

Innovation, competitiveness and sustainability factors for evaluation and prospection of geographical indications in Brazil

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Abstract. The paper systematizes critical factors for the development of Geographical Indications, allowing to identify potentials of intervention in order to support GIs' structuring and consolidation, to prospect new ones and to compare GIs from different regions or products. Despite the importance of the GIs, there is a relative consensus among experts that its success is related to factors ranging from actor engagement and governance to institutional support and public policy. Twenty critical factors were selected, classified into five dimensions: environmental, economic, social, political-institutional and territorial. The factors were evaluated and validated by ten experts regarding their pertinence and relation with sustainability, innovation and competitiveness. The evaluation of the experts validated the 20 factors, considering more significant those linked to the territorial and political-institutional dimensions. Environmental factors were considered important but not essential; however, the process of consolidation of GIs has the potential to improve performance in this direction. Also, the evaluation allowed to relate the main factors in terms of innovation, competitiveness and sustainability for GIs' structuring and management. The application of the scale allows assessing different regions, indicating opportunities and barriers for their development.

1. Introduction

Geographical Indications (GIs) are a modality of intellectual protection, whose main function is to recognize and protect the specificities of the producing regions, contributing to the preservation of the patrimony and, at the same time, to add value to the products and services. Considered as a reference of qualification or older mark, with references already in the Bible, the theme evokes diverse discussions involving intellectual property, international trade and territorial development [1,2]. In a broad approach, the term Geographic Indication refers to the defined origin of products, which incorporates assets (i) materials such as reputation, environmental and human factors, in order to translate the identity and culture of a given geographical area, providing differentiated products and with its own characteristics [3]. In this sense, the use of a Geographical Indication differentiates not only products, but the territories themselves. A GI is based on several elements, among which can be considered as pillars the product, place of origin and quality [4].

In modern times, the discussion of the subject and evolution of the use of GIs is deeply related to the world of wine, even though there are already examples in other areas such as coffee in Colombia, Darjeeling tea in India or Argan oil in Morocco. As an example of its importance, in 2016, only France had 464 AOP / AOC, of

which 361, or almost 78%, were related to wines [5]. A similar phenomenon occurs in other EU countries such as Portugal, Spain and Italy. In general, the GIs are related to products of rural, agricultural or artisan origin, but it has also been appropriated by other categories of products, as in the case of Brazil, which includes products of industrial origin, mineral and services.

Several studies have been observing GIs in many countries, analyzing motivations, expectations, strategies and impacts, as well as legal issues. Because they are often associated with agricultural and rural products, GIs have been seen as a paradigm of rural development, insofar as they become an alternative to recognize and value traditional knowledge [2,4,6–8]. Thus, the GIs have been the object of policies by countries or organisms, as a form of territorial articulation [4,9]. At the same time, among the expected impacts is the protection and valorization of products, which refers to aspects of marketing, differentiation and economic return [10–14]. In the case of Brazil, the main impacts resulting from the structuring of the GIs of wines are: the organization of the sector' actors on a regional scale, the valorization of products, the tourism production and the promotion of the region [15–17].

However, the process of Geographical Indication does not end with recognition. The management of a GI involves several factors, from the articulation of local producers and actors to the adoption of new technologies and initiatives in order to strengthen the territory and to expand product recognition. Thus, as important as

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assessing the impacts of GIs and their course is the definition of a methodological basis, based on a clear frame of reference and a set of relevant indicators [12].

The objective of this paper is to systematize critical factors for the development of Geographical Indications in the Brazilian context, allowing the identification of intervention potentials to support the development of current GIs, prospect new ones, as well as to compare GIs from different regions or product types. The development of the GIs in Brazil is recent, with the first positive legislation of 1996 and the dissemination of the theme from the recognition of the first GI, Vale dos Vinhedos, in 2002. Being a recent issue, it has the potential to be expanded as consumers and producers take ownership of the concept, contributing to the appreciation of local products. In addition, research involving the impact of GIs in the country has shown that they are an important contribution in the organization of producers and the sector, both in terms of institutional representativeness and in the organization of the sector as a whole, especially in the case of GIs of wines [9, 15, 17–19].

The following is an overview of the topic of GIs in Brazil, to contextualize the study. In the session materials and methods the theoretical basis is briefly discussed to present then the factors and the validation by the experts in the results, followed by the final considerations.

