

FEDERAL RURAL UNIVERSITY OF PERNAMBUCO

PROVOST MARIA MADALENA PESSOA GUERRA

CALL DATA**Call (41/2017)**

The Program aims at the selection of Institutional Projects of Internationalization of Higher Education Institutions or Research Institutes that have at least four Postgraduate Programs (PPG) recommended by the Capes in the triennial evaluation of 2013 and in the quadrennial of 2017, among which there must be at least two PhD courses.

Acronym call

CAPES-PRINT

PROGRAMS

CAPES-PRINT

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RENORBIO NETWORK

Field of research:

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DIAGNOSTICS

Strengths

Title:

UFRPE is a centenary institution with regional tradition and excellent laboratory infrastructure

Justification:

Institution with strong tradition in the agrarian, biological and education (teaching degree) areas, with strategic position in the northeastern region, where the process of internationalization is of great importance for the regional development. UFRPE presents, still, an excellent research infrastructure in several fields, with laboratories disseminated in the analytical center and the several academic departments of the main campus and in the analytical centers of the inland campi.

Title:

Postgraduate Program with strong regional impact

Justification:

Important disseminator of PhDs to embody the various faculties of Higher Education Institutions in the North and Northeast Regions.

Title:

Institutional Support, in a concrete manner, to the Research and Postgraduate Programs.

Justification:

UFRPE, through its Provost of Research and Postgraduate Studies, offers complete incentive and support to the postgraduate teaching, as well as infrastructure related to the research and postgraduate program. Besides that, in the past 15 years, important international partnerships have been established for the exchange (professor and student mobility) and the development of collaborative research projects with foreign institutions.

Title:

Consolidated Postgraduate Program with good quality and strong regional impact

Justification:

UFRPE PPGs (Postgraduate Programs) have an elevated grade average in comparison with the national average and with strong undergraduate integration. Based on the CAPES quadrennial evaluation, 25% of PPGs have grades 5 or 6, and those with grade 4 represent 42% of the total. Besides that, UFRPE is an important disseminator of PhDs to form the faculty of the Higher Education Institutions in the North and Northeast Regions.

Title:

A qualified faculty with fundraising capability.

Justification:

UFRPE faculty is made by more than 90% PhDs, with a diversified curriculum in renowned institutions from Brazil and abroad. Due to the high quality of its faculty, UFRPE has presented a high capability and efficiency in fundraising to finance research, development and innovative projects, in several agencies of local development, national and internationally.

Weaknesses

Title:

Poorly consolidated international visibility

Justification:

Although there are important partnerships in action, foreign students still have a low search rate for our institution, in a way that UFRPE still does not appear in the superior extracts of the international rankings of Universities.

Title:

The use of a second language by the academic community

Justification:

Students, mostly, do not have the tradition to master, fluently, a second language.

Title:

Faculty with a high participation of Young PhDs

Justification:

Due to the present faculty renewal in the institution, which is a positive aspect, part of the newly-hired recent professors still present a low rate of productivity, in terms of qualified international scientific production.

Title:

Body of technical staff

Justification:

Despite the superior administration's effort in keeping the technical staff suitable to the good functioning of the institution, the lab technical staff is still in short number regarding the Institutional needs, considering the laboratory infrastructure we have installed.

Title:

Accessibility to people with special needs (people with disabilities)

Justification:

Although there are investments currently related to this issue, the physical infrastructure is still weak regarding accessibility to people with special needs (access ramps and elevators in the oldest buildings), in some sectors of the institution related to research and postgraduate studies.

Do you have a well-defined Institutional Vocation?

Yes.

Describe your Institution vocation

Training professionals at undergraduate and graduate levels, and the scientific and technological development of the State of Pernambuco and the Northeast region of Brazil.

Describe other relevant information about the internationalization level of your Institution

UFRPE throughout the past 15 years recorded a large growth of its postgraduate program, both on the number of Programs and the increase of quality. As consequence, the relationship of these PGPs with universities and international research centers also improved. UFRPE Higher Administration developed, through the Provost of Research and Postgraduate Studies (PRPPG), the International Office (ACI), the Covenant Centre (NURIC) and the Legal Department (PJ), a fast and efficient method of institutional relationship with research groups and foreign entities. Considering this growth, the UFRPE PGPs, especially those with grades 6 and 5, and

some grade 4, are currently developing several activities directly related to internationalization, such as mobility for professors (work missions, postgraduate studies) and students (sandwich PhD); reception of foreign visitant professors (PVE, School of Higher Studies, among others); projects financed through international cooperation, international publication with foreign researchers, foreign students in their PGPs, and disciplines offered in a foreign language. These actions that are being or have already been applied, clearly state that UFRPE for more than a decade has internationalization as an institutional goal, especially through its Postgraduate Programs. The goals in this field are currently being achieved, considering the approval of the Internationalization Institutional Plan that seeks to expand these actions and to consolidate what has already been put into practice. Due to the large diversity of countries and institutions that have an active partnership with UFRPE, the internationalization level reached granted more visibility to the PGPs and the research groups, which enabled a differentiated training for the PGP graduated students, a growth in the international scientific production, and advances in the studies of regional problems, especially for the Caatinga Biome. In the current scenario, UFRPE is a prominent institution in training high level professionals, especially in the great field of agrarian and biological sciences.

INSTITUTIONAL PROJECT REGISTRY – PII

Institution of the Project Coordinator

UNIVERSIDADE FEDERAL RURAL DE PERNAMBUCO

General Goals

1. UFRPE. Profile. 1.1. History: The Federal Rural University of Pernambuco (UFRPE) has 105 years of tradition in teaching, extension and research in the State of Pernambuco, the Northeast area and in Brazil. Its centenary history is marked by the undergraduate and postgraduate high level teaching, mainly in the Agrarian, Biological and Educational Fields. Founded by Benedictine Monks, from The São Bento Monastery in Olinda, with only two undergraduate courses, Veterinary Medicine and Agronomy, in the beginning of the past century, UFRPE went through several academic transformations and administrative changes until reaching the status of Federal University linked to the Ministry of Education, as in present days. **1.2. Institution focus currently:** The Institution currently has 55 undergraduate on-site courses, including Administration, Computer Sciences, Economy, Physical Education, Gastronomy, Information Systems and several Engineering courses. There are three Campi in the State, located in the municipalities of Garanhuns (UAG), Serra Talhada (UAST) and Cabo de Santo Agostinho (UACSA). Also, in the undergraduate level, UFRPE provides bachelor and teaching degrees, through Distance Education - EAD, allowing for the training of highly qualified manpower in the several corners of the State and out of State. There is also a High School unit and technical courses in the Agricultural School Dom Agostinho IKAS - Codai - located in the Municipality of São Lourenço da Mata, near Recife (30km). In the past 20 years, UFRPE invested heavily in faculty qualification, through PhD capacitation and by hiring, almost exclusively, PhDs for the teaching positions available through bid notices that took place throughout this period, due to retirements. With a planning focused on postgraduate teaching and the inseparable scientific research, UFRPE's postgraduate activity grew exponentially, and currently has 41 postgraduate programs. **1.3. Regional Importance:** Nowadays, it's truthful to say that UFRPE has enormous acknowledgment from local, regional and national society, in light of its innovative capacity, the teaching-research-extension tripod, by seeking to contribute to overcome social-environmental issues and the sustainable development in projects and research that involve technological, agrarian, human, social and exact sciences. Until mid-seventies, the education of bachelors and professors represented a highly important action at UFRPE towards contributing with the development of the Brazilian Northeast agribusiness with local, regional and national offer of agronomic engineers, forestry engineers, fishery engineers, veterinary physicians, and Animal Scientists. Most recently, the institution developed a very strong representativeness in providing young masters and PhDs for the State of Pernambuco and the Northeast Region. These young masters and doctors, alumni from UFRPE postgraduate programs, are important actors today in the faculties of the Federal Public Universities and Federal Institutes of Sciences and Technology from the Northeast and North regions of the country. **2. The postgraduate at UFRPE. 2.1. History:** The Stricto Sensu Postgraduate activities at UFRPE initiated in 1973 with the so called at that time, Masters course in Botany. Thereafter, the Postgraduate Studies at UFRPE are completing 45 years of existence in 2018, with an enormous quantitative and qualitative growth. By the end of the 80's, UFRPE had only six Stricto Sensu Postgraduate Programs (PPGs). Starting the 90's, the institution made a huge effort to qualify its faculty, mostly by graduating PhDs,

establishing a policy to hire new professors with PhD degree, allowing, thus, for a fast growth of its Stricto Sensu Postgraduate Program. Currently, UFRPE has 41 Stricto Sensu PPGs, with 38 masters courses and 17 PhD courses in several areas of knowledge. **2.2. Numbers:** In the last quadrennial CAPES evaluation, which took place in 2017, the Stricto Sensu Postgraduate Program obtained a very satisfactory grade average, with 25% of PPGs with grades 5 and 6, and those with grade 4 representing 42% of the total. Based on CAPES quadrennial evaluation, the distribution of PPGs by grade and evaluation area, according with the CAPES quadrennial evaluation that took place in 2017 is: Grade 6 = 2 PPGs = Agrarian Sciences; Grade 5 = 8 PPGs = Agrarian Sciences, Biological Sciences (Biodiversity), Exact and Earth Sciences, Multidisciplinary (Biotechnology); Grade 4 = 17 PPGs = Agrarian Sciences, Biological Sciences (Biodiversity), Exact and Earth Sciences, Health Sciences, Human Sciences, Engineers, Linguistics, Letters and Arts, Multidisciplinary (Teaching); Grade 3 = 12 PPGs = Agrarian Sciences, Biological Sciences (Biodiversity), Exact and Earth Sciences, Human Sciences, Social Applied Sciences. **2.3. Postgraduate Program of International Insertion:** Aware of the need to support the consolidation and advances in its PPGs quality, mostly in CAPES grades, the Rector and the Provost of Research and Postgraduate Studies created the Program of Postgraduate Excellence - PEPG. Among its goals (to have PPGs with grade 6 for international insertion), the PEPG aims to increase the international insertion of the Institution PPGs, as well as to increase the national insertion and the UFRPE representativeness in the decisive environments of education, science and technology in the country. The Program also values academic knowledge in the several segments of UFRPE and discuss, along with the academic community, the goals to be pursued in the long run, through Strategic Planning of the PEPG Research and Postgraduate Studies. PEPG counts on five main actions to achieve intended objectives, described as follows:) Monitoring and Follow-up Program of Postgraduate Indicators;) Institutional Program of Postgraduate International Insertion;) Program of Academic Acknowledgment;) UFRPE Postgraduate National Insertion Program; and) Strategic Planning Program for UFRPE Research and Postgraduate Studies. As one might notice, previous to the initiative from PrInt/CAPES, UFRPE had already created its Institutional Program of Postgraduate International Insertion, which allowed for the institution to obtain two PPGs qualified with grade 6 at CAPES, in the last quadrennial evaluation of 2017. The Postgraduate International Insertion Program was regulated through the CEPE resolution 214/2012 and annually promotes, to PPGs that are grades 5 or higher, annual visitation missions to high level teaching and research institutes abroad. After the end of the mission, the participant PPGs must increase the number of apprentices sent, through the PDSE Program (CAPES or CNPq), to the visited institutions, besides submitting joint academic cooperation projects with the foreign institution. During this time (2013 - 2018), important missions were carried out to distinct North American universities, which led to several ongoing partnerships, such as:) Texas A&M University, College Station, TX;) University of California, Davis;) Michigan State University;) Nebraska State University; **3. UFRPE Postgraduate Internationalization Project for PrInt/CAPES-UFRPE (2019 - 2022):** The proposal here presented to CAPES refers to the UFRPE Postgraduate Internationalization Project for the period between 2019 - 2022, aiming at its financing according with the Bid Notice PrInt/CAPES 2017: The following items were considered in the proposal elaboration: • The UFRPE PPGs expertise in international cooperation; • the quality of the Institution research groups and their competence in carrying out partnerships with foreign universities; • The UFRPE Internationalization Institutional Plan; • The Institution strengths and weaknesses and its regional opportunities; • The effects of internationalization for the intern and external development of the institution; and • Institutional vocation for postgraduate teaching and its capacity for scientific, technological and innovative research. Based on these premises, two main themes were established to englobe the participation of several UFRPE PPGs, non-exclusive to PPGs, which means that a specific PPG may participate in more than one theme. The two themes selected, with their specific goals were: Agriculture and Livestock, Biodiversity and Sustainability Systems. • Goal 1: To expand and consolidate internationalization of programs that research aspects linked to biodiversity and sustainability of the use of natural resources; • Goal 2: To expand and consolidate internationalization of programs that are dedicated to agricultural production research; Goal 3: To expand and consolidate internationalization of programs that are dedicated to research that regards livestock and exploration of fishery resources. Future-Bearing Technologies. • Goal 1: To expand and consolidate internationalization of programs that are dedicated to research that regards the development of bioactive molecules applied to human and animal health and pollutant remediation; Goal 2: To expand and consolidate internationalization of programs that are dedicated to the development of information treatment technologies, modeling of spatial, geostatistics and fractal data. The objectives of this Plan will be developed with the following actions: “expansion and consolidation of international partnerships” and “exchange and improvement of academic training of professors

and students". All participating PPGs have grades 4 or higher, according with the last CAPES quadrennial evaluation. Internationalization actions in which several PPGs may participate simultaneously will be given priority, in a way to minimize investments and maximize benefits from international collaboration, for students and professors from the several participant postgraduate programs.

