Universidade Federal Fluminense

ESCOLA DE ENGENHARIA

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UNIVERSIDADE FEDERAL FLUMINENSE

Doutorado em Sistemas de Gestão Sustentáveis

MSG UFF Mestrado Profissional em Sistemas de Gestão

MBAs • Extension Actions • Research Projetc

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Academic education for sustainability

1 LATEC
TEACHING, RESEARCH AND EXTENSION

OBJECTIVE

The mission of LATEC – Laboratory of Technology, Business Management and Environment is to be internationally acknowledged as a reference in teaching, research and extension of management for organizational sustainability, based on noble values to privilege the common GOOD.

Research studies involving management technologies are based on UN Agenda 21 and follow principles called Sustainable Development.

A relevant focus is the qualification and continuing education of leaders for Brazilian public and private organizations. Since 1994,it has been promoting the professional improvement of the most different professionals from different fields. LATEC is oriented by a renewed philosophical-systemic perspective that meets the requirements of a constantly and fast changing world, which requires a new profile for more dynamic and creative managers.
Citizenship teaching and practice is part of the values practiced in LATEC courses. Ethics, social responsibility and true interest for the human being are the bases for a systemic education that permeates our research, teaching and extension activities.

These actions are guided by the institutional commitment to educate high level professionals for management in several organizations, within an integrated and holistic vision.

LATEC has a center for advanced, interdisciplinary and supra-institutional research, linked to the School of Engineering of Fluminense Federal University, whose general objective is to disseminate the knowledge held in the University.

- Making the Fluminense Federal University an excellence center through university extension (continuing education and technical advice) and the study and research on several aspects involving Quality Management, Occupational Safety and Health, Environment, Social Responsibility and Sustainable Development, Innovation, Responsible Consumption, Knowledge Management and Project Management;
- Train full individuals at postgraduate, Lato and trictusensu, and Extension levels;
- Foment basic and applied research;
- Be an agent of change at technological, economic and social levels;
- Promote the social-economic context through extension activities.

OUR MISSION

Develop persons with skills in ethical and humanist management as well as technical skills, thus contributing to build a sustainable society.

VISION OF THE FUTURE

Be a reference in management teaching, learning and extension, with systemic and sustainable focus, training individuals responsible for their duties and rights.

VALUES

LATEC's fundamental values to embody all relevant actions and accomplish their Vision of the Future:

- Ethics in Relationships;
- Transparency in Management;
- Social Responsability;
- Respect to Humankind and to the Environment.

We are at the dawn of the new millennium and that brings us a series of counterpoints on several aspects of our lives. Today we are left adrift, subject to uncertainties, different from pats, the time of our parents and grandparents, when there, was certainty of a promising and worthy future.

That being said and attempting to decipher what was left to us, the need for change became urgent, the need to rethink paradigms, to balance our attitudes, and, with that, really place ourselves in this high tech future of digitalized communications, economic globalization, and regional mobilization of nations.

Getting to the future faster and at a reasonable cost is today the great challenge of all organizations. This challenge will value and clearly distinguish future-oriented organizations from those that will not resist today's existing barriers, by being apt to win any competitions, maintaining leadership in their market share, generating advantageous profits, increasing their clients' satisfaction and employees' real voluntary commitment.

For such, each organization shall seek their route and outline their strategy in order to keep present in the market and provide the company and its partners (employees and suppliers) with a competitive advantage against their competitors.

The outline of the new route and the definition of the new strategy to be adopted represent an important detachment from the past and the present; that is, how the effective renewal in management and production practices have been executed to date. That means we should adapt to the reality by adopting a new attitude, without however, being "anthropophagic" among ourselves. So we must learn to teach our partners (employees and suppliers) and must behave according to the new internal and external variables.

We understand that this is a huge challenge, because it means that, in other words, what the organization is today, in terms of market participation, does not guarantee its stability in the future. And that is why LATEC – Laboratory of Technology, Business Management and Environment, of the Fluminense Federal University Technological Center, is proposing a systematic set of actions aimed to assist organizations in their transition from the present into the future.

ORGANIZATIONAL SUSTAINABILITY

The management of organizations is becoming increasingly more systematic and requires a higher level of necessary creativity and multiple skills from their managers, to ensure their business survival.

To overcome the new challenges, organizations must internalize their sustainability criteria. Their operations must be adjusted to a new paradigm, based on a triple principle: the responsible use of

social, environmental and economic factors.
Quality Management, Environmental Management and Occupational Safety Management, now followed by Ethics, Transparency and Corporate Social Responsibility Management are included in the sustainability movement.

LINES OF RESEARCH, TEACHING AND EXTENSION

LATEC develops research studies applied to Occupational Health and Safety, Organizational Management, Knowledge Management, Innovation, Logistics, Decision Making Supporting Models, Conscious Consumption, Urban Solid Waste Management and Environment, Social Responsibility, Ethics, Diversity, Project Management and Transparency in Business, in an integrated way, focused on the updating of management and production technologies.
Research makes possible the diffusion of knowledge through papers, seminars and scientific work, as well as the support to qualification of undergraduate students.

LATEC works integrated with the most different sectors of society: NGOs, public and private entities, and the several teaching and researches institutions in Brazil and abroad.

NATIONAL SUPPORT NETWORK

Among the institutions which LATEC UFF keeps Inter-Institutional partnerships with, we can mention INMETRO – National Institute of Metrology, Quality and Technology; INPI – National Institute of Intellectual Propertyl / Academia Propriedade Intelectual (Master's Degree and Doctorate in Innovation and Intellectual Property), FIRJAN FIRJAN – Federação das Industrias do Estado do Rio de Janeiro, among others.

INTERNATIONAL SUPPORT NETWORK

The following international partnerships represent the support and experience sharing network through the exchange of professors and students, as well as joint research studies.

- World Sustainable Development Research and Transfer Centre – WSD RTC;
- Hamburg University of Applied Sciences, LohbrüggerKirchstr, 65, Hamburg Germany;
- Faculdade de Ciências e Tecnologia, Universidade de Coimbra, Portugal;
- Civil , Architetural, and Environmental Engineering;
- The University of Texas in Austin, USA;
- FEUP Faculdade de Engenharia, Universidade do Porto, Portugal;
- Università di Roma "Tor Vergata";
- Dottorato di Ricerca in Ingegneriadell´Impresa;
- SRRNET Social Responsability Research Network, UK;
- Montfort University, Leicester, UK;
- Universidad de Buenos Aires, Facultad de Ciencias Económicas, Buenos Aires, Argentina;
- Universidade do Minho, Portugal, Campus de Guimarães, Engenharia de Produção e Sistemas;
- Escuela Superior de Ingenieros, Universidad de Sevilla;
- World Sustainable Development Research and Transfer Centre – WSD RTC;

SCIENTIFIC JOURNALS

We are responsible for managing some important scientific journals of Organizational Management qualified on Qualis CAPES.

The Systems & Management journal (ISSN: 1980–5160), created in 2006, is aimed at the development and dissemination of knowledge through the publication of scientific papers. The journal is indexed at DOAJ (Directory of Open Access Journal) and its publications are recorded and numbered through The DOI (Digital Identification System for Intellectual Property) system.

The Brazilian Journal of Operations & Production Management (BJO&PM) publishes research studies at the forefront of management disciplines in every aspect of operation and production for those concerned with management of systems, whether in academic institutions or industry.

SCIENTIFIC EVENTS

LATEC, in partnership with different national and international renowned organizations annually promotes scientific events, potentiating the sharing of created knowledge and exchange of experiences among professors, professionals and researchers from Brazil and from abroad.

- ***National Congress of Excellence in Management & INOVARSE – Innovation in Social Responsibility.***

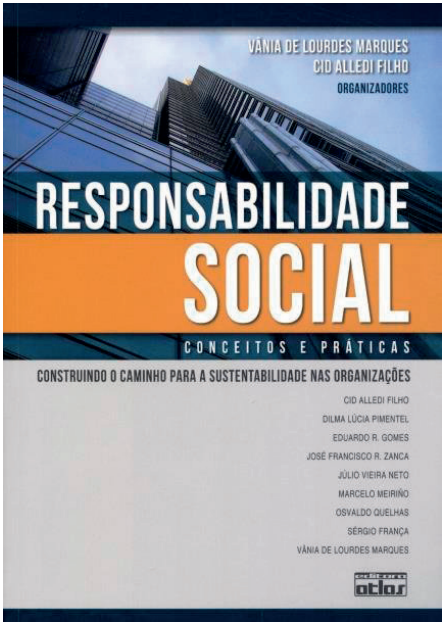
Since the first edition, the CNEG & INOVARSE have dedicated to foment scientific dialogue and production on management and organizational sustainability. The events promote the diffusion and integration of knowledge through lectures, workshops, presentations of scientific works and mini-courses, among other activities.

The initiative for the CNEG & INOVARSE comes from the latent demand from corporate and academic environments, in need ofexchange of theoretical and practical knowledge in Organizational Management, Social Responsibility, Sustainability, Clean Technologies, Risk Management, among others.

BOOKS

LATEC's principle is to promote the knowledge produced in the fields through the continuous publication of works. They are:

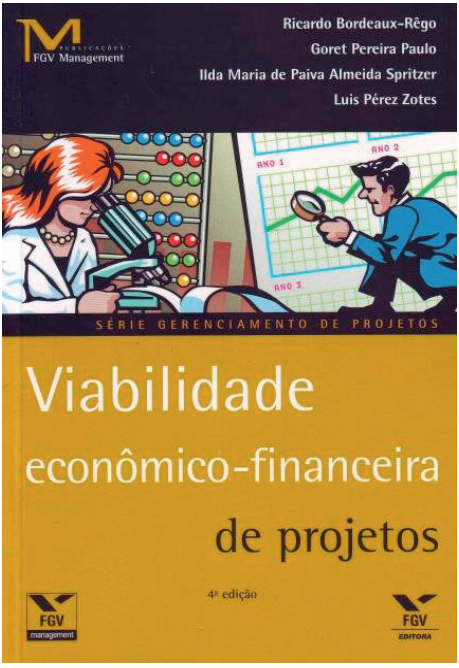
Jabuti Prize Winner



Responsabilidade Social Organizacional

Modelos, experiências e inovações

Organização: Osvaldo L. G. Quelhas, Marcelo J. Meiriño, Sergio L. B. França e Cid Alledi.



