



PRELIMINARY ELEMENTS FOR A TERRITORIAL APPROACH TO ERGONOMICS: THE CASE OF MARICÁ-RJ

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Abstract

This study is an experience report that describes the approach to identifying and mapping stakeholders to integrate a Territorialized Cooperative Ecosystem (ECT) in the healthy food sector in the city of Maricá, based on the theoretical framework of the Economics of Functionality and Cooperation (EFC). This article aims to discuss the ergonomics approach to territorial projects. The result of the analysis of the intervention records listed two thematic categories: the methodology for diagnosing the territory and the construction of discussion forums. The results show that Ergonomic Work Analysis is a method capable of conducting a territory-centered intervention and indicate elements for adapting an ergonomic approach focused on territorial development.

Keywords: Economy of Functionality and Cooperation, Territorialized Cooperative Ecosystem, Ergonomic Analysis of Work.

1. INTRODUCTION

For a long time, ergonomics considered the economy and the territory as a context, whose field of intervention was outside its domains. According to Guérin et al. (2021), because labor relations are located at the company level, this has always been the most common and widespread form of implementing ergonomics, which concentrates its methods of action on the productive organization, management, its spaces, its rhythms, and its technologies.

This scale of action tends to be questioned today based on major economic, social and environmental challenges that motivate the UN 2030 Agenda for Sustainable Development (2015). For Hubault et al (2019), sustainable development has the same origin as ergonomics: human activity has to take responsibility for the consequences of what it produces, meeting the needs of the current generation, without compromising the ability to meet the needs of future

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generations (BRUNDTLAND, 1987) and, therefore, must guide its behavior not only by procedures, but to consider the subjectivity of the work activity as its central point.

To take into account the Sustainable Development Goals (SDGs) (UN, 2015) in line with the transformation of work advocated by ergonomics, it is necessary to go beyond the limits of the company and the territorial scale is therefore imposed as an increasingly structuring level to face current economic and societal challenges (GUÉRIN et al., 2021).

It is noteworthy that the notion of territory, understood here, goes beyond geographical and political delimitation. According to Cunha (2021), the territory is not a neutral object, disconnected from reality, but rather is configured as a product of the work activity and dynamics of its different protagonists. Cunha also points out that the relations between work and territory are plural, geographically situated and include debates on norms and values carried out by its workers, being, therefore, considered as a category of analysis in the study of work activities.

From this perspective, the Economics of Functionality and Cooperation (EFC) and ergonomics offer ways to think about alternative and situated definitions of economic performance, placing the issue of work at the center of the dynamics of value creation in the territory, without losing sight of economic and social relations (DE GASPARO; DEBUC; GUYON, 2016; DU TERTRE, 2018). The OBE can be defined as:

(...) an economic model that consists of designing and producing solutions based on the integration of goods and services, associated with the sale of a performance of use and/or inserted in a territorial dynamic. (DU TERTRE, VUIDEL and PINET, 2019 p.8).

It is based on four principles: a) the insertion of the performance of the use of goods and services in order to guide the reduction in the mobilization of material resources supported by the development of intangible resources; b) the recognition of real work and of the various modes of organization, which underlie the development of cooperative ecosystems of production; c) governance based on the different levels of cooperation of the actors in the territory; d) service dynamics that prioritize solutions that integrate services and material goods (LIMA et al., 2019; SOARES et al., 2020).

At the territorial level, Maillefert and Robert (2017) show us that the OBE brings an innovative approach that advances in relation to other sustainable economic models, such as the Circular Economy, the Functional Economy and Industrial Ecology. The latter almost always take into account the issues of the territory in their projects only *ex post*. Also according to the same authors, the territorial approach in the EFC becomes a premise, an endogenous part



of the project, seeking a new form of alternative economic development, along with the social one, understanding environmental limitations. The territorial dimension, therefore, ceases to be a constraint, to become a spectrum of value creation through its multifunctionality.

It is also in the territorial dimension that the capacity for governance between multiple actors is materialized, which allows "placing public action at the center of sustainable development practices and mobilizing actors around a common project" (FIGUIÉRE and ROCCA, 2008 apud MAILLEFERT and ROBERT, 2017).

The notion of Territorialized Cooperative Ecosystem (TCE) is the result of common interests of actors who share material and/or immaterial investments, who have the need to maintain a performance of common use and to seek to deal with externalities based on cooperation. The term "ecosystem", borrowed from ecology, when used in economics, alludes to groups of actors who act around common interests (sometimes environmental, economic or social) based on the sharing of information, knowledge, material and immaterial resources.