THEMES and SPECIFIC GOALS OF THE PROJECT

Theme

Agriculture and Livestock,
Biodiversity and Sustainability Systems.

Countries

France; Portugal; Spain; Cuba; Italy; Belgium; United Kingdom; Switzerland; Holland; Uruguay; Canada; Argentina; United States of America

Justification

UFRPE has a strong tradition in producing manpower and scientific research related to Agrarian and Veterinary Sciences, since its first years of creation. A considerable percentage of its Postgraduate Programs (PPGs) belongs to these fields of knowledge, acting integrally in the search for knowledge of biodiversity and improvement of the productive process and the sustainable use of natural resources, at Pernambuco and the Northeast Region, mainly in the Caatinga, which is the focus of several PPGs actions, dedicating themselves to study the several aspects related to the issue in question, that is: PGPV - Rational Exploration of Plant Resources. PGEA - Management and Monitoring of the integrated environment, recovery of soils (degraded areas and protected environments). PPGMV - Phylogeny of infectious diseases (swine and bovine), identification of antiviral drugs, development of products with antitoxic activity (plants important to livestock). PPGB - Composition, conservation and sustainable maintenance of plant biodiversity. PPGCS - Microbiology and pollution, recovery of degraded soils, anthropic livestock activities, urban or industrial. PPGAMGP - Conservation of native and naturalized genetic resources, agricultural productivity, breeding of food cultures, olive cultures, flower cultures, fruit cultures, and agroenergy. PPG-RPAQ - Management of aquaculture production and living aquatic resources focused on conservation of biodiversity, sustainability and impact reduction. RENORBIO - Biotechnology in Agribusiness, based on genetics and transgenesis, sanity and germplasm conservation and multiplication. PPEAMB - Conservation of Natural Resources, control and prevention of pollution, technologies to manage environmental issues in the water-soil-atmosphere system. PPGDITM - Natural products used in the pharmaceutical, food, cosmetic and coating markets. PDIZ - Use of forage resources, diets, cattle management, improvement of animal/plant genetic resources, innovation and use of efficient technologies in production systems. PPGETNO - Regional biodiversity, management/conservation of natural resources, sustainable development and systems' growth. PPGEA - management of vegetable pests, large cultures and fruit cultures. PPGF - Biology/Ecology and Taxonomy of Phytopathogens, management of diseases in cultures of economic value. PPGPA - Management of soil and water, epidemiology and pest control, and pathogens and technologies of low impact production.

GOALS

Goal 1

To expand and consolidate internationalization of programs that research aspects connected to biodiversity and sustainability of the use of natural resources.

Description

The objective of this action is to expand and consolidate international partnerships from the PPGs connected to areas of biodiversity and sustainability of the use of natural resources, involving reciprocal activities between PPGs and partners. These include carrying out missions of Brazilian professors to the current and future partner institutions abroad, complementing the training of doctors from the PPGs in the partner institutions abroad and receiving foreign researchers in Brazil. PPGs involved: Biotechnology, Botany, Development and Technological Innovation in Medicines, Environmental Engineering and Ethnobiology and Conservation of Nature. The fields of action and partner institutions of the participant PPGs are: RENORBIO - Fields: Biotechnology in Agribusiness, based on genetics and transgenesis, sanity and germplasm conservation and multiplication - Partners: Louisiana State Univ. (US); Univ. Degli Studi Di Genova (Italy); Cambridge Univ. (United Kingdom). PPGB - Fields: Composition, conservation and sustainable maintenance of plant

biodiversity - Partners: Royal Botanical Kew Gardens, Exeter and Portsmouth Univ. (United Kingdom). PPGDITM - Fields: Natural products used in the pharmaceutical, food, cosmetic and coating markets - Partners: Univ. d'Orléans (France). Gramma Univ. (Cuba); Lisboa Univ. (Portugal) PPEAMB - Fields: Conservation of Natural Resources, control and prevention of pollution, technologies to manage environmental issues in the water-soil-atmosphere system - Partners: TAMU Univ. (US); Palermo Univ. (Italy); IRD (France). PPGETNO - Fields: Regional biodiversity, management/conservation of natural resources, sustainable development and systems' growth - Partners: Illinois and California Univ. (US); Comahue Univ. (Argentina).

Goal 2

To expand and consolidate internationalization of programs that are dedicated to agricultural production research.

Description

The objective of this action is to expand and consolidate international partnerships of PPGs connected to areas of agricultural production, involving reciprocal activities between PPGs and partners. These include carrying out missions of Brazilian professors to the current and future partner institutions abroad, complementing the training of doctors from the PPGs in the partner institutions abroad and receiving foreign researchers in Brazil. PPGs involved: Soil Sciences, Agricultural Engineering, Agricultural Entomology, Phytopathology, Plant Breeding, Agricultural Production and Plant Production. The fields of action and partner institutions of these participant PPGs are: PPGCS - Fields: Microbiology and pollution, recovery of degraded soils, anthropic livestock activities, urban or industrial - Partners: North Carolina State University, Texas A&M University, University of Florida (US); Universidad Santiago de Compostela (Spain); IRD (France). PPGEA - Fields: management of vegetable pests, large cultures and fruit cultures - Partners: Univ. van Amsterdam (Holland); Exeter Univ. (United Kingdom - UK); Kansas State Univ. (US); Univ. Politécnica de Madrid (Spain) PGEA - Fields: Management and Monitoring of the integrated environment, soils reclamation (degraded areas and protected environments) - Partners; California Univ. - Davis, Florida, Duke and TAMU (US); La Coruña Univ. and Santiago de Compostela Univ. (Spain). PPGF - Fields: Biology, ecology and Taxonomy of Phytopathogens, management of diseases in cultures of economic value - Partners: Politécnica de Madrid, Politécnica de Valencia and Salamanca Univ. (Spain); Louisiana State and Clemson Univ. (US). PPGAMGP - Fields: Conservation of native and naturalized genetic resources, agricultural productivity, breeding of food cultures, olive cultures, flower cultures, fruit culture, and agroenergy - Partners: Virginia And TAMU Univ. (US); Bologna Univ. (Italy). PPGPA - Fields: Management of soil and water, epidemiology and pest control, and pathogens and technologies of low impact production - Partners: Wisconsin Duke and TAMU Univ. (US); IRD (France) PGPV - Fields: rational exploration of plant resources - Partners: TAMU And California - Davis Univ. (US); IRD (France).

Goal 3

To expand and consolidate internationalization of programs that are dedicated to research regarding livestock and exploration of fishery resources.

Description

The objective of this action is to expand and consolidate international partnerships of PPGs connected to areas of livestock and fishery resources, involving reciprocal activities between PPGs and its partners. These include carrying out missions of Brazilian professors to the current and future partner institutions abroad, complementing the training of doctors from the PPGs in the partner institutions abroad and receiving foreign researchers in Brazil. PPGs involved: Biotechnology, Veterinary Medicine, Fishery Resources and Aquaculture and Animal Science and RENORBIO - Fields: biotechnology in livestock, based on genetics and transgenesis, sanity and germplasm conservation and multiplication - Partners: Louisiana State Univ. (US); Univ. Degli Studi Di Genova (Italy); Cambridge Univ. (United Kingdom). PPGMV - Fields: Phylogeny of infectious diseases (swine and bovine), identification of antiviral drugs; development of products with antitoxic activity (plants important to livestock) - Partners: Ohio State Georgia, Iowa State, Louisiana State, Rutgers, TAMU Univ. (EUA); Provence and AgroParisTech Univ. (France); Complutense Univ. of Madrid, Leon Univ., Catholic University of Valencia and Autonomous Univ. of Barcelona (Spain); Colúmbia and Guelph Univ. (Canada). PPG-RPAQ - Fields: Management of aquaculture production and living aquatic resources focused on conservation of biodiversity, sustainability and impact reduction - Partners: Miami Univ., Virginia Institute of Marine Science, National Marine Fisheries Service, New Southeast - Florida (US); La Coruña Unv. (Spain).

PDIZ - Fields: Use of forage resources, diets, cattle management, improvement of animal/plant genetic resources, innovation and use of efficient technologies in production systems - Partners: Texas A&M Univ. (TAMU), Florida, California - Davis and California Polytechnic State (US); Aveiros (Portugal).

Theme 2

Theme

FUTURE-BEARING TECHNOLOGIES

Countries:

France; Cuba; Italy; United Kingdom; Austria; Portugal; Belgium; Holland; Switzerland; Spain; Argentina; United States of America;

Justification

The future-bearing technologies theme is a premise for the development of knowledge in different fields, involving the use of innovative methods and tools, although still restrict. Considering this, the following PPGs are acting: PPGETNO - in the development of natural products (food, medicines). PPEAMB - in the description and modeling of hydric resources (hr) management in watersheds, in investigating static and hydrodynamic phenomena of superficial flow and the effects of climate change in the spatial-temporal hr availability, and in the use of remote sensing in hr management. Renorbio - in purifying, describing and producing biotechnological products in heterologous systems, and in the research of industrial biotechnology, using fermentation processes for the production of milk derivatives. PPGDITM - in studies of natural products prospection, through the chemical profile of natural samples, of plant origin, of bees or agroindustrial residues. PPGEA - In the study of insect immunoresponse, insecticide and bioactive products of plants and microorganisms, and applying omics to identify substances with insecticide potential, from insects, bacterial proteins and phytobiotic compounds, as well as categorizing genomes of insects and microorganisms; using tools from the fine physical-chemistry, molecular biology and bioassays. PGEA - In developing mathematical modeling with agricultural and hydrological applications; spatial geostatistics and multifractal analysis for precision agriculture, and in the use of remote sensing aiming at the advancement of estimative models that can facilitate the conduction of agricultural and environmental management. PPGCS - In the use of synchrotron light techniques for chemical and physical studies in the scale of microorganisms and genomic studies of microorganisms and molecular biology, focusing on microorganisms and contaminated soil remediation. PPGBEA - In the use of computerized tomography with x-rays and laser scanners, in the reconstruction of images of calcified structures based on algorithms developed with cuda architecture, and in the development of gpgpus programming, emergent tools of physics statistics. PPGBA - In the production and analysis of biocompounds obtained from plants and microorganisms applied on the control of veterinary important diseases, and in the development of systems of controlled release of veterinary medicine in nanoscale.