2. Overview of geographical indications in Brazil

In Brazil, the GIs are registered by the National Institute of Industrial Property (INPI), according to Normative Instruction No. 25 of August 21, 2013 and Law No. 9,279 of May 14, 1996, in two modalities: geographical Indication and Denomination of Origin [20,21]. According to these norms, a Geographical Indication (IG) refers to places that have acquired notoriety due to a particular product. The Denomination of Origin (DO) has a more specific character and refers to products whose qualities or characteristics are a consequence of the geographical environment, including natural and human factors. In Brazil, GIs of industrial products, services or extraction may also be recognized. Until July 2018, Brazil had 59 registered national GIs, 49 in Geographical Indication label and 10 Designations of Origin, distributed in all regions (Fig. 1), although with a higher concentration in the south and southeast [22].

As previously mentioned, the development of GIs in Brazil is recent, with the first Indication of Provenance being recognized in 2002. The importance and impact of the first Brazilian GI can be perceived by the creation of the Coordinator of Incentive for the Geographical Indication of Agricultural Products of the Ministry of Agriculture, Livestock and Food Supply, by ordinance n° 85 of 2006 [23], which coordinates GIs' initiatives and public policies, in terms of prospecting and promotion. Figure 2 shows the evolution of the recognition of Geographical Indications, showing that from 2009, the GI record began a period of growth, with a peak in 2012 when 18 GIs were recognized, after which an average of 5 records per year was held. The expansion also occurred in qualitative terms, with the involvement of more regions and of new products.

There is a great variety of product types, however wines are the winner, with the highest number of GIs

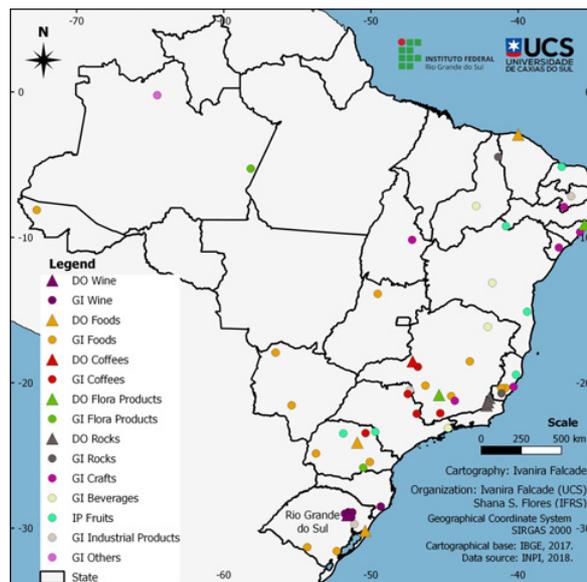


Figure 1. Brazilian Geographical Indications, in terms of Geographical Indication and Denomination of Origin, July 2018.

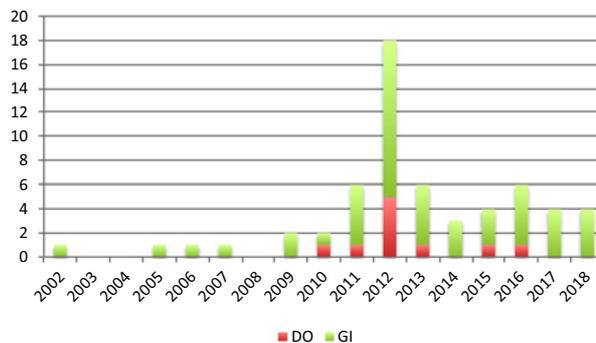


Figure 2. Evolution on the registration of Brazilian geographical indications, July 2018.

registered, as shown in Fig. 4. Until July 2018, Brazil had 7 GIs of wine products, 6 IGs and 1 DO, in addition to other projects under labeling. The registered GIs of wine are concentrated in the south of the country, especially in the state of Rio Grande do Sul; however, new projects are expanding these frontiers to other regions, including the Brazilian Northeast (Fig. 3). Aside from the wines, coffee stands out with 6 GIs (5 GIs and 1 DO), concentrated in the state of Minas Gerais, but also present in São Paulo and Paraná. The handicraft GIs are distributed in the country and recognize diverse works such as golden grass, lace, embroidery and clay pots (Fig. 4).

