IFAGROTECH: THE INNOVATIVE FORM OF TECHNOLOGICAL INCLUSION OF THE SMALL AND MEDIUM RURAL PRODUCERS

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INTRODUCTORY ASPECTS

Academic studies highlight the role of innovation in universities and organizations (FAGERBERG, 2004; RIBEIRO; CHEROBIM, 2017a) due to a strong search for competitiveness among organizations and nations and, above all, for the displacement of the cause of wealth generation, which migrated from traditional factors (land, capital, and labor) to knowledge. Thus, intellectual capital has proved to be a turning point in the possibilities of countries prosperity and organizations, which have found in innovation the way to be effective.

In the organizational world, there is no doubt about the importance of innovation for the generation of knowledge with a direct impact on productivity. However, due to the dynamicity of the environmental variables and configurations (RIBEIRO; CHEROBIM, 2018), the complexity of understanding and managing innovation with organizational resources is evident. Thus, other players must join the organization to overcome the difficulties in dealing with this important phenomenon to the organization and society. In this sense, several possibilities are presented to add capacity to the organizations, especially the university and the government, proposed entities in the Etzkowitz and Leydesdorff (1996) Triple-Helix model. Based on this proposal, many studies and actions have been conducted in search of better ways to exploit innovation.

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To this intention, many studies seek to demystify innovation and encourage its development and practical application. In this sense, there being a national and international effort to innovation be effect and its applications support socioeconomic development for society in general as well. In line with this movement, Brazil in recent decades has been struggling and mobilizing resources to encourage actions aimed at enhancing science, technology, and innovation (ST&I). The proof of this effort materializes in the government provided new legislation and regulation directed to ST&I with special emphasis to i) Law nº 10.973/2004, which incentives scientific and technological research and innovation in the productive environment (BRASIL, 2004); ii) Decree nº 5.563/2005, that regulates Law nº 10.973/2004 (BRASIL, 2005); e iii) Law nº 13.243/2016, which provides incentives to scientific development, research, scientific and technological capacity-building and innovation (BRASIL, 2016).

Aiming at strengthening these efforts, supported by these legal instruments, several Science and Technology (S&T) Institutions, mainly universities and federal institutes, have been dedicated to disseminating innovation in its various forms as a driving force for technological development, by stimulating basic and applied research, to the Intellectual property protection, and to technology-based or social entrepreneurship.

Thus, the Instituto Federal do Paraná (IFPR) adhered to the challenge of promoting innovation in its various campuses, aiming to achieving its institutional purpose, which is to carry out and stimulate research - mainly applied research - cultural production, entrepreneurship, cooperativism and scientific and technological development (BRASIL, 2008), besides to promote the economic and social growth where it is inserted. Thus, in order to demystify and encourage innovation within the scope of the IFPR, the Office of the Vice Provost for Extension, Research, Postgraduate, and Innovation - PROEPPI, through the Innovation Agency - AGIF, initiated a series of procedures.

In its efforts, AGIF has created several institutional programs to promote innovation and consequently, intellectual property. Among these programs, the academic community has been attracted by what has been called the IFAgroTECH, a specific workshop for IFPR's Agroindustrial Technologies. Through this action, AGIF / PROEPPI annually selects the campuses interested in hosting the event that aims to meet the local demands of technological innovations focused in agriculture or family agroindustry, as well as propose innovative solutions to solve problems with

increased productivity and social welfare in the field. It is worth noting that in some situations instead of problems, the biggest challenge is to take better advantage of the opportunities to increase productivity and to leverage the financial gains of producers in agriculture or family agro-industry.

The theoretical basis of the IFAgroTECH is the Triple-Helix model (ETZKOWITZ; LEYDESDORFF, 1996) and brings by objective, to join in the same physical space, those who produce knowledge, those who demand knowledge and those who can intermediate this interaction in order to produce and implement research projects. With its own method, which will be explained throughout this chapter, the IFAgroTECH has facilitated to the researchers of the IFPR - teachers, technicians, and students - to identify what the requester, specifically the agroindustrial producers of Paraná, need effectively to increase productivity. This interaction among the knowledge maker and the requester is supported by the state entity, in this case, the local administration of the city, that hosts the event.

