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Forest Certifications "FSC" and "CERFLOR": multiple case study

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Abstract

The objective of this study is to identify the implementation of key quality management programs, focusing on the FSC and Cerflor forest certification programs, conducting a critical analysis of their adoption, as well as identifying empirical evidence that investments in quality have brought benefits. The methodology used was a quantitative multiple case study. The study assumes that the surveyed pulp and paper and office supply companies can be considered models in the implementation and maintenance of quality programs, environmental management, in addition to forest certification. Another assumption is that forest certification programs are more costly and complex when compared to traditional standards such as ISO 9001 and ISO 14001, and use more complex quality tools. The results indicate that the surveyed companies have implemented various quality and forest certification programs. The main encumbrances encountered in the adoption of quality programs were: preparation and updating of the necessary documentation for the programs, availability of staff time to assist in program implementation, realization of internal audits, and handling of the statistical tools of quality. The study also showed that investments in programs have brought about many benefits such as increased revenue, several improvements in quality and productivity, and greater satisfaction rate among internal and external customers.

Keywords: forest certification; quality programs; Cerflor; FSC-Forest Stewardship Council.

1 Introduction

According to Mello *et al.* (2009), since the 1980s there has been a growing demand in the market for quality programs, primarily due to increase in customer demand and the need for companies to gain access to new markets. In addition to certifying the company in international standards such as ISO 9001 (quality management), ISO 14001 (environmental management), among others, quality programs can generate financial gain, increase productivity and quality, and reduce some expenses by saving water, electricity and scrap.

The realization of the Rio-92 World Conference brought a wide discussion of issues pertaining to the environment. Sectors of the media, as well as many nongovernmental organizations, began to exert pressure on companies, so as to address environmental issues and resources in a more responsible and balanced fashion (COUTINHO and SOARES, 2002).

In 1993, the FSC forest certification board was created, originating from an association present in twenty-five countries, at the time made up by environmentalists, companies from the timber industry, forest owners, indigenous peoples and various community groups. The aim was to audit the practice of forestry based on ecological, economic, and social principles. With the media coverage of forest certification, major wood consumers began to require the FSC label, especially in countries such as Germany, the UK and the Netherlands, where the presence of environmental groups is more significant. However, the volume of wood covered by the certification in the world is still low. Brazil has been suffering great pressure from the international community to implement forest certification in their products, and producers, in particular those of tropical origin, have been facing restrictions in the world market. The main objections to Brazilian producers are based on unrestrained deforestation in the Amazon and

disregard for indigenous protection areas, among other reasons (JACOVINE *et al*., 2006, SCHEPERS, 2010 and SILVA, 2003).

In light of the above, this study aimed to collect and analyze data on the various quality programs undertaken by two companies in the pulp and paper industry, and analyze characteristics such as senior management involvement, difficulties encountered, reasons for implementation of each program, and other points identified by the companies themselves.

To support this work, we have carried out a theoretical review of the quality programs that companies have adopted, with greater focus on CERFLOR and FSC certification, as they are less known by the academic community.

The article is organized in five sections. The first provides a brief introduction on the topic in question; the second and third sections present a summary of the theoretical discussion of the issues addressed and the methodology used, respectively; section four presents the results obtained in the research. Finally, section five discusses the results and presents the main findings, limitations and recommendations for future research.

2 Literature review

This section present the main definitions of ISO 9001, ISO 14001, OHSAS 18001 standards and the CERFLOR and FSC certifications which are quality programs used by the companies in question.

2.1 Quality Management Standard ISO 9001

According to Carvalho and Paladini (2005), the ISO 9001 standard represents a combination of procedures, standards and requirements for the operation of a quality management system, which can be applied in products or services, independently of business sector or size. The standard represents a global reference in international trade and also in the implementation and maintenance of in quality systems in businesses worldwide. The standard's structure is shown in ten chapters (introduction, scope, normative reference, terms and definitions, quality management system, management responsibility, resource management, product realization, measurement, analysis and improvement). In 2008, the ISO 9001 standard was revised to correct some terms and clarify the meaning of some requirements' descriptions. No clauses were added or excluded.