GOALS

Goal 1

To expand and consolidate internationalization of programs that are dedicated to research that regards the development of bioactive molecules applied to human and animal health and pollutant remediation

Description

To expand and consolidate international partnerships that act on the development of bioactive molecules applied to human and animal health and pollutant remediation. To include missions of Brazilian professors to the partner institutions abroad, complementing the training of doctors from the PPGs in the partner institutions abroad and receiving foreign researchers in Brazil. The fields of action and partner institutions of the participant PPGs are: PPGBA - biocompounds from plants/microorganisms in the control of veterinary important diseases and systems of controlled release of veterinary medicines in nanoscale - Partners: degli Studi de Bari, degli Studi di Napoli Federico II, Gênova and Roma "LA SAPIENZA" (Italy - IT); Complutense de Madrid, Valencia and Murcia (Spain- ES); Georgia, Appalachian St. and Florida Agriculture and Mechanical (US); Cambridge and Strathclyde (United Kingdom). Renorbio - purification/description and production of biotechnological products in heterologous systems, and in the fermentation processes for the production of milk derivatives - Louisiana State (US); degli Studi Di Genova (IT); Cambridge (UK). PPGCS - microbiology and pollution,

recovery of degraded soils through urban and industrial agriculture and livestock - North Carolina St., Texas A&M and Florida (US); Santiago de Compostela (ES); IRD (France - FR). PPGDITM - natural products prospection, through the chemical profile of natural samples, of plant origin, bees or agroindustrial residues - d'Orléans (FR). Gramna (Cuba); Lisboa (Portugal). PGEA -- mathematical modeling of agricultural and hydrological application; spatial geostatistics and multifractal analysis for precision agriculture and remote sensing in estimative models for agricultural and environmental management - California - Davis, Florida, Duke e TAMU (US); Univ. de La Coruña e Santiago de Compostela (Spain); Agroscope - Department of Agroecology & Environment de Zürich (Switzerland). Ppgea - insect immunoresponse, insecticide and bioactive products from plants and microorganisms, and applying omics to identify substances with insecticide potential, from insects, bacterial proteins and phytobiotic compounds, as well as describing genomes of insects and microorganisms; using tools from the fine physical-chemistry, molecular biology and bioassays - van Amsterdam (Holland); Exeter (UK); Kansas St.. (US); Politécnica/Madrid (ES). PPGETNO - natural products (medicinal, food) - Illinois and California (US)

Goal 2

To expand and consolidate internationalization of programs that are dedicated to the development of information treatment technologies, modeling space data, geostatistics and fractal data

Description

The objective of this action is to expand and consolidate international partnerships of PPGs that act in the development of information treatment technologies, modeling space data, geostatistics and fractal data, involving reciprocal activities among PPGs and partners. These include carrying out missions of Brazilian professors to the current and future partner institutions abroad, complementing the training of doctors from the PPGs in the partner institutions abroad and receiving foreign researchers in Brazil. PPGs involved: Biometry and Applied Statistics, Agricultural Engineering and Environmental Engineering PPGBEA - Field: The use of computerized tomography with x-rays and laser scanners, in the reconstruction of images of calcified structures based on algorithms developed with CUDA architecture, and in the development of GPGPU programming, emergent tools of physics statistics - Partners: Universidad Nacional del Sur (Argentina); Centro Nacional De Sanidad Agropecuária (Cuba); University of Antwerp (Belgium); Texas A&M University, Appalachian State University (North Carolina) and Portland State University (US); PGEA - Field: development of mathematical modeling with agricultural and hydrological applications; spatial geostatistics and multifractal analysis for precision agriculture, and in the use of remote sensing aiming at the advancement of estimative models that can facilitate the conduction of agricultural and environmental management - Partners: California - Davis, Florida, Duke and TAMU Univ. (US); Univ. of La Coruña and Santiago de Compostela (Spain); Agroscope - Department of Agroecology & Environment of Zürich (Switzerland). PPEAMB - Field: description and modeling of hydric resources (HR) management in watersheds, in investigating static and hydrodynamic phenomena of superficial flow and the effects of climate change in the spatial-temporal HR availability, and in the use of remote sensing in HR management - Partners: TAMU Univ. (US); Palermo Univ. (Italy); IRD (France). PPGCS - Field: the use of synchrotron light techniques for chemical and physical studies in the scale of microorganisms and genomic studies of microorganisms and molecular biology, focusing on microorganisms and contaminated soil remediation - Partners: North Carolina State University, Texas A&M University, University of Florida, National Synchrotron Light Source (US); Universidad Santiago de Compostela (Spain); IRD (France).

POSTGRADUATE PROGRAMS LINKED TO THIS PROPOSAL

Theme 1:

Agriculture and Livestock, Biodiversity and Sustainability Systems

Postgraduate Program
BOTANY

Quadrennial Score (Capes evaluation)
4

Justification

(PPGB) Biodiversity has been largely used in a number of different applications. However, in most cases it is associated with resource depletion, due to inappropriate management and lack of expertise by its users. Unfortunately, it is remarkable that biodiversity losses are more frequent than are the positive effects generated by research and conservationist practices, since these are still not vastly used. It is important to consider that the study of biodiversity must not exclude, at any time, neither human populations and their demands, nor land utilization for the development of farming systems. Within this context, the Postgraduate Program in Botany encompasses areas of knowledge which focus on the understanding of structure and composition of vegetal biodiversity, as well as on generating and maintaining processes of biodiversity, its uses and conservation. All of these areas converge to the understanding of the best ways to fulfill maintaining needs of ecosystems and human populations in a sustainable way.

Postgraduate Program AGRICULTURAL ENTOMOLOGY	Quadrennial Score (Capes evaluation) 6
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Justification

The lines of research in the Postgraduate Program of Agriculture Entomology (PPGEA) include scientific research work which aims at professional training related in the area. Among collaborators and permanent academic staff, seven out of twelve professors implement activities related to productive systems. Five of them develop partnership work in the following productive systems: vegetables (tomato and brassica vegetables), big cultures (cotton and sugar cane), and tropical fruit trees (melon, coconut and Annonaceae). Besides the applied research, two out of seven professors develop research on biosystems and biodiversity related to Scarabeoidea, comprehending species of ecological (nutrient cycling and bio-indicators) and agricultural (underground pests) interest, as well as phytophagous mite and coconut trees and vine predators. Thus, it is important to register that research focus on bioecology of arthropods and natural enemies, seeking new technologies for the sustainable management of pests, such as biological control, selective insecticides, management of insecticides resistance, abiotic stress and trophic interactions.

Postgraduate Program AGRICULTURAL ENGINEERING	Quadrennial Score (Capes evaluation) 6
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Justification

The Agricultural Engineering Postgraduate Program (PGEA) is classified by CAPES in the Agrarian Sciences Area 1, with focus on water and soil engineering. Among the research lines developed by the program, we find: Environmental Monitoring and Recovery of Agricultural Soil and Degraded Areas; Integrated Management of Water and Soil; Waste and Water Reuse and Management of Agricultural Activities in Protected Areas. Some research projects developed by the academic staff are strongly integrated with sustainable farming production. Scientific production in the Agricultural Engineering Graduate Program focus on management, aiming to reduce problems affecting agricultural production, as well as seeking to minimize effects on the environment.

Postgraduate Program DEVELOPMENT AND TECHNOLOGICAL INNOVATION IN MEDICINES	Quadrennial Score (Capes evaluation) 4
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Justification

PPGDITM focus mainly on research of natural products in pharmaceuticals, food, cosmetics and coating. Thus, natural products from various sources, which can be effectively used in industry, are investigated. The main goal is to meet demands for national technologic solutions in the areas above mentioned, based on guidelines of technology full transfer, so that results obtained in academia are promptly converted to effective economic results for society. The knowledge about chemical patterns (standardization), either from plant origin, from bees, or from agro-industrial waste, is helpful for the evaluation of products, depending on applications in specific areas in collaboration with other research groups.

Postgraduate Program AGRONOMY (PLANT BREENDING)	Quadrennial Score (Capes evaluation) 4
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Justification

The main objectives of the PPGAMGP are the following: professional training in genetics and plant breeding; conservation of genetic resources of native or naturalized species, mainly in Brazil Northeast region. The program research projects focus on the development of scientific knowledge that promotes the increase of agriculture productivity, taking into account environmental, social and economic sustainability. Plant Breeding accomplished with food crop species such as oleraceous, flowering trees, fruit trees, agro-energetic, native and naturalizes species, help generate necessary knowledge for the farming production in the Northeast region, as to value biodiversity and sustainability. Northeastern biomes *Tabuleiro Costeiro* (coastal tablelands), *Mata Atlântica* (Atlantic Rainforest) and *Caatinga* (semiarid white forest) have extremely important native species which are genetic resources economically viable. Thus, studies focusing on the characterization and conservation of these resources, and also on the maintenance of Germplasm banks and collections found in institutions are extremely important.

Postgraduate Program
VETERINARY MEDICINE

Quadrennial Score (Capes evaluation)
5

Justification

The Veterinary Medicine Postgraduate Program (PPGMV) has developed, in the Animal Virology Laboratory (LAVIAN), research with focus on the development of tools for molecular and serologic diagnosis as well as for the phylogenetic study of infectious diseases, mainly the classical swine fever, bovine viral diarrhea and border disease. These activities have been funded by state and federal agencies FACEPE, CNPq, FINEP and CAPES. Other examples of high quality research are those related to the application of reverse genetics for the identification of antivirals against dengue and yellow fever. Within this research work, new technologies in flavivirus reverse genetics are applied in order to proceed screening tests to identify low cost natural antiviral agents. In conservation medicine area, PPGMV has also developed studies to evaluate wild birds health condition and avifaunal conservation in the Atlantic Rainforest and Caatinga. Since 2013 there has been done qualitative and quantitative survey of birds with different methods: Mackinnon List, point counts, and transects in ecological reserves and conservation units. Concerning diagnosis approach, PPGMV researchers employ various methods of investigation, such as CAT scan and molecular techniques to identify animal infectious diseases, including some with zoonotic potential. Furthermore, an ongoing research project funded by FACEPE and ANSES (French Agence Nationale de Sécurité Animale) seeks to develop anti-toxins products in order to prevent plant poisoning in ruminants. Another important research area at PPGMV is the study of relevant diseases within the concept of One Health.

Postgraduate Program
ANIMAL BIOSCIENCE

Quadrennial Score (Capes evaluation)
5

Justification

The Animal Bioscience Program is part of the CAPES Veterinary Medicine area, however the PPGBA has also a context of product production and development of agroindustrial processes, involving biological diversity of species and promoting sustainability actions. The Program has several ongoing research projects that use agroindustrial residues for the bioproduct production using microorganisms, that is, the development of sustainable biotechnological processes that, besides putting agroindustrial waste into use, add value to products made. At the same time, biodiversity of microorganisms and plants is used as an inexhaustible source of new molecules, such as enzymes, proteins, antimicrobial compounds, biopharmaceutical, among others. Such products can be used both in human and in veterinary medicines. It's important to highlight that the PPGBA also has a strong social impact in training manpower that is able to resolve problems regional and nationally, mainly those regarding production and animal health, specially the epidemiological study of animal diseases and zoonosis, besides the development and standardization of diagnose techniques and disease control.

Postgraduate Program
FISHERY RESOURCES AND AQUACULTURE

Quadrennial Score (Capes evaluation)
5

Justification

The Postgraduate Program of Fishery Resources and Aquaculture (PPG-RPAQ) acts directly in the development and administration of aquaculture production, including exploration of wild populations and cultivation in open and closed systems. Management of living resources depends on a broad understanding to ensure biodiversity conservation and sustainability of enterprises with the reduction of the productive systems environmental impact. All faculty has expertise aligned with the production themes, biodiversity or sustainability of activities that involve aquatic organisms.

Postgraduate Program

ETHNOBIOLOGY AND NATURE CONSERVATION

Quadrennial Score (Capes evaluation)

5

Justification

The ongoing growth of human population demands transformations on the use of the land, as much of the native forests are being converted into agricultural and livestock areas. Therefore, for a sustainable development of these regions, it's necessary to establish harmonic measures that allow for the growth of the agricultural and livestock systems while maintaining biodiversity, since it offers services and products that enable both the functioning of ecosystems, as the maintenance of human population itself. The Postgraduate Program in Ethnobiology and Nature Conservation (PPGETNO) deals with social-environmental issues, directing efforts to: know the biodiversity of each region; identify the relationship of local population with this biodiversity; understand the dynamic of ways to handle soil use and strategies adopted by human population that could favor conservation of natural resources; highlight the cultural differences of distinct ethnic groups, trying to understand their process of cultural evolution and develop new products from nature (medicines, food, etc.) in order to sustainably meet the growing need of mankind for natural spaces and biological resources. Productive needs of human population generate problems for many species in the environment, but human life and sustainable development depend on a balanced functioning nature. In truth, regions with human settlements and its productive activities create sociobiological systems, with specific problems and characteristics. Taking this into account, the PPGETNO seeks to form, beyond the objectives mentioned above, manpower able to address these issues properly, from the theoretical and methodological point of view, regarding systems of agricultural and livestock production, biodiversity and sustainability.

Postgraduate Program

Soil Science

Quadrennial Score (Capes evaluation)

5

Justification

Lines of research developed in the Soil Science Postgraduate Program (PPGCS) have high and direct relation with the theme in question. In fact, the Concentration Area is named "Soils and Environment" since soil is studied not only for agricultural production, but also in relation with the environment (biodiversity, sustainability and food security). Thus, the totality of thesis and essays developed, as well as lines of research and professor's specialties, focus on sustainable agriculture production with respect to the environment, since soil is the great support for this production. Besides, in the areas of Soil Microbiology, Soil Pollution and Recovery of Degraded Soils, the Program has developed research that directly study the effects of anthropic activities, either in agricultural and livestock, urban or industrial, in biodiversity or in ecosystems' sustainability.