Several studies have been carried out in Brazil in order to observe the impacts of Geographical Indications in the territories [24], many of them are based on the Vale dos Vinhedos case, the first Brazilian GI and a reference in terms of positive externalities, especially the promotion of wine tourism. The studies show that the GIs act as economic response to valorize the typical, but also as a mechanism for the promotion of innovation and the development of a given territory [19, 25, 26].

The GI recognition process has the potential to contribute to the articulation of the actors, which can promote important impacts in terms of institutional representativeness and organization of the sector as

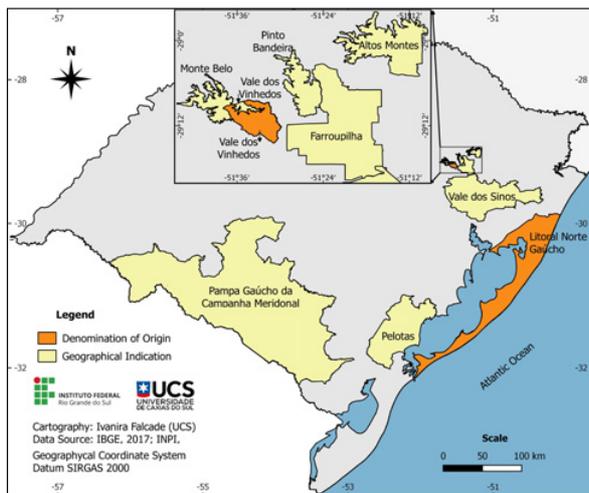


Figure 3. Geographical Indications and Denomination of Origin of Rio Grande do Sul, highlighting the geographical indications of wines in the region of Serra Gaúcha, July 2018.

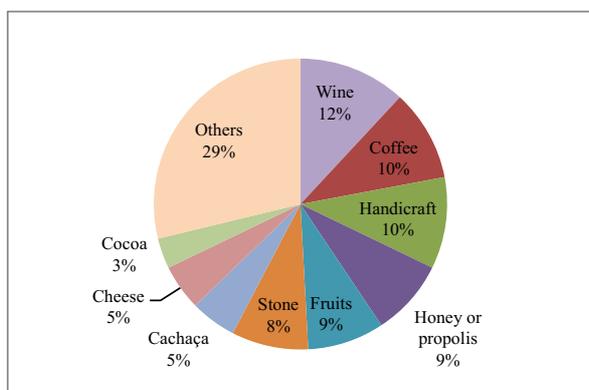


Figure 4. Geographical indications by type of products, in%, until July 2018.

a whole [17,27]. After recognition, the main positive externalities identified as a result of a GI are: the organization of the region and of its actors, the valorization of products and production, and the promotion of tourism, which generates new sources of income and also feeds the value of products and territory [15,25]. For this reason, among other motivations, GIs have been the focus of initiatives and public policies in the country, with a view to mobilizing and enhancing the territories [9].

However, it should be emphasized that the registration of a GI is not an end in itself, its impacts, results, as well as the legitimacy of the process are related to the participation, appropriation and involvement of the various local actors, both in recognition and later on in the management of the GI. In terms of management, one of the actions that has been adopted is the articulation of Forums of Geographical Indications and Collective Brands, which brings together representations of associations related to GIs and partner institutions in the scope of education and research. The Forums have been organized by state, with support from the Ministry of Agriculture, Livestock and Food Supply, for example, in Rio Grande do Sul and Espírito Santo.

In addition to these forums, in the context of vine and wine, the Brazilian Wine Institute (Ibravin) created the Committee for Geographical Indications in 2016, which

brings together representatives of GIs (recognized and structuring), industrial entities and partners, as well as education and research institutions. The Committee is a space for discussion of issues relevant to the sector that is linked to the GIs. In addition, once a year a workshop has been held for producers and partners, with a technical and training nature. As a result of the articulation of the Committee, the following stand out: market actions, focused on the promotion of wines and sparkling wines of the GIs, with the partnership of the Brazilian Service of Support to Micro and Small Companies (SEBRAE); contributions to the adequacy of relevant national legislation, such as intellectual property legislation itself and the labeling of wines and sparkling wines; the diagnosis of the situation of GIs and an endomarketing project.