Important to notice that the creation and realization of the IFAgroTECH project were possible by the implementation of the Nuclei of Technological Innovation (NIT) in the IFPR. Due to the great capillarity of the IFPR -26 campuses that are distributed from north to south and from east to west of Paraná- it was necessary to instrumentalize a way to operationalize the actions in the area of innovation. Thus, the legislation has been improved, creating a structure that allowed each IFPR campus to have its own NIT linked to what was called the NIT-mãe (head-NIT), which is the AGIF. This network structure allowed a direct technical link between the teachers of each campus and AGIF, intermediated by the coordinator of the NIT-campus. This encouraged the dissemination of knowledge and agility in the exchange of information. Figure 1 shows the distribution of IFPR campuses.

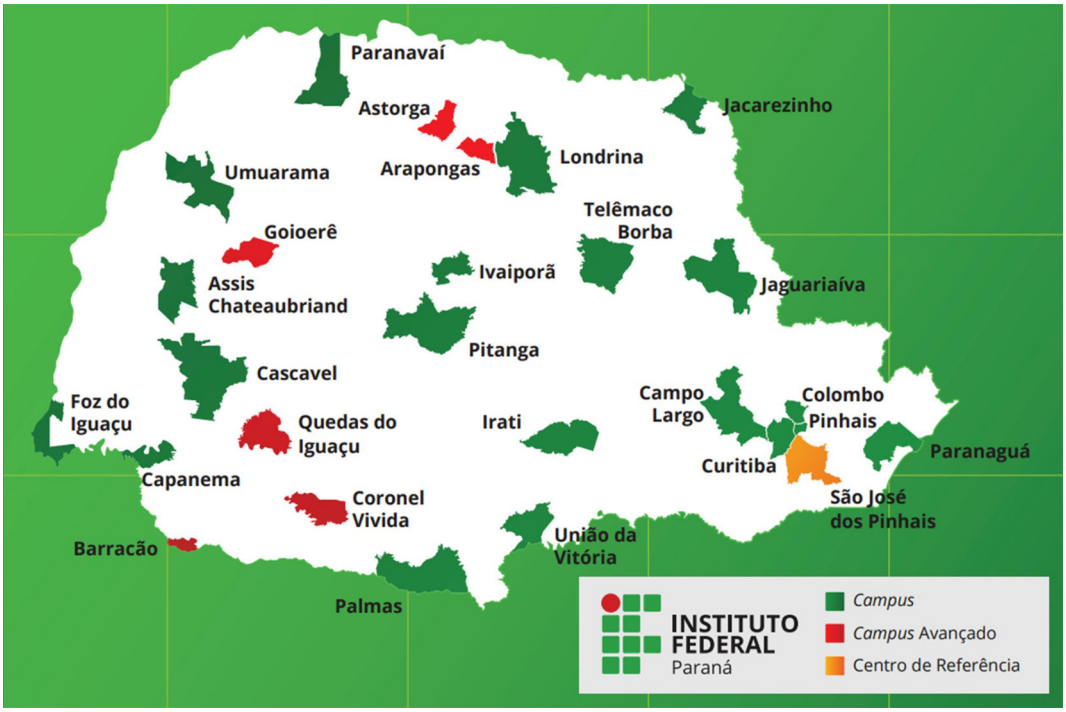

Figure 1 - The distribution of IFPR campuses
Source: IFPR website (2019)

Due to the short time since its creation and the results obtained in this program, IFAgroTECH has proved to be a successful experiment that can be replicated in other federal institutes, as well as in other S&T Institutions, directed the transformation of the former Directorate of Innovation into the AGIF with coordination that provided better conditions for the development of actions in the field of entrepreneurship, intellectual property, transfer of technology, robotics development and new technologies.

THEORETICAL CONSIDERATIONS

To take place the knowledge of innovation concept, its various forms, and strategies, is fundamental to understand the theoretical aspects that support the successful IFPR experience. In this sense, the basic postulates about innovation and the Triple-Helix model used for its exploration are presented below.

Innovation Elementary Aspects

Studies show that innovation can be understood as the application of new ideas to a product, process or another aspect of a company's productive activity, adding value to its product (GREENHAGH; ROGERS, 2010; RIBEIRO; CHEROBIM, 2017b). In this concern, comprehends that innovation is associated with the creative process by the adoption of originality. For Schumpeter (1939), innovation is characterized by a function based on creative thinking and action, allowing that products and consumption habits are replaced by value-added products, suggesting that innovation differentiates and provides value to a business.

However, it is necessary to emphasize that only from the introduction in the market that the effectiveness of the innovation takes place, implying that it has already been evaluated and accepted by the same (SCHUMPETER, 1939). Observes with this, that innovation will only occur if the idea - invention - is introduced and maintained in a particular market, which can be global, regional or local. It is also considered innovation when products, processes, services, and methods that previously did not exist or that have come into existence with a new and different specificity of the one that was verified until then were introduced successfully in the market (FRASCATI, 2002).