The representation of the cooperative ecosystem involves a series of actors and their multiple relationships, which is why it is represented in a multiple and diverse way (DU TERTRE; VUIDEL; PINET, 2019). According to Lima et al., 2019, cooperative ecosystems, as long as they maintain direct relationships between the actors involved, whether producers or consumers, beneficiaries, manifest themselves territorially and can occupy spaces on a local, national, or even international scale.

From this perspective, through an experience report on an intervention for the formation of a Territorialized Cooperative Ecosystem (TCE) in the food sector in the city of Maricá, Rio de Janeiro, this article aims to discuss the ergonomics approach to territorial projects.

From the reflection on the role of ergonomics in the reconnection of ties in the territory around its sustainable, socially just and democratic development, it is intended to bring elements of answers to the question of how to mobilize the perspective of work for much broader approaches, at the territorial level, with a heterogeneity and multiplicity of actors, environments and experiences.

2. METHOD

This study is an experience report that describes the approach of identifying and mapping the actors to integrate a Territorialized Cooperative Ecosystem (TCE) in the field of healthy eating in the city of Maricá. The Experience Report in an academic context intends, in



addition to the description of the lived experience, to value it through the explanatory academic-scientific effort and through critical-reflective application with theoretical-methodological support (MUSSI et al, 2021).

The records of the intervention, still in the process of development, were used as a data source, under the title: "Cooperative Ecosystems and Local Development in the City of Maricá", the result of the demand of a municipal authority focused on science, technology and innovation actions. The team of researchers is multidisciplinary, formed by 1 coordinator and 4 researchers working in the Production Engineering Program, at COPPE/UFRJ.

The data were collected between July 2022 and July 2023, and include the field notebooks of the researchers involved, documents and minutes of meetings between the team, in addition to the project reports generated. Throughout the first year of the project, visits were made to about 30 different actors, including rural producers and individual and collective consumers.

3. RESULTS AND DISCUSSIONS

The result of the analysis of the intervention records listed two thematic categories: the methodology of diagnosing the territory and the construction of the debate forums. Both constituted the axis for the apprehension of the reported experience and served as a basis for the discussion on the approach to ergonomics in the territory.

Category 1: Methodology for the initial mapping of the territory

According to Du Tertre *et al* (2019), part of the approach to the consolidation of Territorialized Cooperative Ecosystems (TCE) involves collective reflection on the uses, ways of life, ways of organizing work, and making the contours of an integrated solution emerge. In the project in question, the intervention began with a diagnosis of the territory, carried out through the mapping of local producers and consumers and forums for debate on the challenges encountered by the actors.

The mapping is based on the method of Ergonomic Work Analysis (GUÉRIN et al., 2001). From the orientation of the project's demand, the stage of understanding the General Functioning of each mapped actor begins. This stage was characterized by a global approach and allowed the articulation between the aspects of the company/producer's operation to better understand the challenges and difficulties.



According to Guérin et al. (2001), the mapping of the general functioning of the actors sought to understand the different dimensions involved, such as:

- Economic and commercial dimension, in which the actor's activity is analyzed with reference to the context in which he is inserted. This analysis allows us to situate the functioning of the company/producer in relation to the market.
- Social and demographic dimension, in which the aim is to understand the diversity of workers. This knowledge provides information about the organization of work and the conditions under which it is carried out.
- Laws and regulations
- Actor's geographical environment
- Technical dimension of production and organization, in which it seeks to understand: (i) the knowledge of the technical process from the actor's point of view; (ii) the overall knowledge of the production process (such as quantitative data, production quality criteria and production evolution) and of the organization of work in relation to this mode of production.

These were the crucial points for conducting the interviews, adapted according to the diverse reality of rural and peri-urban producers, as well as collective consumers, such as restaurants, first-time food processing entrepreneurs and food processing plants. Cooks, horticulturists of short-cycle and long-cycle plantations, processors who carry out the minimal processing of food (spices, herbs, sweets, pasta, breads and other fermented products), egg producers, poultry producers, gardeners, rural extension workers, agronomists, entrepreneurs in the field of gastronomy and hospitality were interviewed.

The visits for the interviews were preferably carried out at the workplaces themselves, and at times reserved for this. Ideally, the interviews were conducted by pairs of researchers, although there were some with the presence of only one, and others with the presence of more people. The duration of the interviews ranged from one hour in the fastest visits, whose interviewees did not have much time or were not very interested in the ECT proposal, to more than four hours in the longest visits. The latter had a tasting of the production and more detailed



processes of information exchange between the interviewees and the project's team of researchers.

