real; 46% monitoring of the cost per unit of output and 36% monitoring of rework and rework index. As non-adopted practices include the monitoring of risks and opportunities for the organization's activities due to climate change (38% of companies) and prioritization of spending on local suppliers (12%).

Other economic practices that were cited are: analysis of the benefit cost, health concerns in working with adoption of Health program, Safety and Environment (HSE), sharing program outcomes, condensed water reuse of boiler and machinery for use in bathrooms and taps for washing, planning and production control (PPC), search for resources to finance environmental design, product with technological advancement, implementation reports on the company's machine park, internal program to reduce costs, packaging reuse , planning and control targets, KG / Male / Time, cost of rework, minimum inventory of raw materials, development of new processes and products, production efficiency, cost control and margins, establish long-term partnerships with suppliers, program continuous improvement in all aspects - product - process and working environment, normal practices of industrial activity, overall cost control, annual budgeting, planning, budgeting, monitoring and projection scenarios (Predicted x Held), investment planning and expenditure area industrial horizon of up to four years, agricultural products purchased in the city, recovery and disposal of resale, internet - turn off computers and energy of the room when not in the same, investment planning.

4.1 ANALYSIS OF PRACTICES IN FULL LEVEL AND THOSE WHO ARE NOT TAKEN

This section describes the six practices that were cited by the largest number of companies surveyed to be adopted in full level.

Table 1: Sustainable practices adopted in full level

Environmental Practices			**Social Practices**			**Economic Practices**		
Practices	N.	%	Practices	N.	%	Practices	N.	%
Waste separation	28	56%	Conducting training regarding health and safety at work	26	52%	Monitoring the loss ratio in the process in real	19	68%
Treatment of industrial effluents	19	38%	Monitoring and recording of injuries, the injury rate, the rate of occupational diseases, lost days, absenteeism and number of work-related fatalities for all workers (ie employees and contractors)	24	48%	Cost of monitoring per unit produced	23	46%
Audits of internal processes	17	34%	Conducting training on accident prevention in the workplace	23	46%	Monitoring rework index and reprocessing	18	36%
Reverse logistic	15	30%	Monitoring the number of complaints and claims of customers and suppliers	22	44%	Identifies the significant indirect economic impacts, both positive and negative	9	18%
5 Rs	12	24%	Benefit payments regularly the organization of full-time employees	19	38%	Monitoring of risks and opportunities for the organization's activities due to climate change	8	16%
Clean energy	11	22%	Ergonomics training on performing in the workplace	18	36%	Prioritization of spending on local suppliers	8	16%

Source: Research Data

Note in Table 1 that the environmental practices adopted in full level refer to minimize the impacts that have been generated along the production chain. Only the alternative clean energy, adopted by 12 companies surveyed, which represents 24% of the sample studied can be considered an innovative alternative as it introduces a new energy alternative in the value chain and brings economic, social and environmental benefits when compared to relevant alternatives.

As regards the social practice this behavior repeats itself. Mapped practices show that the indicated indicators signal a business concern to accompany employees in nonlinearities arising on the production process. Only three practices are associated with employee training in order to sensitize them of the importance of accident prevention, the care of ergonomics in the routines of the production chain and the importance of health and safety at work. Such conduct refer to adequate labor legislation, which provides for training and capacity building to prepare the employee for exercising his function safely. So these are reactive and some innovative measures.

As the economic practices again manifests a reactive posture. The damage has already been caused and indicators aimed to measure only seek damages, losses and waste that occurred during the production process. This shows that also in economic level the emphasis is on the costs that are associated with faults and contingencies occurred. Therefore, they are not considered innovative. They are only control practices.

