

SPATIAL CIRCUIT OF THE PRODUCTION OF FOOTWEAR AND TERRITORIAL INTERACTIONS OF THE COMPANY GRENDENE, SOBRAL, CE

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Abstract

For the footwear industry, Sobral, in Ceará, stands out as the most expressive productive territory, a fact that is justified by the location of Grendene's production units. This article sought to analyze the general aspects of territorial interactions in the production of footwear by Grendene-Sobral based on the spatial circuits of production. In order to carry out this demand, the methodological procedures consisted of: a) literature review based on authors specialized in the subject; b) documentary and statistical survey and c) field research. Through the research, it was found, among other results, that Sobral receives all orders and determinations of production, characterizing itself as a territory used for production itself. Therefore, the product is designed in the South, produced in Sobral and distributed to the national and global consumer market, which explains the multi-scalarity of inputs, the organization of the production process and the multi-scalarity of distribution and consumption of the company's footwear production.

Keywords: Footwear industry. Spatial circuit of production. Sobral. Grendene.

Resumo / Resumen

CIRCUITO ESPACIAL DA PRODUÇÃO DE CALÇADOS E INTERAÇÕES TERRITORIAIS DA EMPRESA GRENDENE, SOBRAL, CE

Para a indústria calçadista, Sobral, no Ceará, se destaca como o mais expressivo território produtivo, fato que se justifica pela localização de unidades produtivas da Grendene. Este artigo buscou analisar os aspectos gerais das interações territoriais da produção de calçados da Grendene-Sobral com base nos circuitos espaciais da produção. Para a realização desta demanda, os procedimentos metodológicos consistiram em: a) revisão de literatura arrimada em autores especialistas no tema; b) levantamento documental e estatístico e c) pesquisa de campo. Por intermédio da pesquisa, constatou-se, entre outros resultados, que Sobral recebe todas as ordens e determinações da produção, caracterizando-se como um território usado para a produção propriamente dita. Assim sendo, o produto é idealizado no Sul, produzido em Sobral e distribuído para o mercado consumidor nacional e global, o que explica a multiescalaridade dos insumos, a organização do processo produtivo e a multiescalaridade da distribuição e consumo da produção calçadista da empresa.

Palavras-chave: Indústria calçadista. Circuito espacial da produção. Sobral. Grendene.

CIRCUITO ESPACIAL DE LA PRODUCCIÓN DE CALZADO E INTERACCIONES TERRITORIALES DE LA EMPRESA GRENDENE, SOBRAL, CE

Para la industria del calzado, Sobral, en Ceará, se destaca como el territorio productivo más expresivo, hecho que se justifica por la ubicación de las unidades productivas de Grendene. Este artículo buscó analizar los aspectos generales de las interacciones territoriales en la producción de calzado de Grendene-Sobral a partir de los circuitos espaciales de producción. Para llevar a cabo esta demanda, los procedimientos metodológicos consistieron en: a) revisión bibliográfica a partir de autores especializados en el tema; b) levantamiento documental y estadístico y c) investigación de campo. A través de la investigación, se constató, entre otros resultados, que Sobral recibe todas las órdenes y determinaciones de producción, caracterizándose como un territorio utilizado para la producción propia. Por lo tanto, el producto es diseñado en el Sur, producido en Sobral y distribuido al mercado consumidor nacional y mundial, lo que explica la multiescalaridad de insumos, la organización del proceso productivo y la multiescalaridad de distribución y consumo de los productos de la empresa. producción de calzado.

Palabras-clave: Palabras clave: Industria del calzado. Circuito espacial de producción. Sobral. Grendene.

INTRODUCTION

This article is the result of part of the analyses developed in the master's research *Productive and Territorial Restructuring of the company Grendene and its implication in the middle city of Sobral-CE*, conducted between 2020 and 2022, more specifically, in the information collection phase at Grendene during interviews with managers and field work, carried out between August and October 2021.

The productive restructuring of capital in Brazil led to the productive deconcentration of several productive segments, especially those sectors that demanded a greater number of workers in the production process, such as the footwear, food and textile industry. Thus, since then, the Brazilian Northeast has become the *locus* of the materialization of capital movements in Brazil.