Postgraduate Program

PHYTOPATOLOGY

Quadrennial Score (Capes evaluation)

5

Justification

PPGF act in the Agrarian Sciences/Agronomy/Phytopathology fields of knowledge, in several areas of concentration directed to two lines of research in the Agricultural & livestock and Sustainability areas: Biology, ecology and taxonomy of phytopathogens and Epidemiology and management of plant diseases. Research developed in the Program, beside studies of diseases in cultures of high economic value, such as tropical fruit trees and vegetables, have made important contributions in the knowledge and management of cultural diseases typical from the North and Northeast regions, such as yams, cowpea beans, and fava beans, besides others used in family farming, such as sweet potatoes and cassava. Modern techniques have been used as research tools, following the world scientific development. Faculty and student knowledge will be improved through a better Program internationalization.

Postgraduate Program

ANIMAL SCIENCE

Quadrennial Score (Capes evaluation)

5

Justification

PPGZ and PDIZ lines of research are directly related with the agriculture and livestock production systems, notably livestock, which is one of the most important activities regarding employability in the Northeast region development. Caatinga, as a complex and at risk biome, is the food basis of ruminant flocks and the source of energy extraction for many rural populations. There is a great percentage of flocks that are dependable on the food available in the Caatinga. However, there are many limitations to these systems. Such limitations are the result of several factors, among which: the inadequate use of forage resources, formulation of diets, general management of flocks for this ecosystem, inappropriate usage of animal and plant genetic resources, absence of innovation and inappropriate use of technologies and the need to develop or adapt new technologies to make the production systems and the rural property stability more efficient. Research actions in this program are directed to solving problems in this system of production, in order to ensure sustainability of the activity and the Caatinga biome. Training of manpower with capacity to act in these systems and develop research and technologies is crucial to improve production and productivity of systems and requires the most possible broad education for these students, which can be enriched with their participation in projects with other national and, mainly international institutions.

Postgraduate ProgramPlant Production (*Crop Science*)**Quadrennial Score (Capes evaluation)**

4

Justification

PGPV is inserted in the Brazilian semi-arid region and its concentration area is Plant Production in the Semi-arid, acting in three lines of research related to specific problems that affect the agricultural sustainability in this environment: (1) Physiology, improvement and technology of native and cultivated plants in the Semi-arid; (2) Interaction of biotic and abiotic factors in ecosystems in the Semi-arid and (3) Management and conservation of agroecosystems in the Semi-arid". Thus, all research projects led by PGPV professors, generating thesis and scientific publications, are inside one or more of these thematic lines.

Postgraduate Program

BIOTECHNOLOGY - RENORBIO Network

Quadrennial Score (Capes evaluation)

5

Justification

The Biotechnology Postgraduate Program (RENORBIO) has 4 areas of concentration, of which Biotechnology in Agriculture and livestock and Biotechnology in Natural Resources are directly related to the theme in question. In the Agriculture and Livestock area, there are three lines of research: 1- Genetics and transgenesis; 2 - Health; and 3- Conservation and multiplication of germplasm. In the Natural Resources area, there are two lines of research: 1 - Bioprospection, biodiversity and conservation; and 2 - Purification, description and production of biotechnological products in heterologous systems. Still, in the Industrial Biotechnology research line, there are projects being developed aimed at using different fermentation processes for the production of milk derivatives.

Postgraduate Program

ENVIRONMENTAL ENGINEERING

Quadrennial Score (Capes evaluation)

4

Justification

One knows that the environment degradation is perceived by the direct contamination of the soil, water courses, groundwater, aquiferous and the atmosphere, or by their indirect consequences on men and other living organisms through the food chain. The unwelcomed presence, in the environment, of foreign chemical elements, such as solid residues or industrial effluents, harms life forms and their regular development characterizes environmental pollution. Pesticides used by farmers contribute with the non-point pollution of watersheds. The UFRPE Postgraduate Program in Environmental Engineering (PPEAMB), acting in pollution control and remediation, in sediment engineering, environmental management, modeling of environmental systems and soil degradation diagnostics, is a viable alternative in the control and prevention of the pollution

involved in the agriculture and livestock systems of production. This way, by improving performance of productive processes, one simultaneously develops technologies for biodiversity preservation, also achieving sustainability.

Theme 2

FUTURE-BEARING TECHNOLOGIES

Postgraduate Program

ANIMAL BIOSCIENCE

Quadrennial Score (Capes evaluation)

5

Justification

The Animal Bioscience Program (PGBA) is part of the CAPES Veterinary Medicine area, as well as part of a context of production of products and development of agroindustrial processes, involving biological diversity of species, and promoting actions of sustainability. The Program has several ongoing research projects that use agroindustrial residues for the production of bioproducts using microorganisms, that is, the development of sustainable biotechnological processes, that makes use of agroindustrial waste while adding value to the products created. At the same time, biodiversity of microorganisms and plants is used as an inexhaustible source of new molecules, such as enzymes, proteins, antimicrobial compounds, biopharmaceutical, among others. Such products can be used both in human and in veterinary medicines. It also develops research projects in the nanotechnology area applied to veterinary medicine, focusing on the development of pharmaceutical controlled release systems in gauge scales, with application in aquaculture and other livestock lines of production. It's also relevant for the nanoecotoxicology area, evaluating environmental impact of nanoproducts, such as nanoparticles and inclusion complexes of drugs in the environment.

Postgraduate Program

BIOMETRY AND APPLIED STATISTICS

Quadrennial Score (Capes evaluation)

4

Justification

The PPGBEA develops research with consolidated interfaces in the fields of sustainability and biodiversity, under distinct approaches. Sustainability: Application of emergent methods of physics statistics towards supporting planning, operation and management of hydric resources, as well as other impactful phenomena for the agrarian and environmental sciences, such as: wind, solar radiation, burnings, etc. The techniques applied include: sample entropy, permutation entropy, complexity entropy plane, Detrended Fluctuation Analysis, Multifractal Detrended Fluctuation Analysis, among others. Otoliths are limestone concretions found in the internal ear of fishes and represent an important source of relevant information to evaluate current stocks and management procedures. There is great interest on the form, size, growth and diversity of otoliths, however, few studies address the modeling of its formation process in a quantitative manner. In this proposal, the phenomena of otolith formation in fishes is examined under a new perspective, as a process of stochastic deposition. On this matter, the described research proposal must contribute for a better understanding of: 1 - functional reasons for different forms of otoliths in a two-dimensional and three-dimensional perspective; 2 - process of diffusion involved in the otolith biomineralization; 3 - relation between the otolith density and its growth; 4 - faster implementation of algorithms based on CUDA C architecture to analyze the otolith images and growth. Biodiversity: evolution, competition and propagation of species, sustainability of eucalyptus trees, evolution of otoliths, dynamic of propagation of species and diseases in the hydrographic network of the Amazon River. Planning, design, operation, and management of water resources systems. Study of wind, solar radiation, burnings, techniques: sample entropy, permutation entropy, complexity entropy plane, Detrended Fluctuation Analysis, Multifractal Detrended Fluctuation Analysis.

Postgraduate Program

Soil Science

Quadrennial Score (Capes evaluation)

5

Justification

The Soil Science Postgraduate Program's academic staff has increasing interest in bearing future technologies. In this sense, it has already started national and international cooperation with groups who work with rare land elements, identified as "future-bearing elements". Another study area already started deals with

the use of synchrotron light techniques for studies in chemistry and physics on a microcosmic scale. Within these studies we have interacted with researchers from Laboratório Nacional de Luz Síncrotron (Campinas, Brazil) and from Synchrotron Light Source II (EUA). In regard to biotechnology, the program has developed research in genomics of microorganisms and molecular biology, with a focus on soil microorganisms (phosphate solubilizing microorganisms, for instance) and remediation of contaminated soils (environmental microbiology). Taken into account our context, all techniques described above are complementary and are used in various projects developed in the Soils Science Postgraduate Program.

Postgraduate Program

BIOTECHNOLOGY-RENORBIO Network

Quadrennial Score (Capes evaluation)

5

Justification

The program encompasses four areas of study, from which Agricultural and Livestock Biotechnology and Natural Resources Biotechnology are directly related to this theme. There are three research lines in Agricultural and Livestock: 1- Genetics and Transgenesis; 2 – Animal health; and 3 – Germplasm conservation and multiplication In regard to Natural Resources there are two research lines: 1 - Bioprospection, biodiversity and conservation; and 2 - Purification, description and production of biotechnological products in heterologous systems. Still, in the Industrial Biotechnology research line, there are projects being developed aimed at using different fermentation processes for the production of milk derivatives.

Postgraduate Program

AGRICULTURAL ENGINEERING

Quadrennial Score (Capes evaluation)

6

Justification

The development of scientific methodologies has undergone exponential growth and the Agricultural Engineering Postgraduate Program (PGEA) seeks to incorporate current themes of international relevance. Among the main mathematical tools, modelling attached to agricultural and hydrological application; multifractal and geostatistics space analysis for the development of precision agriculture are integrated to projects developed by PGEA Another technology used in PGEA research projects is the remote sensing by spectral images obtained from satellites and drones, in order to elaborate estimate patterns, which facilitates agriculture and environmental management.

Postgraduate Program

AGRICULTURAL ENTOMOLOGY

Quadrennial Score (Capes evaluation)

6

Justification

Four out of twelve professors from the Agriculture Entomology Postgraduate Program (PPGEA) work in activities related to insect immune response, insecticides of plant and microorganism origin, and employment of omics to identify substances with insecticide potential, from insect compounds, proteins found in bacteria and plant bioactive compounds. In addition, they work on genome characterization of relevant insects and microorganisms. As for the biological target, omics are used to determine receptors and mutation associated to susceptibility and resistance to control methods Bioactive substances in plants identified by chromatography are being tested so that they can be formulated by nanotechnology and thus directly used in pest control, as mixture with synthetic insecticides, seeking reduction in required dosage, with lower costs and less environmental impact, as well as a better understanding of transmission of vector-borne diseases.

Postgraduate Program

ETHNOBIOLOGY AND NATURE CONSERVATION

Quadrennial Score (Capes evaluation)

5

Justification

Brazilian biodiversity provides a wide range of environmental services and products which enable life of human populations, as it can be exemplified by medicinal use of natural resources. Due to the low-income condition, many families in the Northeast region seek in the forests resources for the treatment of their ailments: fruit peels, roots, leaves, flowers and seeds of various species, many of them without pharmacologic effectiveness tested. Thus, research developed by Ethnobiology and Conservation Postgraduate Program seeks to evaluate chemical and pharmacological properties of species used by local populations, in order to evaluate their

therapeutic activity, as well as to identify new substances, new drugs that may be further used in public healthcare system for a number of ailment treatment.

Postgraduate Program

ENVIRONMENTAL ENGINEERING

Quadrennial Score (Capes evaluation)

4

Justification

One knows that the environment degradation is perceived by the direct contamination of the soil, water courses, groundwater, aquiferous and the atmosphere, or by their indirect consequences on men and other living organisms through the food chain. The unwelcomed presence, in the environment, of foreign chemical elements, such as solid residues or industrial effluents, harms life forms and their regular development characterizes environmental pollution. Pesticides used by farmers contribute with the non-point pollution of watersheds. The UFRPE Postgraduate Program in Environmental Engineering (PPEAMB), acting in pollution control and remediation, in sediment engineering, environmental management, modeling of environmental systems and soil degradation diagnostics, is a viable alternative in the control and prevention of the pollution involved in the agriculture and livestock systems of production. Through the improvement of performance in production, it also develops technologies for biodiversity preservation, with possible forms of sustainability.

Postgraduate Program

DEVELOPMENT AND TECHNOLOGICAL INNOVATION IN MEDICINES

Quadrennial Score (Capes evaluation)

4

Justification

The Postgraduate Program in Development and Technological Innovation in Medicines focus mainly on the research of natural products to be used in pharmaceuticals, food, cosmetics and coating. It also encompasses the area of Biotechnology in Human and Animal Health, within which bioactive molecules are to be developed. Biological activities related to this area include leishmanicide, anti-Tripanossoma cruzi (Chagas disease), antivirotic, antibiotic, antifungal, antimalarial and anticancer agents.

Activities

Theme 1

Agriculture and Livestock, Biodiversity and Sustainability Systems.