Transformação Organizacional

para a Sustentabilidade

Organização: Osvaldo L. G. Quelhas, Marcelo J. Meiriño, Sergio L. B. França e Cid Alledi Filho.

Benício Biz

LATEC'S SOCIAL RESPONSIBILITY

LATEC's social responsibility starts with practices of relations with collaborators, which include the commitment to the development of the person's potentials, aiming at social, personal and professional development. LATEC developed, through its Coordination, a Code of Ethics for collaborators and professors, applied to their activities.

LATEC, considering the need to promote activities associated with social responsibility, identified the public for the application of social responsibility actions: it developed the "Education for Prevention of Accidents involving Children" project. The project is developed in public schools of Niterói, offering children, parents or guardians and to teachers the opportunity to improve their capacity to identify accident risks in areas used by children.

Other activities classified as social responsibility activities are equally executed. One of them is the adoption of charity institutions to donate food and clothes that are raised by the action of post-graduate students. LATEC Coordination foments this type of citizenship actions, like, for example, the Cycle of Conferences on Sustainability. The Cycle of Conferences on Sustainability was created by LATEC in order to strengthen the relationship between society and university, so that, together, they can form a permanent discussion forum on contemporary themes. Enrollment in conferences is free of charge and participants are requested to donate 1 kg of non-perishable food, except for salt, which is automatically donated to a charity institution. With that, we believe we are contributing to a better education level and to the dissemination of knowledge, thus contributing to the social role of universities in society


Escola
de
Engenharia

2 MASTER'S DEGREE
IN MANAGEMENT SYSTEMS

STRICTO SENSU PROGRAM FOR MANAGEMENT SYSTEMS

The Master's degree in Management Systems (MSG) was created to host a multidisciplinary and supra-institutional research center. The program is linked to the Production Engineering Department of the Fluminense Federal University (UFF) School of Engineering and relies on a diversified group of researchers/professors comprising of lawyers, anthropologists, biologists, social scientists, engineers, economists, psychologists and physicians, among others.

The focus of the management development process, promoted by the MSG, is to make the professional reflect on the most appropriate organizational model to achieve the expected business results by, emphasizing the concerns about the humanization of the organization, in order to ensure a safe production process and guarantee assets/patrimony and an excellent environment as well.

The MSG teaching emphasizes the development and improvement of management thinking with focus on the quality of corporate results, occupational safety and health, as well as the provision of basic guidelines to implement efficient actions with regard to environmental aspects of organizations. In short, the central theme of this program is the development of research applied to management methodologies based on Sustainable Development principles.

Founded in 1999, the program has already graduated 1,278 professionals linked to the development of corporate management, emphasizing activities associated to social, environmental and economic responsibility.

OBJECTIVE

The objective of the MSG is to develop research applied to sustainable business management models, aiming at the graduation of professionals with skills and intellectual competencies to exercise business management in free enterprise, with insertion in public service and other organizations.

The MSG expects to receive, as students, professionals from different areas who perform or intend to perform management activities and advice in organizations, based on the transmission of solid knowledge on Business Management. Such focus is obtained through the integration of the study fields of the program (Total Quality Management, Environmental Management and Occupational Safety Management), which provides contact with the most recent management technologies for the students.
The flexibility offered by the MSG program represents a relevant differential, considering the several options of disciplines and hours, which meets the "school-work market" feedback system, making participants fit to face an increasingly competitive environment.

VALUES

The Professional Master's Degree in Management Systems was structured grounded on the following values:

- Man is an inexhaustible source of possibilities;
- Teaching transforms Man into a civic and more human being, both master and apprentice;
- The illiterate of today and the illiterate of tomorrow will not be just the one who can't read and write, but mainly the one who won't learn to learn;
- Working provides the evolutionary growth of participants, making them collaborative and cooperative;
- The current world is a large global village;
- Change is the most constant fact in our lives;

- Ethics, reason, and companionship are the main objectives to be achieved;
- The solution to meet human needs involves social-technical and economic aspects, and requires a systemic and transdisciplinary approach;
- The approach grounded on sustainable development concepts is the basis for the development of theses and the complete researched, developed and diffused knowledge in the central core of ideas that justify the MSG.

CONTENT

The MSG is directed to professionals that exercise or are developing themselves to lead change processes, aiming at excellence in the management of organizations

The MSG will support the development of a comprehensive and systemic practical/ethical/humanist visions of management technologies as fundamental vectors to the social-economic and sustainable development of state-owned and private organizations. The program is also intended to qualify professionals so that they will use a set of useful techniques and tools in the analysis/assessment of decision making processes involving the most different aspects of organizational management.

So, the MSG aims at:

- Studying the main methodological mechanisms and instruments to assist in the preparation, analysis and assessment of plans and projects for management systems within a leadership and analysis of decision making contexts;
- Dealing with the problems of organizational management from a comprehensive perspective, seeking to establish outlines that will result in a strategic planning approach to self-sustainable development;
- Analyzing/diagnosing current status of organizations, raising/defining excellence references and proposing solutions, by taking into account safety, environment and quality of the result required by the current competitive and demanding environment;
- Dealing with management issues of organizations from a philosophical conception, based on concept of interactivity and society development;

- Discussing themes that are essential to the contemporary world, like safety, environment, ethics, humanist values in organizations, energy consumption, "cleaner production", given its unequivocal interference with the quality of life of society;

- Analyzing management models that integrate focus into the quality of organizational results in terms of safety and environment;

- Discussing prospection techniques for the development of economic and financial scenarios, the field of expected changes, opportunities and threats in environments inside and outside Brazil, while using instruments as a way to make the necessary investments to face the challenges imposed to the country feasible;

- Developing qualitative and quantitative methods to support organizational decisions that comply with Sustainable Development principles;

- Discussing and developing practices/concepts on:
  - Interpersonal communications;
  - Evolution of production and management systems;
  - People management;
  - Essential competencies for the manager;
  - Organizational architecture;
  - Management of conflicts and negotiations;;
  - Finance;
  - Ethics in the business and social responsibility of organizations;
  - Technologies to support decision making;
  - Marketing;
  - Logistics and Relations managent;
  - Communications.

PROGRAM STRUCTURE

The Professional Master's Degree in Management Systems comprises two categories of disciplines: common disciplines (to all lines of research), which must be attended regardless of the line of research chosen by the applicant; and specific disciplines for each line of research, chosen by the coordinator of the program according to the profile of the class

Common disciplines:

- Strategic administration
- Statistics applied to management systems
- Scientific methodology
- Management systems
- Special topics – Research techniques

Total Quality System Management

- Strategic Marketing Administration
- Public administration
- Ethics and Social Responsibility
- Corporate finance
- Human resources management in contemporary organizations
- Knowledge management
- Total product management
- Corporate logistics
- Information Technology

Environment Management Systems at Work Environment and Safety

- Modern Administration of Workplace safety
- Analysis of Product Life Cycle
- Risk Analysis Process
- IEnvironmental Assessment Impact – AIA
- Complexity of Interinstitutional Relations
- Energy conservation
- Environmental Law
- Environmental Economics
- Fire Engineering
- Ergonomics
- Occupational Hygiene and Health Management
- The environment and work diseases
- Work Psychology
- Environmental Risks
- Techniques and Equipment for Exit Control
- Special Topics in Environment
- Special Topics in Occupational Safety

Social Responsibility and Sustainability Management System

- Certifications and social indicators
- Preparation and implantation of corporate social responsibility programs
- Corporate governance and social responsibility
- Social responsibility projects: Preparation, implementation and assessment
- Social responsibility and Social issues
- Social responsibility in Brazil
- Social responsibility: concept and organizational practice

FIELD OF STUDY AND LINES OF RESEARCH

Field of study: **ORGANIZATION & STRATEGY**

Lines of Research	Research Projects
Total Quality Management System	-Studies, Models and Practices of Knowledge Management, People and Innovation - Supply chain and logistics investigations, methods and tools - Studies and practices in integrated innovation management and technology transfer mechanisms - Research, Development and Applications in Quality Management in Public, Private and Third Sector Organizations - Multicriteria Assessment and Decision in Corporate Environments - Research and Decision Support in Risk Management, Maintenance, Safety and Industrial Environment - Methodological Proposals oriented to Organizational Development within the Strategic Perspective, based on the new results measurement models
Environment and Occupational Safety Management System	- Investigations, Methods and Tools in Natural Resource Management - Studies, Preparations and Applications of Risk Management in Process, Safety and Environment - Research and Development of Practices at Work, Health and Education - Studies and Practices in Lean Production Systems for Manufacturing and Service - Release of metals from sediments in dredging operations of Anaerobic Environments
Social Responsibility and Sustainability Management System	- Investigations and Mechanisms for Social Responsibility Management, Corporate Governance and Sustainability - Studies, Development and Applications in Strategies for Organizational Sustainability - Sustainability Study in Brazilian Organizations: Relationship with Stakeholders. - Paths to sustainability: Development of organizational learning through processes and practices of Social Responsibility and Knowledge Management

3 DOCTORATE PROGRAM IN SUSTAINABLE MANAGEMENT SYSTEMS

PROGRAM PRESENTATION

Doutorado em Sistemas de Gestão Sustentáveis

The Doctorate Program in Sustainable Management Systems is the natural evolution of professional, academic and team work competencies for professors that are members of the Professional Master's Degree Course in Management Systems. Professors have formed together, since 2000, an interdisciplinary research team at School of Engineering at the Fluminense Federal University. From 2000 to July 2012, around 800 research studies on issues inherent to sustainability in social, economic and environmental aspects were carried out, among which, 285 research studies were developed on sustainability. Due to the nature of the sustainable development theme and complexities involved in the application in the management of public, private and third sector organizations, the group of professors evolved to research, teaching and guidance competencies, chiefly linked to interdisciplinarity.