During the 1990s, the footwear industry began the displacement of productive units of the segment to northeastern states, including Ceará, which underwent deep political transformations, based on developmentalism, which aimed to increase industrial activity in the State, through tax incentives.

Highlight in the attractions and tax incentives, the State of Ceará, in 1990, in a period of changes caused by the intrinsic relationship between capital and political forces that at that time executed projects that intended to include the State in the circuit of capitalist accumulation already consolidated in the South and Southeast. Ceará was the state that most used attractive elements for the implementation of these companies that went through deconcentration to states and municipalities that until then did not have traditional industrial bases (LOAYZA, 2011; PEREIRA JÚNIOR, 2011; SANTOS, TELES, PEREIRA JÚNIOR, 2021).

The footwear industry found, in Ceará, elements that allowed its full development, since, in addition to attractive policies, the industry appropriated the cheapness of the available labor, a fact that occurred due to the production of footwear expressing itself as a traditional activity of industrial production that, despite technological advances, still has characteristics of artisanal labor that require a greater number of workers in the production process (NAVARRO, 2006).

Among the many companies that migrated to the State of Ceará was the footwear company Grendene S.A., which, through tax benefits and the technical equipment provided by the state and municipal governments, installed in Ceará, specifically in the municipalities of Fortaleza, Crato and Sobral, manufacturing units specialized in the production of footwear for the national and international market.

Due to the political actions filed by the local elite, in 1993, Grendene installed in the city of Sobral the company's second industrial unit in Ceará. The choice for the new territory of the company's footwear production was influenced, above all, by political factors, because municipal political leaders at the time played a prominent role in what is consistent with the attraction of Grendene to Sobral. The Grendene facility in Sobral was a direct action of the then Governor of the State, Ciro Gomes (1990-1993), through a strategic development program that allowed the arrival in Sobral of a large company such as Grendene.

The problem question that guide this article is: How does Sobral participate in the Grendene production circuit? In this perspective, this research sought to identify the general aspects of territorial interactions of Grendene-Sobral footwear production based on the spatial circuits of production. To perform this demand, the methodological procedures consisted of: a) review of the literature in which authors specialized in the field; b) documentary and statistical survey and c) field research at the Grendene industrial complex in Sobral.

In addition to the introduction and final considerations, the article has a section designed to investigate the spatial clipping of our study, Sobral, while in the other sections our gaze turns to the analysis of the Grendene production circuit.

GRENDENE AND THE CITY OF SOBRAL

The analytical section of the study is the company Grendene, located in the city of Sobral, which integrates the northwest region of the State of Ceará, 239 km from the capital, Fortaleza. Sobral occupies the fifth position in the ranking of the highest population indexes in Ceará, with an estimated population of 212,437 inhabitants (IBGE, 2020).

In the urban network of Ceará, Sobral emerges as one of the most important cities in the State, occupying today the position of Regional Capital C (2C) in the Brazilian urban network, a fact that is justified by the role played in the context of the region.

Signed in the productive restructuring, as well as the neoliberal policies consolidated in Brazil, the years 1990 represented the beginning of the incorporation of Sobral into the latest process of industrial expansion. The Grendene Company is a footwear company from Rio Grande of Sul that develops activities of - development, production, distribution and marketing of synthetic footwear for the female, male and children's segments.

Only in the Northeast, in the period 1990 - 1997, Grendene installed in Ceará manufacturing units in Fortaleza (1990), Sobral (1993), Crato (1997) and, more recently, in Teixeira de Freitas (2007) in Bahia, as shown in Figure 1.



Figure 1- Spatialization of Grendene's manufacturing units. Source: GRENDENE (2022) Prepared by the authors.

In Farroupilha, Rio Grande do Sul, is home to Grendene's research, product development, portfolio management, commercial operations, export, marketing and financial management sectors.