Until the end of the latest century, according to the Frasati Manual (2002), the focus of innovation is basically linked to the research and development (R&D) processes. However, at the beginning of the 21st century, there was an expansion in the scope of the innovation concept, which now includes a new method of marketing and a new organizational method in business practices, way of organization of the workplace, and outside relationships. In this sense, the linear model of innovation was replaced by the systemic approach (RIBEIRO; CHEROBIM, 2017b).

Innovation originating from the Latin word *innovatione* represents the act or effect of to innovate, to introduce something new or to renovate something that already exists (MICHAELIS, 1998). Thereby, innovation proves to be a complex and diffuse activity, requiring more studies and consolidation in the academic and business community. Considering innovation as an exploration of new ideas, it should not necessarily be a revolutionary creation in global terms and may represent local (for organization), regional, national or international innovation (OSLO, 2005). In this regard, innovation can be:

a) Product innovation - is the design of a new product (material / tangible) or changes in the characteristics of those that already exist (pen, motor, machine, containers, etc.).

b) Service innovation - is the design or modification of a non-material (intangible) product through procedures that meet a customer's specific needs (sanitation, cleaning, security, maintenance, reprography, etc.).

c) Process innovation - is the design of a new way of producing (doing) a product, service or a change in the existing form (a new technology for packaging, a new raw material, a new way of training, or agglutinate functions, etc.).

d) Marketing innovation - is the design or modification of i) obtaining the procedures to present a product - product or service (example: new packaging); ii) price definition (example: innovative cost structure); iii) innovative way of making a product viable in the market place (example: location, distribution, etc.); and iv) way of promoting a product or service with customers (example: promotion, publicity, public relations, etc.).

e) Business innovation - is the design or modification of the way to offer a product or service to the interested parties (market) (example: logistics employed, type of financing made available, etc.).

f) Organizational innovation - is the conception or change in the way an organization is structured (organized to function) to have more agility, flexibility, and capillarity to reach goals, and how to coordinate actions in a rational and effective manner (example: organization chart, verticalization, "horizontalization", downsizing, etc.).

From the presentation of the innovation forms, the strategy for the innovation to take effect will depend on the environment where it occurs, and mainly, on the characteristics of the actors involved and the form of interaction. Several authors presented strategies for the occurrence of innovation, which were consolidated in models, mainly: Pipe-Line, Chain-Linked, Research System in Transition, Mode II of knowledge production, Triple-Helix model, Postmodern research system, Quadruple-Helix model, and Quintuple-Helix model (RIBEIRO; CHEROBIM, 2017a). To promote innovation in the IFPR, the model adopted was that of the Triple-Helix, which will be explained below.

The Triple-Helix Mode

Depending on the actors acting in the dynamic and complex environment where innovation takes place, it was considered elementary to identify the most important players, as well as the way they relate. This conception of innovation induction enabled Etzkowitz and Leydesdorff (1995; 2000) to idealize the model known as Triple-Helix. In this, the basic players identified were: the university (producer of knowledge/innovation), company (producer of wealth and knowledge and innovation requester) and government (facilitator in the interaction between the players).

The basic concept of the Triple-Helix model is that the university must interact with the old dual model existing between industry and government since, for the development of knowledge, innovation appears as a booster. With the arranged of environmental conditions for the relationship between the university, industry, and government, there are the basic conditions to leverage the production of scientific and technological knowledge. Thus, in general, universities and corporations are increasing their activities in research, which was previously attributed to other sectors, not necessarily in the R&D area. These activities, adjusted to S&T, are regulated at different levels (LEYDESDORFF, 2000). In this context, the university is a player that promotes development through knowledge, in particular, by innovation.

Thus, according to Etzkowitz and Zhou (2017), the university, the government and industry are the propellers that interact, conceive codified knowledge, in innovation that fosters economic growth. Figure 2 characterizes the conceptual proposal of the interaction of innovation players according to the Triple-Helix model.