The obtention of grade "4" in the Professional Master's Degree in Management Systems, by the end of triennium 2010 to 2012 (CAPES MEC Ordinance 1077, of 08/31/2012, DOU 09/13/2012), motivated the group of professors who form the master's degree staff of researchers, to sight the perspective on discussing of a proposal to create a Doctorate program in the interdisciplinary area of CAPES.

In 2013, the Post-graduation Program had its doctorate program approved by UFF (CUV decision number 036/2013) and the respective acknowledgement by CAPES (Approval letter number 264-28/2013/CTC/CAAIII/CGAA/DAVCAPES of December 17, 2013), having started its academic activities in the second semester of 2014, with the opening of the 1st Public Notice of Selection.

In this regard, the Doctorate in Sustainable Management Systems is

the result of the natural evolution of academic, extension and research competences of professors from the Post-graduation Stricto Sensu Professional Master's Degree in Management Systems, working in an interdepartment way, with professors from different backgrounds (exact sciences, applied social sciences, social sciences, Earth science), among other areas, from different teaching units of the University.

The course is intended to emphasize the researcher's scientific development; it is grounded on solid scientific, technological, pedagogical and humanist principles that will permit them to exercise their roles in a conscious, responsible, analytical and efficient way, with social projection, providing investigative conditions to form knowledge disseminators in the pedagogical and technological fields, within the national educational system.

The "interdisciplinary course", to be delivered with the experience acquired through the compulsory and optional disciplines of the Doctorate in Sustainable Management Systems, will promote the development of the integration of individual thinking with the systemic approach in research, liberating the doctorate student from the premises, methods and rules of a specific academic discipline or professional group. The objective is to catalyze a potentially inclined vision for the generation of innovative ideas to solve problems.

OBJECTIVES

- Developing in-depth studies on the Management System theme, including Sustainable Development premises;
- Qualitying high-level professionals for the exercise of teaching, research and extension, through the development of knowledge according to the interdisciplinary nature of the Doctorate;
- Disseminating knowledge in the field based on the close articulation among fields of science and those of management, through accredited vehicles for publications in interdisciplinary areas;
- Graduating doctors to meet the strong global marketing and academic demands for professors and researchers, with interdisciplinary approach in Science and Management fields;

- Enabling egress students to develop research and exercise higher education teaching in Management, Science and other subjects related to them.

Moreover, egresse students will also be apt to:

- Assess the anthropic influence in science approaches and in those related to social-environmental and organizational management;
- Characterize, quantitatively and qualitatively, social-environmental systems and processes;
- Analyze and represent social--environmental processes using cognitive and mathematic models;
- Plan and develop management systems aiming at sustainable development;
- Plan and implement energy efficiency, natural resources and social-environmental diversity conservation strategies.

EGRESS STUDENT PROFILE

The profile of the future egress student will involve the proposal for academic demands, job market demands and higher qualification requirements in new fields of knowledge associated with sustainability. Regarding market and the needs of institutions, one concludes that it is necessary to promote the graduation of qualified professionals to deal with new technologies, languages, people, products and processes, among others. In order to meet these new demands, professionals become motivated, through post-graduation (attending a doctorate program), to seek achievements in several ambits, such as: the material ambit, through means of qualification in the professional field; the academic ambit, by acquiring knowledge; or even the personal achievement ambit and/or social status and returning to the job market ambit. The egress student will live academic experiences not directly associated with the academic experience he/she had during under-graduation. The egress student is expected to visualize a phenomenon from different angles, and also the understanding that one knowledge perspective is not inherently superior to any other. The result of the Doctorate in Sustainable Management Systems is expected to provide advantages in terms of aggregation of integrating knowledge and development of systemic competencies, highly

valued in the job market and in the academy, the society of knowledge.

Grounded on the program proposals, researchers are graduated prepared to offer results that will impact sustainability, with relevant impacts on society – companies, third sector, governments, social projects, regional development – and on the development of new frontiers for state-of-the-art science associated with organizational management, according to sustainable development premises.

The professional will be generalist, critical, ethical and holder of appropriate theoretical background in contemporary problems, enabling him/her to:

1) Act in the applied sciences field, developing studies and research on Science and Technology;

2) Present creativity and leadership to apply the scientific method, guided by sustainability principles and to act in the job market, with focus on the investigation and implementation of new technologies;

3) Develop innovative ideas and strategic actions to expand his/her area of work from the sustainability perspective;

4) Rely on humanist , entrepreneurial and innovative education, enabling its application to solve social problems society and contributing to the country's technological, scientific and social development;

5) Act on multi-professional and inter-professional teams in the different fields of science and technology, in order to identify, analyze and solve problems in the area, applying ethical and scientific principles;

6) Act in multidisciplinary teams in an integrated way (by supervising, planning, coordinating or executing at a higher level of complexity) in inter-disciplinary partnerships with other academic programs, as well as with public and private management agencies and environmental and regulatory agencies.

The Doctorate in Sustainable Management Systems also meets the academy and the market demands, chiefly those from the following regional and national partners:

National Institute of Metrology, Quality and Technology (Inmetro); Petrobras University; Petrobras Gas and Energy; FUNDACENTRO / Ministry of Labor; IBP – Brazilian Institute of Oil, Gas and Biofuels; INPI–National Institute of Intellectual Property / INPI Academy (Master's Degree and Doctorate in Innovation and Intellectual Property); CNEN – National Commission of Nuclear Energy; CEFET / RJ; IFF – FIELDS; TJERJ – Court of Justice of the State of Rio de Janeiro; AMBEV; ENEL – Electric Power Distribution Company; Bank of Brazil; BNDES; BRASCAN; Daimler Chrysler from Brazil; ELETROBRÁS; EMBRATEL; American stores; Ministry of Labor and Employment; Sergen; Shell; Siemens; South America; LIVE; Telemar; UFRJ; Unimed; VALLEY; CNO – Norberto Odebrecht Construction Company; BP British Petroleum; among others.

TARGET PUBLIC

The doctorate program is offered to professionals with full graduation and Master's Degree who meet the selection criteria and are apt to act as researchers capable of accomplishing scientific and technological innovations; professors at higher education levels or qualified professionals to create instruments for codification, formal capture, incorporation and dissemination of qualitative and quantitative Decision Models in organizations and in society.

PREMISES

The program is grounded on the following guiding principles:

1. Scientific and humanist, entrepreneurial and innovative qualification to solve social problems with intelligent learning;

2. Creativity and leadership to subsidize scientific, technological and innovative development aiming at sustainability;

3. Interdisciplinary and integrated actions with interdisciplinary partnerships and a permanent awareness of social responsibility by the graduated professional;

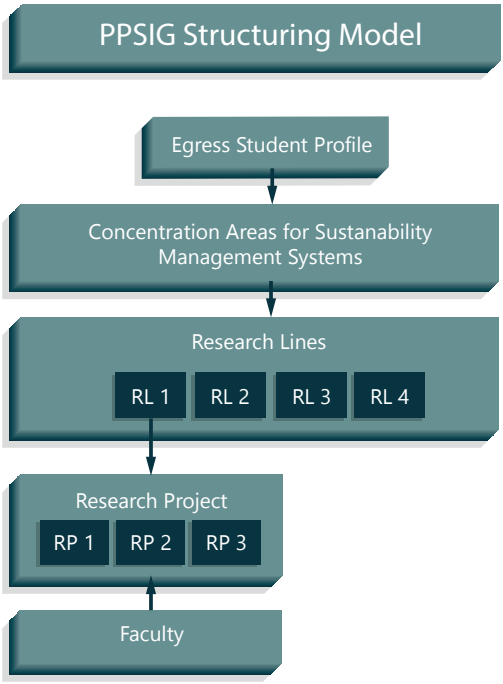
4. Knowledge, solution and improvement of integrated sustainable technologies, acting as the main protagonist of the integrated and sustainable development process;

5. Promotion of reflections on the role of clean technologies in society and in the development process itself;

6. Offer of a set of activities, of interdisciplinary nature, graduating new Doctors, who are oriented to research, teaching and professional practices in organizational sustainability management.

The Doctorate in Sustainable Management Systems meets a demand from society, particularly the regional society, in the State of Rio de Janeiro. The main companies engaged in the research, extraction and commercialization of oil, gas and biofuelsare are headquartered in this state. This economic activity requires professionals with higher education compatible with international performance. No other institution in the state of Rio de Janeiro provides this type of graduation course based on interdisciplinary research, as the one offered by the Doctorate in Sustainable Management Systems.

The interdisciplinarity logic behind shaping compulsory and optional research projects and disciplines, is based on the assumption that both, basic research and applied research may integrate the historically fragmented disciplinary knowledge and solve complex social problems.



PROGRAM STRUCTURE

The Doctorate Program in Sustainable Management Systems comprises disciplines and academic activities organized in academic semesters to ensure options and flexibility of the student work plan.

The program disciplines, regardless of being theoretical or practical, are classified as compulsory or optional. Compulsory disciplines are basic, and are offered in one single field of study, thus conferring unity to the course. Optional disciplines complement the students training with specialized knowledge.

Compulsory disciplines

– Research activity I and II
– Thesis seminar
– Research seminar on interdisciplinarity
– Interdisciplinarity in sustainable management

Common optional disciplines

– Innovation and sustainable technology
– Research planning on interdisciplinarity
– Computational modeling in sustainable systems
– Indicators system applied to sustainable management
– Teaching internship I and II
– Special topics in sustainable management systems I to VI

Optional disciplines per line of research

· Line of research on sustainable organizations' management

– Introduction to complex thinking-sustainable management systems
–strategic environmental assessment
– Public financing and sustainability
– Social responsibility and social issues
– Intercultural management and social responsibility
– Integrated management system for quality, environment, occupational health and safety
– Strategic thinking, corporate anthropology and prospective scenario in one environment
– Special topics in sustainable organizations' management I and II

· Line of research on technologies applied to sustainable organizations

– Energy generation processes and sustainability
– Development of sustainable prod–

ucts
– Clean technologies: technical and economic feasibility
– Computational modeling in sustainable systems
– Product life cycle management
– Energy resources in sustainability
– Special topics in technologies applied to sustainable organizations I and II

· *Line of research in decision support in sustainable organizations*
– Decision processes in sustainable organizations
– Operational research on sustainable organizations
– Integrated risk management
– Economic and financial feasibility in socio-environmental projects
– Preparation and management of sustainable projects
– Special topics in decision support in sustainable organizations I and II

LINES OF RESEARCH

The threeproposed lines of research seek to be relevant and consistent with the institutional context, the program proposal, and the academic production profile of the faculty, in order to be consolidated through interdisciplinary research activities in the field.