In Fortaleza, the factory installed turned to the production of PVC shoes and components and, more specifically, in the production of Melissa brand shoes, while in Sobral it presents itself as the headquarters of Grendene and the largest productive and workforce of the company. In Crato, Grendene turns to the production of styrene vinyl acetate – EVA, being this unit responsible for all eva production used by Grendene in Ceará, in addition to the production of footwear from brands that demand this raw material, such as Carthage and Azaleia (Figure 2). From March 1994 to April 2021, Grendene counted a production of 3,550,978,926 pairs of footwear in establishments in the Northeast region. In 2020, the volume produced in Sobral was 133,165,938 pairs. Table 1 specifically shows the volume produced in the years 2004 to 2019 in the production units of Ceará, which resulted in a production of 2,555,957,883 pairs of shoes from the three cities where Grendene is located, especially Sobral, which, since 2004, demonstrates the largest volumes of the company's production in Ceará and Brazil.

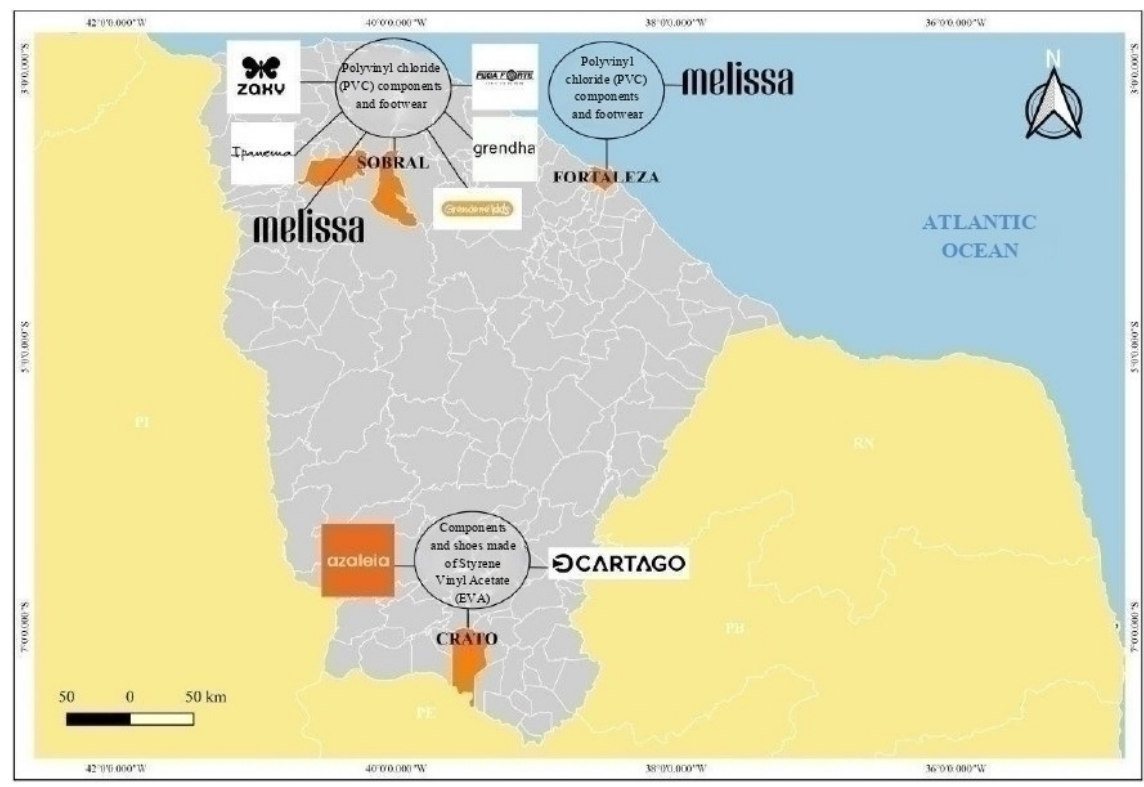


Figure 2 - Spatialization of Grendene brand production in Ceará. Source: Field work. Prepared by the authors.

Year	Sobral	Crato	Fortaleza
2004	134.221.475	7.492.066	1.123.662
2009	146.135.809	5.771.889	2.099.046
2014	187.153.802	6.547.662	7.631.272
2019	138.056.860	6.662.993	5.669.229

Table 1- Volume of footwear produced by Grendene in Ceará (2004 to 2019). Source: Field search.

In 2019, the Sobral industrial unit had a production of 138,056,860 pairs of footwear, which means that the city was responsible for 91.8% of the entire volume produced by the company in Ceará.