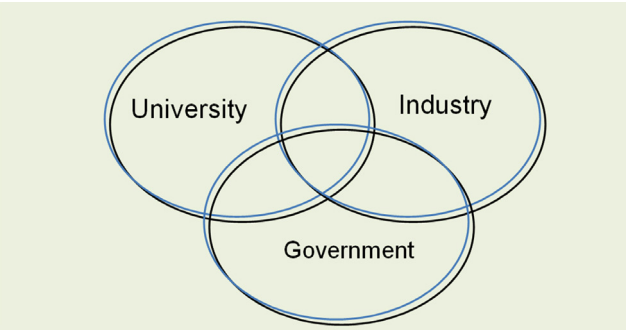

Figure 2 - The Three-Helix Model
Source: Authors (adapted from Etzkowitz and Zhou, 2017)

It should be noted that Etzkowitz and Leydesdorff (1996, 2000) argue that the main players of innovation must work together in a kind of system where each entity impacts the interaction and is impacted by it. In this sense, the university plays the role of inducing the interaction between industry and government, in order to foster and direct innovation, and in particular economic and social development.

CONTEXTUALIZATION AND THEORETICAL CONCEPTION OF THE PROJECT

The theoretical conception of the IFAgroTECH project is based on the Three-Helix model, proposed by Etzkowitz and Leydesdorff (1996), which proposes interaction between those who produce knowledge (universities), those who demand knowledge for solving problems or explore opportunities (organizations) and those that offer environmental conditions (government), so that this interaction is more effective in the production of knowledge and innovation. In the case of IFAgroTECH, the government player is considered in its smaller instance, which is the municipality.

In this sense, characterizing the concept of innovation and its forms of operationalization was fundamental to consolidate the culture of innovation on the IFPR. That became a continuous goal to be sought in the Institution actions, particularly by AGIF, created in 2018. It should be reiterated that because of the emphasis on products and services, it was common in this Federal Institute to associate innovation with a robot (hardware) or with a software program. Because innovation is not only this, the AGIF sought ways to increase knowledge about the subject, and the implementation of actions to foster innovation in the institution as well.

In this context, it should be noted that the IFPR participated in the public call 92/2013 of the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) (the name of the former Conselho Nacional de Pesquisa), which had as its aim the support and implementation of NIT, applying to receive financial resources with the project entitled "Implementação e estruturação de Núcleos de Inovação Tecnológica do IFPR". The project was considered with the desired financial resources, but this was only carried out in 2016 and 2017 due to budgetary adjustments.

With the completion of the project, in 2016, the Directorate of Innovation named now as AGIF, planned and carried out at IFPR a series of actions to

train employees to clarify and consolidate knowledge about innovation, intellectual property and especially the role and performance of NITs. Among these actions, two are worth highlighting: 1) four innovation workshops were held focusing on the NIT's coordinators of the IFPR campuses to become their headquarters, multipliers of the knowledge obtained in these events; and 2) were formalized to be structured in legislation the NITs on the IFPR.

It is worth mentioning that at the third innovation workshop, held in Curitiba, during the coffee break, the innovation director listened to two fellow researchers talking about research results. In this dialogue, one of the researchers informed the other that, from an investigation project, he had created a very interesting prototype and that he needed to find out who could appropriate the generated knowledge.

Having just finished his Ph.D. in innovation at UFPR, and in his research studies about the entrepreneurial role of universities, the Director of Innovation judged that the process was in reverse order, because knowledge was being produced unknowing the demand; the ideal would be to identify a market request and to produce knowledge to serve it effectively. It should be noted that there is innovation only if knowledge is valued and embraced by the market. Thus, in a conversation with two other fellow teachers, the Director of Innovation decided to create a program that would facilitate the meeting and interaction between applicants (organizations) and knowledge providers (university) with the support of an interaction facilitator (city hall). Because Paraná has strong agroindustry, it was initially decided to foster projects in this area and was formulated an initial with IF from Federal Institute; Agro has indicated the option for the agro-industry of the state, and TECH was designated the term technology. Thus, the project was named an agroindustrial technologies workshop of the IFPR, receiving the acronym IFAgroTECH.

Because one of the teachers belongs to the campus located in Capanema city, in the western of Paraná, this municipality was chosen as the site for the pilot project. The next step was to structure the format of the event and to establish the schedule and actions that would be covered by the event. Costs were covered with the resources of the CNPq project. Figure 1 shows the location of Capanema on the Paraná map.

