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TECHNOLOGICAL CAPABILITY BUILDING IN THE AGRO-INDUSTRIAL COOPERATIVISM

CONSTRUÇÃO DE CAPACIDADES TECNOLÓGICAS NO COOPERATIVISMO AGROINDUSTRIAL

ÁREA TEMÁTICA: Inovação, Tecnologia e Empreendedorismo

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Abstract

Technology is used to develop a strategic role in organizations, it can provide opportunities for innovation; however, the technological process not only demands tangible assets, it demands a set of abilities to enable innovation. In a fast change environment, organizations need to reconfigure and build competences to maintain competitiveness. The agro-industrial cooperatives context differs in terms of a normal organizational structure and in the relationship with the local community, these organizations have the role to diffuse and adopt new technologies aiming in productivity in order to maintain their competitiveness in an oligopoly market. This study aims to identify how technological capabilities are built in an agro-industrial cooperative, For this investigation a qualitative research was made, using case study strategy in a agro-industrial cooperative, the evidences was found by data collect in interviews with key-members of the organization, documents and secondary documents, the data was analyzed by content analyses with Atlas.TI software. A research protocol and a code book were developed to guide data collection and analysis. A semi-structured interview guide was developed based on a technological capacity model measurement dimensioned by levels and technological functions. As results: technological capabilities advanced levels in each researched function; and it was found that the use of technologies provided increased productivity and reduced costs, in this sense, this study provides a technological capability measurement model applicated to the agro-industrial context.

Keywords: Technological Capability, Technological Innovation, Cooperativism, Agroindustry.

Resumo

A tecnologia é usada para desenvolver um papel estratégico nas organizações, pode fornecer oportunidades de inovação; entretanto, o processo tecnológico não exige apenas ativos tangíveis, exige um conjunto de habilidades que possibilitem a inovação. Em um ambiente de mudança rápida, as organizações precisam reconfigurar e construir competências para manter a competitividade. O contexto das cooperativas agroindustriais difere em termos de uma estrutura organizacional normal e no relacionamento com a comunidade local, essas organizações têm o papel de difundir e adotar novas tecnologias visando a produtividade de forma a manter sua competitividade em um mercado oligopolista. Este estudo tem como objetivo identificar como as capacidades tecnológicas são construídas em uma cooperativa agroindustrial. Para esta investigação foi realizada uma pesquisa qualitativa, utilizando a estratégia de estudo de caso em uma cooperativa agroindustrial, as evidências foram encontradas por meio de coleta de dados em entrevistas com membros-chave do organização, documentos e documentos secundários, os dados foram analisados por meio de análise de conteúdo com o software Atlas.TI. Um protocolo de pesquisa e um livro de código foram desenvolvidos para orientar a coleta e análise de dados. Um roteiro de entrevista semiestruturado foi desenvolvido com base em um modelo de capacidade tecnológica dimensionado por níveis e funções tecnológicas. Como resultados: níveis avançados de capacidades tecnológicas em cada função pesquisada; e verificou-se que as tecnologias proporcionram aumento de produtividade e redução de custos, em complemento, o estudo fornece um modelo de mensuracao de capacidades tecnologicas aplicadas ao contexto agroindustrial.

Palavras-chave: Capacidade Tecnológica, Inovação Tecnológica, Cooperativismo, Agroindústria.

1. INTRODUCTION

Technology has been used frequently on business, it can be a supporter to organizational activities and can develop a strategic paper to achieve competitive advantage (Teece, Pisano & Shuen, 1997; Wu & Chiu, 2015; Oliveira & Maçada, 2017). Since this affirmation, technology can support strategic goals in organizations (Bolukbas & Guneri, 2018).

Technologies can provide innovation, cost reduction, higher profits and organizational growth (Phaal, Farrukh & Probert, 2006) through technological processes. The technological process is mainly focused on combination of specific tangible and intangible assets, Moreover, this combination must behold individual abilities, antecedents, know-how (Danneel, 2016; Deligianni et al., 2019), thus, this complains of knowledge worries by agents who use technology (Huda, 2019). However, it is important to highlight that the technological process requires decision making support from the managers (Phaal, Farrukh & Probert, 2006), this fact mainly refers to the strategy processes of where resources can be allocated (Seram, *et al.*, 2019).