Approximately 1,000,000 (one million) ISO 9001:2008 certificates have been issued in 176 (one hundred and seventy-six) nations. The increase of the number of certificates between the years 2007 and 2008 was 3%. The countries with the most certified companies are, in descending order: China, Italy, Spain, Japan, Germany, the UK, India, the United States, France and Korea (ISO-THE ISO SURVEY, 2008).

Despite the rapid increase in the number of certified companies around the world, the impact of ISO 9001 certification on performance remains controversial. Some studies emphasize the benefits of certification in improving the quality and also in trade performance, yet there remain questions regarding other improvements. Such controversies bring to light the complexity and paradoxes related to the measurement of organizational performance (BOIRAL and AMARA, 2009 and Chow-CHUA et al., 2003). According to the authors, there are four types ISO 9001 configurations: effective certification, covering the good performance in the traditional criteria of ISO 9001 certification; ceremonial certification, where application of the rule improves business performance and quality, but also generates significant resistance and implementation problems mainly expressed by procedural bureaucracy and lack of individual commitment; management certification, which can be solely characterized as management, as many internal problems are not identified and it is well integrated into management practices, although it doesn't contribute to performance improvement; and ineffective certification, where there is low performance and significant problems in the implementation of ISO 9001.

A study conducted with 2,880 (two thousand, eight hundred and eighty) organizations certified with ISO 9001 in the province of Quebec (Canada) has showed that, according to the aforementioned

typology, only the effective configuration corresponding to high performance and few internal problems seems to be, in fact, effective. This configuration was identified in about a quarter of the studied cases. For these companies, ISO 9001 seems to be an effective way to improve overall performance. The survey showed that 27% of the studied cases were associated with low performance, high levels of internal problems and that their adoption brought unsatisfactory results. Only 18% of the cases studied were characterized by good performance, albeit with high levels of internal problems. 28% of cases showed poor performance, but without significant internal implementation problems.

Although the implementation of the standard requires significant investments, as well as the commitment of the entire staff, the benefits generated for the certified company can be numerous, including: closing of new deals (national and international), increased profits, greater integration between company sectors, reduction of manufacturing costs, improved performance of products and services, as well as of productivity and efficiency, and greater customer satisfaction rates (PINTO et al., 2006).

2.2 Environmental Management Standard ISO 14001

Another quality program that can be used in healthcare institutions is the international standard ISO 14001, which indicates elements for an effective Environmental Management System (EMS). It applies to all types and sizes of organizations and has its origins in British Standard BS 7750, in a similar fashion to the creation of ISO 9001 from another British standard, BS 5750. The aim of ISO 14001 is to balance environmental protection and pollution controls with the socioeconomic needs of the population. It is not intended to be used as a non-tariff barrier to trade. Though there are questions about the effectiveness of an EMS, there are several benefits in adopting the standard, such as: strengthening the company image so as to acquire new markets or expand its own; abiding by legislation, rules, and regulations concerning the environment, which have been becoming increasingly stringent; maintenance of good relations with stakeholders; decrease in costs and waste; and improvement of new technologies (PHENG and KWANG, 2005 and SEIFFERT, 2008).

An important aspect of ISO 14001 is that the rule does not establish specific criteria for environmental performance which companies must meet—that is, they are set by the company or government themselves. The standard indicates that the organization must commit to comply with the legal requirements that relate to environmental aspects (CARVALHO and PALADINI, 2005). The ISO 14001 certificates issued worldwide exceed 190,000 (one hundred and ninety thousand), in approximately 155 (one hundred and fifty five) countries. The growth in the number of certificates issued between 2007 and 2008 was that of 20%. The country with the most certificates is, once more, China, followed by Japan, Spain, Italy, the UK, South Korea, Germany, the USA, Switzerland and Romania (ISO - THE ISO SURVEY, 2008).

2.3 Occupational Health and Safety Standard OHSAS 18001

The OHSAS 18001, Occupational Health and Safety Assessments Series, is a standard that aims to provide organizations with the elements of a Management System of OHS (Occupational Health and Safety), effectively helping them to achieve their health and safety goals, in integration with other management requirements (ARAUJO, 2002). It was developed in order to obtain compatibility with ISO 9001 and ISO 14001, to help the company meet its health and safety obligations in an efficient manner.