Such aspect aims at strengthening and contributing to the interdisciplinary work to consolidate the field of study through scientific and intellectual production of the faculty of Management Systems, oriented to the three lines of research.

The Doctorate Program in Sustainable Management Systems (PPSIG) aims to train qualified human resources, at the doctorate level, through interdisciplinary research on themes involving Science, Technology and Management. It is organized in order to act as network with society to, in addition to its teaching and research assignments, establish actions to support economic, social, scientific and cultural development of the community, at regional and national levels. The purpose is to program, coordinate and execute interdisciplinary scientific and technological research activities. Moreover, the objective is to graduate researchers capable of reflecting on the sustainability thematic in the corporate ambit, in government actions and third sector, to build concepts and positions in face of today's reality.

Field of study: Sustainability Management Systems

Lines of Research	Research Projects
Sustainable Organizations Management	1. Studies, Development and Applications in Strategies for Organizational Sustainability 2. Studies and Practices in Integrated Management of Innovation and Technology Transfer Mechanisms 3. Studies, Models and Practices for Knowledge, People and Innovation Management 4. Sustainability Study in Brazilian Organizations: Relationship with Stakeholders 5. Investigations and Mechanisms for Social Responsibility Management, Corporate Governance and Sustainability 6. Methodological proposals oriented to organizational development within the strategic perspective based on the new results of measurement models
Applied Technologies for Sustainable Organizations	1. Development of processes for power generation from biogas 2. Studies and Practices in Lean Production Systems for Manufacturing and Service 3. Investigations, Methods and Tools in Natural Resource Management 4. Release of metals from sediment in anaerobic dredging operations 5. Research, development and study of the technical and economic feasibility of new technologies for clean energy generation
Decision Support in Sustainable Organizations	1. Research and Decision Support in Risk Management, Maintenance, Safety and Industrial Environment 2. Multicriteria Assessment and Decision in Corporate Environments 3. Eco-efficiency assessment through Data Envelopment Analysis models in the LCA + DEA approach 4. Study and development of Multiobjective and Target Programming models in Data Envelopment Analysis (DEA) and Life Cycle Assessment (LCA) integration models

ABOUT THE LINES OF RESEARCH

Sustainable organizations management

The line of research aims to develop studies to form strategies in different organizations, with focus on process, influence of social and organizational culture and knowledge management. It is intended to diagnose the best social, economic, political, cultural and environmental practices to promote the development of management models in organizations and public, private and third sector projects.

Management models are duly supported by the application of principles of strategic management of persons, production and systems management. Research studies on the management of sustainable organizations will consider current paradigms like organizational ethics, good governance practices, transparency and social responsibility. The incorporation of innovation in practices and decisions and the adoption of indicators of social, cultural, environmental and economic results will be required to assess the organizational global performance.

Applied technologies for sustainable organizations

Considering the current models and mechanisms for clean, socially responsible and ethical development, the line of research aims to apply sustainable technologies in organizational environments that demand constant technological innovations. For such, it will be necessary to identify and develop technologies to encourage the assessment of relations among science, technology, competitiveness and cooperation in all publics of interest. In the research on innovative technologies concepts and methods of life cycle assessment, energy efficiency, eco-efficiency analysis in manufacturing and services, environmental labeling, clean development mechanisms, ethics and human rights will be considered.

To diagnose possibilities for the development of organizational and

technological options to contribute as potential inducers of socio-economic, political and environmental variables in the evolution of technologies and organizations.

Decision support in sustainable organizations

This line of research is characterized by the development and application of models and methods to support decision making in sustainable management systems in public, private and third sector organizations based on qualitative or quantitative data. Aspects like Design and Ergonomics, Quality, Environment, Social Responsibility, Public Policies, Energy Efficiency, Eco-efficiency in production, Occupational Health and Safety, among others, are strongly considered. To create knowledge for a society where there is a need for qualified and differentiated models and structures to support organizational decisions, associated with Engineering, Applied Social Sciences and Human Sciences. This line also aims at the qualification of human resources professionals to act and understand reality and future demands.

4 MBAS/ SPECIALIZATION

MBA in Advanced Management Development with emphasis on:

- Lean Six Sigma production

Prepares professionals to implement the Lean Six Sigma methodoligy aiming to improve process performances, connecting significant strategies, objectives and indicators to contribute to corporate full potential. The qualification in techniques to reduce process variability stands out among other secondary objectives;

- Building and sustainability management

The student will learn varied techniques, methodologies and technologies to enable him/her to project, manage and assess buildings and their social-environmental impacts;

- People management

Prepares the professional to coordinate and/or act in multidisciplinary groups, as well as manage people with different specialization levels and integrate professionals and knowledge aiming at the success of the company or organization;

- Health care management

Professionals will develop contemporary management competencies and techniques to identify solutions to administrative problems in the healthcare area;

- Energy management and energy efficiency

Enables professionals to prepare planning, control and development of energy efficiency programs, consultancies and audits;

- Innovation management and entrepreneurship;

Provides participants with indispensable knowledge for the complete understanding of issues associated with organizational development, innovation management and their implications in competitiveness.

MBA in Sustainable business management:

Provides the professional with strong experience in social-environmental management techniques while giving him/her technical skills for assessments and businesses aiming to meet the growing market demands for managers aligned with global concerns.

Specialization in Production Engineering:

Prepares professionals to develop competencies in advanced techniques of production engineering, while expanding the professional development in production planning, operation and control activities, qualifying human resources to exercise management roles.

MBA in Total Quality Management

Develops and disseminates up-to-date Management concepts: Systemic view integrating total quality, management system integration, corporate social responsibility and ethics. Provides professionals with knowledge for management practices in public and private organizations. Forms leaders conscious of their civic, technical and ethical/humanist duties to society.

MBA in Advanced finance management:

Prepares professionals to manage corporate finances with complete understanding of market structures and operations, permitting reduction of capital, production, and risk costs.

MBA in Strategic management of production and maintenance:

Prepares the professional for the globalized market demands and the current technological environment, which require the compatible and

harmonized maintenance production goals to reach higher levels of competitiveness.

Specialization in Occupational safety engineering:

Qualifies professionals to intervene in the production processes in industries and companies, making them able to project, develop and implant quality, productivity improvement, operational safety and environmental management programs.

IMPROVEMENT COURSES

In addition to the courses above, other courses are developed to meet specific needs of private and public organizations.

These courses have two basic objectives within our strategy to assist organizations in becoming more competitive in the market. The first objective is internal, that is, is one of the chief elements in our action with organizations when we are providing consultancy. The second objective is to make it possible for the external environment to professionally recycle, that is, self-employed professionals or other professionals can rely on a forum to receive qualification on current main subjects in the new order of the business world. Improvement courses can be taken in two ways, one of them is 'in city', that is, a location pre-established by the Laboratory, and the other, exclusive to organizations, that is, the course is administered at the participants' workplace.

5 SUPPLEMENTARY ACTIVITIES

LATEC organizes several academic and professional extracurricular activities such as: conferences, seminars, lectures, organizational consultancies, technical visits to companies with focus on all the management aspects in private and public organizations. The prevailing focus on organizational management is based on sustainable development principles

RESEARCH ON MANAGEMENT ACTIVITIES

Research, advice, and consultancy in management work represent one of the direct results of the knowledge developed by LATEC. It is prepared by professors along with professionals and researchers from the Professional Master's Degree in Management Systems and Doctorate in Sustainable Management Systems. This activity center aims to develop applied research, presenting new proposals and solutions in the organizational management process. This will provide higher qualification of the national production with optimization of processes and improvement of quality of the provided services, contributing to making the implantation of a sustainable management model in private and public organizations a reality.

The Triple Helix, University – Industry – Government, Relations provides knowledge developement based on applied research in order to solve management problems and contribute to the development of society as a whole.

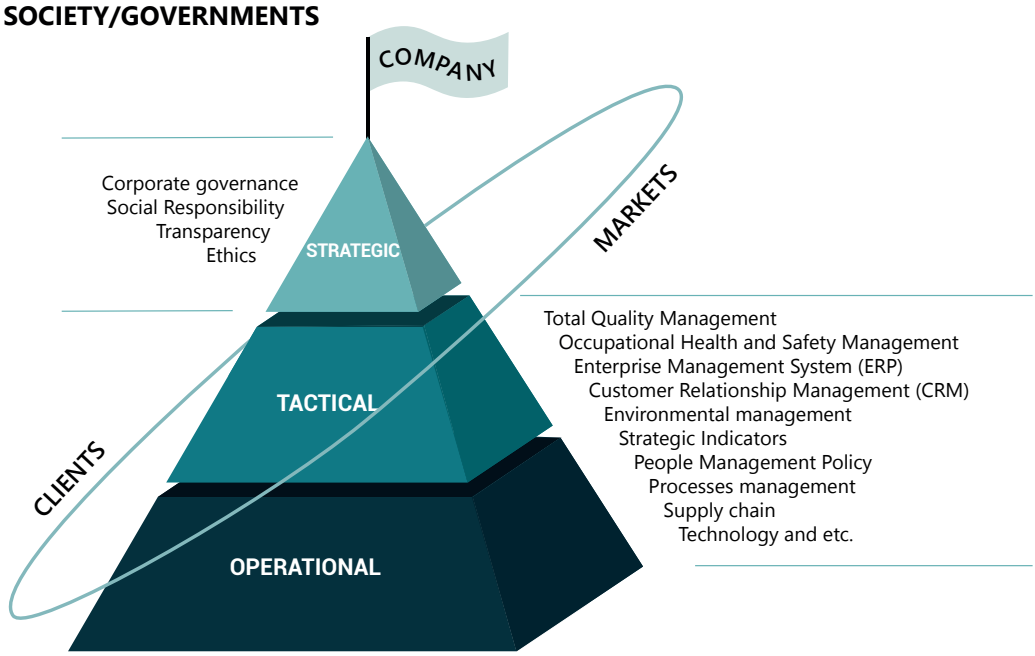
These activities strengthen the technological qualification process, enabling to seek solutions to problems presented to the University by society, services and industrial sectors. The University is responsible for analyzing, researching, proposing and conducting solutions to the main problems in management and production technologies.