The industrial technological accumulation is used in literature by the taxonomy matrix measurement proposed by Lall (1992) and reinforced by Bell and Pavitt (1995); Bell & Figueiredo (2012). This taxonomy aims to analyze how accumulation gradually occurs, mainly in industries from developed and developing countries. The accumulation process has been used in a plenty of studies focused on understand the differences or similarities on different contexts (Figueiredo, 2001; Figueiredo, 2004; Bell & Figueiredo, 2012; Franco, Moreira & Façanha, 2015; Pinheiro *et al.*, 2017; Peerally *et al.*, 2017). Relatively little is known about understanding the process of technological accumulation in the industrial sector that does not use technology as its main entrance but uses it as a facilitator of its main objective, food.

In order to identify the process on how technology occurs in agro-industrial context, cooperatives seem to be a potential sector to investigate the phenomenon, they represent a great part of Brazilian GDP. Paraná agribusiness itself is responsible for 30% of the state's GDP and the agribusiness shows itself as a highly competitive sector. The Paraná cooperatives scenario is represented by 19% of the GDP of the state of Paraná (Ocepar, 2018), which mainly shows its strength of the cooperatives agroindustry's and its relevance in the country.

In particular, more attention needs to be given to the agribusiness cooperatives by its relevance itself, and its technological uses. In this sense, this research aims to understand how technological capabilities are built in agribusiness cooperatives. This study can provide both researchers and management contribution by giving insights of how technological accumulation occurs in the agribusiness cooperatives and its accumulation process. Thus, this study can contribute to the literature by provide a model for measuring technological capabilities for the agro-industrial sector.

In addition, this context represents a great part on state modernization, this includes agrotechnology, the cooperatives also have a social factor, which means that they contribute to the local community cooperatives are participants in competition, and seek to adapt to technological advances, consumer needs as well as possible market expansions (Bortoluzzi, 2016), and are actively present in the growth of the productivity of the sector (Coscione, 2019).

2. LITERATURE REVIEW

2.1 Technological Capability

Based on the definition of technology developed by Dosi (1984), Lall (1992) introduced the concept that capabilities can be used in three categories: (1) investment, which is considered a 'basic' resource; (2) physical capital, considered as human capital, which implies that a

company must have financial resources to acquire technologies, as well as, transmit and train the personnel responsible for the correct functioning of these technologies; such factors must be convergent with (3) the company's technological direction.

The direction or technological trajectory was called path dependence (Nelson & winter, 1982; Teece; Pisano & Shuen, 1997). These three categories are configured as the main factors for the development of technological capacities at the country level (Lall, 1992; Bhatt & Grover, 2005; Piccoli & Ives 2005; Lim et al., 2011). Technological change is understood as a continuous process of absorption and / or creation of technical knowledge, which partly originates from outside the organization and partly due to the accumulation of knowledge related to past experiences, at an organizational level (Lall, 1992; Takahashi, 2005; Takahashi; Bulgacov & Giacomini, 2017).

The development of technological capabilities comprises an effort at all levels of an organization, such as the skills and knowledge necessary to operate and use new technologies (Lall, 1992; Kruss, et al. 2015). The more advanced the technological capabilities of an organization, industry, city or even country, the more susceptible the ability to absorb and develop new efficient products and processes (Watson et al., 2015).

Thus, the study by Franco, Moreira and Façanha (2015) aimed to understand the relationship between technological capabilities and the advancement of imitation in order to achieve innovations, through the learning process; this study was applied to the Brazilian energy sector. Pinheiro et al. (2017), seek to identify within the natural resources sector the efficiency of the organization's performance combined with technological capabilities.

Therefore, it is understood the importance in identifying the collective organizational and sectoral efforts in which technological capacities are accumulated, through the application and adaptation of models as suggested by Figueiredo (2003), Figueiredo (2010), Peerally et al. (2017), Piana & Figueiredo, (2017), Petralia et al. (2018), since each sector has its specificities and can accumulate technological capabilities to be innovative and possibly sustain itself competitively (Mendonça & Cunha, 2014).