According to Seiffert (2010) and De Cicco (1999), the international standard OHSAS 18001:2007 (Occupational Health and Safety Assessment Series) supplies a management occupational health and safety system which aims to reduce or even eliminate risks to company employees as well as other stakeholders who may be exposed to certain risks in the carrying out of business activities. The main benefits of adopting this standard are: to assure customers of the company's commitment to the proper management of occupational health and safety; to establish and maintain good relations with employees and also with trade unions and public oversight; to improve the company's public image; to reduce the number of accidents leading to civil liability; to enable the company to participate in several types of funding; to improve productivity and employee motivation; to obtain a systematic process of risk

analysis and measurement of hazards related to work-related incidents and accidents, and to enable the sharing of experience in anticipation of occupational hazards.

The OHSAS 18001 was developed to be compatible with ISO 9001 and ISO 14001, aiming to integrate the management systems and to save human and material resources. The main areas focused by the OHSAS 18001 are: the planning of hazard identification; risk assessment and risk control; structuring and definition of responsibilities; required training, awareness, and competence; internal communication and consultation, operational control; readiness and quick response to emergencies; performance measurement, monitoring and improvement of processes. OHSAS 18001 can be adopted by any organization that wishes to implement a formal procedure to reduce the risks associated with health and safety in the workplace for employees, customers and the general public (CERQUEIRA *et al.*, 2004).

2.4 Forest Stewardship Council FSC

The FSC, Forest Stewardship Council, is a non-governmental, international and independent organization formed by environmentalists, researchers, representatives of social movements, farmers, businessmen and representatives of traditional communities, founded in 1993 with the objective of encouraging correct management and accredited certification of forests (DA LUZ 2010). It does not issue certificates, but ensures that those issued by certifiers comply with quality standards. The certifiers develop their methods for certification based on the Principles and Criteria of the FSC, adapted to the reality of each region or production system. The development of national or regional standards of forest stewardship, adapted to the realities of different countries, is held by the National Initiatives and Working Groups, with the support of the FSC, and the result is called the National Standards for Certification, documents that must necessarily be used by certifiers to assess forest operations (FSC-BRAZIL, 2011). The FSC Brazil – Brazilian Forest Stewardship Council's main objective is the dissemination and expedition of correct forest stewardship in Brazil, using the "Principles and Criteria" previously established.

The FSC certification follows ten principles: compliance with laws and FSC principles and criteria; possession and right to land use; rights of indigenous peoples; relationship with community and workers' rights; benefits of the forest; environmental impact; management plan; monitoring and evaluation; forest of high conservation value; and forest plantations. In Brazil, as of the end of 2010, there are approximately 600 certifications of chain of custody for products of forest origin and about 80 combined forest stewardship certifications with chain of custody. In total, there are almost 6.25 million hectares of forests, with approximately 2.73 million hectares of native forests and 3.51 million hectares of planted forests. The Brazilian states with the largest number of planted forests are Minas Gerais, Paraná, São Paulo, Bahia and Santa Catarina (FSC-BRAZIL, 2011).

The FSC certification process is very similar to other certifications such as ISO 9001 or ISO 14001, and can be summarized in five major steps: (i) Initial contact - the forestry operation interested in certification makes prior contact with a certifier of its choice, (ii) Assessment – in this stage, an overall stewardship and documentation assessment is carried out, as well as a field analysis, in order to enable the operation to receive certification, realizing public consultations in which interest groups can manifest themselves, (iii) Compliance – after evaluation, usually "non-conformities" (situations that need correction) arise and the forestry operation must resolve them, (iv) Final stage of operation certification - in this final phase, the forestry operation is certified and the certifier prepares a general public report of the assessed situation, (v) Annual Monitoring - the certificate is valid for a period, after which at least one yearly monitoring of operation is undertaken, aiming to analyze the permanence of the certification process (FSC BRAZIL, 2011).

