



RESEARCH ARTICLE

OPEN ACCESS

PROACTIVE ENVIRONMENTAL MANAGEMENT, IN THE MACRO TECHNOLOGICAL AND MICRO TECHNOLOGICAL DEMANDS OF A COMPANY IN THE SOUTH OF CEARA – BRAZIL

*¹Franklin Gregorio Fernandes, ²Virginia Tomaz Machado, ²Marcelo Oliveira Feitosa, ³Fernando Antonio Portela Cunha, ⁴Joanacele Gorgonho Ribeiro Nóbrega and ¹Hugo André Coutinho Januário

¹Graduating in Bachelor of Administration, Faculdade Santa Maria, Cajazeiras, Paraíba, Brazil

²Teacher of the Administration course, Faculdade Santa Maria, Cajazeiras, Paraíba, Brazil

³Teacher of the Chemistry, Federal University of Campina Grande, Cajazeiras, Paraíba, Brazil

⁴Executive Coordinator of IMJOB - Maria José Batista Lacerda Institute, Paraíba, Brazil

ARTICLE INFO

Article History:

Received 17th March, 2019

Received in revised form

26th April, 2019

Accepted 03rd May, 2019

Published online 30th June, 2019

Key Words:

Proactivity, Environmental Management, Macro technology, Micro Technology.

ABSTRACT

This article exposes the dimensions of the term "technology", unfolding in the macro and micro concepts, with its products/processes, and in its technological capability of organization, with a focus on research and development, inserted in the context of companies, it is a case study, where they sought to understand the need to minimize the environmental impact with a proactive management. In this way, while the macro technology is indicative of systemic within the organization, the micro technology covers the technology introduced the products/processes. These concepts translate and allow profound reflections of operating methods in the field of the development of environmental management. This is an exploratory, descriptive, who used as an instrument to collect data a semi-structured questionnaire applied to a population of thirty-eight employees of a technology company. This study revealed in a preliminary manner a significant limitation of the company with respect to the conceptual elements and their application of micro technology and macro technology in the general context of research and development, leaving the desired efficiency of proactive actions under environmental, social and economic.

Copyright © 2019, Franklin Gregorio Fernandes et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Citation: Franklin Gregorio Fernandes, Virginia Tomaz Machado, Marcelo Oliveira Feitosa, 2019. "Proactive environmental management, in the macro technological and micro technological demands of a company in the south of ceara – Brazil", *International Journal of Development Research*, 09, (06), 28570-28574.

INTRODUCTION

Having as one of the consequences of the facets of organizational strategies the conscious use of technology for the benefit of the environment (micro technology), as well as the development of products that can benefit the organizational processes (macro technology), where the internal and external cooperation is essential in search of measurement parameters of a "output of the company", in seeking review of outcome for the decision-making assertive, as hillebrand; biemans (2004). In recent times the nature and technology are in different aspects, where the first suffers negative impacts of human development, already the second has advanced, constantly changing and accelerating into new frontiers of research.

Each day the professional, ethical and forms of coexistence with the environment, have suffered changes and adaptations, because the technology is a ground where it enables various nuances to live and mingle with both man and nature, this interaction, in a positive way forward is vital to perch and excesses of the world technological and environmental. Within the context of the they measured productivity in R&D (Research and Development) usually refers to activities of long-term and/or oriented to future, related to science and technology, using similar techniques when scientific method there is no pre-determined results, only hypotheses, but with general forecasts of some commercial benefit, which implies the differences between "research" and "development", in this context are included products, processes, systems, the environment and all relations with the community, as pointed out correctly Karlsson et al. (2004). Although impossible to schedule a technological innovation, due to the speed of processes, it may be possible to create means of absorption and