2.2 Cooperatives and Agro-industrial context

Cooperativism begins with industrial revolution, largest modifications on process due to introduction of machinery to replace manual labor. This fact is a mark on social exclusion, however the substitution of the machines. Although the substitution by machines has led to the exclusion of social groups and, as a result, an increase in poverty, contrary movements have arisen, with the aim of attributing egalitarian forms in the distribution of goods, in the face of these movements, cooperatives have arisen (Pinho, 1977; De Lima & Alves, 2011)

Cooperatives are entities attributed to a duality, at the same time that they are constituted as associative social organizations based on economic motivation, in times of crisis appear as a foundation for the economic reorganization of groups disadvantaged by the industrial movement, also act as a collective productive organization, whose purpose is to bypass situations and attribute the collectivity to the economic process (Loureiro, 1981; Fajardo, 2016). In addition, cooperative actions become real as the need for individuals converges with the will to overcome them (Willers, 2015).

Thus, the cooperative movement in Brazil was influenced by religious characteristics and political views of immigrants coming in the opposite direction to the crisis in Europe, where the economy, politics and social transformations forced the expropriation of a large part of individuals (Casagrande, 2014). The agribusiness cooperatives from the state of Paraná, southern region of Brazil, began to increase their representativeness in the state around 1940, mainly due to the colonization areas of Italian and German ethnic origin, recognized as *Teuto* and *Italo* Brazilians (Freitag, 2001; Gregory, 2002; Freitag, 2007), since the colonization

process was made possible by the territorial policy aimed at selected groups, which shared common identity principles, such as: Christian religiosity, work ethics focused on dealing with the land (Freitag, 2001; Gregory, 2002; Freitag 2007) and the associative practice (Freitag, 2019).

The Paraná cooperatives scenario is represented by 19% of the GDP of the state of Paraná (Ocepar, 2018), whereas agribusiness is responsible for 30% of the state's GDP. Agribusiness shows, therefore, itself as a highly competitive sector, which goes against the historical economic crisis in Brazil. The state of Paraná thus plays an important role in this context of economic recovery, in addition to its great influence on the modernization and consolidation of the agro-industrial context, the context in which cooperatives are inserted (Canetti, 2017).

In addition Cooperativism brought a direct modernization process to the industrial process, it assumed the logic of intervention in agriculture before the military regime, allowing access to credit to stimulate installations related to agricultural infrastructure as well as in the construction of policies for the context (Fajardo, 2016).

The modernization of Paraná's agricultural processes also has the characteristic of the colonization migrants, since the colonization history of Paraná is connected to the production of grains, and concerns about agro-industrial cooperatives and the advance and investment on industrialization process. Thus, technologies are applied and are of great importance for the improvement of these industrial applications (Bortoluzzi, 2016), However, technological applications are not the focus of this type of business, but a facilitator to improving food production.

In this context of development, cooperatives and their relationship with public and private teaching and research institutions do a very important role in contributing to technological development for the industry, as well as the dissemination of technical and scientific knowledge to associate members (Coscione, 2019). Thus, the cooperatives enable the training and qualification of their members, it brings new technologies that provide increased productivity and helps to create opportunities which the producer can add value to his production in the market (Chaddad, 2017)

Cooperatives, as well as any organization participating in a competitive environment, seek to adapt to technological advances, consumer needs as well as possible market expansions (Bortoluzzi, 2016), and are actively present in the growth of the productivity of the sector (Coscione, 2019).

3. METHODOLOGICAL PROCEDURES

This study has a qualitative approach to investigate what agents are doing in daily activities and understand how these actions mean to them (Norman & Denzin, 2018). This study is characterized as an analytic-descriptive which mainly aims to describe and characterize phenomenon and daily situations, this refers to understanding, identifying and comparing those situations, without the researcher manipulation (Raupp & Beuren, 2006; Babbie, 2007).

As a research strategy, the study is characterized as a unique case study, which mainly focuses on answering ‘how’ and “why” questions as said by Eisenhard (1989), when the researcher has no control of the facts and search to understand reality facts (Yin, 2014). In addition, this study has a cross-sectional record with longitudinal approximation, to understand the phenomena in different situations of the time (Cooper & Schindler, 2013; Yin, 2014).