There are two modes or types of certifications that are implemented organs accredited by the FSC:

<u>a) Certification of Forest Stewardship:</u> When operations that fulfill the FSC Principles and Criteria are certified. The definition of forest stewardship, according to Brazilian standards NBR 14789-Forest Stewardship - Principles, Criteria and Indicators for Forest Plantations and NBR 15789 – Forest Stewardship - Principles, Criteria and Indicators for Native Forests, is: "stewardship of the forest to

obtain products and services, respecting the environmental and social variables which ensure the support mechanism of the ecosystem subject to stewardship".

b) Chain of Custody Certification: When forest products are certified by means of the "green seal", with the inspection on the entire production chain under the guarantee that all raw material employed has been extracted from certified forests (Nardelli and TOMÉ, 2002). This fact is important because the forest product, having originated in a certified management unit, is often transported and processed by different organizations until it reaches the end-user. The definition of chain of custody, according to the Brazilian standard NBR 14791, is: "all changes in custody of forest-based products and derivatives during harvest, transport, processing and distribution chain, from the forest to end-use."

In Brazil there are only two certification systems: the Forest Stewardship Council (FSC), of international initiative, and the Brazilian Forest Certification—Cerflor—of national initiative. Nationally, the FSC is represented by the Brazilian Forest Stewardship Council, an independent, nongovernmental and nonprofit organization whose primary purpose is to promote stewardship and forest certification in the country. The second certification, Cerflor, encompasses the Brazilian Association of Technical Standards (ABNT—Associação Brasileira de Normas Técnicas), the National Institute of Metrology, Standardization and Industrial Quality-(INMETRO—Instituto Nacional de Metrologia, Normalização e Qualidade Industrial) and the Brazilian Silviculture Society (SBS) and will be described in section 2.5.

The international FSC sets rules for the accreditation of certifiers that will be the responsible for the release of the FSC seal. To ensure credibility and follow the development of certification in the world, the certifiers are constantly monitored. In Brazil, there are five accredited certifiers, and they are, therefore, authorized to evaluate the Forest Stewardship units – tended by businesses or communities – and the processing industries (chain of custody) and authorize the use of the FSC logo (FSC BRAZIL, 2011).

In recent years in Brazil the FSC forest certification has grown dramatically (SMERALDI, 2009). According to BRACELPA - Brazilian Association of Pulp and Paper (2011), 50% of more than six million hectares of planted forests in Brazil are certified by FSC and Cerflor, and the pulp and paper industry accounts for more than two million hectares (INMETRO, 2012). A national opinion poll by Datafolha showed that, while in 2006 the level of recognition of the FSC was still negligible, in 2009, one fifth of Brazilians claimed to have had some contact with the certified products and recognized the FSC trademark.

On the market of these certified products, Garlipp (1995) stated that the certification process is a huge challenge imposed by consuming countries, serving, sometimes, as a non-tariff barrier to trade, which has implications and restrictions on the trade of forest products without this certification. The growing number of certified forests has enabled Brazilian exports, in the sectors of pulp and paper, to increase by approximately 9.3% between 2010 and 2011.

2.5 Forest Certification - Cerflor

The Cerflor is the proof of existence of a forest that meets to the requirements of the Brazilian standard NBR 14789 - Forest Stewardship -Principles, Criteria and Indicators for Forest Plantations. The Cerflor is a set of national standards focused on forest certification, comprising: NBR 14789 - Forest Stewardship: Principles, Criteria and Indicators, the NBR 14790 - Forest Stewardship: Chain of Custody, the NBR 14791 - Guidelines for Forest Auditing: General Principles, the NBR 14792 - Guidelines for Forest Auditing: Forest Stewardship Audit Procedures. However, the standards that are certifiable (a certificate can be issued to attest the standard has been followed) are the NBR 14789 and NBR 14790. The main requirements of NBR 14789 regarding legislation is the rational use of forest resources in the medium and long term; respect to the biological diversity in the areas of management; careful use of water, soil and air; and the environmental , economic, and social development in regions where there is cultivation of forests.

According to Inmetro (2011), voluntary forest certification has been developing internationally since the 1980s, with many systems operating and competing with each other. In Brazil, since 1996, the Brazilian Silviculture Society - SBS, in partnership with industry associations, educational and research institutions, nongovernmental organizations and with support from some government organs, has been working with a voluntary program called Cerflor - Brazilian Program of Forest Certification. Still according to Inmetro (2012), the Cerflor was released in a meeting of the Competitiveness of the Productive Chain of Wood and Furniture Forum, on August 22, 2002, in order to meet with the demands of the forest productive sector in the country. Since 1996, the Brazilian Silviculture Society - SBS - established an agreement of cooperation with ABNT to develop the principles and criteria for the sector. The composition of the Technical Subcommittee of Forest Certification is divided in four categories: government representatives (regulators of the environmental and forestry sectors, workers, industry and trade, and foreign relations), representatives of the productive sector (forestry, pulp and paper, solid wood, charcoal), consumer representatives (civil society organizations, nongovernmental environment organizations and social, etc.), and neutral representatives (from research institutions and academia, standardization entities, workers) (INMETRO, 2012).