Considering that the topics related to ST&I are diffuse, complex and complicated, the legislation itself tries to resolve ambiguities about the definition of some important topics, such as those included in the Decree

that regulates Law 10.973/2004. In order to avoid differentiated approaches, IFAgroTECH used the same definitions presented in the legislation, which are now replicated:

a) Development agency: a body or institution of a public or private nature which has among its objectives the financing of actions aimed at stimulating and promoting the development of science, technology, and innovation;

b) Creation: invention, utility model, industrial design, computer program, integrated circuit topography, new cultivar or essentially derived crop, and any other technological development that results in or may lead to the appearance of a new product, process or incremental improvement, obtained by a or more breeders;

c) Creator: a researcher who is an inventor, breeder or author of creation;

d) Innovation: introduction of novelty or improvement in the productive or social environment that results in new products, processes or services;

e) Scientific and Technological Institution - ST&I: body or entity of the public administration whose institutional mission, among others, perform basic or applied research activities of a scientific or technological nature;

f) Nucleus of Technological Innovation: nucleus or organ constituted by one or more ST&I with the purpose of managing its policy of innovation;

g) Institution of support: institutions created with the purpose of giving support to projects of research, teaching, and extension and of institutional, scientific and technological development;

h) Public researcher: occupant of the effective position, military position or public employment that carries out basic or applied research of scientific or technological character; the researcher should seek answers to the problem solving using scientific methods; and

i) Independent inventor: natural person, not the occupant of the effective position, military position or public employment, that is inventor, breeder or author of creation.

Based on these concepts and the idea of what would be IFAgroTECH, the next step was to formalize the method of the event, to organize the participation and to do what was planned. Thus, on April 25 - 26, 2017, the first IFAgroTECH takes place at IFPR, with the participation of members of the local government and representatives of the municipal and state legislature, including entities such as Emater-PR, Sebrae, Unioeste, and others.

IFAGROTECH METHOD

For the realization of IFAgroTECH, different ways to manage the process were adopted, in view of the main goal of bringing together in the same university, producers and municipal government, according to the model of the Triple-Helix model (ETZKOWITZ; ZHOU, 2017). In this sense, a minimum of 30 days was set to map the small and medium producers demand of technical knowledge in order to solve the main problems related to production. On the day previously scheduled and informed to the participants, the producers would present their businesses, products, and main problems for production and sale. Note that this is not always the problem since a possibility of improvement can be visualized.

Based on this assumption, a team of teachers and technicians and students from the Capanema campus, where the pilot experiment was conducted, looked for potential producers that could be included in the project and on a specific date to participate in the two-day workshop. However, it was identified the difficulty of the agroindustrial producers selected for the project in presenting to the team made by researchers, the problems faced in the production and services.

The strategy to overcome this obstacle was to develop a standard PowerPoint presentation with predetermined key-points. To reduce the fear of presentation delivered, an IFPR student would be responsible for this. It is usual in rural areas of the state that IFPR students be relative, friend or relative of a friend of the producers. Added on this, that a professor of the then Directorate of Innovation (now AGIF) would be the master of ceremony and would assist the presenter (student) in the exposition of the agroindustrial organization, mediating with questions or highlighting about a specific topic of the presentation. An important point of this strategy was to place near of the presenter the agroindustrial producer of the business

in evidence, since by the characteristic of the presentation, this would be called, in a very unique way, to participate in the exhibition.

It is noteworthy that the presentation began with a photograph of the agroindustrial producer's family gathered in front of the establishment; the shoot was taken during the first contact with the planers (mapping). During the presentation, the master of the ceremony asked about the agroindustrial producer's family history, time of work experience and how the business began. The producer answered and over time, the agroindustrial producer's spontaneously responded to the questions, becoming more comfortable to speak in public. With this, the agroindustrial producers was willing to make interventions during the explanation of the business/problem of the business, often occupying the place of the presenter.

In order to disseminate knowledge about innovation and the possibilities of interaction between university-industry-government, the schedule of the event was arranged within two days with four times with four hours each (08:00 to 12:00 and 13:30 to 17:30). The first session took place on the April 25 morning, and was designed for the opening of the event the IFPR Provost, that was followed by the Pro-Provost for Extension, Research and Innovation, and the Director of Innovation of the Institution, and the lecture that had as the theme the innovation in the Institute environment which one was followed by a discussion about the subject. The guests were separated into two groups. In the first day afternoon, the group I made the presentation, having in this period a one-hour coffee break, to enable the visit to the stands of the agroindustrial producers who participated in the event.

One of the strategies used to attract producers was to allocate space for them to be able to advertise, promote and sell their products, both for IFPR's internal audience, as well as for invited partners and the outside community. Thus, at a specific time between presentations, the public was able to visit the stands to meet and buy the items exhibited. On the morning of the second day of the event, the presentations of group II took place. It should be noted that after the presentation was set a time for the researchers (teachers, technicians, and students) to elucidate their doubts and gather information for a better understanding of the productive process and its problems. In the last period of the second day, the participants were invited to a technical visit to the property of one of the event's partakers, with IFAgroTECH closed with a discussion on what was presented and talk about the importance and specificities of scientific research and possible contributions to the community.