Goal 1

To expand and consolidate internationalization of programs that research aspects connected to biodiversity and sustainability of the use of natural resources

Activity 1

To expand and consolidate international partnerships

Start date

11/2018

End date

07/2022

Description

To promote the expansion of PPG international partnerships and to consolidate those already existent. This action includes carrying out missions abroad and welcoming foreign researchers (visiting professor in Brazil). PPGs involved: Biotechnology, Botany, Development and Technological Innovation in Medicines, Environmental Engineering and Ethnobiology and Conservation of Nature.

Indicators from Activity 1

Type	Indicator	Current situation	Goal for the 2nd year	Final goal
Quantitative	Missions Carried out Abroad	2	6	14

Quantitative	Young Talents Abroad	0	3	6
Quantitative	Foreign Visiting Professor	3	15	30

Activity 2	Start date	End date
Exchange and improvement of academic formation of professors and students	11/2018	07/2022

Description

To promote professor exchange by going abroad (junior and senior visiting professor), and students (PhD), by carrying out sandwich PhD abroad.

Indicators from Activity 2

Type	Indicator	Current situation	Goal for the 2nd year	Final Goal
Quantitative	Visiting Junior Professor Abroad	0	1	2
Quantitative	Sandwich PhD Abroad	5	10	20
Quantitative	Senior Visiting Professor Abroad	0	2	4

Goal 2

To expand and consolidate internationalization of programs that are dedicated to research regarding agricultural production

Activity 1	Start date	End date
Expanding and Consolidating International Partnerships	11/2018	12/2021

Description

To promote the expansion of the PPG international partnerships and consolidate those already existent. This action includes carrying out missions abroad and welcoming foreign researchers (visiting professors in Brazil). PPG involved: Soil Sciences, Agricultural Engineering, Agricultural Entomology, Phytopathology, Plant Breeding, Agricultural Production and Plant Production.

Indicators from Activity 1

Type	Indicator	Current situation	Goal for the 2nd year	Final goal
Quantitative	Young Talent Abroad	0	5	10
Quantitative	Missions carried out abroad	3	9	22
Quantitative	Visiting Foreign Professor	3	24	48

Activity 2

Exchange and improvement of academic training for professors and students.

Start date**11/2018****End date****07/2022****Description**

To promote professor exchange by going abroad (junior and senior visiting professor), and students (PhD), by carrying out sandwich PhD abroad.

Indicators from Activity 2

Type	Indicator	Current situation	Goal for the 2nd year	Final goal
Quantitative	Visiting Senior Professor Abroad	1	6	12
Quantitative	Sandwich PhD	4	16	32
Quantitative	Visiting Junior Professor Abroad	1	3	6

Goal 3

To expand and consolidate internationalization of programs that are dedicated to research regarding livestock and exploration of fishery resources

Activity 1

Exchange and improvement of academic training for professors and students.

Start date**11/2018****End date****07/2022****Description**

To promote professor exchange by going abroad (junior and senior visiting professor), and students (PhD), by carrying out sandwich PhD abroad.

Indicators from Activity 1

Type	Indicator	Current situation	Goal for the 2nd year	Final goal
Quantitative	PhD Sandwich	2	4	8
Quantitative	Visiting Junior Professor Abroad	0	1	2
Quantitative	Visiting Senior Professor Abroad	1	2	4

Activity 2

To expand and consolidate international partnerships

Start date**11/2018****End date****07/2022**

Description

To promote the expansion of PPG international partnerships and to consolidate those already existent. This action includes carrying out missions abroad and welcoming foreign researchers (visiting professor in Brazil). PPGs involved: Biotechnology, Veterinary Medicine, Fishery Resources and Aquaculture and Animal Science

Indicators from Activity 2

Type	Indicator	Current situation	Goal for the 2nd year	Final goal
Quantitative	Mission Abroad	2	4	6
Quantitative	Visiting Foreign Professor	4	6	8
Quantitative	Young Talent Abroad	0	2	4

Theme 2

FUTURE-BEARING TECHNOLOGIES

Goal 1

To expand and consolidate internationalization of programs that are dedicated to research related to the development of bioactive molecules applied to human and animal health and pollutant remediation.

Activity 1

Exchange and improvement of academic training of professors and students

Start date

11/2018

End date

07/2022

Description

To promote professor exchange by going abroad (junior and senior visiting professor), and students (PhD), by carrying out sandwich PhD abroad.

Indicators from Activity 1

Type	Indicator	Current situation	Goal for the 2nd year	Final goal
Quantitative	Sandwich PhD	1	7	14
Quantitative	Visiting Junior Professor Abroad	0	1	2
Quantitative	Visiting Senior Professor Abroad	0	2	4

Activity 2

To expand and consolidate international partnerships

Start date

11/2018

End date

07/2022

Description

To promote the expansion of PPG international partnerships and to consolidate those already existent. This action includes carrying out missions abroad and welcoming foreign researchers (visiting professor in Brazil). PPGs involved: Animal Bioscience, Biotechnology, Soil Science, Development and Technological Innovation in Medicines, Environmental Engineering, Agricultural Entomology and Ethnobiology and Conservation of Nature.

Indicators from Activity 2

Type	Indicator	Current situation	Goal for the 2nd year	Final goal
Quantitative	Mission Abroad	0	4	6
Quantitative	Young Talent Abroad	0	2	4
Quantitative	Visiting Foreign Professor	1	11	21

Goal 2

To expand and consolidate internationalization of programs that are dedicated to the development of information treatment technologies, modeling space data, geostatistics and fractal data

Activity 1

Exchange and improvement of academic formation of professors and students

Start date

11/2018

End date

07/2022

Description

To promote professor exchange by going abroad (junior and senior visiting professor), and students (PhD), by carrying out sandwich PhD abroad.

Indicators from Activity 1

Type	Indicator	Current situation	Goal for the 2nd year	Final goal
Quantitative	Visiting Junior Professor Abroad	0	3	4
Quantitative	Visiting Senior Professor Abroad	0	4	7
Quantitative	Sandwich PhD	4	11	22

Activity 2

To expand and consolidate international partnerships

Start date

11/2018

End date

07/2022

Description

To promote the expansion of PPG international partnerships and to consolidate those already existent. This action includes carrying out missions abroad and welcoming foreign researchers (visiting professor in Brazil). PPGs involved: Biometry and Applied Statistics, Agricultural Engineering and Environmental Engineering

Indicators from Activity 2

Type	Indicator	Current situation	Goal for the 2nd year	Final goal
Quantitative	Young Talent Abroad	0	4	8
Quantitative	Mission Abroad	0	7	10
Quantitative	Visiting Foreign Professor	0	16	33

STRATEGIES

1. Strategy for the consolidation of existing international partnerships, as well as the construction of new partnerships and cooperation projects to increase the relationship between the Brazilian institution and research groups abroad:

UFRPE's Postgraduate Studies grew increasingly in the past fifteen years, both in numbers and in quality of Postgraduate Programs (PPGs), as indicated by the increase on the grades average of programs evaluated by CAPES. Consequently, there is a visible improvement in the interpersonal relationships between professors and students from the PPGs at UFRPE and other Universities, as well as Foreign Research Centre (CPE), thus increasing international mobility and collaborative scientific production of high level. Considering what was mentioned above, UFRPE sought to facilitate the relationship of its research groups and PPGs with Universities and CPE through integrated actions from the Provost of Research and Postgraduate Studies (PRPPG), the International Office (ACI), Covenant Centre (NURIC) and Legal Advisory (AJU), all working in an orchestrated manner within each competence field. It's worth to mention that the UFRPE Internationalization Plan was recently elaborated by ACI, approved by the Higher Councils and is effective for the period of 2018 to 2022. To consolidate international partnerships and establish new ones, UFRPE adopted debureaucrating measures of institutional support for its groups of excellence in research and PPGs that, in short, are qualified as follows: In the Legal field, actions were developed to: a. Consolidation of a single "Memorandum of Understanding – MOU", previously approved by AJU, used for the initial proposal of interinstitutional international cooperation; b. Consolidation of Simplified Work Plans, aiming to define responsibilities among parts involved in international cooperation. In the Plan of Institutional Support, the UFRPE rectory established: c. Creation of a financial support program (tickets and day rates), in order that leaders from high level research groups, from the PPGs assessed with CAPES grades 5 or superior, could carry out initial visitations to international institutions of academic excellence, in search of international scientific cooperation. d. Establishment of a Foreign Language Centre, to train professors, students and UFRPE staff in several languages. e. The semiannual offer of a Portuguese for Foreign Students subject enrolled in the UFRPE PPGs; and f. Periodic offer of free Proficiency Tests of English (TOEFL) and other languages.

2. Strategy to attract foreign students to Brazil:

Aiming to meet the PPG needs with CAPES grades 5 or 6, by which having foreign students in our students' body, UFRPE established strategies so that the PPGs could attract learners from other countries, notably from South America and Africa. The main actions that are part of the strategies to attract foreign students to the postgraduate programs are: • To expand the disclosure of UFRPE PPGs abroad, mainly in countries from South America and Africa; • To effectively participate in International Programs of Student Mobility, as those promoted by OAS and other foreign countries (i.e. Erasmus Mundus, Coimbra Group, etc.); • To support professors with high international cooperation capacity in search of talented students to participate in the

UFRPE PPGs; • To attract international students in the undergraduate level, aiming to keep them as postgraduate students in mid-term; • To annually grant a determined number of masters and PhD scholarships to foreign students; • To create a welcoming institutional structure to foreign students; • To regularly offer a Portuguese subject for international students, and promote free Portuguese Language Proficiency tests; and • To promote integration between international and native students.

3. Strategy to attract faculty and researchers with international experience for period of activities in Brazil:

The Stricto Sensu UFRPE Postgraduate program was very successful in the 2017 evaluation, with several programs reaching grades 5 and 6 (2 PPGs obtained grade 6). Without a question, the positive outcome of this evaluation was due to the intensive use of the opportunities provided by CAPES internationalization programs that allowed for a larger access to investments in the field of international cooperation. We highlight the following initiatives: • Creating several Schools of Higher Studies, by welcoming high level international professors, linked with institutions of indisputable scientific renown and acknowledged by the international academic community; • The intensive use of the CAPES Program for Foreign Visitants - PVE/CAPES. In the last quadrennial, dozens of PVE Scholarships were achieved by the UFRPE PPG professors who participated in all bid notices promoted by CAPES and CNPq, throughout the Science without Borders Program and, subsequently, in specific bid notices from the International Relations Board - DRI, CAPES; • Formation of PhD thesis committees of UFRPE PPGs having, at least, one international professor, carried out on-site and by webconference; • Carrying out International Congresses, Seminars and Workshops, with intense participation of foreign researchers, coordinated by UFRPE PPGs. • International participants, invited by the institution and professors from the several UFRPE PPGs with the support from the PRPPG, to carry out Post-PhD internships and Technical Visitations systematically.

4. Strategy to prepare the scholarship holders (professors and students) for the period abroad as well as for their return, especially in order to increase the knowledge appropriation by the institution:

UFRPE encourages its professors connected to the Stricto Sensu Postgraduate Programs to carry out post-PhD activities and senior internships abroad. To do so, once the professor's working load is calculated in the department, the institution facilitates the professor's leave of absence to study abroad for up to twelve months, granting them authorization for international leave. Also, there is an institutional policy to facilitate professors to go abroad, when referring to short-term missions. On the other hand, postgraduate students are encouraged to spend a semester abroad to conclude their PhD research. PDSE Scholarships (CAPES and CNPq) are regularly used by students when carrying out sandwich PhDs. We highlight below some of the facilitating strategies to support professors/students preparing to go abroad: • The Institution Languages Centre offers regular tests of Language Proficiency for professors, students and staff (these offers are free of charge); and, • The Institution Languages Centre has a regular offer of foreign language courses for professors, students and staff. Regarding institutional strategies to welcome students and professors who are returning to their country after international internships, Post-PhD and PDSE (in the student's case), the UFRPE PPGs encourage professors and students: • To give lectures and seminars about their experiences abroad, with scientific and technical content and information that report their social and cultural experience living outside their country; • To contribute and share with fellow professors and students their experiences living abroad, that can add value for research innovation and teaching in their field of knowledge; • To promote innovation in their pedagogical practices, especially in the field of information technology applied to teaching and scientific and technological research; • To promote, along with research groups and visited institutions, the expansion of international cooperation with UFRPE; and • To consolidate and expand, with visited groups, collaborative intellectual production, through joint scientific publication with international partners.