In our globalized universe, where competitiveness is associated with

immediate response, the preparation of organizational processes focused on Total Quality is necessary. Things that could earlier be integrated in the whole set of internal and external processes of the organization, today become an unavoidable factor for continuing in the market and achieving customers' loyalty, adding value to the organizational performance.

The Fluminense Federal University relies on proven public acknowledgement for its competency in continuing education and qualification in Total Quality for management development of public and private organizations.

Among other themes, LATEC provides advice for:



Management model

1. Organizational diagnoses

They are in-depth analysis of public, private or third sector organizations through already established techniques in technical/scientific environments, in order to consider how the organization is behaving in several highly important aspects of the new reality. Some of these aspects include:

- Reports and balances;
- Management systems;
- Human resources management;
- Market participation versus installed capacity;
- Organizational architecture;
- Corporate productivity;
- Client satisfaction;
- Relations with suppliers;
- Quality management;
- Technological management;
- Corporate computerization;
- Strategic planning versus market behavior, among others;
- Organizational transparency;
- Use of social networks by organizations;
- Public management: electronic government, transparency in public management, contract management in public management.

This diagnosis is intended to show the organization its current status as a milestone for future decision makings on how to act to go faster and at an affordable cost towards the future.

2. Project for organizational structures

The intention is to gather strengths to improve towards the future. The work comprises a preliminary diagnosis to verify the current organizational status and, along with the board of directors, bring guidelines to be fulfilled within a certain term. Our work is intended to strengthen actions in in the different management areas of organizations, by involving aspects like:

Quality

- Strategic planning;
- Support in defining the new organizational architecture;
- Innovation management;
- Support in defining quality management of processes aimed at more addition of value;
- Trainings to improve motivation within the organization;

- Trainings in techniques for the development of products through requirement of clients and proposition of employees, such as QFD (quality function deployment);
- Trainings in tools to improve quality;
- Trainings in techniques of statistical quality control;
- Support in the implantation of new methodology of cost appropriation;
- Trainings in quality management for the several hierarchic levels;
- Support in the formation of functional teams aimed at specific projects;
- Support in defining monitoring items and the implantation of these items;
- Support in the choice of excellence in benchmarks and effective comparison of results among stakeholders;
- Training in the certification of suppliers;
- Training in ISO 9000 and how to be prepared for the certification;
- Training in preparing the implementation of "5S" programs;
- Normalization, certification and awards for quality;
- ISO, ISM (boats), OSHAS, SA 8000 certifications;
- Integration of management systems, among others;
- Project management; Organizational and product design;
- Management of economic, social, environmental, operational risks;
- Crisis management and business continuation plan.

Productivity

- Support in the definition of policies on productive and administrative computerized processes;
- Support in mapping all processes of the organization;
- Support in defining the key processes of the organization;
- Support in defining or not new technology to be adopted in key processes;
- Support in the reengineering of key processes or not unmapped processes;
- Support in logistics restructuring to assist reengineering;

- Specific training of employees in the new configuration of key processes;
- Support in defining productivity standards to be achieved by the new processes;
- Support in the choice of excellence in benchmarks to compare and train in new production techniques (JIT, lean production, MRP II, cells, among others);
- Support in defining a new physical arrangement of the shop floor;
- Support in studies to manufacture new tools and machines;
- Support in ergonomic studies of production and management;
- Support in the studies of new information flow with full informatics assistance;
- Management of projects and processes;
- Port management;
- Audit in management systems;
- Integration of management systems, among others.

Economic and financial management

- Financial management;
- Analyses of financial statements;
- Economic conjuncture;
- General accounting;
- Corporate strategy;
- Price formation;
- Project management;
- Financial risk management;
- Capital market;
- Financial market;
- Quantitative and computational methods;
- Budget planning and control.

Corporate social responsibility, ethics, transparency and diversity

Assessment of internal attitude and focus on the organization external public regarding social responsibility principles.

- All sorts of reports, including integrated reporting;
- Compliance;
- Organizational ethics;
- Communication with stakeholders;

- Development of internal policies and market policies on conscious consumption.
- Organizational planning for gender equity.

Occupational health and safety

Diagnosis of the organization status in terms of safety management and proposals for improvement or implantation;

- Training courses for experts in the labor area (for occupational physicians and occupational safety engineers);
- Support in the development of proactive actions/attitudes for ICAP components;
- Firefighting brigade;
- Risk mapping;
- Accident prevention;
- Total safety management;
- Safety costs;
- Safety motivation (for supervisors);
- First aid Improvement;
- Labor legislation assessment (engineers, physicians, occupational safety technicians and other professionals of the area);
- Boiler operation;
- Assessment of the protection against fire in residential, commercial and industrial buildings;
- Diagnosis of the quality of life at work;
- Implementation of quality of life programs at work;
- ISO, ISM (boats), OSHAS, SA 8000 certifications.
- Preparation of emergency plans;
- Occupational safety and health management;
- Ergonomics: diagnosis and project;
- Hygiene and health at work;
- Safety in production;
- Analysis of technological risks;
- Integration of management systems.

Environment

LATEC is structured to offer opportunities to solve/minimize environmental issues, particularly in: Environment quality and enterprises with environmental interface; to provide, among others, the following research studies/services:

- Preparation of environmental diagnoses, management plans for environmental protection areas and other conservation units;
- Individual emergency plans (CONAMA number 293);
- Development of projects for environmental ordainment and zoning based on geo-processing techniques;
- Preparation of environmental impact studies and reports (EIA/RIMA);
- Preparation of environmental normalization for different organizational activities;
- Execution of legal management audits;
- Structuring of propositions and environmental devices and preventive and corrective actions to ensure the environmental performance of the enterprise;
- Development, implementation and improvement of environmental management systems compliant with ISO 14000 requirements;
- Development, implementation and improvement of ISO 19011: Quality Audit and/or environmental management systems;
- Preparation and implementation of environmental management programs considering the legislation in force and the needs of the directly affected communities;
- Preparation of environmental performance reports;
- Human resources qualification for corporate environmental management;
- Methodologies for the optimization of environmental licensing;
- Training and improvement of professionals in environmental materials;
- Analysis of the ecologic life cycle of the product and environmental labeling;
- Environmental licensing;
- Port management;
- ISO, ISM (boats), OSHAS, SA 8000 certifications.
- Management systems audit;
- Environmental risk analysis;
- Sustainability indicators;
- Environmental survey;
- Preparation of environmental sensitivity maps;
- Development of clean technologies

and planning for the implementation of energy efficiency in organizations and buildings;

- Planning and management of urban solid wastes;
- And other research studies/services on demand.

6

PPSIG
ACADEMIC EDUCATION FOR SUSTAINABILITY

INTERDISCIPLINARY TRAINING FOR COMPLEX PROBLEM SOLVING FOR SUSTAINABILITY

Osvaldo Luiz Gonçalves Quelhas[1], Sergio Luiz Braga França[2], Marcelo Jasmim Meiriño[3], Gilson Brito Alves Lima[4], Luís Perez Zotes[5], Nicholas Van-Erven Ludolf[6]

ABSTRACT

This research is a case study on the Stricu-Sensu Program in Management Systems (PPSIG) at the Fluminense Federal University (located in the city of Niterói, Rio de Janeiro, Brazil). The PPSIG incorporates the context of Sustainability through an Interdisciplinary approach in the formation of the student / researcher. The PPSIG program includes the following courses: Doctorate in Sustainable Management Systems and Professional Master´s in Management Systems. Both courses have the aim to develop human resources with skills for research, teaching and extension, with an interdisciplinary perspective, integrating the scientific, technological and cultural developments from different areas of knowledge in order to solve complex problems involving Sustainability. To achieve the aim of this research, a literature review as well a data mining study throughout the PPSIG database were performed in order to analyze its performance and results, including scientific production, technical reports, research projects, teaching activities, official documents, among other technical and technological outputs developed by

[1] Fluminense Federal University – Rio de Janeiro, Brazil e-mail: osvaldoquelhas@id.uff.br.
[2] Fluminense Federal University – Rio de Janeiro, Brazil e-mail: sfranca@id.uff.br
[3] Fluminense Federal University – Rio de Janeiro, Brazil e-mail: marcelo@latec.uff.br
[4] Fluminense Federal University – Rio de Janeiro, Brazil e-mail: gilson@latec.uff.br
[5] Fluminense Federal University – Rio de Janeiro, Brazil e-mail: lpzotes@gmail.com
[6] Fluminense Federal University – Rio de Janeiro, Brazil e-mail: nicholasuff@gmail.com

our professors, researchers and egress students. This study reveals that factors such as the promotion of interdisciplinary courses, social actions, internationalization, interinstitutional integration, among others, have contributed to the promotion of Education for Sustainable Development (ESD), making the PPSIG a high-qualified agentfor sustainability implementation in different contexts.

1. INTRODUCTION

Humankind has been going through a sustainability crisis that can be comprehended as "production and consumption patterns that are incompatible with the capacity of the biosphere to provide minimal biophysical conditions to support the human welfare of the present and future generations" (CEPAL/ FES, 2019). This current crisis brings along new challenges and also opportunities for the sustainable development of organizations and society.