*Corresponding author: Franklin Gregorio Fernandes,

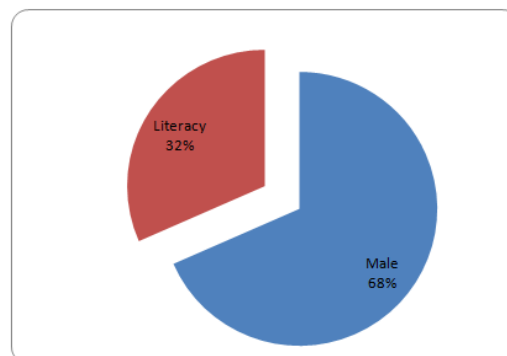
¹Graduating in Bachelor of Administration, Faculdade Santa Maria, Cajazeiras, Paraíba, Brazil

development of new knowledge within the organization, as well as the impacts of amendment of a technology inside and outside the company. Only the capability (technological capacity + ability) of an organization leads to constant work for the development of key technologies for products and processes within its market segment. Companies seeking to remain competitive or even survive and adjust to this new business environment, marked by difficulties, uncertainties, instabilities and rapid technological change, realize that, in the face of environmental management, demands new postures in their organizations and in order to operate their business. This new attitude implies continuous change, such changes should be managed internally through strategies and collective actions of an entire collaborative body headed by management. Before this, this paper seeks to analyze the vision of proactive environmental management front of the technological world in the company, focus essential for its development and growth in competitiveness. For this, it is vital to reflect on the priority in the use of equipment that bring less environmental impact (macro technology) arising from the productivity in R&D, including the need for a quality environmental management in the organization and observing the company services and cooperation of collaborators in the development of strategies for the technological and environmental issues, for the identification of the understanding about the importance of technology for the development of a favorable environmental management (micro technology). Due to the increase of users in accessing the innovative technologies, to be fundamental in terms of physical and legal, there is a real need to devise strategies for a good driving between the environment and technological purchases offered by the company (BARBIERI, 2007). The vision of an environmental management front of the technological management need to walk in a linear manner in positive actions for the company? For this purpose the cycling in conjunction that has both the profitability, as well as the environmental quality is a focus to be achieved and thus covering by all *stakeholders*. Having such an emphasis be axis in all economic sectors and technology, an effective environmental management. The capacity for technological innovation is a determining factor in the competitiveness of companies and constitutes one of the main causes that lead to the economic well-being, social and environmental development, this is a *Triple Bottom Line*, when used with fairness (Montgomery et al., 1997). These innovations will extend the dynamism of undertakings is a continuous process of technological development, being recognized as one of the greatest sources of economic growth. Thus, in order to maintain the levels of innovative activity, the company should invest in factors that elevate its capacity for innovation in research and development (R&D), so macro technology and micro technology (BECHEIKH, LANDRY AND AMARA, 2006).

MATERIALS AND METHODS

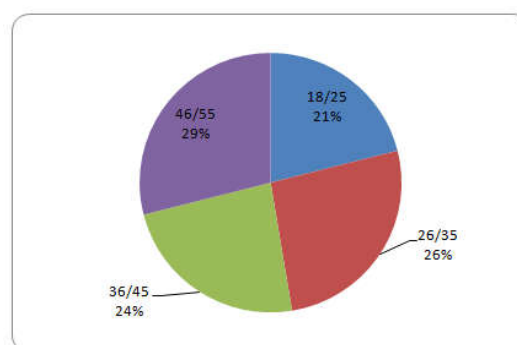
For an analysis of the vision of proactive environmental management front of the technological world shrouded the micro and macro processes of a company in the south of Ceara, with focus in need of P&D to your growth forward to competitiveness, this chapter has the objective to explain in detail the methodological procedures used in the preparation of this research, thereby providing a better understanding of the same. Thus, this research has in view that the work carried out by the researcher will contribute to further studies on the subject, having great relevance in the academic environment.

As well, after the conclusions, it will also provide the resolution possible practical problems encountered during the study in the company.



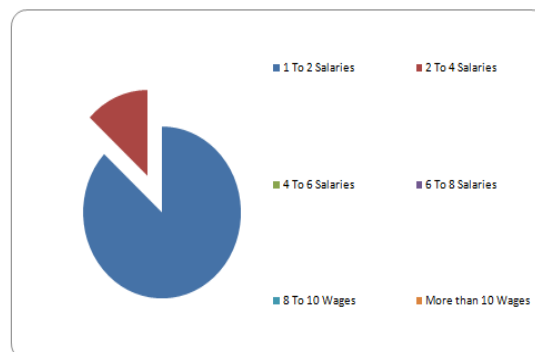
Source: Prepared by the authors (2019)