A week after the closing of the event, the members of the Directorate of Innovation met to conduct a Post-Action Assessment (APA), aim to identify the possibilities for improvement and the strengths of the event.

Aiming at improving the project, a new edition of IFAgroTECH was taken out in 2017, this time in the city of Pitanga, in the middle region of the Paraná state, as shown in Figure 1. At the Pitanga campus, to decrease costs and time, we opted to reduce the event to one day only. Although very profitable, it was found that there was not time enough for the execution of the activities, and for the participants to walk through the facilities where the agroindustrial products of the participants of the event were exposed neither. The talk and the discussion scheduled for the end of the event were not held for an absolute shortage of time. In a new APA, that happened after the Pitanga's event a couple of requirements was observed that needed a new structuring of the Directorate of Innovation, and the format of the event as well.

The needs arising from the work presented at the IFAgroTECH events dealt with intellectual property, technology transfer, robotics and new technologies, and entrepreneurship. Thus, at the beginning of 2018, the Directorate of Innovation became the AGIF. In order to improve the project, a call was published by the IFPR, search for campuses to apply for IFAgroTECH-2018. After that, the campuses were selected and the events were held in the cities of Assis Chateaubriand, Ivaiporã, Quedas do Iguaçu, Coronel Vivida, Pitanga, and Colombo. Some actions were included or replaced in the initial project in an attempt to improve it. With APAS carried out after each event, a format was considered as the ideal for the continuity of the project.

Based on the experience accumulated over the two years and eight events, AGIF devised a presentation and programming model for the IFAgroTECH event that was analyzed, improved and standardized under the IFPR. With the success of this experiment, other FIs have asked the IFPR for permission to replicate the event in its regions. Thus, AGIF requested the registration of the trademark IFAgroTECH® from the National Institute of Industrial Property (INPI). The main results achieved by the AGIF, presented in the following item, had as precursors the actions related to the event.

In order to maintain the successful format of the project in question, the activities, duration, and actions demanded were standardized and formalized in the PROEPPI Ordinance No. 10/2019, which order the format of the event Workshop de Tecnologias Agroindustriais do Instituto Federal do Paraná - IFAgroTECH, at the IFPR. In this sense, all events within the framework of this Institute must follow what was standardized in the institution.

MAIN RESULTS

IFAgroTECH highlighted the need to structure the then Directorate of Innovation so that it had specific bodies that could advise the campuses on the promotion of innovation and the production of knowledge within the IFPR. Thus, the first effective result was the transformation of the IFPR Directorate of Innovation into Innovation Agency (AGIF), whose main objective is to promote activities to stimulate innovation, entrepreneurship, production and transfer of technology, as well as the domain and exploitation of knowledge in the areas of robotics and new technologies, with a view to local, regional or state development. This objective is in line with the duties of this Institute.

In order to achieve its goals, the AGIF seeks to disseminate in the IFPR the knowledge produced by its researchers, giving them the conditions for production and intellectual protection, with conditions to become an entrepreneur or transfer technology. The main tasks of this agency are:

a) To provide the internal community with the identification of opportunities for the production and exploitation of innovation in order to increase the impact of teaching, research and extension in favor of sustainable socioeconomic development;

b) To foster entrepreneurship in the IFPR in order to contribute to local, regional and/or state development;

c) Promote the protection of intellectual property of the institution's researchers, as well as give due support in cases of technology transfer; and

d) Build and disseminate knowledge of robotics and new technologies in the IFPR in order to leverage the skills and competencies of the institution's teaching and students.

It should be noted that AGIF has executed its tasks in order to promote and leverage innovation and entrepreneurship on the IFPR. In a little more than a year of creation, with the support of the campuses, the AGIF has provided encouraging numbers for IFPR by regulating the flow and promoting applications for the protection of intellectual property of the members of this Institute. In a short time, the AGIF has contributed greatly

to IFPR confirming its excellence in education and scientific production. One example is the intellectual production of its members (teachers and students) through intellectual protection applications. Table 1 below presents this data:

Table 1 - Production with requests for intellectual protection

Institution	Type of the requests	Year	Amount
IFPR/PROEPPI/ AGIF	Patents	2017	9
		2018	15
		2019	11
	Computer Program Register	2017	-
		2018	9
		2019	3
	Marcas	2017	-
		2018	1
		2019	-