In Brazil, the Cerflor has Inmetro as the certifying organ that certificates and manages the quality of the program and ABNT is the organization responsible for the process of preparation and revision of standards. In addition, it adopts the same policy of PEFC - Programme for the Endorsement of Forest Certification. The PEFC certification was established in 1999, in a voluntary basis, based on their own criteria on forest protection in Europe and is recognized by the European community. Both certifications are extremely similar and have two main categories: Forest stewardship and chain of custody. The first refers to the forest, while the second involves the production chain that uses certified material (JACOVINE, 2006).

According Inmetro (2012), the Cerflor is based on five basic principles, described as follows: Principle No. 1 - Compliance with the law. The forestry enterprise must be managed with attitudes and actions that ensure compliance of Federal, State and Municipal legislation; Principle No. 2 - Rational use of forest resources in the short, medium and long term, aiming for its sustainability; Principle No. 3 - Protection of biological diversity. The company must manage the forest plantations to minimize the negative impacts of silvicultural activity on the native flora and fauna; Principle 4 - Respect for water, soil and air; and Principle No. 5 - Environmental, economic and social development of regions in which forestry activities are carried out. They establish the need for a relationship policy with employees and the communities that live in the vicinity of the Forest Stewardship units. The investment to be made by the company for the Cerflor certification depends on factors such as the size of the forestry enterprise, and the amount of stewardship units that the organization wants to certify. The certificate issued to Cerflor is valid for five years and can be renewed after this period. Currently, the Cerflor certification rules defined by Inmetro (2012) do not allow integration with other certifiable standards such as ISO 9001 or ISO 14001. An alternative is to schedule internal and external audits for the same period, which allows the optimization of several funds destined to certification purposes. In Brazil, as of the end of 2011, there are about 51 chain of custody certifications and 21 certifications of Forest Stewardship. The Brazilian states with the largest number of planted forests are São Paulo, Espírito Santo, Mato Grosso do Sul, Minas Gerais and Rio Grande do Sul (INMETRO, 2012).

The main benefits for the FSC certification, as well as Cerflor, are countless and can be summarized as follows: creation and improvement of the organization's public image before society and external and internal customers; increase of forest productivity; access to new markets; contribution to the preservation of biodiversity and associated values such as water and soil; maintenance of the ecological function and integrity of forests; contribution to the preservation of endangered species and their natural habitats; increased respect for workers', indigenous peoples' and local communities' rights; decrease of the amount of work accidents; increase of tax collection and other legal tributes; general improvement of work conditions; improves of the quality of personnel; elimination of forced labor and child labor. The main difficulties encountered in the FSC and Cerflor certification process are: the legal compliance of

the company, the low qualification of labor in companies (owned and outsourced); different types of specific training which generate costs and time requirements; seasonal operation pursuant to climatic conditions in some regions, which creates a lack of continuity of manpower used in such enterprises; production scale incompatible with market demands a result of the heterogeneity of natural forests; the high costs of the process, especially for small and medium enterprises. It should be highlighted that there are no conflicts between Brazilian certifications such as Cerflor and international certifications such as FSC or others, because the various initiatives pertain to different areas and levels of demand. The creation of numerous seals is a result of an increased consumer demand worldwide. Currently, the FSC forest label is the most accepted internationally, because it is the result of a transparent and democratic movement, present in over 30 nations, with the active participation of environmental leadership, as well as that of business and technical sectors, and of several social movements, local forest communities, among other stakeholders. Therefore, principles and criteria established by the FSC reflect the interests of all parties involved and interested, with equal importance.