3. Materials and methods

The theoretical and methodological basis of the research was developed during a study aimed to construct a sustainable wine framework [27,28], with technical visits in 6 countries (Brazil, France, Italy, Spain, Hungary and Romania) and consultation of documentation and protocols in others 5 countries (USA, South Africa, Australia, New Zealand, Chile). The research used as a theoretical basis the territorial approach, which proposes to study sustainability at local level, in order to overcome the economic issue and pay attention to the environment in a broad sense, involving physical and socio-cultural aspects [29,30]. Territory is seen as an open and dynamic system and the difference(s) between two territories can be related both to its elements and to the way in which they organize themselves [31,32]. At the same time, the territory is understood as the result of a process of territorialization [33–35], thus, sustainability becomes the result of territorialities, that is, of the relationships between natural, built and human environments [36]. Figure 5 [37] summarizes this theoretical approach.

The present research was based on the theoretical approach and empirical references mentioned above to reflect on the Geographical Indications and Collective Marks, since both devices were identified as instruments to preserve, promote and strengthen territorial identities. This paper is focused on the Geographical Indicators and the Collective Brands will not be analyzed. Thus, 20 factors of innovation, competitiveness and sustainability were systematized. Factors are considered key not only for the recognition of a GI, but for its management and consolidation, which is particularly important in a new institutional environment, as is the case in Brazil. Based on Magnaghi's definitions [36,38], the factors were classified into five dimensions: environmental, economic, social, political-institutional and territorial.

After the definition, in order to validate the factors, these were submitted to the evaluation of 10 experts who had experience in the area, with special emphasis for those who had experience with the structuring processes of Geographical Indications; the experts were executives in the management of GIs or researchers and members of institutions working in the field. Due to confidentiality commitments, names and institutions will not be disclosed. It should be noted that all the experts consulted were

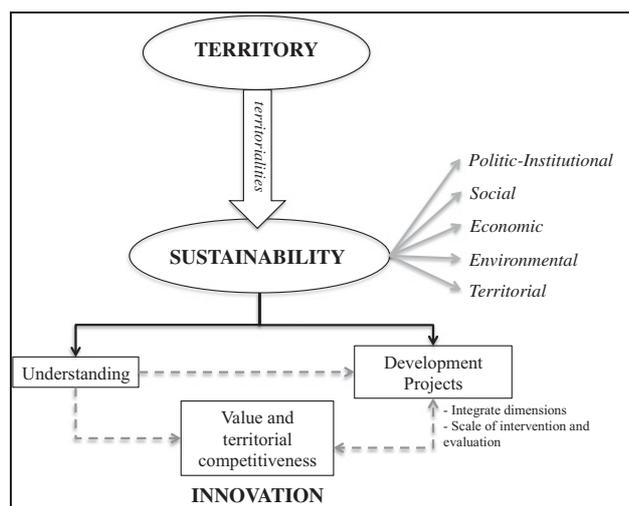


Figure 5. Sustainability, competitiveness and innovation in the territorial approach [37].

directly linked to the topic, either in a research context or with a more practical action in the articulation of GIs.

The survey was structured to be answered online. The experts evaluated the relevance of each factor to the development of a GI on a scale from 0 to 10, and then to correlate the factors with the potential impacts on innovation, competitiveness and sustainability. In each dimension a space was provided for comments, which were very important for the analysis. The following are the factors of innovation, competitiveness and sustainability systematized.

3.1. Territorial factors

The territorial factors are related to the capacity of reproduction of the local identity and directly deal with the integration between product, production and territory. It is a basic dimension for Geographical Indications. The systematized territorial factors are:

- *Heritage and culture* (T1): aspects of heritage (natural and constructed, tangible and intangible) and local culture, which are recognized by local actors or from outside the territory, valued from specific initiatives or in the projects of products and installations, as well as potential to be recognized or valued.
- *Landscape* (T2): aspects of the local landscape that are recognized by the local actors or from outside the territory, valued from specific initiatives or in the projects of products and facilities or potential to be recognized or valued.
- *Knowledge* (T3): enhancement of education and research as tools for knowledge and recognition of the territories' potential and specificities through initiatives such as, support for educational and research institutions at all levels, support for specific educational initiatives (such as dissertations, theses and internships), market research, articulated initiatives to foster multidisciplinary educational and research initiatives in the topic of Geographical Indication or Collective Brand.