The data collection methods involved in-depth interviews with knowledgeable managers and collaborators employees who witnessed the change caused by technology in the enterprise among the years. To correspond with Yin’s (2014) triangulation, other documents were utilized, archives, other studies, organization reports, news and non-participant observation. Moreover, for this research, the names of the interviewers and the Cooperative name were omitted. For

this study five interviews were conducted, the total time of interviews was 186,6 minutes, from 28 *mins* the shorter, to 59 *mins* the longer. We understood that the saturation process was achieved. Moreover, the observation data was able by a technical visit in the corporative university and to the management headquarters during in total 70 minutes. To respect the triangulation (YIN, 2014), we analyzed in addition the cooperative registers and its corporate magazine.

To analyze the data, we used content analysis. Bardin (1977, p.40) describes as "techniques to analyze the communications, which uses systematic procedures and objectively de content of messages". To contribute to the data analysis, this study used codification respecting the constructs criteria, moreover 37 codes were created to help the analyses process.

The analytical framework was based on Peerally et. al (2017) and adapted to the context, which measures the technological capabilities in agroindustry. This model measures relations with community, which seems appropriate to apply in a cooperativity system, the measurement can be observed in Panel 1. The results will be discussed in the next section.

Panel 1 – Technological Capabilities Framework

Levels		Technological Functions			
		Project Management and Equipment	Process	Product	Linkages with the local community
Advanced	Capability to implement complex modification in technologies and production system based on applied research and exploratory development.	World-Class engineering, providing technical assistance in expansion decisions and e assistência técnica em decisões e negociações de expansão, desenvolvimento original de equipamentos e tecnologias diárias.	Engagement in the organization of processes and production, design, selection and evolution in products and specific processing techniques based on research and development, new for the world.	generation of innovative products and related technical skills, based on something new for the world.	engagement and collaboration with research projects with universities, research institutes to generate innovative processes or products,
Intermediate	Capability to implement relatively complex changes in technologies and production systems based on non-original experimentation, and engineering and design.	Total monitoring, control and execution of feasibility studies, search, evaluation and selection, renovation of large equipment without technical assistance.	Continuous improvement in processes, production equipment and systems, reverse engineering, integration of process automation, development of production processes and / or product specifications.	Continuous improvement in products without technical assistance, daily product creation laboratories, product feasibility studies	organizational innovations that bring positive effects to the community.
Basic	Capability to implement minor adaptations in existing technologies and production	Technical involvement and sources of technological assistance, project management, monitoring and feasibility studies, choice of technology sources, slight modifications to systems, equipment.	Integration of automated / semi-automated process systems, light process adaptations, cost reduction and execution time	intermittent adaptations in product specifications, creation of own product standards, incremental improvements in products based on customer specifications, in-house quality control.	Search and absorption of information from members of the local community, active involvement in the expansion in the participating community (associates) and improvements in retention and recruitment.
Operational Capability	Capability to implement operational activities based on the use of existing technologies and production systems in line with local efficiency and quality standards	Construction planning and equipment installation, preventive maintenance systems, routine changes of non-functional equipment.	Routine operations, installation and testing, unit maintenance, basic production planning and quality control	Product quality system	Search for inputs based on the production of the community (associates) eg: (soybeans, wheat, animals for slaughter), partnership with the community to buy and sell to reach the target market.

Source: Based on Peeraly (2017) and Researcher`s own data (2020).

4. RESULTS AND DISCUSSION

In order to discuss the results in an analytic-descriptive form, we elaborate panels for each of technological functions aiming to comprehend the trajectory of the company among time and the development along it, each function has it characterized, described in panel 1 and used to find elements which can describe its accumulation. Thus, we describe using time periods and its most important factors related to each technological capability functions.

4.1 Project management and equipment-related

Panel 2 – Project management and equipment-related

	Time			
Levels	1970-1982	1983-1994	1995-2008	2009-2019
Advanced			Development of a logistical feed monitoring system, based on its own development.	
Intermediate			Seed Processing Unit, improvements in physiological quality, germination, internal quality control, conducting seed tests.	Seed Processing Unit, improvements in physiological quality, germination, and seed purity, internal quality control
Basic		Seed Processing Unit, improvements in physiological quality, feasibility studies for implantation, light adaptations in systems.	Seed Processing Unit, improvements in physiological quality, feasibility studies for implantation, light adaptations in systems.	Seed Processing Unit, improvements in physiological quality, feasibility studies for implantation, light adaptations in systems.
Operational Capability	feasibility studies for the choice of places to house storage of produced grains.	feasibility studies for production systems, scheduled maintenance on equipment and information systems.	feasibility studies for production systems, scheduled maintenance, information backup, database centralization, internal update policies	feasibility studies for production systems, scheduled maintenance, information backup, database centralization, internal update policies

Source: Based on Peeraly (2017) and Researcher`s own data (2020).