Chart 1. Gender



Source: Prepared by the authors (2019)

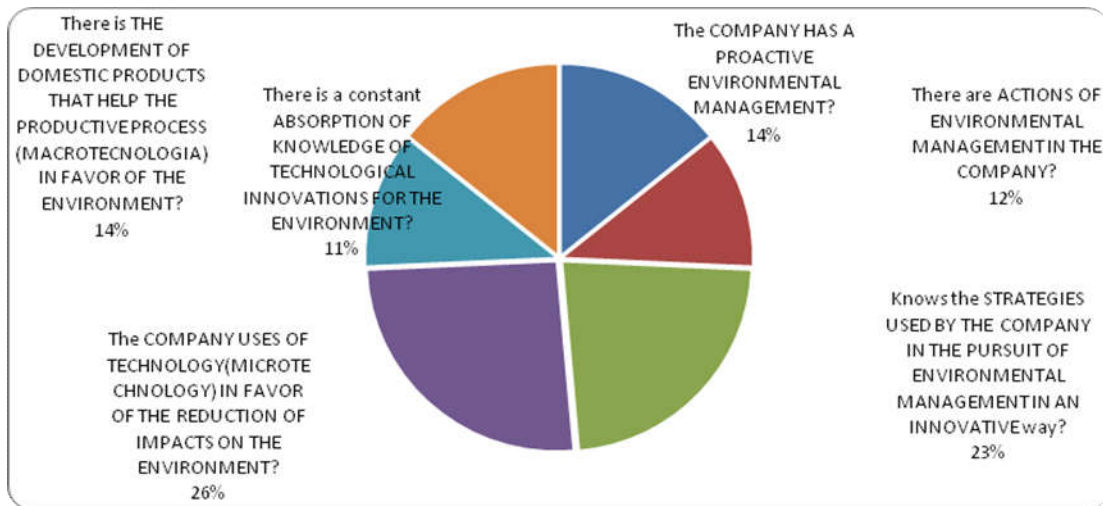
Chart 2. Age



Source: Prepared by the authors (2019)