Source: Authors (2019) - extracted from the INPI database (2019)

It should be noted that IFAgroTECH initiated the practice of seeking legal protection for the search results. The examination of the number of applications in recent years shows this tendency in this Institute. The data of intellectual property protection requests (patents and computer programs) registered at the INPI by the main educational institutions of the state of Paraná highlights the IFPR surveys, as can be seen in Table 2. For the elaboration of the table, it was considered the year of the first registration in the INPI of each institution and the number of requests. These parameters were consolidated in a metric called "Intellectual Production Rate Registered at INPI" for years of operation:

Table 2 – Intellectual Production Rate Registered at INPI

Requests	Institution	Total	Year	Rate	Classification
Patents	IFPR	35	3	11,7	**2º**
	UP	5	14	0,4	**9º**
	PUC	131	14	9,4	**5º**
	UEL	158	20	7,9	**6º**
	UEM	138	14	9,9	**4º**
	UEPG	107	15	7,1	**7º**
	UFPR	478	19	25,1	**1º**
	UNIOESTE	55	13	4,2	**8º**
	UTFPR	184	17	10,8	**3º**
Computer Program	IFPR	10	2	5,0	3º
	UP	8	2	4,0	5º
	PUC	72	13	5,5	2º
	UEL	38	11	3,4	6º
	UEM	28	19	1,5	9º
	UEPG	11	6	1,8	8º
	UFPR	51	12	4,3	4º
	UNIOESTE	24	10	2,4	7º
	UTFPR	238	9	26,5	1º

Source: Authors (2019) - extracted from the INPI database (2019)

For the progress verified in the presented data, several actions were carried out by the AGIF, highlighting: 1) Formalization of NIT's (Nucleus of Technological Innovation) in the IFPR; 2) Structuring the flows of applications for the protection of intellectual property; 3) Elaboration of the Innovation Policy and the encouragement of entrepreneurship within the scope of the Federal Institute of Paraná; 4) Guidance on the procedures for stimulating entrepreneurship and technology transfer; 5) Holding events to bring academic knowledge closer to society in general, among others.

The effectiveness of AGIF's actions, mainly arising from IFAgroTECH, can be seen in the various national and international awards that the IFPR, through its agency, has obtained over the last two years, as shown in Chart 3 below:

AWARD	YEAR	PLACE	CLASSIFICATION
REDITEC	2018	Búzios-RJ	1st place in works in the area of innovation
InnovaCities	2018	Cascavel-PR	5 Innovation projects awarded in the top 10
Feira de Inovação de Foshan	2018	Foshan-China	1st e 3rd place
FEBRAT	2018	Belo Horizonte-MG	Awarded and selected project for the innovation fair in Portugal
FEBRACE	2018	São Paulo-SP	Awarded project
FICIÊNCIAS	2018	Foz do Iguaçu-PR	Awarded project
Fase Nacional do "Programa Células Empreendedoras"	2018	Recife/PE	2 Classified projects (among the 60 of the regional stage)
Feira Paranaense de Ciência e Tecnologia (FEPARCIT)	2019	Cascavel- PR	2nd place in the area of Health Sciences, 2nd place in the area of Social Sciences and 3rd Place in the area of Exact and Earth Sciences

Chart 1 – Awards granted to the IFPR through the AGIF
Source: Authors (2019)

In summary, the numbers mentioned contributed to IFPR's position in the international ranking of the best institutions in Latin America, according to QS World University Rankings, ranking No. 351 (Figure 2). QS World University Rankings is one of the three most influential and widely observed international classifications of universities, along with the Times Higher Education World University Rankings and the Academic Classification of World Universities by Quacquarelli Symonds (QS) of the United Kingdom.