3 Research method

The aim of this paper is to analyze and compare the process of quality management in two pulp and paper industries and in an office supply business organization. The analysis of these companies is important, as they have a direct impact on the environment. According to the BRACELPA - Brazilian Association of Pulp and Paper (2011), Brazil has gained recognition in the global market for producing pulp and paper only from plantations, without resorting to extract from the native forests - a practice that is still active in major competitors. Therefore, to remain competitive in the both the internal and external markets, companies in the pulp and paper industry have needed increasing numbers of environmental certifications, and other quality standards.

This work consists of an exploratory research, using the a qualitative multiple case study, which refers to the observation of phenomena, analyzing the process of operation of the object of analysis, in order to explore its aspects and identify relationships between them (Bryman, 1990). To ensure more robustness to the analysis three case studies were carried out, both based on the use of a questionnaire followed by an interview (YIN, 2002).

Company "A" is a paper industry located in southern Brazil. With its approximately 360 employees, the factory has an annual production capacity of 180 thousand tons of paper. Approximately 90% of the total is sold domestically. This organization has five quality programs: ISO 9001, ISO 14001, OHSAS 18001 and Certifications Cerflor and FSC. Company "B", in turn, is a paper industry located in southeastern Brazil. With over 2,500 employees, the company has an annual production capacity of one million tons of paper, distributed in its three plants. The company has five quality programs: ISO 9001, ISO 14001, OHSAS 18001 and Certifications Cerflor and FSC. Company "C" is a consumer goods industry that manufactures office supplies, with two plants located in the southeastern and northern Brazil, totaling approximately 2,500 direct and outsourced employees. The company has an annual production capacity of approximately 1.8 billion pencils. This company has four quality programs: ISO 9001, ISO 14001, the Code of Conduct and FSC certification. The Code of Conduct program was developed by the company C itself, and therefore will not be detailed in this work.

The questionnaire contains ten questions through which it was intended to observe the quality programs that businesses had and the involvement of the top management in implementing each of them; the main difficulties encountered by companies during the deployment process and the main reasons for companies to obtain certification; the quality tools used in these programs; the investment required for implementation and the financial returns which have been acquired; and the main benefits and reductions resulting from the implementation of each program .

The current study presents the following assumptions: P1) The implementation of Cerflor and FSC certifications is more complex and expensive than that of certifications widely adopted by organizations

such as ISO 9001 and ISO 14001; and P2) FSC and Cerflor certifications use more sophisticated tools of quality in comparison with ISO 9001 and ISO 14001.

4 Analysis and discussion of results

The three companies surveyed have programs for ISO 9001, ISO 14001, and FSC. Companies A and B, in addition to the aforementioned three quality programs, also have the OHSAS 18001 and CERFLOR programs.

Companies "A" and "C" invested heavily in quality training programs, since 100% of their employees were trained in all quality programs. Company "B" prioritized the ISO 9001, FSC and CERFLOR programs in training, although a smaller share of employees has also been trained in other programs.

Regarding the involvement of company management in the quality programs, it was made clear in the responses the high degree of commitment of companies "A" and "C", given the level of involvement was "high" in all programs. Company "B", in turn, re-prioritized the ISO 9001, FSC and CERFLOR programs with "high" priority in involved directors' agendas, and "average" involvement in other prorams.

Evaluating the main difficulties encountered in companies for the implementation of quality programs, it is noticeable that the most relevant for all programs were: the preparation and updating of documents for certification, available time for employees of companies to assist in program implementation, realization of internal audits to verify the program adequacy, and handling of statistical tools of quality. Company "C" also came up against difficulties in preparing and updating documents, but other factors such as use of consultants to assist the process of implementation of quality programs and customer focus presented a higher degree of difficulty.

For company "A", one of the main reasons for the implementation of quality programs was "customer demand", as well as "own initiative to improve quality and productivity of its products." As for company "B", the main motivator of the implementation was "alignment with business strategies," followed by "customer demand" and the possibility of using the programs as a "marketing tool". Examining the specific Cerflor and FSC programs, the motivation for adoption was "customer demand". The two companies also reported that these certifications represent an internationally recognized competitive advantage, and are also highly valued by customers. Company "C", in turn, had as its main reason for implementing quality improvement programs their own initiative, followed by the use of ISO 14001 and FSC programs as a marketing tool.

The benefits caused by the various quality programs were substantial for all three companies. Regarding specifically the Cerflor and FSC programs, companies A and B indicated that the implementation was satisfactory, given the fact that benefits were obtained above projected levels. Company "C", in turn, got all the benefits as planned.