In this regard, continuing education has an important role in the promotion of more sustainable lifestyles within the current context. Education for Sustainable Environment (ESD) can be defined as education that aims to prepare individuals to deal with problems that threaten sustainability (economic, social and environmental problems). ESD also aims to affect attitudes, change behaviors and promote the necessary competencies to shape a sustainable future beyond the knowledge and understandingof social and environmental issues (UNESCO, 2007).

According to Mintz and Tal (2013), sustainable development (SD) can be considered one of the biggest challenges to be confronted by humankind in the 21st century. Thus, ESD has a pride of place not only according to students, but also to the Higher Education Institutions (HEI). ESD in higher education has a recent origin. The majority of the initiatives occurred after the Rio Earth Summit in 1992 and Agenda 21. The great relevance of the role of education in the context of sustainability was recognized by the UN through the declaration of the Decade of Education for Sustainable Development (DESD) (2005-2014). Research studies and evaluations emerged after the DESD, showing that higher education is transforming teaching and research, so that they will contribute to a sustainable life (Rose

et al 2015; Segalas et al, 2018; Dahlin and Leifler, 2018).

Bringing the discussion to the context of Latin America and the Caribbean, a study conducted by the ECLAC (Economic Commission for Latin America and the Caribbean) pointed out many challenges to be overcome by SD in that region. The study revealed an industrial standard: specialization in products with low-technological complexity, due to difficulties in the incorporation of technical progress and the development of capacities that enable the access to dynamic markets with more added value, aggravating the external vulnerability of those countries in relation to developed countries (ECLAC/ FES 2019).

In the specific case of Brazil, the study demonstrates high levels of structural heterogeneity of the production system. Therefore, deep production unevenness within specific economic sectors, among distinct sectors and among different regions in Brazil as well, can be observed. The referred unevenness is far above the average of the ones in developed countries, creating a core that generates inequalities, which are spread and reproduced in society.This situation is represented by social and regional inequalities that might deepen because of aspects of the sustainability crisis that is originated in its environmental sphere, global warming for example, that will make the Brazilian semiarid region bigger and drier, and might even raise the external vulnerability indicators of the Brazilian agriculture exports.

In Brazil, this factor leads to the concentration of workforce in low-productivity sectors, remuneration and formality, besides few perspectives of social mobility.

According to ECLAC/FES (2019), not seeking actions to confront this crisis means confrontingmore serious structural problems, including poverty, migration, food security, loss of competitiveness and external vulnerability.

The present case study discusses the PPSIG (Post-Graduation Program in Management Systems), which is connectedwith the Engineering School of the Flumiense Federal University (UFF), enabling it to be understood as a study in the researching, teaching and extension areas, which unfolds in projects for education, profession-

alization, capacitation and innovation linked with the development of competencies, skills and attitudes for sustainability in businesses and for the welfare of society.

The methodology of the present study consists of a bibliographic revision and a search in the PPSIG database for the analysis of its performance and results, including scientific production, technical reports, research projects, teaching activities, official documents, among other technical and technological productions by the professors, students and egress students of the program.

The genesis of the PPSIG is based on meeting the current and future demands of the national, regional and local sustainable development, through the qualification of professionals with systematic and diversified vision, capable of acting in the socio-environmental and economic transformation of institutions and society in an innovative way. Diverse initiatives in terms of research projects and institutional exchange programs are proposed in order to achieve results, in terms of economic, social, environmental and scientific impacts.

This way, the PPSIG is composed by the articulation between the Doctorate in Sustainable Management Systems (DSG) and the Professional Master´s in Management Systems (MSG). This articulation aims to align academic, research and extension efforts that intend to formalize the interdisciplinary science through different areas of knowledge (Exact and Earth Sciences, Biological Sciences, Engineering Areas, Health Sciences, Agricultural Sciences, Management, Humanities, Linguistics, Portuguese and Arts) and their applications with focus on the qualification of researchers and the creation of knowledge applied to the needs of society.

Three strategic guidelines stand out in the trajectory of the PPSIG:

1. Building competencies, promoting technological innovation and scientific development for the solution of problems with high social, economic and environmental impacts. Associated goals: integration with government, private and third sector institutions to promote applied research to solve problems with high social, economic and environmental impacts through the MSG and DSG. Promo-

tion of the growth of employment, competitiveness and R&D.

2. Enhancingtheinter-institutional cooperation mechanisms with Interdisciplinary Post-Graduation Programs. Associated goals: development and enhancement of the technical-scientific events at the CNEG (National Congress on Excellence in Management) and at INOVARSE (Innovation in Corporate Social Responsibility) aiming at the exchange of experiences to reduce social inequality, to improve work conditions and to improve efficiency in the use of natural resources.

3. Internationalization ofthe PPSIG. Associated goals: Integration, through actions and permanent pragmatic mechanisms, with the Centre of the World Sustainable Development Research and Transfer Centre (WSD-RTC) and with the international scientific event World Symposium on Sustainability Science. Such partnerships are relevant to the program, because their goal is to increase the incentives given to professors in order to further improve their already existent action in diverse levels, like the elaboration of international cooperation projects, exchange of students and special visiting researches, joint publications with renowned international researchers, participation in the editorial board of qualified international periodicals, among others, especially in the area of sustainable management systems.

The strategic guidelines of the PPSIG are enhanced in a continuous way at the Annual Governance Meeting, with the participation of professors, students and egress students, as well as representatives of public and private institutions, of the third sector and society. From these annual meetings, practices, goals and broad themes of the program are updated, aiming to meet the current and future demands of society, in the context of sustainable development.

The remarkable feature of the interdisciplinary construction is ingrained in the modus operandi of the program, when promoting the problematizationof the real from a widen network of innovation agents, formed by dozens of egress students from the most diverse public or private demands. There was a real inversion in the way the potential research problems are constructed and favored, from an endogenous way, internally

generated by research groups based on literature gaps, to an exogenous way, generating the empirical knowledge from the real demand, which will inform or feed the construction of the necessary theory, usually, interdisciplinary.

Adopting a systematic approach, a holistic and interdisciplinary view, means considering everything, as well as the intention among them and the attempt to foresee conflicts or problems, by considering the environmental, social, economic and technical dimensions, without sub- optimizing any of them (BjornbergandSkogh, 2015; Guerra, 2016; Thurer et al. 2017).

The PPSIG presents itself as an integrating, comprehensive and dynamic proposal, aligned with the socially relevant demands, without losing sight of the universalist perspective that characterizes science. The program understands that qualification, learning and research must advance together, not restricting the application of the results obtained from research projects to a specific sector, but shifting its critical and analytical potential to the demands and challenges of the state of Rio de Janeiro and the other states of the southeast region and other regions of the country.

The goals established by the PPSIG are linked with the Sustainable Development Goals (SDGs) and Agenda 2030. In this sense, the scope of the program is aligned with the following SDGs:

- SDG 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all;

- SDO 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all;

- SDO 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation;

- SDO 17: Strengthen the means of implementation and revitalize the global partnership for sustainable development;

2. IMPLEMENTATION PROCESS OF THE PPSIG

In 1993, the Laboratory of Technology, Business Management and Environment (LATEC), linked with the School of Engineering of the Fluminense Federal University, located

in the city of Niterói, Rio de Janeiro, was created. During its first years, it was constituted by academics and market professionals with the most varied formations. Nowadays, the LATEC/UFF is a national reference center that offers opportunities for management qualification with a systematic approach, aimed at Sustainable Development. Therefore, even though the PPSIG conception reaches 19 years of existence in 2019, its multidisciplinary bases were established more than 25 years ago, when the LATEC was created.

MSG

The origin of the efforts for the development of the PPSIG, an interdisciplinary program, a strong thread of management and sustainability, datesfrom the first semester of 1999, when the UFF professors develop a Master Plan for the Engineering areas. That plan provided the integration of researchers who acted in the management area, and, from diverse theoretical, methodological and professional perspectives, they elaborated a project for the development of the Professional Post-Graduation Master´s Program in Management Systems (MSG). Still, as a result of the referred Master Plan, a project for the interaction of the various areas of knowledge interested in the development of interdisciplinary research in Management Systems was elaborated. At that time, the Professional Master´s Program in Management Systems (resolution # 36/99 CUV, from March 31st, 1999), accredited by CAPES with an initial grade "3" (Approval Letter CAA/CTC/49, on June 20th, 2000), was created.

Since its origin, the MSG already had multidisciplinary characteristics, placing researchers with different educational trajectories side-by-side, and adopting, as its mission, the technological and scientific development in the Organization and Strategy concentration area. Its evolution ended up showing the interdisciplinary path, producing knowledge and qualifying people in research lines in Total Quality Management System, Environmental Management System, Workplace Safety Management System and Social Responsibility and Sustainability Management System. The natural outcome was the later creation of the Interdisciplinary Doctorate in Sustainable Management Systems (DSG).

DSG

In 2012, due to the strategic planning of the MSG, interdisciplinary vocation became evident, not only the vocation of the professors and researchers of the program, but also of the own students who sought the area expecting to comprehend and confront the challenges of interdisciplinary nature experienced in the world of business and sustainable production. Obtaining grade "4", at the end of the 2010–2012 triennium (CAPES MEC Ordinance 1077, of 08/31/2012, DOU 09/13/2012), motivated the group of professors that compose the staff of researchers of the master´s program to begin the discussion about the creation of a Doctoral course in the Interdisciplinary area of CAPES.

In 2013, the Post-Graduation Program had its Doctorate Course approved by the UFF (CUV decision number 036/2013) and the respective acknowledgement by CAPES (Approval Letter number 264-28/2013/CTC/CAAIII/CGAA/DAVCAPES of December 17th, 2013), beginning its academic activities in the second semester of 2014, with the opening of the 1st Public Notice of Selection. The Program kept grade "4" in its first evaluation, referring to the period of 2014–2017, the original grade granted during its approval process.

In this aspect, the DSG is the result of the maturing of the competencies and academic, extension and research strategies of the professors that integrate the StrictoSensu-Post-Graduation (Professional Master´s) in Management Systems, working in an interdepartmental way, with professors with distinct backgrounds (Exact Sciences, Applied Social Sciences, Social and Earth Sciences, the Chemical, Civil, Production and Mechanical Engineering areas) from various educational units of the University.