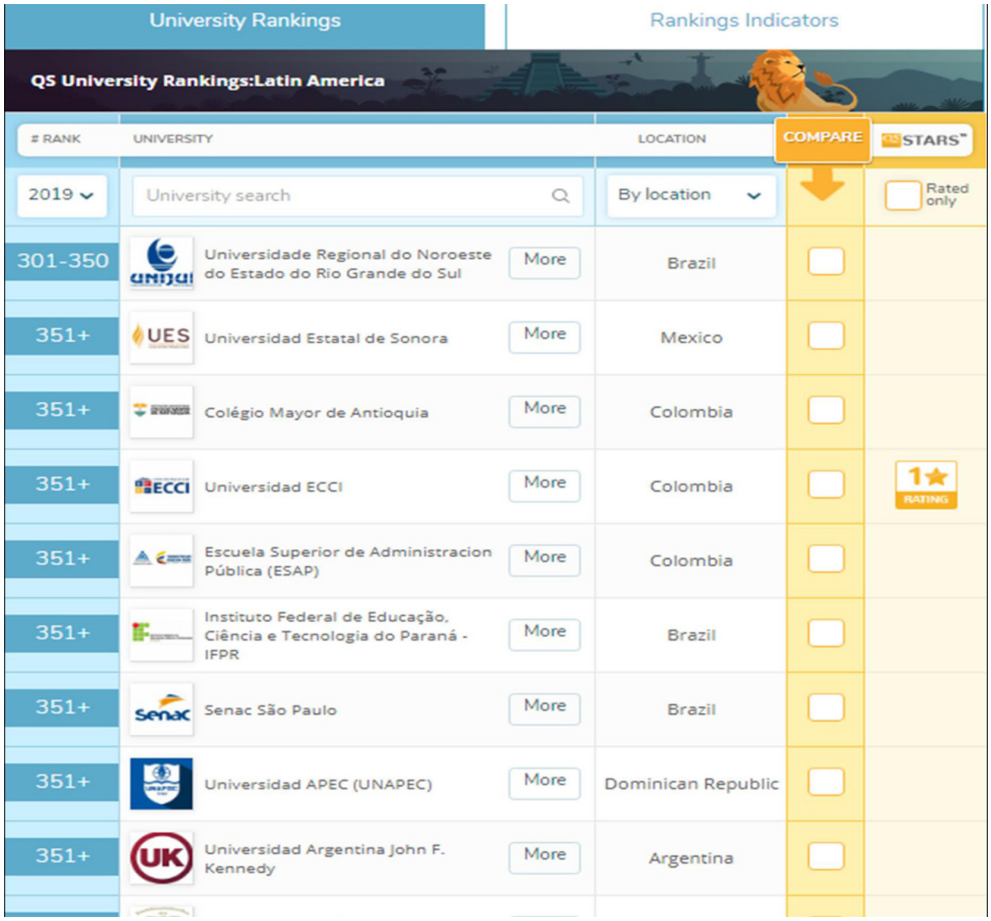

Figure 3 – QS Word University Ranking
Source: QS World University Rankings (2019) [https://www.topuniversities.com/]

Finally, it is noted that the results presented evidence the IFPR's excellence in fulfilling its legal duties, producing significant results for society, especially for the places and regions where the IFPR campuses are located.

FINAL CONSIDERATIONS

It was possible to observe that the dichotomy between theory and practice can be minimized or eliminated in certain areas of knowledge, especially those related to innovation, which can provide different

knowledge for solving problems or exploitation of opportunities in economic and social development area.

It was also observed that researchers can take advantage of models that enable, in a logical and practical way, experimentation with a focus on knowledge production. Based on these premises, the AGIF utilized the Triple-Helix model (ETZKOWITZ; LEYDESDORFF, 1995; 2000) and started the project entitled Workshop de Tecnologias Agroindustriais do Instituto Federal do Paraná – IFAgroTECH aiming to encourage a culture of innovation in the IFPR and to cause in a targeted way the production of knowledge by the institution's researchers.

IFAgroTECH could be field tested and its results were the precursors of new ways of researching in the institution, as well as the inducer of the practice of seeking intellectual property protection of the knowledge produced by the researchers. It should be noted that the improvement of the process occurred in a systemic way, because in the same time that the AGIF (former Directorate of Innovation) induced the researchers to adopt new practices in the conduct of their research, the researchers influenced the AGIF to review their procedures adopt more specific practices for certain demands as well. It should be noted that the most striking development was the transformation of the PROEPPI's Directorate of Innovation into the IFPR Innovation Agency - AGIF. This agency, with a structure shaped to meet the researchers' expectations, allowed them to leverage the results of IFPR as all.

There was no doubt about the latent scientific production capacity of researchers at this Institute. However, with the induction to systematize the process of producing knowledge, this capacity was demonstrated, which, translated in numbers, enabled the IFPR to be recognized for excellence in the production of knowledge and, through innovation, to be one of the inducers of economic and social development in the realities where this Institute is inserted. The figures show society the results of a process that had in IFAgroTECH a propulsive spring.

Finally, from what has been presented, there is no doubt about the recognition that the IFAgroTECH initiative has truly confirmed itself as a successful project with successful experiences.

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