Due to the high degree of satisfaction with the results achieved, the three companies indicated that they intend to continue with quality programs adopted by renewing their certifications when necessary.

With respect to investments for the implementation of each program, the company "A" applied between R$ 50,000.00 and R$ 99,999.00 in most programs, except for the FSC and CERFLOR, which required a larger investment, encompassing a range between R$ 100,000.00 and R$ 499,999.00. Companies "B" and "C" preferred not to disclose the amounts invested, claiming them to be confidential.

While recognizing many benefits from the implementation of programs, none of the companies could inform the financial gain obtained in each program. This fact can be explained by the difficulty in measuring financial benefits such as "increase in external customer satisfaction." Such indicators, however perceptible, are intangible.

Although company "A" is committed to quality management, it still makes little use of quality tools, focusing only on the PDCA cycle. Company "B", in turn, has the most developed area, using tools from the

most simple and common as 5S (sense of use, storage, cleaning, health and hygiene and self-discipline) and Cause and Effect Diagram, to more complex statistical tools, such as CEP-Statistical Process Control and Hypothesis Testing. It should be noted that programs Cerflor and FSC, in company "B", use the greatest amount of statistical tools of quality when compared to other programs. In company "C", the ISO 9001 quality program is the most used quality tool.

One of the programs that have led to the greatest cost reduction in the companies surveyed was the environmental management standard ISO 14001, as their environmental nature generated energy and water savings as well as the reduction of scrap output and operating costs. In general, the other quality programs showed no significant cost savings for companies.

5 Conclusion

The examined paper and pulp sector companies hold five certifications: ISO 9001, ISO 14001, OHSAS 18001, FSC and CERFLOR. The office supplies company, in turn, holds three certifications: ISO 9001, ISO 14001 and FSC and plan to implement OHSAS 18001. The three certifications, ISO 9001, ISO 14001 and OHSAS 18001, are already well-established and widely implemented by the market, and can be deployed in various types of businesses and industries. The FSC and Cerflor, in turn, had a greater emphasis in the study because they are known by those involved in timber-related industries, such as the companies addressed in the study.

After conducting a results analysis of the survey applied to the companies "A", "B", "C", we can observe that the organizations did not encounter major difficulties in the implementation of quality programs. For company "A", one of the main reasons for the implementation of quality programs was "customer demand". Company "B", in turn, had "alignment with business strategies" as a main motivator, while Company "C" was motivated by its own "initiative to improve itself." All companies claimed that the financial returns were equal to or exceeded projected levels.

Assessing the assumption P1 (Deployment of Cerflor and FSC certifications are more complex and expensive than those certifications widely adopted by organizations such as ISO 9001 and ISO 14001), we can conclude that it is partially true, as, although the investments performed by the companies for these programs were higher than in other programs, the difficulties in implementation were not significant.

As for assumption P2 (FSC certifications Cerflor and use more sophisticated tools of quality when compared with ISO 9001 and ISO 14001), we can conclude that it is considered to be partially true, since there is no distinction in the use of quality tools in companies "A" and "C". However, in the case of organization "B", FSC and Cerflor certifications adopted the most complex quality tools when compared to other quality programs.
While companies "A" and "C" are committed to quality management, they still make little use of quality tools, focusing only on the PDCA cycle. Company "B", however, has the most developed area, using tools from the most simple and common to more complex statistical tools. It should be noted that in company "B", the FSC and Cerflor certifications implemented countless quality tools.

Whilst it is voluntary, good Forest Stewardship Certification is a reality today and will remain so in the future. Designed for the certification of raw wood material production means needed by the pulp and paper, sawmill, and furniture industries, by deploying the Cerflor industry certification, the organization will reap benefits which reflect in customer satisfaction and profits.

This study shows the limitations inherent to the research method adopted, that is, the results should not be generalized, but it is believed that they can contribute to a better understanding of the factors that exert influence on the quality improvement programs adopted in the companies.

The current study addressed only two companies. A possible extension is to repeat this survey in other organizations, so as to compare results. Another future project would be the application of the same

methodology in other countries, such as Portugal and Spain, in Europe, and in Chile and Argentina in South America, so as to compare nations from different continents.

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