Panel 2 introduces the evolution of project management and equipment-related accumulation among the time. The cooperative begin it function in 1970, in this time, the idea was guarantee more operational capability, with the feasibility studies, which was made against a group of associates and their grains, in order to stock those production as one, this capability continues until 1983, when the company starts to expand some activities and introduces on new market segments.

This time was marked in two different situations, in a preoccupation with information systems on organizational management, this is mainly focused on IS adaptation for the company uses and maintenance of equipment IS-related Peeraly *et al*., (2017), confirms that those actions are linked to a basic level of technological capability. The process of adaptations and search for

technologies needs to be linked to organizations main goals (Lall, 1992). Second focus is on expansion about new plant sites to allocate industries and storage units, creation of a facility which has the main objective processing seeds, to guarantee more production and quality.

In 1995-2008 mainly operational capabilities continues the same, with the addition in IS maintenance policies, additional security with backup data two times a day, on basic capability it remains the same, in intermediate capability we see a new seed process unity providing more technology and quality to germination process, physiology quality, and a implementation of seed quality control made by a technical laboratory.

2008 is marked by innovation technology price, the company develops in-house a unique system which mainly controls the logistic process of delivery feed, this system uses GPS as base, this configures as advanced capability. The *in-house* development characterizes as the advanced level by doing complex modification as well Lall (1992) and Peerally *et al*., (2017) describes.

2009-2019, continues the operational, basic and intermediate levels in this function, although, the advanced level do not continue, the company does not develop more the recognized logistical, and calls it a necessity to remake certain functionalities in order to advance its uses.

4.2 Process

As an operational capability, the process function began with the company in 1970 and advances until 1982, with the feasibility demonstrated in project management function, the company starts to care operational routines, test and basic maintenance on the production plants, they start to create quality controls, in order to walk with the planning industrial sites.

In 1983 we see a great advance in this function, mainly marked by the change of the managers in 1985 to 1990, this period was marked as a time of crises in the studied company, with no long range planning, in operational capability they upgrades some quality and regimentation systems, in 1994 mainly de year which changes in the company starts to appears, a poultry project was introduced, and with it, new productive process, cost reduction achieving not only basic capacity, but the intermediate level, the project introduces in addition a concern about new product specifications in company.

In 1995-2008, the scenario continues, only develops new IS controls, and introduces mapping the processes, which implicates on reduction of execution time, administrative tasks, and introduces a total quality methodology on swine production, an another mark is in 2000, the company begin it corporative university, in order to corroborate with the training of the associates and members of the cooperative.

2008-2019, the process function achieves advanced level, that implicates based on the linkages with the community function, the explication of this fact is basically in Rural event elaborated by the cooperative in order to reach the community and diffuse new technologies focused on agribusiness, this fact, induces new techniques to production which affects the production, other factor is that the cooperative has projects based on training the associates. the accumulation on this function can be verified in panel 3.

We noticed that mainly accumulation on process function are related to the stimulus for learning processes that can be explained by the cooperative principle that aims to encourage access to education and information, as noted by Coscione (2019), and the practices of the studied cooperative related to the `Rural Event` and Corporative University which are a channel to demonstrate techniques to improves organizational activities (Lall, 1992; Takahashi, 2005; Takahashi, Bulgacov & Giacomini, 2017).