5. Describe innovative strategies that will be used by the institution that were not mentioned above:

From the existence of an international cooperation institutional program at UFRPE (as it will be with the approval of the PrInt/UFRPE Proposal), with established financing and tangible programmed goals, the institution will be strengthened to: • Intensify communication and disclosure of existing international cooperation opportunities, taking information directly to PPG professors and students, through a more efficient

and effective communication process of the responsible institutional actors through international relationship (i.e. ACI, PRPPG); • Positively register, in the professors' careers, the international cooperation activities. • To grant academic credits to students participating in international activities of short-term internships, International Congresses, Seminars and Workshops, as well as long-term internships abroad (i.e. PDSE); • To financially invest, if possible, in professors and students who develop work of renowned scientific and innovative value, helping them in their relationship with advanced centers of research and teaching abroad; To keep an institutional free access data bank, containing information of professors and students with relevant participation in international cooperation, focused on their academic, scientific and innovative technological advances; and, • To promote events that can nurture initiatives of great scientific, technological, social and cultural relevance for the discussion of research topics and teaching in the edge of scientific knowledge and social development.

POLICIES

1. Policy for selection of foreign partners, considering that 70% (at least) of the resources should be earmarked for partnerships with institutions based on countries that Capes maintains effective cooperation (listed in Annex I of the call).

The implementation of a policy of such nature, at first, will value successful ongoing partnerships, but also trigger the identification of new partners with high potential for success, in a way that they can become close to our research groups and be aligned with our goals for the PrInt Capes bid notice. It's important to highlight that, nowadays, the grand majority of international cooperation of the UFRPE PPGs are established already with the countries listed as priority in the Annex I from the Capes PrInt Bid Notice. Aiming to assure the success of our actions at the Capes PrInt bid notice, the following strategies will be applied: - Systematize all information on current international partnerships among the PPGs included in this proposal; - identify groups of excellence abroad with potential to establish partnerships with UFRPE; - Evaluate outcomes of previous actions and create mechanisms to adequate goals, based on local, regional and national interests; and - Set, in the Management Group agenda, priority of partners according with the steps established in the Capes PrInt bid notice, giving priority to countries that have effective agreements with Capes.

2. Grant policy and internal selection process for specific actions, within the funding lines of the Capes-PrInt program. In the case of cooperation projects with foreign institutions, the proposer should specify the application of funds, the plan of activities, reciprocal funding, academic mobility, technical - scientific production, counterparts in the partner institutions, among others.

The choice of actions will be initially based on what are the objectives and goals presented in the proposal, where specific actions to be achieved are defined. The Board Group (GG) will define the execution of the actions planned in the institutional project, as well as the selection of beneficiaries. Selection of beneficiaries will be made through an internal bid notice, observing the technical competence of the benefit candidates to each specific action to be carried out. Highlighted points to establish the policy of internal selection of specific actions and beneficiaries: - Once contemplated, UFRPE will release specific bid notices to each action within the institutional proposal criteria; - UFRPE will use external advisors to evaluate the beneficiaries' selection bids of each specific action of the institutional proposal; - Priority will be given to proposals that can increase mobility of professors/students, international finance counterparts, and the possibility of technical-scientific production among the institutional participants; activities that can have a broader scope among the participant PPGs; a higher possibility to bring innovative technology to apply in research works developed in the institution; and research that can positively impact society through goods and/or services.

3. Policy for hiring faculty with recognized scientific performance at an international level.

UFRPE in the last Capes quadrennial evaluation has evolved more than 30% in the PPG grades, as an answer for several actions with the support of the higher administration, such as the release of bid notices for tenure in higher education (permanent positions), aiming at professor activities both in the undergraduate and in the postgraduate levels, which allowed for a high quality renovation of permanent professors in several UFRPE PPGs, clearly reflecting in the increase of their scientific performances. Thus, continuing such actions, the policy for this goal will be: - To keep the policy of hiring professors to support the PPGs, authorizing bids for

permanent positions to hire high level professors for the higher education, enabling a renewal of the PPGs' professors/researchers with high quality; and - Within the possibilities of the federal institutions of higher education, UFRPE will provide positions for visiting professors, when authorized by MEC, to hire temporary professors of renowned scientific performance, aiming at the qualitative and quantitative increase of professors with the possibility to strengthen the PPGs internationalization.

4. Policy to increase proficiency in foreign languages for students, postgraduate faculty and technical staff that have a direct relationship with the proposed Internationalization Project.

PPGs involved in the Institutional Project here proposed are committed to improve encouragement of students, faculty and technical staff to carry out courses of foreign language proficiency, especially English, French and Spanish. The improvement of foreign language proficiency is made in the UFRPE Languages Centre, through on-site classes, as well as the periodic offer of free of charge proficiency tests in English (TOEFL) and other languages (DELE, DELF/DALF). The Languages Centre has provided professional cultural-pedagogic experience to the community (undergraduate and postgraduate students, professors and technicians). Among the main objectives of the Languages Centre we find the increase of the academic community competence in communicating in a foreign language and, also, mobility encouragement, mainly for students and professors to study abroad. Beyond the previous established actions, UFRPE, to promote the technical-administrative staff career, will adopt the policy to offer foreign language courses promoted at UFRPE that can be added to their in-work progression. Furthermore, there will be an incentive for the academic community to use the English language course promoted by the Ministry of Education (my English online), and to stimulate the offer of disciplines in a foreign language inside the PPGs curriculum.

5. Policy for recognition of academic and scientific activities performed by faculty and students abroad.

UFRPE has already been carrying out policy actions of this nature, in a way that, by executing our project into the Capes PrInt bid notice, we will expand them to a higher number of beneficiaries (professors and students), consolidating our internationalization actions. In this field, we highlight the following actions: - Activities by professors carried out abroad, such as subjects, courses and/or lectures, are accounted for in their working load and activities report for purposes of in-work vertical or horizontal progression; - Subjects taken abroad by the UFRPE PPG students will be evaluated in the Didactic Coordination Collegiate in order to equalize workload and number of credits so they can, afterwards, be approved as credited, for the purpose of completing the masters and PhD courses; UFRPE will set a standard for the equivalence of internships taken abroad such as the subject "Special Topics", accounting credits to complete the PhD and Masters courses; - At the same time, through the CEPE Nº 201/206 Resolution, UFRPE has set the rules for regulating postgraduate education with joint degrees, making clear in the first clauses what are the objectives related to joint degree; UFRPE may grant a degree in the cotutelle regime with other foreign Higher Education Institutions, under Agreements through their Stricto Sensu Postgraduate Programs, conducting, thus, to the joint degree; - Regulation of Postgraduate Education with Joint Degree regards norms and modalities of activity development, in the Stricto Sensu Postgraduate area, allowing for UFRPE students and students from foreign institutions in a cotutelle partnership with UFRPE, to concomitantly obtain a diploma in this University and in another peer foreign Institution.

6. Policy for hosting and support of foreign faculty, researchers and students.

UFRPE Internationalization Plan contemplates welcoming professors, researchers and foreign students, through ACI, the body responsible for facilitating the entering procedures, orientation and permanence of professors, researchers and foreign students, providing for a productive stay, besides carrying out research projects, mobility, internships, cotutelle projects, publications and events with the international community. This way, students are welcomed through ACI and the Provosts of Undergraduate Teaching and Research and Postgraduate Studies to assist in the demands regarding student housing, medical and dental care, psychological support, Portuguese as a second language courses, besides actions that ensure the integration and socialization of the foreign student inside the campus. It's worth to highlight that the ACI is implementing a project called ADOPT A FOREIGN STUDENT, with the objective to register Brazilian students and professors, belonging to UFRPE, to become responsible for a foreign student in the Institution. This action

includes getting in contact with the visitant previous to his/her arrival, by phone or email, offering to help finding accommodations, to pick him/her up in the airport and taking him/her to UFRPE for their first contact with the University. Thus, the person responsible for the adoption will conduct this foreigner within the institutional facilities, aiming to facilitate his/her access to the University Restaurant registration, as well as the library and the medical and dental care (when it's the case). UFRPE is a center for application of some official language tests made available to foreign visitants. This action also includes trips and visits to cultural centers of the city, aiming to disseminate Brazilian culture and, in particular the culture of Pernambuco. ACI is organizing every year in the month of November, the Student International Day event, where each student presents the culture of his/her country for the academic community. Aiming to strengthen internationalization in the academic environment, UFRPE will expand the Rural Hosting Program for the PPGs foreign students, in order to provide grants for Reception/Hosting services to undergraduate/postgraduate students when receiving foreign students in their houses, through International Cooperation, allowing for the foreign students to interact with the UFRPE students, enabling the language improvement and access to another culture.

7. Policy for the appropriation of knowledge and experience acquired abroad by the beneficiaries of the actions of the Institutional Internationalization Project.

UFRPE has Postgraduate Programs with different levels of consolidation and internationalization, that converge for one or more areas of knowledge. Thus, by returning to UFRPE, the scholarship and grant beneficiaries, under the coordination of the Provost of Research and Postgraduate Studies, will present the academic community with the knowledge and experiences acquired, through semiannual institutional seminars, aiming to share their experiences with other researchers from common areas of the benefited program, with the objective to maximize the acquired knowledge and expand the number of capable researchers in the different themes of the project. When the work developed abroad result in patent generation, the beneficiary will be oriented by the Centre of Technological Innovation (NIT), since there are technicians prepared to aid researchers from UFRPE and foreign institutions in the appropriation of the knowledge produced within the scope of international cooperation. It's worth to notice that UFRPE has a Policy of Intellectual Property (resolution N° 034/2017 from CONSU) approved according to the new Legal Mark of Science, Technology and Innovation (Federal Law n° 13.243, of January 11th, 2016), which refers to the appropriation of scientific and technological knowledge by the university and its partners. Legal instruments signed between foreign institutions and UFRPE with co-ownership have a clause of Intellectual Property, defining the profit sharing from the research activities, as a source that generates articles, patents, industrial designs, etc. Still, UFRPE has the structure and a Term of Confidentiality to carry out the defense of academic projects in secrecy, in case some patentable technology is involved.

8. Policy for management and operationalization of the Institutional Internationalization Project.

Management and execution of the Internationalization Institutional Project will be carried out by the Board Committee, presided by the Provost of Research and Postgraduate Studies, and formed by 5 professors with permanent positions at UFRPE, tutors in stricto sensu postgraduate programs, as well as by 2 foreign researchers with international knowledge in the project thematic areas, defined as priority by the institution. The international experience of members from the Board Committee will be of essential importance for the disclosure of the UFRPE bid notices with foreign institutions of renowned competence in the defined priority themes of the institutional project, in order to train foreigners that can contribute in a significant manner for the consolidation of the internationalization project of the institution Postgraduate Programs. As a collegiate, the Board Group will follow the Bid Notice constant orientations. Complementarily, each member from the Board Committee will have a specific function, being responsible for the following actions: 1) To coordinate staff trainings and capacity buildings for the internationalization activities of the Postgraduate Programs; 2) To identify groups of excellence abroad, with potential to establish a partnership with UFRPE; 3) To manage new bid notices and follow-up selection processes for scholarship grants and aid to students/professors/technicians; 4) To implement benefits and carry out resources accountability; 5) To manage policies for disseminating knowledge acquired for the academic community. However, the effectiveness of each specific action will be evaluated and approved by the Board Committee.

9. Policy for monitoring and internal evaluation of the goals of the Institutional Internationalization Project.

The process of continuous follow-up and assessment of the project execution goals will be carried out by the Board Committee in two ways: 1) Bimonthly meetings, where the Committee's president and internal members of the institution will participate, aiming to promote the execution of the actions planned in the project; 2) semiannual meetings, where all members of the Board Committee will participate, including foreign members, aiming to analyze the achievement of the project defined goals, to adequate institutional mechanisms to achieve goals in the provided deadline or to allow for a new deadline for goals that weren't reached, seeking to use project resources efficiently. Thus, we highlight that this follow-up process aims to identify possible issues in executing the project, with enough time to address them, so that, by the end of the project, the institution can achieve the expected outcomes.