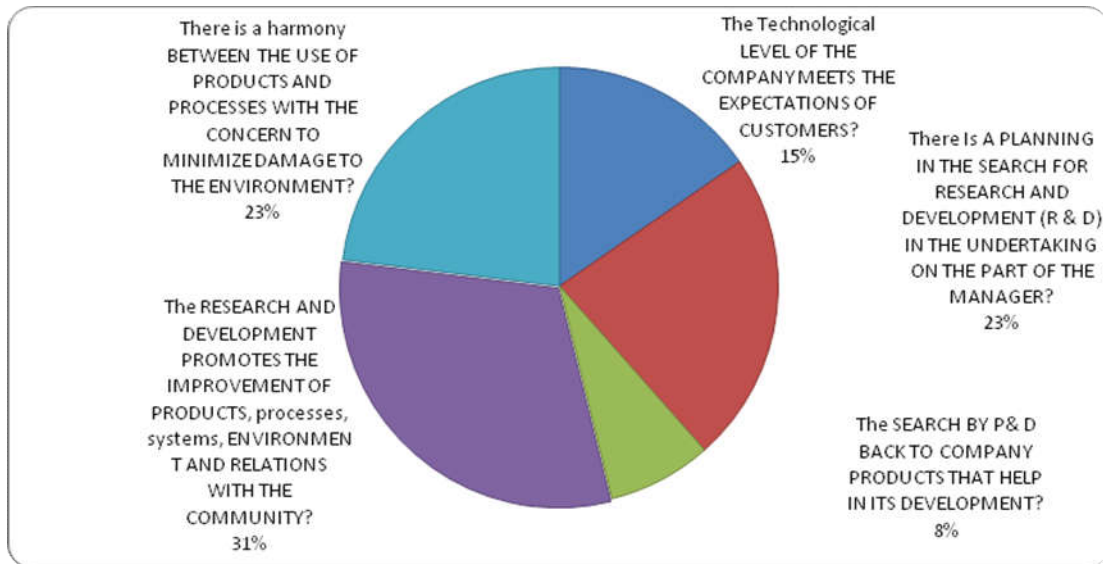
Chart 3. Monthly Income

With the intention of achieving the proposed objectives, we adopted an exploratory and descriptive approach, with characteristic of case study carried out in a company of technological follow inside the Ceara - Brazil. That as the proposition of scientific databases: Gil (2011) and Lakatos (2010), the study can be classified as a study of basic nature, generating new knowledge to the region, allowing practical application. Exploratory, because provided greater familiarity with the problem of environmental management, it was done a bibliographical study with research on sites and the source of that company studied. Descriptive, to investigate the characteristics of a given company. This type of criterion used standardized techniques of data collection, as questionnaire and systematic observation *in loco*, applied with the employees, covering a total population of 38, in the month of February 2019, in an attempt to disregard the satisfactory results to respond to the proposed objectives.



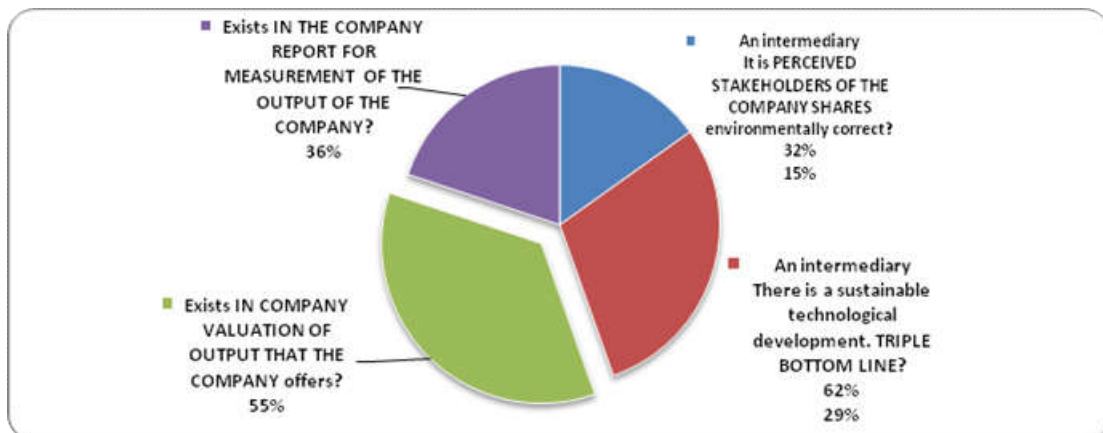
Source: Prepared by the authors (2019)

Chart 4. Review of company in respect to environmental technology in the processes



Source: Prepared by the authors (2019)

Chart 5. Importance of R&D in the company and the fruits of the same



Source: Prepared by the authors (2019)

Figure 6. Analyze the processes of output, environmental actions and strategies of the Triple Bottom Line of the company

The approach of a case study with qualitative and quantitative format, probabilistic, enabled the deeper knowledge of the factors and phenomena related to problematic, within an analysis of corporate environmental management, which in turn, sought to reflect in equipment (macro technology) which bring lower environmental impact with the measurement of productivity in P&D, observing the quality of services provided by the company and the cooperation of collaborators in the development of technological and environmental strategies (micro technology) integrated and favorable to the business environment. With this to minimize environmental impacts and social and economic rights, prioritizing a proactive environmental management and technology. The research was developed in the city of Aurora-EC, which is a Brazilian municipality located in the Southern region of the Cariri and is distant 466 kilometers from the capital of the capital Fortaleza. It occupies an area of approximately 885.827 km² and its população is 24,658 inhabitants, in the estimate of the IBGE (2010). Aurora has four districts, located in the rural area. Has a great incentive in the area of family agriculture, which is expanding along the livestock. The present study was conducted in a small company SEBRAE (2013), which provides services for 09 years at Aurora/EC, this has 38 employees and is highlighting in this sector since 2010, demonstrating quality in products and services performed, with concern for the well-being of the customer and the excellence of its services.

RESULTS AND DISCUSSION

This topic will have in its composition the demographic and socioeconomic aspects: those relating to the theme.