Table 2: Adopted sustainable practices not adopted

Environmental Practices			**Social Practices**			**Economic Practices**		
Practices	N.	%	Practices	N.	%	Practices	N.	%
Incineration (mass burn)	40	80%	Hiring indigenous and tribal employees	34	68%	Monitoring of risks and opportunities for the organization's activities due to climate change	19	38%
Composting	32	64%	Communicate to stakeholders the sustainable performance via specific reports (sustainability report and social audit)	22	44%	Prioritization of spending on local suppliers	7	14%
Use of surface water in the processes	31	62%	Local employment discriminating quotas	19	38%	Monitoring rework index and reprocessing	6	12%
Environmental audits in production processes and management of effluents and waste	26	54%	Report the significant risks related to corruption identified based on risk assessments	19	38%	Identifies the significant indirect economic impacts, both positive and negative	6	12%
Use of groundwater in the processes	27	54%	Report the formal procedures for complaints and claims by local communities	17	34%	Cost of monitoring per unit produced	5	10%
Green chemistry	27	54%	Report the anticorruption policies and procedures adopted by the organization	17	34%	Monitoring the loss ratio in the process in real	5	10%

Source: Research Data

Practical not adopted, as can be seen in Table 2 are those having a greater degree of complexity to be implemented. Can be considered more innovative because they seek to focus on the entire value chain and the systemic aspects and impacts caused throughout the production chain.

As regards the social practices are associated with the commitment to life and society, in a dimension of accountability to all stakeholders and the inclusion of people with a high degree of social vulnerability. They relate to overall goals, the millennium goals and the objectives of sustainable development adopted at the UN Summit on Sustainable Development.

Table 3: Innovation level of sustainable practices in top form

Kemp e Arundel (1998)	Environmental Practices	Social Practices	Economic Practices
- pollution control (end of pipe)	- Audits of internal processes	- Conducting training regarding health and safety at work - Monitoring and recording of injuries, the injury rate, the rate of occupational diseases, lost days, absenteeism and number of work-related fatalities for all workers (ie employees and contractors) - Conducting training on accident prevention in the workplace	- Monitoring of the loss ratio in the process in real - Monitoring rework index and reprocessing
- Clean up technologies (to remedy damages that have already occurred)	----------	- Monitoring the number of complaints and claims of customers and suppliers	- Identify the significant indirect economic impacts, both positive and negative - Monitoring cost per unit produced
- Waste management technologies	- Waste Separation - Reverse logistic	----------	- Prioritization of spending on local suppliers
- Recycling technologies	- Treatment of industrial effluents	----------	----------
- clean technologies related to production processes	- 5 Rs - Clean Energies	- Conducting training on ergonomics in the workplace - Benefits Concession regularly the organization of full-time employees	- Monitoring of the risks and opportunities for the organization's activities due to climate change
- Clean products or products that have little impact throughout its life cycle.	----------	----------	----------

Source: Research Data

As Table 3 shows the practices mostly have corrective function in production processes. The damage has already been done and they seek to minimize this fact, either, are created for products and processes. Few preventive innovations, namely, that alter or replace products and processes with the intention of preventing the occurrence of adverse environmental impacts or reduce its intensity. There is little adoption of clean or integrated technologies that directly address the cause of emissions during the production process or in the product level, ie measures to reduce energy inputs and emissions during production and consumption.

Table 4: Sustainable practices in innovation level adopted by companies

Kemp and Arundel (1998)	Environmental Practices	Social Practices	Economic Practices
- Pollution control (end of pipe)	Use of surface water in the processes	Communicate to stakeholders the sustainable performance via specific reports (sustainability report and social audit)	Prioritization of spending on local suppliers Monitoring rework index and reprocessing Identifies the significant

			indirect economic impacts, both positive and negative Cost of monitoring per unit produced Monitoring the loss ratio in the process in real
- Clean up technologies (to remedy damages that have already occurred)	Environmental audits in production processes and management of effluents and waste	Hiring indigenous and tribal employees Local employment discriminating quotas Report the formal procedures for complaints and claims by local communities	----------
- Waste management technologies	Incineration (mass burn) composting	----------	----------
- Recycling technologies	----------	Report the significant risks related to corruption identified based on risk assessments	----------
- Clean technologies related to production processes	Use of groundwater in the processes green chemistry	Report the anticorruption policies and procedures adopted by the organization	Monitoring of risks and opportunities for the organization's activities due to climate change
- Clean products or products that have little impact throughout its life cycle.	----------	----------	----------

Source: Research Data

Note in Table 4 that the practices that reinforce the need to reduce impacts on all levels of the chain are the least adopted by the companies surveyed. This shows a great opportunity to incorporate improvements in the production, assimilation or exploitation of a product, production process, service or management or business method that is developed or adopted in the organization.