10. Policy for the conciliation of national development programs supported by Capes to the internationalization effort.

The Provost of Research and Post-Graduate Studies and the UFRPE PPG Coordination will have an essential role in conciliating actions from the different Capes Internationalization Programs, considering: 1) Social Demand Program: prioritize granting doctorate scholarships to students that are willing to have their internships abroad and provide scholarship quotas for foreigners that are willing to take their masters or PhD in the institution; 2) Postgraduate Support Program (PROAP) and Program of Academic Excellence (PROEX): provide resources to publish articles in international journals A1, A2 and B1; 3) Post-PhD National Program (PNPD/CAPES): prioritize granting scholarships to doctors who can contribute with increasing the number of publications of articles in international journals; 4) PhD Training Teacher Program (PRODOUTORAL): to strengthen the quality of UFRPE professors in fields linked with the strategic themes of the PrInt Capes Institutional Project. 5) Senior National Visiting Professor Program (PVNS): allows professors to go to the Postgraduate Programs created in the academic units, outside the main campus, aiming at their consolidation; 6) Program of Support for Events in the Country (PAEP): to promote events with the participation of researchers of renowned academic-scientific merit to give lectures with the possibility of creating future international partnerships. Besides that, the Provost of Research and Postgraduate Studies will disclosure bid notices to get financing and grants from other development agencies, which can contribute significantly to consolidate the internationalization process of the Postgraduate Programs. This action is already a reality at UFRPE, where the Postgraduate Program Coordinators are encouraged to send projects for bid notices that promote the internationalization support, such as the "Incentive to International Cooperation of the Pernambuco Postgraduate Programs", released in 2017 by the Foundation for the Support of Science and Technology of the State of Pernambuco (FACEPE), where 12 UFRPE Postgraduate Programs had been approved.

11. Describe here other innovative policies that will be adopted by the institution that were not addressed in the above items.

UFRPE will make an effort to promote: • communication and disclosure of existent opportunities for international cooperation; • appreciation in the professor's career, of international cooperation activities; concession of academic credits to students participating in international activities in short-term internships; • financing of professors and students who develop innovative work of renowned scientific value; • maintenance of an institutional free access data bank, with information of professors and students with relevant participation in international cooperation; and • carrying out innovative events of scientific, technological, social and cultural relevance.

FURTHER INFORMATION

1. Number of postgraduate courses taught in English between 2013 and 2016	6
2. Number of joint supervision postgraduate programs between 2013 and 2016	1

3. Number of double degree postgraduate programs between 2013 and 2016	1
4. Number of bilateral postgraduate programs between 2013 and 2016	0
5. Number of products derived from research projects and contributions to international databases between 2013 and 2016	87
6. Number of Capes' development programs from which the institution benefited between 2013 and 2016	33
7. Number of Capes' international cooperation projects from which the institution benefited between 2013 and 2016	22

8. Forecast insertion of materials, themes and subjects in foreign language in the postgraduate program curricular structure

The internationalization of Postgraduate teaching involves adapting the curriculum of courses and programs, offering mandatory, elective and optative subjects in a foreign language. Since currently there are already English subjects being offered in some of the UFRPE postgraduate programs, they will be encouraged to increase their offer of English subjects. This way, we aim to improve the use of this language in the academic environment for postgraduate students.

EXPECTED BENEFITS

THEME 1

AGRICULTURE AND LIVESTOCK, BIODIVERSITY AND SUSTAINABILITY SYSTEMS

INTERNATIONAL COOPERATION PROJECTS

Name of the project	Start date	End date
To expand and consolidate international partnerships	01/11/2018	31/07/2022

Description

The project goal is to expand the PPG international partnerships and consolidate those already existent, including carrying out missions abroad and welcoming foreign researchers (visiting professor and young talents with experience abroad). PPGs and their respective partner institutions including: PPGZ – Univ. Univ. (TAMU), Florida, California - Davis and California Polytechnic State (US); Aveiros (Portugal). PPG-RPAq – Univ. Miami, Virginia Institute of Marine Science, National Marine Fisheries Service, New Southeast - Florida (US); Institut de Recherche pour le Développement – IRD (France - FR); Univ. La Coruña (Spain - ES). PGPV – Univ. TAMU and California - Davis Univ. (US); IRD (France). PGPA – Univ. Wisconsin, Duke and TAMU (US); IRD (France) PPMGP - Univ. Virginia and TAMU Univ. (US); Bologna Univ. (Italy - IT). PPGMV – Univ. Ohio State, Georgia, Iowa State, Louisiana State, Rutgers, TAMU Univ. (EUA); Provence and AgroParisTech Univ. (France); Univ. Complutense of Madrid, Leon, Catholic University of Valencia and Autonomous of Barcelona (Spain); Colúmbia and Guelph Univ. (Canada). Instituto Nacional de Investigación Agropecuária (INIA/Uruguai). PPGF – Instituto de Agricultura Sostenible, Univ. Politécnica de Valencia and Salamanca Univ. (Spain); Louisiana State and Clemson Univ. (US). Institut National de La Recherche Agronomique (FR). PPGETNO – Illinois And California Univ. (US); Comahue Univ. (Argentina). PPGEA – INRA (FR); Univ. van Amsterdam (Holland); Exeter Univ. (United Kingdom - UK); Kansas State Univ. (US); Univ. Politécnica de

Madrid (ES) PPGEAMB – TAMU Univ. (US); Palermo Univ. (Italy); IRD (France). PGEA – California - Davis, Florida, Duke and TAMU Univ. (US); Univ. of La Coruña and Santiago de Compostela (Spain); Agroscope - Department of Agroecology & Environment of Zürich (Switzerland). PPGDITM – Univ. d'Orléans (FR). Univ. de Gramma (Cuba); Univ. de Lisboa (PO) PPGB – Royal Botanical Kew Gardens, Exeter and Portsmouth Univ. (United Kingdom). PPGCS – North Carolina State, TAMU and Florida Uni. (US); Santiago de Compostela Univ. (ES); IRD (FR). RENORBIO – Louisiana State Univ. (US); Univ. Degli Studi Di Genova (Italy); Cambridge Univ. (United Kingdom). PPGBA – Univ. degli Studi de Bari, degli Studi di Napoli Federico II, Gênova e Roma "LA SAPIENZA" (IT); Univ. Complutense de Madrid, Valencia e Murcia (ES); Georgia, Appalachian State and Florida Agriculture and Mechanical Univ. (US); Univ. of Cambridge and Strathclyde (UK).

Work missions related to the cooperation project

Year	Quantity	Amount
2020	8	R\$ 249,696.00
2022	4	R\$ 124,848.00
2019	10	R\$ 312,120.00
2021	6	R\$ 187,272.00

Resources to maintenance the projects

Year	Amount
2019	R\$ 10,000.00
2021	R\$ 10,000.00
2020	R\$ 10,000.00
2022	R\$ 10,000.00
2018	R\$ 10,000.00

Scholarships related to the cooperation project

Year	Modality	Quantity	Amount
2020	Visiting Professor (15 days)	30	R\$ 484,658.70
2020	Young Talents - A (12 months)	6	R\$ 696,663.48
2021	Young Talents - A (12 months)	6	R\$ 696,663.48
2021	Visiting Professor (15 days)	30	R\$ 484,658.70
2022	Visiting Professor (15 days)	15	R\$ 242,329.35
2019	Young Talents - A (12 months)	4	R\$ 464,442.32
2019	Visiting Professor (15 days)	15	R\$ 242,329.35
2022	Young Talents - A (6 months)	4	R\$ 236,621.16

Name of the project	Start date	End date
Exchange and improvement of professors and students academic training	01/11/2018	31/07/2022

Description

The objective of this project is to promote professor exchange by going abroad (junior and senior visiting professor), and students (PhD), by carrying out sandwich PhDs abroad. PPGs and their respective partner institutions including: PPGZ – Univ. Univ. (TAMU), Florida, California - Davis and California Polytechnic State (US); Aveiros (Portugal). PPG-RPAq –Univ. Univ., Virginia Institute of Marine Science, National Marine Fisheries Service, New Southeast - Florida (US); La Coruña La Coruña (Spain - ES). PGPV – Univ. TAMU and California - Davis Univ. (US); IRD (France). PGPA – Univ. Wisconsin, Duke and TAMU (US); IRD (France) PPMGP - Univ. Virginia and TAMU Univ. (US); Bologna Univ. (Italy - IT). PPGMV – Univ. Ohio State Georgia, Iowa State, Louisiana State, Rutgers, TAMU Univ. (EUA); Provence and AgroParisTech Univ. (France); Complutense of Madrid, Leon Univ., Catholic University of Valencia and Autonomous Univ. of Barcelona (Spain); Colúmbia and Guelph Univ. (Canada). PPGF –Univ. Politécnica de Valencia and Salamanca Univ. (Spain); Louisiana State and Clemson Univ. (US). PPGETNO – Illinois And California Univ. (US); Comahue Univ. (Argentina). PPGEA - Univ. van Amsterdam (Holland); Exeter Univ. (United Kingdom - UK); Kansas State Univ. (US); Univ. Politécnica de Madrid (ES) PPGEAMB – TAMU Univ. (US); Palermo Univ. (Italy); IRD (France). PGEA – California - Davis, Florida, Duke and TAMU Univ. (US); La Coruña Univ. and Santiago de Compostela Univ. (Spain). PPGDITM – Univ. d'Orléans (FR). Univ. de Gramna (Cuba); Univ. de Lisboa (PO) PPGB – Royal Botanical Kew Gardens, Exeter and Portsmouth Univ. (United Kingdom). PPGCS – North Carolina State, TAMU and Florida Uni. (US); Santiago de Compostela Univ. (ES); IRD (FR). RENORBIO – Louisiana State Univ. (US); Univ. Degli Studi Di Genova (Italy); Cambridge Univ. (United Kingdom). PPGBA – Univ. degli Studi de Bari, degli Studi di Napoli Federico II, Gênova e Roma "LA SAPIENZA" (IT); Univ. Complutense de Madrid, Valencia e Murcia (ES); Georgia, Appalachian State and Florida Agriculture and Mechanical Univ. (US); Univ. of Cambridge and Strathclyde (UK).

Resources to maintenance the projects

Year	Amount
2018	R\$ 10,000.00
2021	R\$ 10,000.00
2022	R\$ 10,000.00
2019	R\$ 10,000.00
2020	R\$ 10,000.00

Scholarships related to the cooperation project

Year	Modality	Quantity	Amount
2022	Visiting Professor Abroad Junior (6 months)	2	R\$ 121,276.80
2019	Sandwich PhD (6 months)	15	R\$ 607,176.00
2021	Sandwich PhD (6 months)	15	R\$ 607,176.00
2019	Visiting Junior Professor Abroad (12 months)	3	R\$ 341,150.40
2020	Sandwich PhD (6 months)	15	R\$ 607,176.00
2021	Visiting Junior Professor Abroad (12 months)	3	R\$ 341,150.40
2020	Visiting Senior Professor Abroad (12 months)	4	R\$ 492,307.20
2020	Visiting Junior Professor Abroad (12 months)	2	R\$ 227,433.60
2022	Visiting Senior Professor Abroad (6 months)	4	R\$ 262,713.60
2019	Visiting Senior Professor Abroad (12 months)	6	R\$ 738,460.80
2021	Visiting Senior Professor Abroad (12 months)	6	738,460.80
2022	Sandwich PhD (6 months)	15	607,176.00

Missions Not Linked to Project

Year of work mission	Quantity of work missions per year	Amount of work missions
2021	1	R\$ 31,579.00
2020	1	R\$ 31,579.00
2019	1	R\$ 31,579.00

SCHOLARSHIPS NOT RELATED WITH RESEARCH PROJECTS R\$ 0,00**OTHER PROGRAM ACTIONS NOT RELATED TO PROJECT**

Year	Actions	Description:	Amount
2022	Visits to partner institutions abroad	Visitation to foreign institutions by members of the Board Group or indicated representatives, in order to enable cotutelle between UFRPE stricto sensu postgraduate courses and foreign partners, as well as Project follow-up and evaluation.	R\$ 78,948.00
2020	Visits to partner institutions abroad	Visitation to foreign institutions by members of the Board Group or indicated representatives, in order to enable cotutelle between UFRPE stricto sensu postgraduate courses and foreign partners, as well as Project follow-up and evaluation.	R\$ 78,948.00

THEME 2**FUTURE-BEARING TECHNOLOGIES****INTERNATIONAL COOPERATION PROJECTS**

Name of the project	Start date	End date
To expand and consolidate international partnerships	01/11/2018	31/07/2022

Description

The project goal is to expand the PPG international partnerships and consolidate those already existent, including carrying out missions abroad and welcoming foreign researchers (visiting professor in Brazil and young talents with experience abroad). PPGs and their respective partner institutions including: PGPA – Univ. Wisconsin, Duke and TAMU (US); IRD (France) PPGF - Instituto de Agricultura Sostenible, Univ. Politécnic de Valencia and Salamanca Univ. (Spain); Louisiana State and Clemson Univ. (US). Institut National de La Recherche Agronomique (FR). PPGETNO – Illinois And California Univ. (US); Comahue Univ. (Argentina).