The diversity of people interviewed was also reflected in the variation in the education of the interviewees, (from people with incomplete elementary education to people with postgraduate degrees), which brought us the challenge of the form of language in conducting the interviews.

The difficulty of access to some areas of the municipality, especially the peripheral rural neighborhoods, due to the poor conditions of the roads, was also a point of adversity in this stage of the project. The interviews were conducted in people's workplaces contributed to the real perception of the recurrent demands of the actors who live in areas with these access conditions.

It is not yet possible to say precisely about the process of building trust with some of the actors involved. But the methodology of active listening that underpins the ELA contributed in this sense and that could be observed (in some cases explicitly verbalized) by some actors as a positive point of the approach in the territory.

A challenging characteristic of the moment of realization of the project is the high number of researches, mappings and diagnoses that the municipality is going through. These are partnerships, for example, with research institutes, universities and private companies. There is a fine line between overlapping actions and potential articulations between different projects aimed at overcoming dependence on oil royalties. One question that emerges is that of which space, institutional or not, can dialogues and articulations be established between projects of territorial scope, often complementary.

Category 2: The Functional and Cooperation Economy Forums

The Forums consist of moments of public discussions on the challenges related to the transition to a new economic model as a way to overcome the current model. The periodicity of the forums was initially bimonthly in 2022 and became monthly in 2023. 6 meetings have been held so far.

The content of the first 2 meetings, still in 2022, was focused on the contextualized presentation of the principles of OBE, and some concrete cases already in progress. As the mapping of the territory's actors advanced, the team of researchers invited case experiences related to the production and consumption of healthy foods to expose their challenges in the Forums.



Each case presentation, in the 4 Forums of 2023, was previously built in meetings between researchers and the people of reference of the experience. In each meeting, the preliminary result of the mapping of the general functioning (GUÉRIN *et al.*, 2001) was the starting point for the discussion with the actors, which allowed for subsequent modifications, corrections and validations. The product of these meetings consisted of presentations organized in such a way as to help guide the collective discussions in the Forums.

We noticed that in this preparation of the Forums, the process of co-construction of a public presentation based on the general functioning of the organization, contributed to the internal reflection of the business of the invited actors. The placement of problems related to daily work made it possible to broaden the collective understanding of these problems, to foster discussion between different actors/organizations around a common element. In addition to being a form of public recognition of the contribution of these people to the collaboration of a culture of healthy eating in the municipality.

If, on the one hand, the public presentation format broadens the debate beyond the company's borders and finds an echo in other similar ventures. On the other hand, as an internal process of organizations, there is little room for deepening the problems.

4. FINAL THOUGHTS

The preliminary results of the mapping stage are under analysis and discussion among researchers for further publication. However, throughout the first year of the project, we can observe the importance of points that interest the ergonomist beyond the boundaries of a single organization. Some clues include the redesign of the roles of intra- and extra-organization management, characterized by the plurality of activities, values and relationships contained in the territory.

For interventions within a company, the work objectives and political relations are usually established around a delimited "space". When it comes to the territory, it is necessary to broaden the view and the capacity to listen to find the common elements and weave the relationships between such heterogeneous actors. The role of the ergonomist, in these cases, is to bring the possibility of listening and inclusion of different points of view, and to mobilize different knowledge and different perspectives, which at the same time have an intimate relationship with work and its impact on daily life.

In this sense, the method of Work Activity Analysis (AET), as well as in the context of the company's interior walls, brings the possibility of understanding the point of view of work,



an integrating element to understand the economic and social relations in the territory. In the case of projects for the construction of Territorialized Cooperative Ecosystems (TCEs), in which it is necessary to bring together actors around common environmental, economic and social interests, the ELA (and the mobilization of its methods, such as semi-structured interviews, open observations, active listening and analysis of the activity) expand the possibility of building management, the governability of actions between different actors, permeated by relations in the territory in a democratic, transparent, effective way.

The researchers' experience with the initial mapping has brought clues about which elements need to be mobilized for an ergonomic approach in territorial development projects. Regarding the diversity of languages perceived during the interviews, it is pointed out that it is not enough just to 'translate' the content of the semi-structured scripts into a popular language, but it is necessary to anchor the themes around people's work, a place of speech that the interviewees, regardless of education, felt comfortable reporting.

This anchoring in the work is also an important element for building the confidence of the actors in the objectives of the intervention and in the researchers, mainly because the place where the interviews are carried out is usually the house itself. At the same time, this is also an element that broadens understandings of local ways of life. Understanding the multifunctionalities of life in the territory is equally important for the transition to the economic model, as proposed by the Economics of Functionality and Cooperation (EFC).