The faculty of the Doctorate Program is characterized by its willingness to extend the borders of knowledge, develop technologies and promote sustainable innovation with experience, competence and productivity. Its multidisciplinary background, as well as its professional performance in diversified research, are coherent with the proposal of the Doctorate Program and are aligned with the idea of contributing to the extensionof the knowledge basis outside its

expertise areas, and deepen the collaboration in productive sustainable processes.

The Doctorate program has attracted candidates from various higher educational institutions of the State of Rio de Janeiro and of other States in the country, too. The same way, the initial qualification area presents a distribution, within a set of areas, which encompasses engineering areas (about 50%), Applied Social Sciences, Exact and Earth Sciences, Human Sciences, Linguistics, Portuguese and Arts, and Multidisciplinary (about 50%). The thesis proposals distributed themselves in three Research Lines of the DSG: Management of Sustainable Organizations, Technologies Applied to Sustainable Organizations and Decision-Making Support in Sustainable Organizations, which currently represent 50%, 21,43% and 28,57% of the thesis proposals, respectively.

The selection process consisted of an eliminatory stage (Assessment of Documents and Foreign Language Content Test) and later of a classificatory stage (Assessment of Thesis Proposal and Assessment of the Candidate´s Curriculum). The search for diversity and multiple composition of the first class was a factor that reasserts the intention of the collegiate of the course related to the interdisciplinary character of the proposal of the PPSIG Program.

The qualification process of the first class occurred in the 2013-2016 quadrennial. In the process of international partnership fomentation, the Program invited and encouraged the participation of prominent professors from international institutions in the qualification and thesis defense boards, highlighting, in the second process, the participation of Professor Walter dos Santos Leal Filho, PhD at the Hamburg University of Applied Sciences and Professor Clara Maria Rodrigues da Cruz Silva Santos, D.Sc., at the University of Coimbra.

At the end of the second semester of 2017, on the expected scheduled period of the student activities of the class, and after fulfilling the regulatory requirement of the PPSIG (passing a qualification test and publishing articles in periodicals with Qualis grade B1-A1, with SCOPUS and/or JCR index), the thesis defense process of the first class was initiated.

Through the deliberation of the Collegiate of the Program, the selection process for the fourth class

occurred in January of 2017, with the opening of ten (10) places. About 40 (forty) candidates applied to the vacancies, and 10 out of them were approvedand are registered in the Student Module of the Sucupira Platform. Keeping the vocation of the program, throughout the 2014-2017 quadrennial, 41,94% of the approved candidates were students from basic and/or higher educational institutions, being 6,45% of them from Programs at the UFF and 35,49% from Programs at other local, regional or national Institutions.

Keeping the same philosophy as the previous years, the basis of the Program consists in the development of methodologies linked with its research lines, which can be applied to distinct productive sectors. The search for diversity and multiple composition of the four existing classes,until this moment, represented by the profile of the candidates from distinct qualification areas (Exact Sciences, Human Sciences, Social and Applied Sciences and Technological Sciences) constitute themselves in a factor that reasserts the intention of the collegiate of the course regarding the interdisciplinary character of the proposal of the PPSIG Program.

By complying with its first strategic guideline, the PPSIG has succeed in promoting its integration with Government, Private and Third-Sector Institutions in order to promote applied research projects aimed at the solution of problems with high social, economic and environmental impacts through the MSG and DSG. Therefore, cooperation partnerships with the CNEN (National Nuclear Energy Commission), Pedro II School, CEFET-RJ (Celso Suckow da Fonseca Federal Center for Technological Education of Rio de Janeiro), PETROBRAS, The Industry Federation of the State of Rio de Janeiro, Federation of Industries of the State of Espirito Santo, Industrial Federation of the State of Minas Gerais , SENAI RJ (National Industrial Training Service), SESI RJ (Industry Social Service), Banco do Brasil, Brazilian Navy, Peugeot Citroen, The Court of Appeals of the State of Rio de Janeiro, and other industrial production and service companies from the State of Rio de Janeiro or other Brazilian states, were established.

The creation of conditions that enable the PPSIG to act as a protagonist and a reference center for research, teaching and extension with effective impact on the improvement of the environmental, social and economic performance

of the mentioned organizations is among its results. The integration work with the organizations generated a replicable model for other institutions interested in aligning their organizational management and capacitation programs with the principles of Sustainable Development.

CNEG

Regarding the second strategic guideline of the PPSIG, in 2018 the CNEG & INOVAR SE (National Congress on Excellence in Management and Innovation in Corporate Social Responsibility) academic events had their 14th and 3rd editions, respectively. The CNEG/INOVARSE was created by the group of professors that developed the PPSIG, and became a huge happening, evolving from a regional into an international event. In its 14th edition in 2018, the CNEG/INOVARSE was held in Rio de Janeiro, at the headquarters of the Industry Federation of the State of Rio de Janeiro (FIRJAN), with the theme: Industry 4.0, Lean and Organizational Sustainability.This event had the participation of 28 lecturers and authors of the 360 approved articles who represent various Brazilian states and countries, among them: Portugal, Argentina, Uruguay, Chile, Angola and Canada. The International Opening Lecture by Professor Elaine Mosconi, Ph.D. at Université de Sherbrooke (Canada) stood out.

The CNEG/INOVARSE became the main Latin-American event engaging universities, the government and companies in the presentation and reflection on sustainable development and innovation, by offering students from national and international educational institutions, and from the PPSIG itself, opportunities to publish articles.

INTERNATIONALIZATION

The third strategic guideline of the PPSIG consists in the internationalization. In this sense, the PPSIG sought for integration, through actions and research mechanisms, techno-scientific production and organization of programs, networked with the Inter-University Sustainable Development Research Programme (IUSDRP) and with the WSD-RTC. Some of the achievements, result of this integration are, for example, the accomplishment of the World Symposium on Sustainability Science scientific event, in Manchester – United Kingdom in April of 2017, which produced the Handbook of

Sustainability Science and Research.

In 2019, the second symposium with the theme "Implementing the UN Sustainable Development Goals" took place. This event had the participation of professors and students from the PPSIG in the Scientific Committee and in the presentation of selected articles. The symposium was organized along with the University of Hamburg /School of Applied Sciences (Germany), PPSIG, PUC-PR (Catholic Pontifical University of Paraná) and in cooperation with various UN (United Nations Organizations) agencies, government offices and authorities, universities, companies, NGOs and organizations from all over the world.

Still about the mechanisms to promote international cooperation, the PPSIG has been developing innovative and highly relevant research studies for the program, through the exchange of professors for post-doctoral programs, visits and collaborations, as well as throughhosting renowned visiting professors who, associated with the regional effort, in the academic and also in the professional and organizational fields, develop competencies forapplied research in management systems. Nowadays there are already several cooperation programs with foreign universities, as presented in the item international exchange programs. It is possible to exemplify it through the exchange program attended by the DSG students Jean Carlos Machado Alves and Fabio Ribeiro de Oliveira, who participate in teaching and research activities at the University of Coimbra (Portugal) and at the University of Nova Lisboa (Portugal), respectively.

3. RESULTS OF THE PPSIG AND LEARNED LESSONS

The analysis of the experience of developing and implementing the PPSIG reveals learned lessonsin the qualification of Masters and Doctors in the scientific, extension and teaching production. The sensitivity of the professors and coordinators when identifying the difficulties of the students and choosing the research themes represents a differential that impacts the performance of the PPSIG positively.

The coordination of the PPSIG highly provides the adequate support for the demand of skills in the solution of problems associated with

regional, national and international sustainability. This paradigm transformed the quality of the teaching process, research and interaction with society, according to guidelines and specific directions for each research project. The systematic follow-up by the professors was enhanced with actions, from the beginning to the end of research projects, which was important to minimize dropout rates and strengthen the positive results related to the doctorate process. After the conclusion of the dissertations and theses, there is a natural support for the inclusion of the egress students in the academic environment or in the professional field in private, public or third-sector organizations.

The follow-up of the egress students of the PPSIG reveals evidence of behavior, skills and attitudes that contribute to different perspectives of performance for the solution of social, economic and environmental problems. A researcher prepared to solve problems in the context of sustainability, with relevant results in regional development. It is a fact that is in conformity with one of the main goals of the program, which is, forming skillful egress students to apply and improve techno-scientific knowledge in methodologies, methods, practices and tools that contribute to the collective, organizational or regional knowledge, and more specifically, to the advancement of Knowledge Management Systems (KMSs). In this regard, professional egress student of the PPSIG is generalist, critical, ethical, and has adequate contextualized and interdisciplinary theoretical foundation, and is qualified to:

1) Be able to act in the field of applied sciences and technologies, developing studies and research projects;

2) Have creativity and leadership to apply the scientific method guided by sustainability principles and act in the job market by focusing on investigation and implementation of new technologies;

3) Develop innovating ideas and strategic actions capable of broadening and enhancing his/her acting area from the sustainability perspective;

4) Broaden his/her humanist, entrepreneurial and innovative qualification, enabling its application to solve problems in society and contributing to the technological,

scientific and social development in the country;

5) Act on multi-professional and inter-professional teams in the different fields of science and technology, being able to model, analyze and solve problems in the area, by applying ethical and scientific principles;

6) Act on multidisciplinary teams in an integrated way (by supervising, planning, coordinating or executing at ahigher complexity level) in interdisciplinary partnerships with other academic programs, as well as with public, private, environmental organizations and regulatory agencies.

The result of the qualifying process of egress students provided benefits in terms of aggregation of integrating knowledge and development of systematic competences, highly valued by the job market and by the academy, in the knowledge society.