- *Product with territorial identity* (T4): existence of product that has a link with the territory.
- *Product with notoriety* (T5): existence of a product that is linked to the territory and that is recognized in other territories.

3.2. Political-institutional factors

Political-institutional factors reflect the territory's ability to organize itself and make decisions about its resources. It deals with aspects related to the institutional organization of the territory, either through networks of relations or forums. The systematized political-institutional factors are:

- *Governance* (PI1): at micro level, management practices in producers, companies and entities; considering the territory, the presence of associations or representative entities that congregate the producers and other actors involved.
- *Articulation* (PI2): at the micro level, the integration of the various actors related to the industry, which may be at the level of information exchange or the development of partnerships with specific objectives; considering the territory, the partnerships established with external agents for the promotion of the territory or access to diverse resources.

3.3. Economic factors

Economic factors are related to the production of territorial added value, which values territory and identity, while contributing to the local economic system. The scale is broad and reflects the ability of producers to take advantage of local potentialities in terms of typicity, differentiation and communication. The systematized economic factors are:

- *Production and operations* (E1): considering aspects such as standardization of the production process, quality programs and territorial quality parameters.
- *Management systems* (E2): considering aspects such as planning processes, marketing structure and commercialization and formalization of business management processes.
- *Access to resources* (E3): considering aspects such as access to external resources (financial, knowledge, materials or equipment), access to technical support and consultancies.
- *Diversification* (E4): diversification of products, markets or services.
- *Tourism* (E5): tourism development as a mechanism for diversifying revenues or promoting products.

3.4. Social factors

The social dimension deals with issues related to quality of life and social indicators related to the establishment of ethical relationships with the public involved. The social factors were considered in three levels, going from the micro to the macro, involving internal public, relations with the community and society in the broader sense, as it can be seen:

- *Health, safety and working conditions* (S1): considering aspects such as good conditions and working environment, initiatives for ergonomics and occupational health, initiatives to prevent accidents and use of PPE and initiatives for quality of life at work.
- *Training and qualification* (S2): considering aspects such as initiatives for training and qualification in a specific or individual way, articulation and partnerships for training and endomarketing actions.
- *Community* (S3): considering aspects such as relation to the environment (for example, monitoring and initiatives to minimize impacts on the environment), initiatives to improve public spaces, preference for local products in purchases, valuation of local professionals and participation in social and community programs.
- *Territory* (S4): considering aspects such as participation in public policies for the territory or industry and participation in local or industrial associations.

3.5. Environmental factors

In the environmental dimension, the notion of reducing the ecological footprint is diminished, restricting the consumption of natural resources (such as water and energy), improving the quality of products (in relation to the environment and culture) and restoring the local ecosystem. The dimension originally had 7 themes and 40 indicators [27,28], as the approach was focused on sustainable winemaking, which was simplified in the current framework for 4 factors:

- *Water and energy* (En1): eco-efficiency programs; initiatives for water quality, reduction of consumption and reuse, participation in water management committees or other forums; initiatives for energy efficiency, design of facilities, use of renewable energy for production of energy.
- *Waste and wastewater* (En2): initiatives for waste management (reuse, composting, selective collection, recycling), adequate disposal of special waste, reduction in the use of materials or generation of waste and wastewater, wastewater management.
- *Biodiversity* (En3): initiatives for the monitoring of biodiversity, maintenance of native vegetation, conservation and environment areas, maintenance of soil cover, participation in initiatives to promote biodiversity and integrated landscape management.
- *Environmental Management Programs* (En4): integrated initiatives aimed at environmental management that may involve air or water quality, water and energy consumption management, waste and effluent, or specific aspects involving production and environmental quality (such as integrated management, safe food program, organic agriculture, among others).

4. Results

The analysis of the results took into account, at first, the validation of the 20 factors. Then their relationship with the dimensions of innovation, sustainability and competitiveness was analyzed, as follows.

4.1. Factors

Table 1 summarizes experts' evaluation about the factors, considering their importance in terms of GI structuration, management or as research topic.

The validation of the factors proposed by the experts took into account two aspects: the note given to the factor and the Cronbach's Alpha Coefficient. The note reflects the importance of the factor for the GIs, at the same time as the Cronbach's Alpha indicates the reliability of the instrument. Cronbach's alpha was chosen because it is an indicator to validate reliability of questionnaires widely used in research in the area of management and quality [39]. As a complementary analysis, the comments left by the experts after the questions were also considered.