In the case of the project described, the common objectives that emerged as important elements in the mapping interviews (agroecological production, respect for labor and the environment) appear as a link between these actors for the formation of a territorialized cooperative ecosystem. Likewise, the recurrent problems between producers and consumers (difficulty in collaboration between agricultural producers for the purchase of inputs, sharing of equipment, among others) are levers of transformation to be discussed within the group.

However, there is a need to make room for the exchange of experiences and points of view between these actors. In this sense, the forums are an opening to include this dialogue during the intervention, in addition to presenting the concepts and elements related to the OBE. It is perceived that the more real, practical cases are presented (jointly between actor and researcher), the more the theme can be concentrated in the point of view of the real work and support the discussions. It is important to emphasize that the forum alone does not sustain the discussion around the difficulties faced in the territory: the co-construction of the presentations based on real cases, brought from the mapping, are necessary elements to support and foster the



discussions. In this sense, mapping and forum complement each other and contribute to the construction of the ECT.

Finally, the political characteristics of the territories are elements that need to be considered and analyzed. In the case studied, understanding the different researches, mappings and diagnoses that coexist in the territory (and that are conducted by different institutions) is a key point to allow an articulation between these various initiatives.

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REFERENCES

- BRUNDTLAND, G H et al. **Report of the World Commission on Environment and Development: Our Common Future**. Oxford: Oxford University Press. Acesso em: 28 jul. 2023, 1987.
- CUNHA, L. Atividade de trabalho, território, e seus protagonistas: para uma agenda do futuro – Introdução ao dossier, **Laboreal [Online]**, v. 17, n. 2, 2021.
- DU TERTRE, C. Economia de serviço e trabalho: Contribuição teórica do desenvolvimento de uma Economia da Cooperação. **Trabalho & Educação**, v. 27, n. 3, p. 15–42, 2018.
- DU TERTRE, C.; VUIDEL, P.; PINET, C. Desenvolvimento Sustentável dos Territórios: a via da Economia da Funcionalidade e da Cooperação. **Horizontes Interdisciplinares da Gestão**, v. 2, n. 1, p. 1–25, 2019.
- DE GASPARO, S.; DEBUC, T.; GUYON, M. Quand les ergonomes se mêlent de la performance. In: **ACTES DU 51ÈME DE LA SELF 2016**, Marseille, 2016.
- GUÉRIN, F.; PUEYO, V.; BÉGUIN, P.; GARRIGOU, A.; HUBAULT, F.; MALINE, J.; MORLET, T. **Concevoir le travail, le défi de l'ergonomie**. Toulouse, France: Octarès éditions, 2021.
- HUBAULT, F., DE GASPARO, S., DU TERTRE, C. Sustainable Development, Arguments for an Immaterial Ergonomics. In: Bagnara, S. et al (eds), **Proceedings of the 20th Congress of the International Ergonomics Association (IEA 2018)**. IEA 2018. **Advances in Intelligent Systems and Computing**, v. 825. Springer, Cham, 2019.
- LIMA, F. de P. A. et al. Ecossistemas cooperativos de produção e inovação servicial: Economia da Funcionalidade e da Cooperação (EFC) e desenvolvimento territorial. In: **XVIII Seminário de Diamantina sobre Economia Mineira**. Diamantina (MG), 2019.



- LIMA, F. de P. A.; DIAS, A. V. C. Financeirização, Trabalho e Saúde: A Economia como Doença Social. In: **Desenvolvimento Colaborativo para a Prevenção de Acidentes e Doenças Relacionadas ao Trabalho**. 1. ed. São Paulo: ExLibris, 2020. p. 69–93.
- MAILLEFERT, M.; ROBERT, I. Nouveaux modèles économiques et création de valeur territoriale autour de l'économie circulaire, de l'économie de la fonctionnalité et de l'écologie industrielle. **Revue d'Économie Régionale & Urbaine**, Décembre, n. 5, p. 905–934, 15 jan. 2017.
- MUSSI, R., FLORES, F, ALMEIDA, C. Pressupostos para elaboração de relato de experiência como conhecimento científico, **Práxis Educacional**, v. 17, n. 48, pp. 60- 77, 2021.
- ORGANIZAÇÃO DAS NAÇÕES UNIDAS (ONU). **Objetivos do Desenvolvimento Sustentável**, 2015. Disponível em: <https://brasil.un.org/pt-br/sdgs>
- SOARES, R. MIRANDA, G.; LYRIO, L.; XAVIER, A.; DUARTE, F. Modelo Econômico Empresarial com base na Economia da Funcionalidade e da Cooperação: caso Gaz de France. In: **XL Encontro Nacional de Engenharia de Produção**, 2020.