Panel 3 –Process

	Time			
Levels	1970-1982	1983-1994	1995-2008	2009-2019
Advanced				demonstrations of techniques and innovations related to livestock, pig, poultry, and grain activities
Intermediate		Development of production processes and product specifications, poultry project	Development of production processes and product specifications, poultry design, automation of processes related to software developments	Development of production processes and product specifications, poultry design, automation of processes related to software developments
Basic		Cost reduction with new processes linked to the poultry project	Cost reduction, poultry project, adaptation in organizational processes, reduction of execution time in administrative tasks, process mapping, total quality methodologies	Cost reduction, poultry project, adaptation in organizational processes, reduction of execution time in administrative tasks, process mapping, total quality methodologies
Operational Capability	Routine operations, installation and testing, unit maintenance, basic production planning and quality control	Routine operations, installation and testing, unit maintenance, basic production planning, sanitation systems and legislation	Internal Quality Systems	Implementation of total quality methodologies in pig production

Source: Based on Peeraly (2017) Researcher`s own data (2020).

4.3 Product

To describe the product function, 1983-1994 demonstrate a great concern about quality and introduces intermediate level, with the poultry project the cooperative introduces new production process and starts to develop new product specifications, in addition, this project gave the company internal quality controls, creation of standards and improvement on product, in this case, related to poultry. Thus, came sanitation systems and adequation to legislation.

In 1995-2008, the company maintain it operational, basic and improves intermediate capability, the improvements are based on the Seed Processing Unit, which has the main objective as improve physiological quality on grains, and in livestock, swine, poultry activities, until achieves advanced providing projects related to environmental care, which can cause benefits for the associates who has some of those productions.

2009-2019 maintaining the same characteristics, in order to illustrate this, the Panel 4 is presented.

Panel 4 - Product

	Time			
Levels	1970-1982	1983-1994	1995-2008	2009-2019
Advanced			demonstrations of techniques and innovations related to livestock, pig, poultry and grain activities, projects related to environmental care.	demonstrations of techniques and innovations related to livestock, pig, poultry and grain activities, projects related to environmental care.
Intermediate		Development of production processes and product specifications, poultry project	improvements in physiological quality, germination, related to livestock, swine, poultry and grains activities, internal quality control, production quality, testing.	improvements in physiological quality, germination, related to livestock, swine, poultry and grains activities, internal quality control, production quality, testing.
Basic		Internal quality control, creation of own standards, product improvements.	Internal quality control, creation of own standards, product improvements.	Internal quality control, creation of own standards, product improvements.
Operational Capability		Routine operations, installation and testing, unit maintenance, basic production planning, sanitation systems and legislation	Routine operations, installation and testing, unit maintenance, basic production planning, sanitation systems and legislation	Routine operations, installation and testing, unit maintenance, basic production planning, sanitation systems and legislation

Source: Based on Peeraly (2017) and Researcher`s own data (2020).

4.4 Linkages with the community

This is the main factor of the study, which cooperativism and technology makes difference, cooperativism induces that some of its characteristics are from immigrant agents, this came, embodied with a cultural and work ethics (Freitag, 2001; Gregory, 2002; Freitag 2007). And some principles that guide cooperativism in the world.

This function highlights cooperativism principles and its influences at the local community, corroborating with Coscione, (2019) and the important role of these institutions and the development for the industry, as well as the dissemination of technical and scientific knowledge.

In 1970, the cooperative initiated its operation, guided by the will of trespass crises, associates united allocate their grain production, and began to seek new members in the local community, in order to search inputs and expand members, this continued until 2019, and can be classified as operational and basic capabilities.

1983-1994 has a mark on intermediate capability, with the creation of a Rural event, which brings field experiences, learning mechanisms and application of new technologies to the context and the local community.

1995-2008 has another mark in this technological function, the intermediate level amplifies when a corporate university is introduced in 2000, this university has the main principle to take the knowledge and capacitate any associate or local member, this indirectly inflicts on other functions measured in this research.

This function achieves advanced level and continues to maintain and upgrade each element's content in Panel 4, mainly, 'Rural Event' is the most reckonable event of agribusiness in Latin America, and interviewers confirm that is a "*success case*" implemented by the cooperative. Thus we noticed that most of the organization technological accumulation process achieved success by the preoccupation in transfer knowledge among the employees and in the community, in addition, this corroborates with Lall (1992); Takahashi (2005) and Takahashi et al., (2017) by transferring the 'basic' financial resources, into a concern about accumulate knowledge.