PPGEA – INRA (FR); Univ. van Amsterdam (Holland); Exeter Univ. (United Kingdom - UK); Kansas State Univ. (US); Univ. Politécnica de Madrid (ES) PPGEAMB – TAMU Univ. (US); Palermo Univ. (Italy); IRD (France). PGEA – California - Davis, Florida, Duke and TAMU Univ. (US); Univ. of La Coruña and Santiago de Compostela (Spain); Agroscope - Department of Agroecology & Environment of Zürich (Switzerland). PPGDITM – Univ. d'Orléans (FR). Univ. de Gramna (Cuba); Univ. de Lisboa (PO) RENORBIO – Louisiana State Univ. (US); Univ. Degli Studi Di Genova (Italy); Cambridge Univ. (United Kingdom). PPGBA – Univ. degli Studi de Bari, degli Studi di Napoli Federico II, Gênova e Roma "LA SAPIENZA" (IT); Univ. Complutense de Madrid, Valencia e Murcia (ES); Georgia, Appalachian State and Florida Agriculture and Mechanical Univ. (US); Univ. of Cambridge and Strathclyde (UK).

Work missions related to the cooperation project

Year	Quantity	Amount
2020	5	R\$ 156,060.00
2021	3	R\$ 93,636.00
2019	6	R\$ 187,272.00
2022	2	R\$ 62,424.00

Resources to maintenance the projects

Year	Amount
2021	10,000.00
2018	10,000.00
2020	10,000.00
2022	10,000.00
2019	10,000.00

Scholarships related to the cooperation project

Year	Modality	Quantity	Amount
2021	Visiting Professor (15 days)	18	290,795.22
2019	Young Talents - A (12 months)	2	232,221.16
2020	Visiting Professor (15 days)	18	290,795.22
2020	Young Talents - A (12 months)	4	464,442.32
2022	Visiting Professor (15 days)	9	145,397.61
2019	Visiting Professor (15 days)	9	145,397.61
2022	Young Talents - A (6 months)	2	118,310.58
2021	Young Talents - A (12 months)	4	464,442.32

Name of the project	Start date	End date
Exchange and improvement of professors and students academic training	01/11/2018	31/07/2022

Description

The objective of this project is to promote professor exchange by going abroad (junior and senior visiting professor), and students (PhD), by carrying out sandwich PhDs abroad. PPGs and their respective partner institutions including: The project goal is to expand the PPG international partnerships and consolidate those already existent, including carrying out missions abroad and welcoming foreign researchers (visiting professor in Brazil). PPGs and their respective partner institutions including: PGPA – Univ. Wisconsin, Duke and TAMU (US); IRD (France) PPGF - Univ. Politécnic de Valencia and Salamanca Univ. (Spain); Louisiana State and Clemson Univ. (US). PPGETNO – Illinois And California Univ. (US); Comahue Univ. (Argentina). PPGEA - Univ. van Amsterdam (Holland); Exeter Univ. (United Kingdom - UK); Kansas State Univ. (US); Univ. Politécnic de Madrid (ES) PPGEAMB – TAMU Univ. (US); Palermo Univ. (Italy); IRD (France). PGEA – California - Davis, Florida, Duke and TAMU Univ. (US); Univ. of La Coruña and Santiago de Compostela (Spain); Agroscope - Department of Agroecology & Environment of Zürich (Switzerland). PPGDITM – Univ. d'Orléans (FR). Univ. de Gramna (Cuba); Univ. de Lisboa (PO) RENORBIO – Louisiana State Univ. (US); Univ. Degli Studi Di Genova (Italy); Cambridge Univ. (United Kingdom). PPGBA – Univ. degli Studi de Bari, degli Studi di Napoli Federico II, Génova e Roma "LA SAPIENZA" (IT); Univ. Complutense de Madrid, Valencia e Murcia (ES); Georgia, Appalachian State and Florida Agriculture and Mechanical Univ. (US); Univ. of Cambridge and Strathclyde (UK).

Resources to maintenance the projects

Year	Amount
2019	10,000.00
2022	10,000.00
2018	10,000.00
2021	10,000.00
2020	10,000.00

Scholarships related to the cooperation project

Year	Modality	Quantity	Amount
2019	Visiting Senior Professor Abroad (12 months)	3	R\$ 369,230.40
2019	Visiting Junior Professor Abroad (12 months)	2	R\$ 227,433.60
2022	Sandwich PhD (6 months)	9	R\$ 364,305.60
2020	Visiting Senior Professor Abroad (12 months)	3	R\$ 369,230.40
2020	Sandwich PhD (6 months)	9	R\$ 364,305.60
2021	Sandwich PhD (6 months)	9	R\$ 364,305.60
2022	Visiting Senior Professor Abroad (6 months)	2	R\$ 131,356.80
2019	Sandwich PhD (6 months)	9	R\$ 364,305.60
2021	Visiting Senior Professor Abroad (12 months)	3	R\$ 369,230.40
2020	Visiting Junior Professor Abroad (12 months)	2	R\$ 227,433.60
2021	Visiting Junior Professor Abroad (12 months)	1	R\$ 113,716.80
2022	Visiting Junior Professor Abroad (6 months)	1	R\$ 60,638.40

Missions Not Linked to Project

Year of work missions	Quantity of work missions per year	Amount of work mission
2021	1	R\$ 31,579.00
2019	1	R\$ 31,579.00
2020	1	R\$ 31,579.00

SCHOLARSHIPS NOT RELATED WITH RESEARCH PROJECTS R\$ 0,00**OTHER PROGRAM ACTIONS NOT RELATED TO PROJECT**

Year	Actions	Description:	Amount
2020	Visits to partner institutions abroad	Visitation to foreign institutions by members of the Board Group or indicated representatives, in order to enable cotutelle between UFRPE stricto sensu postgraduate courses and foreign partners, as well as Project follow-up and evaluation.	R\$ 78,948.00
2022	Visits to partner institutions abroad	Visitation to foreign institutions by members of the Board Group or indicated representatives, in order to enable cotutelle between UFRPE stricto sensu postgraduate courses and foreign partners, as well as Project follow-up and evaluation.	R\$ 78,948.00

Amount of Expected Benefits

Amount of Cooperation Projects	R\$ 16,290,646.98
Amount of missions not linked to research projects	R\$ 189,474.00
Amount of scholarships not linked to research projects	R\$ 0.00
Amount of Other actions	R\$ 315,792.00
Total Project Amount	R\$ 16,795,912.98

COUNTERPART

1. Internationalization of the curriculum - Incorporation of international themes in postgraduate and undergraduate classes

Internationalization of undergraduate and Postgraduate teaching involves adapting courses and programs curricula since some countries, such as Brazil and other Latin America countries, addresses the academic curriculum in a broad manner, offering mandatory, elective and optative subjects. Thus, UFRPE through the Provost of Undergraduate Teaching, the Provost of Research and Postgraduate Studies, and the International Office, will act in translating the curricula of all undergraduate and postgraduate courses, which will be linked to the university academic system (SIGA), making it easier, thus, to issue a transcript when the student from another international institution ends his/her mobility at UFRPE, for instance. Furthermore, the university will offer Portuguese and English subjects, contextualizing them, and making them mandatory subjects in the curriculum, so that students can master their bibliographic reading of a specific field, such as manuals, highlighting the importance of this language for their participation in training programs, postgraduate courses, and such. Besides making English as a second language mandatory, the student will have to choose one more foreign language as optative, offered in the semi-presence mode, in a way that, by the end of the course, they have a bilingual education. Since currently there are already English subjects being offered in some of the UFRPE postgraduate programs, they will be encouraged to increase their offer of English subjects. By doing so, with the goal to enhance the language use in the academic environment and enable the understanding of foreign students, UFRPE has encouraged the offer of subjects fully lectured in English for undergraduate and postgraduate students. We also highlight that UFRPE's internationalization process includes lectures, seminars and events, aiming at the creation of a scientific environment linked to the themes defines as priority for the University in its internationalization process. These events will be opened to undergraduate and postgraduate students, in order to contribute with the dissemination of updated knowledge to all scientific community, as well as the internationalization of higher education in the university.

2. Production of international publicity material in other languages, including Postgraduate Programs websites

Considering this information, it is important to register that UFRPE's website and the website of its Postgraduate Programs is already translated to English, in order to increase visibility and disseminate academic activities developed by the university community and, consequently, increase the access of foreigners to the institution information, thus attracting a higher number of people to choose this university for their education. Besides that, UFRPE discloses its academic material in other languages through its University Publishing House, as well as enabling thesis and essays to be written in English, in order to increase visibility of research works developed during the masters and PhD courses, and creates opportunities for publishing scientific articles in international journals of impact for several areas of knowledge, thus carrying out a larger dissemination of knowledge for the international academic community. In international events, the PPGs have disclosed their academic activities through folders and posters written in foreign languages, mostly English. We also point out that there is a catalogue in process of creation, as a disclose material for the UFRPE Postgraduate Programs in English and Spanish, aiming to give more visibility to Programs in the International scenario.

3. Training and qualification of staff for institutional internationalization.

UFRPE provides to all academic community, through the Languages Centre, courses of several languages, especially English, French and Spanish. Thus, the University makes it possible for the faculty (undergrad and postgraduate), students and technical staff to attend proficiency courses in several languages, without any financial costs to them. The Languages Centre has provided to the UFRPE community a pedagogical-cultural professional experience, aiming to increase their competence in communicating in a foreign language and encouraging mobility to study abroad. With the objective to train professors and administrative technicians to receive students and foreign professors, UFRPE has been stimulating proficiency in a foreign language, making it possible for the language course to be accounted as valid credit for the staff in-work progression. Another UFRPE counterpart is the periodic offer of free of charge proficiency tests in English (TOEFL) and

other languages (DELE, DELF/DALF), to increase proficiency in foreign languages for students and administrative staff.

4. Counterparts offered by foreign partnership institutions, when applicable.

UFRPE firm partnerships mainly with foreign institutions that are committed with the waiving the charge of academic taxes, such as the use of library (on-site and online), wifi network, research taxes, aiming to reduce costs to carry out study missions abroad, thus promoting rational use of financial resources obtained with internationalization actions, as with the PrInt CAPES Project.

5. Other counterparts, when applicable.

Due to the importance of stimulating Postgraduate Programs internationalization, UFRPE granted scholarships from CAPES Social Demand (Provost quota) to foreign students received by programs through Brazil Scholarship Bid Notices, carried out with the Coimbra Group of Brazilian Universities (GCUB) and the American State Organization (ASO). This action had a surprising outcome, since that, in the year of 2013, UFRPE had received only two students through this bid notice and, by the end of 2016, this number had already surpassed 57 students from several nationalities. Besides providing these scholarships, UFRPE gave all the support to welcome these students in the institution, such as subsidized access on the University Restaurant, where the student can have quality daily meals, as well as medical and dental care when needed, overall an efficient and attentive way to promote institutional internationalization. It's important to notice that UFRPE has also financed, with its own resources, travels to prospect new partners and consolidate ongoing partnerships with foreign institutions. Ultimately, let the records show that UFRPE has put an effort to provide housing to undergrad and graduate foreign students in the student's dormitory.

DOCUMENTS

Descriptions	Type	Date
CAPES-PRINT-742504P - form in english - UFRPE.pdf	Institutional Project for Internationalization in English	20/05/2018 15:52:58
Comprovante de Inscrição	Registration receipt	09/05/2018 14:28:15
Executive Summary - Projeto de Internacionalização da UFRPE.pdf	Executive Summary, in English, of the Institutional Plan aligned with the Project presented in Print	09/05/2018 12:56:27
Sumário Executivo - Projeto de Internacionalização da UFRPE.pdf	Executive Summary of the Institutional Plan aligned to the Project presented in PrInt	09/05/2018 12:34:42
Oficio Reitora UFRPE.pdf	Letter of presentation issued by the maximum authority (8.2.4 of the Final Tender Protocol)	09/05/2018 12:31:07
João Luís Mendes Pedroso de Lima - CV.pdf	Curriculum Vitae foreign members	09/05/2018 12:30:52
Plano de Internacionalização da UFRPE.pdf	Institutional Plan of Internationalization of	07/05/2018 17:11:19

the Institution

Mathis CV 03-2018.pdf

Curriculum Vitae
Foreign Members

07/05/2018
17:04:20

Datnoff-CV_2018.pdf

Curriculum Vitae
Foreign Members

07/05/2018
17:04:08