This process is more than a replacement for low-carbon technologies, but the evidence of new learning involving the creation of new knowledge, values, rules and search capabilities, as well as the creative destruction of ancient practices and capabilities.

5 FINAL CONSIDERATIONS

The aim of this study is to examine what are the sustainable practices adopted in the Brazilian industrial operations. They were punctuated with full adoption of the following stage: separation of waste; industrial wastewater treatment; audits of internal processes; reverse logistic; Rs 5; clean energy; conducting training regarding health and safety at work; monitoring and recording of injuries, the injury rate, the rate of occupational diseases, lost days, absenteeism and number of

work-related fatalities for all workers (ie employees and contractors); training sessions on accident prevention in the workplace; Monitoring the number of complaining customers and suppliers and complaints; granting benefits to regular full-time employees of the organization; training sessions on ergonomics in the workplace; monitoring the loss ratio in the process in real; monitoring the cost per unit of output; monitoring of rework and rework index; identifies the significant indirect economic impacts, both positive and negative; monitoring of risks and opportunities for the organization's activities due to climate change; prioritization of spending on local suppliers.

A key question is how to reasonably integrate environmental policies and practices with approaches to business excellence. Innovation in a particular way is suggested as a partial response to this problem. Innovation is considered a key integrative string of gains realized by an effective environmental policy and the implementation and effective use of practices that align with models of business excellence. It is innovation that addresses the social, environmental and financial performance and thus integrates sustainability and business excellence and do it regularly, accurately, comprehensively, and profitably.

The results of this research show that there is a great opportunity to incorporate institutional eco-innovations in Brazilian companies, which are characterized as innovative institutional responses to sustainability issues such as local and agency networks, as well as global governance and international trade. They are seen as a key building block for sustainability policy. Another mapped gap is associated with the social eco-innovations, which are expressions of sustainable consumption patterns that have received increasing attention, being considered as changes in the values of the people and their lifestyles for sustainability.

Still, there is room for incorporating organizational eco-innovations, which are changes in management tools in the company (eco-audit) and service innovation (energy demand management and waste transport management). This requires new infrastructure and changes to the system that goes beyond the changes of a particular technology. And healing technologies - repair damage (eg contaminated soils).

Especially sustainable innovation it is defined as a measure replacing polluting production processes, wasteful, unhealthy and dangerous with more clean and sparing resources. On the other, it is associated with the company's ability to remain competitive in the markets in which it operates. Eco-innovation is different from innovation to be related to the reduction of environmental burdens. That is, an innovation that consists of changes and improvements in environmental performance within a dynamic greening of products, processes, business strategies, markets, technology and innovation systems.

This study brought contributions to literature and managerial implications. For literature, this study showed the importance of more empirical studies on sustainable innovation. The study indicates that although the organizations

surveyed have sufficient theoretical knowledge about sustainable practices, they do not have an integrated strategy for the management of its technological innovations incorporated along the value chain. Subsequently, decentralized activities were undertaken to address the minimization of waste and impacts. These activities can be considered ad hoc; ie not planned or coordinated between departments and downstream and upstream of the production chain. As a result, there were few practices that present systemic view of the chain and go beyond the reaction and prevention, but that may be considered proactive and protagonists of a cleaner value chain. Ie practices incorporated as part of a greater integration of sustainable innovation strategy. This shows the importance of integrating activities related to sustainability in the corporate strategy of the organization.

For future studies are recommended to investigate the sustainable leadership as the protagonist in the merger process of innovative sustainable practices in industrial companies. Check if the leaders of different sectors companies tend to be pioneers and leaders in the process of incorporating eco-innovative practices in the value chain.

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