Socio demographic aspects: Participated in the survey thirty and eight employees of the company of technology, analyzing in Graph 1, in relation to sex, the prevalence of males (68%). The Graph 2 indicates that the age range was practically equal with predominance for 46 to 55 years (29%), followed by the age of 36 to 45 years (24%). In Graphic 3 shows the economic range of employees with a frequency equal to 87%, highlighting in 1 to 2 salaries. Being the variables of age, gender and monthly income, for the socio demographic. Put the environmental issues in a visible level is important for the company as a way of managing a proactive, tracing as well, guidelines, policies and strategies where the risks and environmental impacts will be assessed in its production processes and also in their products. However, obstacles arise in front of the development of environmental technologies, according to Hall And Vrendenburg (2003), is the belief that, hardly, the adoption of this, on the part of firms, will result in the generation of profits for the same. In Graph 5, it was observed that there is a priority for the understanding of the need for more research into the production and thus, the development of new technological spheres, or the improvement of which are already in use, in accordance with this thinking cites Nelson & Rosemberg (1994) where they mention that should exist in Brazil a culture that appreciate the realization of R&D activities in companies (SUTZ, 2000). Since this formula, the assessment of their needs, thus will perfect, researches, assuming a more granular focus, so that the process becomes necessary. These searches for more efficient production technologies help to expand the number of available tools used for the optimization of processes, in companies leading to collective gains and full.

The variables contained in the figure above clearly demonstrate that there is a context of transition in the company, for the issues of R&D, but so shy yet, i.e., 31% of employees believe in advancing with this phase of innovation for better interaction with the P&D in favor of the development of the company, covering the community and with it a greater support in that it offers, in terms of quality, innovation and minimization of environmental damage. In Graphic 6, when asked if employees had knowledge about the measurement of *output report's* company, 36% said that yes, and regarding the evaluative process 55% possessed the knowledge. As *stakeholders* with respect to environmentally correct actions only 15% claimed to have knowledge of these actions, and the strategies adopted by the company as the *Triple Bottom Line*, responded that 29% know about the sustainable technological development that is being mobilized and integrated the company in recent years. Since the process of transformation involves various activities which typically result in a complex system of different processing resources that invariably will consist in an output (output) or finished product. Nowadays, business competition, constantly changing the designs and patterns in Brazil of forms of know-how, thus, the care in managing social, environmental and economic that have responses to external and internal sectors of the company are vital for this remain on the market and meet the demands of its customers.

Final Considerations

The article brings an array of initiatives and problematizations on the recasting of the company forwards to the new technological challenges to the environment, i.e., its products and services offered are the "postcard" of the company, and these should be designed in a projection that has active responsibility with the environment, efficiency and effectiveness, that will not bring harm to both, either discard or during the use of these materials, thus, improving economic and commercial matters. The new technological trends that bring the strands of macro technology and micro technology emphasize a new attire for the branch of the company studied, but one of their questions mentioned above found that even the company with environmental issue engaged in suit proactively, for its employees there is no understanding, in its entirety, the paramount need to advance in R&D in its processes, configuring which in this sense everything is backed up in the long term and which do not comply to affirm a positive return, only a work of hipoteses, with this is to have a median perception at present. The company has a vision for the future within this bias, but there is still a long way to go, because I have not yet made concrete brings positive for your organization and administration in the present moment. The company seeks a proactive environmental management, but also observes mishaps, such as the strategic factor in understanding the requirements of the dimensions of the formalization of environmental issues, and specific budgets for environmental management, which has less emphasis, and on the analysis of technological innovations, it was observed that the same, still has a shy monitoring in technological innovations and look technological macro and technological micro processes.

REFERENCES

Arundel, A., Patel, P., Sirilli, G., Smith, K. 1997. The Future of Innovation Measurement in Europe: Concepts, Problems