Regarding reliability, the Cronbach's Alpha for the set of responses was 0.8933, which is considered "high" level of reliability – it is considered reliable values above 0.7 [39]. The same occurs when the factors are analyzed individually. Thus, both the set of factors and the factors individually were validated.

Table 1 shows that all territorial and political-institutional factors were considered significant by the specialists. The territorial factors are considered as the basis for the process, while the political-institutional ones act in the consolidation and development of the GIs. In the territorial factors, it was pointed out that knowledge, landscape and heritage has high relation with the search for the recognition of the GI, in its justification. In this sense, the notoriety could also be the result of structuring the GI, as it contributes to the structuring and organization of the regions. In terms of political-institutional factors, the governance was placed as a condition for the articulation of the actors. At the same time, it was emphasized the importance of stakeholder participation throughout the process and the establishment of partnerships with external actors, performing an integrated work and promoting the funding of GI.

In terms of economic and social factors, there were 2 that were evaluated as less important, but each of them was correlated as very important for innovation and competitiveness. On average social factors were considered important by 8 out of 10 experts, while both economic factors and environmental factors, the average was a little lower. In terms of economic factors, the item of diversification had a lower valuation, but was nevertheless validated taking into account mode (8) and high standard deviation (2.67) in the analysis of responses, indicating that most of the experts classified the factor as important. In the economic sphere, it was also emphasized the importance of managers' training and the planning of resources to structure the GIs.

In the social dimension it was emphasized that the impact of the factors is related to the local culture and its form of organization, in which the capacity to work collectively is determinant for the success of a GI. The experts also emphasized that the recognition of a GI is a broad subject and is related to the recognition of many factors, especially the social level of the region. In addition, the community itself does not necessarily participate in the organization and promotion of the GI, but it benefits from the externalities of the process. Regarding the environmental factors, it was emphasized that they are important but not essential for the consolidation of a GI.

Table 1. Evaluation of innovation, competitiveness and sustainability factors.

Code	Factor	Average	Cronbach's Alfa
T1	Heritage and culture	8.90	0.8961
T2	Landscape	8.30	0.9035
T3	Knowledge	8.90	0.8918
T4	Product with territorial identity	9.70	0.8917
T5	Product with notoriety	8.40	0.8938
PI1	Governance	9.30	0.8898
PI2	Articulation	8.90	0.8925
E1	Production and operations	8.60	0.8861
E2	Management systems	8.30	0.8796
E3	Access to resources	7.70	0.8923
E4	Diversification	6.30	0.8813
E5	Tourism	8.10	0.8785
S1	Health, safety and working conditions	6.90	0.8889
S2	Training and qualification	8.30	0.8924
S3	Community	8.10	0.8925
S4	Territory	8.90	0.8919
En1	Water and energy	7.50	0.8742
En2	Waste and wastewater	7.70	0.8790
En3	Biodiversity	8.50	0.8875
En4	Environmental Management Programs	7.60	0.8724

In this sense, according to the experts, the GIs can act by fomenting the discussion, guiding, even, the relation of the product with the environment and preservation of the biodiversity.

The next phase of the research is the application of the instrument *in loco*, observing both consolidated and in structuring GIs. In this way, it will be possible to cross the field data with the experts' evaluation in order to elucidate the critical factors, to observe development and consolidation paths in the Brazilian GIs, which may allow the indication of specific actions to strengthen the GIs.

4.2. Innovation, competitiveness and sustainability

After the evaluation of the notes, the analysis guided the relation of the factors with aspects of innovation, competitiveness and sustainability, which are represented in Fig. 6.

The results of the research revealed that for the experts there are some factors considered more significant (between 7 and 9 out of 10 experts) to assess and prospect innovation, competitiveness and sustainability in the GI environment. For the experts there are two main factors in terms of innovation, which are diversification and knowledge. These factors reflect two moments of the products with GI, respectively, their application and the origin or structuration of the GI, which positions innovation throughout the process. On a smaller scale are related to innovation: management systems, articulation and territory.