In the 2013-1016 quadrennial, PPSIG qualified doctors who are actually part of the permanent faculty of other public universities in the country, such as the UFOP (Federal University of OuroPreto), UFFRJ (Federal Rural University of Rio de Janeiro), CEFET RJ and UFF. It is worthy highlighting that more than 80% of the doctors attending the Program act in active research groups that are acknowledged by the university. Several egress students of the PPSIG are in the productive sector occupying top management positions, or acting as Professors and Coordinators in Latoand StrictoSensu Graduate Courses or Post-Graduate Courses in private Higher Education Institutions. Among them, it is possible to highlight:

- Alberto Almeida dos Santos: public official at the National Energy Commission (CNEN) where he occupies the position of acting chief of the logistics and infrastructure service at the CNEN/Headquarters;

- Alexandre Elias Ribeiro Denizot: accepted as a professor for the Work Safety Course at the Federal Technology Center - CEFET RJ in December, 2018.

- Jean Carlos Machado Alves: professor of exclusive dedication at the Federal University of Ouro Preto (UFOP);

- Marcelo Arese: accepted as a substitute professor for the Production Engineering Course at the Fluminense Federal University (UFF), Petrópolis Campus, in 2018.

- Rodrigo dos Santos Amado: professor of exclusive dedication of the Bachelor´s course in Hotel Management and graduate course in Tourism at the Federal Rural University of Rio de Janeiro. He is also a professor for the Professional Master´s Course of the Postgraduate Program in Strategic Management at the UFRRJ.

- Rodrigo Goyannes Gusmão Caiado: accepted to attend a Postdoctoral Internship in the Postgraduate Program in Production Engineering (Master´s and Doctorate), Department of Industrial Engineering of the Catholic Pontifical University of Rio de Janeiro – PUC RJ, in July 2018, developing a project with the title "Research and Development of the VSM 4.0 Dynamic Model for the Optimization of Supply Chain Management in Manufacture".

The articulation between qualified research and the solution for organizational problems is in the core of the PPSIG. This proximity can be observed in the research themes demanded by the most diverse productive sectors. The applicability of the Research Study can also be noticed through letters sent by the researched organizations available on the MSG website, where, in many cases, the researchers compose the work force.

The PPSIG has made efforts to develop competences, abilities and capacities for the organizational sustainability and the improvement of life conditions in society. After years of learning and experience, some principles have been established, so the Program can accomplish its goals:

- Considering the institutional and individual partners from other national and international institutions, which act as protagonists in the production of knowledge for the solution of problems that afflict society; Constant concern and emphasis on the measurement of the scientific, economic and social impacts on society, generated by the intellectual production for the qualification of doctors and masters;

- Permanent exercise of Planning and self-assessment as fundamental elements for constant improvement and the establishment of continuity in the Program;

- Emphasis on the integration/articulation with the several sectors of society: industrial, government, economic and financial;

- Appreciation of the faculty through the acknowledgment of its accomplishments, demonstrated in the awards event in the first semester of each year, by granting acommemorative plaque to the professors who published works in international periodicals with broaden impact on science development;

- Appreciation of the culture of passion for the scientific production work, forteaching and for the inclusion of the sustainability theme in the professional and academic activity of each component of the PPSIG, in synergy with individual values.

4. ANALYSIS OF RESULTS

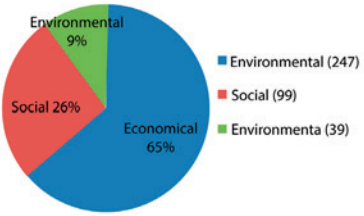
The PPSIG presents results that bring positive impacts to the economic, social and environmental sustainability dimensions.

As already presented in the text, one of the main PPSIG goals is the establishment of partnerships with Government, Private and Third-sector Institutions to promote applied research aimed to solve problems with high social, economic and environmental impacts through the MSG and DSG, according to the information mentioned in the study.

In the last five years and seven months (January/2014 and July/2019), the PPSIG has produced 448 term papers, being 14 Doctorate Theses and 474 Master´s Dissertations, result of the orientation process between the professors and students of the program. The results of the 488 term papers were analyzed by aiming at the compliance of the indicators of each one of the Sustainable Development dimensions (Economic, Social, and Environmental). It was possible to conclude that 385 of the Theses and Dissertations comply with the respective indicators, it means, 79% of compliance with the theme.

The total of 385 defended Theses and Dissertations is represented by the following percentage of the Sustainable Development dimensions: 65% Economic, 26% Social and 9% Environmental.

Graphic 1 – Quantity of PPSIG Theses and Dissertations X Sustainable Development Dimensions

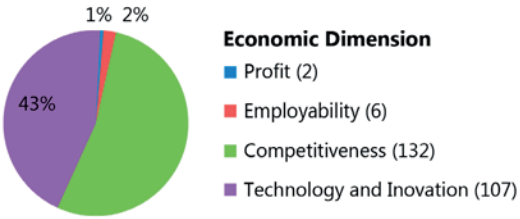


Source: The Authors (2019)

The following graphics present the relation between the Theses and Dissertations developed by the PPSIG and sustainability dimensions.

Graphic 2 shows this result for the economic dimension.

Graphic 2 – Quantity of PPSIG Theses and Dissertations X the Economic Dimension Indicators.



Source: The Authors (2019)

In this sense, according to what is presented by the graphic, the Theses and Dissertations complied with the following indicators:

- Increase of the GDP, added value and/or gross income: 2 PPSIG studies;

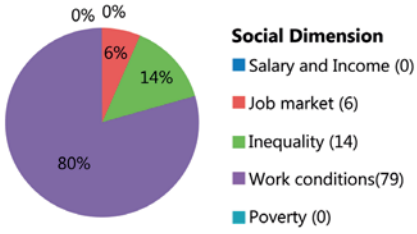
- Creation of new work positions: growth of the existing employment and/or creation of new professional careers: 6 PPSIG studies;

- Increase in competitiveness, understood as cost reduction, increase in productivity, improvement of the quality of products and/or services, increase in market share (national or global) and/or conquering of new markets: 132 PPSIG studies;

- Building of technological and innovative capacities: increase of R&D, hiring of experts in technological development, development of partnerships between science, technology and innovation institutes with companies, new and/or better implemented products or productive processes or increase in the number of registered patents: 107PPSIG studies.

Graphic 3 explains these results for the social dimension

Graphic 3 – Quantity of PPSIG Theses and Dissertations X the Social Dimension Indicators



Source: The Authors (2019)

For this dimension, the PPSIG studies complied with the following indicators:

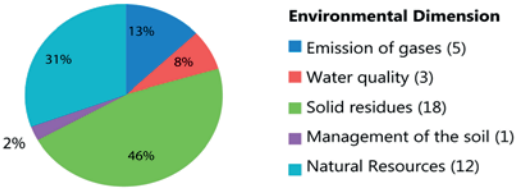
- Better access to the formal job market, education, health and/or social protection: 6 PPSIG studies;

- Reduction of income, gender, race inequality, ethnicity, generation, origin inequalities, and/or other structural gaps: 14 PPSIG studies;

- Improvement of work, health and/or relationship conditions with the consumers: 79 PPSIG studies

Lastly, Graphic 4 demonstrates the environmental dimension..

Graph 4: Number of Theses and Dissertations x Environmental Dimension Indicators



Source: The Authors (2019)

The PPSIG developed research studies that observe the following indicators in the referred dimension:

Reduction of the emission of greenhouse effectgases and/or other atmospheric pollutants: 5 PPSIG studies;

- Improvement of water availability and/or water quality: 3 PPSIG studies;

- Reduction of the generation, in other words, management of solid residues; circular economy: 18 PPSIG studies;

- Recovering, it means, management of the soil, pastures and forests; 1 PPSIG study;

- Improvement of the efficiency of the use of natural resources (energy, silviculture, minerals, materials, etc.): 12 PPSIG studies.

5. FINAL CONSIDERATIONS

The present study addressed the actions of the PPSIG for the promotion of Sustainable Development. Besides acting for the promotion of Sustainable Development Education (SDE), the program sought to develop applied research studies, in partnership with institutions from the most varied sectors, in order to develop professionalization, capacitation and innovation linked with the creation of sustainable competencies and capacities.

In this sense, several initiatives performed by the PPSIG were analyzed, aiming to verify their results regarding the benefits to institutions and society in the context of sustainability in its social, economic and environmental dimensions.

The study shows that the results of the PPSIG can impact the economic, social and environmental indicators of companies and society positively, characterizing it as a catalyst for socio-environmental and economic demands, contributing to the development of projects, social actions, internationalizations, inter-institutional integration and development of proposals for the solution of complex problems, aiming to benefit society.

In this regard, It is possible to notice that the goals and results of the PPSIG seeks a set of investments capable of promoting a virtuous cycle of economic growth, creation of employment, development of productive chains, decrease of environmental impacts, and simultaneously recovers the productive capacity of the natural capital.

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COORDINATION:

Prof. Osvaldo Luiz Gonçalves Quelhas, D.Sc.
osvaldoquelhas@id.uff.br

Prof. José Rodrigues de Farias Filho, D.Sc.
zerodrigues@id.uff.br

Prof. Gilson Brito Alves Lima, D.Sc.
glima@id.uff.br

Prof. Luis Perez Zotes, D.Sc.
lpzotes@id.uff.br

Prof. Marcelo Jasmim Meiriño, D.Sc.
marcelojm@id.uff.br

Prof. Sérgio L. B. França, D.Sc.
sfranca@id.uff.br

Prof. Julio Vieira Neto, D.Sc.
julion@id.uff.br

Realization:

PAPODESIGN

Latec
Universidade Federal Fluminense

Address:

156 Passos da Pátria street, Suite 329A, São Domingos, Niterói-RJ, Brasil.
Block E of the School of Engineering, Zip Code (CEP): 24210-240

Mailbox 100.175, Zip Code (CEP): 24020-971

General Secretariat:

Monday to Friday from 8am to 10pm / Saturday from 8am to 5pm
www.latec.uff.br
coordenacao.latec.tce@id.uff.br
Phone: +55 (21) 2629-5245 / 99331-4298

Master's and Doctorate Secretariat:

Monday to Friday from 8am to 6pm / Saturday from 8am to 5pm
mestrado.latec.tce@id.uff.br / doutorado.latec.tce@id.uff.br
www.latec.uff.br/mestrado / www.doutoradosg.uff.br
Phone: +55 (21) 2629-5246 / 96500-7390