Panel 4 – Linkages with the community

	Time			
Levels	1970-1982	1983-1994	1995-2008	2009-2019
Advanced			demonstrations of techniques and extreme innovations related to livestock, swine's, poultry and grain activities, partnerships with companies and universities.	demonstrations of techniques and extreme innovations related to livestock, swine's, poultry and grain activities, partnerships with companies and universities.
Intermediate		Event that brings together field experiences, learning and applicable technologies, available to members and the local community.	Event that unites field experiences, learning and applicable technologies, available to members and the local community, partnerships with educational institutions to engage in the study of employees, associates and family members, environmental awareness projects	Event that unites field experiences, learning and applicable technologies, available to members and the local community, partnerships with educational institutions to engage in the study of employees, associates and family members, environmental awareness projects
Basic	Search for members in the local community to expand	Search for members in the local community to expand	Search for members in the local community to expand	Search for members in the local community to expand
Operational Capability	Grain production, Search for Inputs (Bovine and Swine), partnerships with milk producers	Grain production, Search for Inputs (Bovine and Swine), partnerships with milk producers	Grain production, Search for Inputs (Bovine and Swine), partnerships with milk producers	Grain production, Search for Inputs (Bovine and Swine), partnerships with milk producers

Source: Based on Peeraly (2017) and Researcher`s own data (2020).

5 CONCLUSION

It was found in the cooperative that technological capabilities have accumulated to the point of becoming in advanced levels, as they were arranged in the matrix proposed by Peerally (2017), however the impact on the technological function project and equipment management is not only by itself, the processes and strategies related to the acquisition and maintenance of machinery and equipment, product characteristics or of information systems. The evolution over the years in the cooperative, interferes in the whole entity's processes and activities, as well as productive activities and the relations with the community and the economy.

The improvement in specialized equipment for slaughter is not only embedded in the tangible element, this condition is extended, from the improvement of the whole production process, to the cooperative's concern for training and qualifying employees and associates. It also becomes visible, the reverse process, it was identified that the rural producer and the technologies he chose to acquire, can potentially provide an increase in productivity of the Cooperative, an individual action transcends from the community to the company.

Although the organization makes cooperative principles possible and active, this only works, because cooperatives has a unique functional way, respecting principles that came with the migration process and empowerment to the community, bringing technology and the qualification of production processes not only to its members, but also the rural community, indirectly without allocating direct resources to these producers, there is a gain in productivity and a reduction in costs for the cooperative members and the surrounding community.

This is possible because, the cooperatives principle of regional and community development, and the encouragement of study and personal development of members, the cooperative takes actions, such as the 'Rural Event', which aims to present all the advances in technologies for agribusiness, bringing specialized companies and assisting in the technology financing process, allowing access to these improvements and ensuring an increase in productivity, for the community in general, regardless of whether they are associated or not.

It also appears that the role of relationship with the community in this context, is one of the main functions highlighted. Under the trajectory, it is visible the anticipation of its maximum level of technological capacity, identifying an organizational innovation that can bring positive benefits to the community, corroborating with the findings of Peerally et al. (2017).

It is worth mentioning that cooperatives have a great role in the technological modernization of agribusiness, not only as agents that introduced technologies to the field, but as an agent that propagated this fact, corroborating with Fajardo (2016). In the Cooperative, an event is created with the specific objective of presenting agrotechnology's. Moreover, the context of agro-industrial cooperatives is marked by a reconfiguration of the sector in 1990, this mark made cooperatives introduce and modify their strategies to compete in a globalized and oligopolized market (Fajardo, 2016).

Thus, the combination of technical resources and individual factors to build technological capacity, as studied by Lall, (1992) and Camisón-Haba et al., (2019) could be verified by the development of new process, products and services, corroborating the studies of Figueiredo, (2002); Figueiredo (2005) and Camisón-Haba et al. (2019). In addition, this study contributes to technological capabilities literature by providing a measurement model that can be applicated in the agro-industrial context.

Future studies can guide through other market segments, another methodology, comparative studies between cooperatives and normal organizations on agroindustry to understand the differences and contest or corroborate the results presented in this study. Other studies can investigate each function formation, to comprehend the modification processes through time and modification factors in depth, in addition another research line can be based on knowledge management theories or technology transfer and adoption of innovations.

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