In terms of competitiveness, the experts related five factors: training and qualification, products with territorial identity and notoriety, governance and articulation. In this analysis, the construction of competitiveness is based on political-institutional factors and supported by territorial factors and the training of work teams.

Sustainability is the most related aspect in a total of 11 factors considered significant, which demonstrates the transversal character of the concept, especially in the territorial approach. This fact was noted in the comments

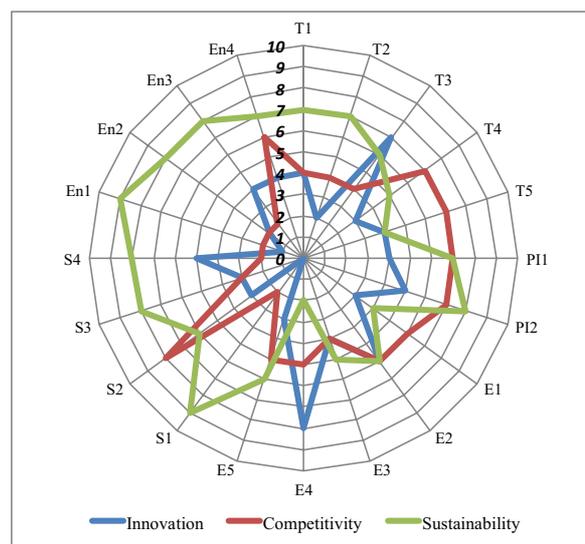


Figure 6. Factors versus dimensions of innovation, competitiveness and sustainability.

of experts and is confirmed by the number of factors related to the aspect. Sustainability is, at the origin of the concept, intrinsically related to the environmental and social dimensions, but in this analysis it can be noted strong linkage to the political-institutional dimension and some territorial issues.

The analysis did not identify a significant correlation between the factors and the aspects. Occasionally, it is possible to check the tendency of specialists to relate certain factors to some specific aspect, as the following examples. According to experts the diversification factor is very important for innovation, but no important for the sustainability of a GI. On the other hand, the water and energy factor is not important for innovation and very important for sustainability. Also, important factors for competitiveness were considered less significant for innovation, which is interesting to be deepened by other

instruments considering that literature in management points out that innovation is basis for competitiveness. Moreover, innovation is not usually considered as a GI key factor of success in the literature, which can explain this lack of link between innovation and competitiveness [26].

It is important to emphasize that 16 of the 20 factors were considered relevant in any dimension, be it innovation, competitiveness or sustainability, which demonstrates the validity of the factors listed. Regarding the least significant factors, it is observed that all are in the economic dimension. Such an occurrence may be justified by the fact that this dimension is often related more to results, while the factors are related to the process of GI consolidation.

5. Conclusions

Completed the first phase of the research, the paper presented the results focused on the proposition and validation of the methodology for analyzing innovation, competitiveness and sustainability of geographical indications. In this context, the research aims to contribute in terms of learning opportunities to the actors involved and self-adjustments to the organizations, in order to strengthen this important instrument that are the GIs. In addition, another objective is the indication of priorities for the creation of public policies to support and encourage the achievement of competitiveness and sustainability of GI and the sectors.

Regarding the proposed methodology, the experts demonstrated that there are differences in the importance of the dimensions factors according to the stage of evolution of a GI. Also, the selected factors guide issues ranging from the conditions of existence of a GI to its management, topics that are becoming more important according to the stage of maturation of the GIs. The specialization and experience of the experts in the theme were critical success factor to the validation of the methodology, qualifying the results and reflecting the main issues facing the Brazilian GIs.

In the next phase of the research, the methodology will be applied in geographical indications of different products in the Brazilian territory, with special focus on Rio Grande do Sul. A relevant contribution will be placing in the same methodological basis the evaluation of several GIs, which is particularly important in Brazil whose main research is focused on single case studies or with a very close scope. At the same time it must contribute to understand the management process and its influence on the success of the GIs, i.e., go beyond the structuring conditions.

As a limit of the research, it is important to highlight that it is always a challenge to compare processes, especially in cases strongly related to territorial issues, which have multiple variables that can influence processes. In this sense, the methodology should contribute to staggering progress and tracing learning paths. It is clear that scales are not closed answers, but a way of organizing and quantify subjective factors, whose main objective must be to support the understanding of the processes in progress, helping to identify opportunities and barriers to their development.

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