- and Practical Directions. STEP Group OSLO, IDEA Paper Series No. 3.
- Barbieri, J. C. 2007. *Environmental management in companies: concepts, models and instruments*. 2 ed. and current and ampl. São Paulo: Saraiva.
- Becheikh, N., Landry, R., Amara, N. 2006. Lessons from innovation empirical studies in the manufacturing sector: A systematic review of the literature from 1993-2003. *Technovation*, Vol. 26, No. 5.
- Calabrese, A. 2012. Service productivity and service quality: the necessary trade-off?. *International Journal of Production Economics*, v. 135, n.2, p. 800-812.
- Charpentier, J.C. 2005. Process Intensification by miniaturization; *Chemical Engineering Technology* -28, No. 3.
- Disep, C. F. M. 2004. *Economic Environmental Law and ISO 14000: legal analysis of the model of environmental management and ISO 14001 certification*. São Paulo: magazine of the Courts.
- Fleury, A. C. C. 1978. *Organization of industrial work: a confrontation between theory and reality*. São Paulo, Thesis (Doctorate), Polytechnic School, University of São Paulo.
- Gil, A. C. 2011. *How to prepare research projects*. 5 ed. São Paulo: Atlas.
- Gomes, M. T. green that comes before the garden. *Examination*, ed. 608, year 29, n.9, p. 66-7, 24 Jan. 1996.
- Hall, J. 2003. Vrendenburg, H. The challenges of innovating for sustainable development. *MIT Sloan Management Review*, v. 45, n.1, p. 61-68.
- Hillebrand B., Biemans W. G. 2004. Links between internal and external cooperation in product development: an explorator y study. *Journal od Product Innovation Management*, v. 2, USA.
- Ibge. 2016. The Brazilian Institute of Geography and Statistics. 2010. Available in: <hppt://www.censo2010.ibge.gov.br/> Access in: 12 set.
- Karlsson, M., trygg, L., Elfstro B.O. 2004. Measuring R&D productivity: complementing the picture by focusing on research activities. *Technovation*, v. 24, p. 179-186, USA.
- Kerr, R. Hall, J. 2003. Innovation dynamics and environmental technologies: the emergence of fuel cell technology. *Journal of Cleaner Production*, v. 11, p. 459-471.
- Kruglianskas, I. 1996. *Making small and medium business competitive*. São Paulo Institute of Management Studies and Publishing Company.
- Lakatos, E.M., Marconi, M.A. 2010. *Foundations of scientific methodology*. 6.ed. São Paulo: Atlas.
- Lustosa, M. C. *Economy of the Environment: theory and practice*. Rio de Janeiro: Elsevier, 2003.
- Moura, L. A. 2003. *Environmental Economics: Management of costs and investment*. 2. ed. rev. and current. São Paulo: Juarez de Oliveira.
- Oliveira, M. 2001. *The cooperation of UFSCar with the external environment*. Dissertation (Thesis). Department of Production Engineering - Federal University of São Carlos. São Carlos, sep. 134 p.
- Roome, 1994. Nigel. Business strategy, R&D management and environmental imperatives. *R&D Management*, Vol. 24, No. 1, p. 65-82.
- Rosenberg, N., Nelson, R. American university and technical advance in industry. *Re-search Policy*, 23, p. 323-348, 1994.
- Schommer, P. C. 2007. Responsabilidade Socioambiental. (Development of didactic material or instructional - handout for discipline of MBA in Sustainable Regional Development - Distance Learning).
- Sebrae Nacional, 2019. The characteristics of family business. Available at: <https://SEBRAE.com.br/ sites/portalsebrae/artigos/ascharacteristias-de-negocios-familiares, 48e89 e66 5b1842410vgncvnc100000b272010arcrd>. Access in: 01 april.
- Seonez C. M., Angulo, A. I. 1999. *Manual de Gestión Medioambiental de la Company: environmental management systems, environmental audits, environmental impact evaluations and other strategies*. Madrid: Mundi-Press.
- Silva, J.C.T. 2003. Technology: new approaches, concepts, dimensions and management. *Production magazine- ABEPRO*, Porto Alegre, v. 13, n.1, p. 50-63. 2003. (ISSN 0103-6513)
- Sutz, J. 2000. The university-industry-government relations in Latin America. *Research Policy*. v.29, p.279-290, Feb. 17. The United Nations Organization (UNO). *Agenda 21*. Rio de Janeiro: CMMED,1992.
- Wheeler III., William A. 1992. The revival in reverse manufacturing. *Journal of Business Strategy*, Vol. 13, No. 4, p. 8-13, Jan./Feb
- Wolstenholme, 2003. The use of system dynamics as a tool for intermediate level technology evaluation: three case studies. *Journal of Engineering Technology Management*, v. 20, p. 193-204, UK.