These elements show that, in recent decades, Grendene has built in the territory of Sobral, a true footwear industrial complex, whose relevance is through the productive dynamics it emaves on the factory floor. The Grendene Industrial Complex in Sobral, in a short period, the "new" that is presented in the percentages of the company's production/export and in the multi-scalarity of the production process.

GRENDENE-SOBRAL PRODUCTION CIRCUIT

The relations between local, regional and global are situated in the context of a complex system of networks and accelerated flows, in which places appear to be increasingly closer, mainly due to the density of the communication flow that "[...] some places become close to distant places, while neighboring places may have few relationships with each other" (LENCIONI, 2006, p. 70).

With the "[...] networked organization the space is simultaneously more fluid", because people and goods become free for the territorial movement. Destarte, the "[...] network relationship eliminates

barriers, opens up social and economic exchanges to move from one corner to another" (MOREIRA, 2007, p. 59) or, as Castells said (2003, p. 566), networks are therefore "a set of interconnected nodes".

Networks form the spatial circuit of production. For Santos and Silveira (2001), with the territorial division of labor and productive regional specialization, as well as in the movement of goods, it is based on the need to understand the functioning of the territory from the *spatial circuits of production* and the *circles of cooperation in space*, which is the use of territory by companies, institutions and individuals.

Arroyo (2008) stresses that the spatial circuit of production concerns the stages through which a particular product passes in the general production process – production, distribution, marketing and consumption – formed by companies of goods and services, which act in an articulated way in parts of the territory, articulating various territories through the production process.

Circulation promotes from the movements of product flows, through ideas, orders and information, to the circulation of money and surplus. Each territory is responsible for one or different stages of one or even several production circuits (ARROYO, 2008).

The circulation of goods is what interests the spatial circuits of production, to the extent that it is through the circulation that occurs the geographical chain of production, distribution, exchange and consumption, carried out through a permanent movement. If, on the one hand, productive spatial circuits are characterized by the flow of matter through space, on the other hand, there are still circles of cooperation in space that are nothing more than the movement of immaterial flows. The circles of cooperation in space refer to the communication of capital, orders and information, necessary in the face of the articulations that take place long distances between the places and the agents.

Generally speaking, the productive spatial circuits and the circles of cooperation grant the production a multi-scalarity that involves obtaining insums by companies, production and distribution, that is, the scales of articulations are interspersed with the aim of reaching not only the place, but also the regional, the national and the international, production or consumption of the goods produced.

Sobral's participation in the production process is based on the production of various brands licensed by Grendene. Differently from what is observed in other companies, such as Paquetá¹, practically all Grendene de Sobral production is carried out in the unit itself, except for a few more select stages of the production process.

THE MULTIESCALATION OF GRENDENE'S INSUMS

Considering the production, distribution and consumption process, it is elucidated that Grendene develops a wide productive spatial circuit, which involves various territories in the logic of shoe production. With the production started in Farroupilha, developed and finished in Sobral, Grendene articulates two distinct regions of the country to the production circuit that engenders, being to the concentrated region (SANTOS and SILVEIRA, 2001) in the position of command of the entire production process of the company and Sobral as receiver of orders from the South of the country, as soon as it is verified that, in addition to the production space circuit, Grendene also promotes so-called cooperation circles.

For the production of its footwear, Grendene has a network of suppliers of insums, located in diverse regions of Brazil and the world. The range of Grendene imports reaches several countries, mainly Asian, such as China, Taiwan, Vietnam, Japan and South Korea (Figure 3). It should be worth noting that the countries that present themselves as the biggest competitors of the Brazilian footwear industry are also the same as providing with greater expressiveness the insums for many companies in the sector, such as Grendene.

The data indicate the existence of an important link between Grendene and countries in Asia, Europe, North and South America, through the import of raw materials, machinery and equipment. With regard to the purchase of machinery and equipment used by the company, these come from China, Japan, Italy and Portugal. From Portugal, Grendene acquires all the technologies used in the company's headquarters factory, which is located in Rio Grande of Sul, as well as equipment for the "matrix" of Sobral repairs.

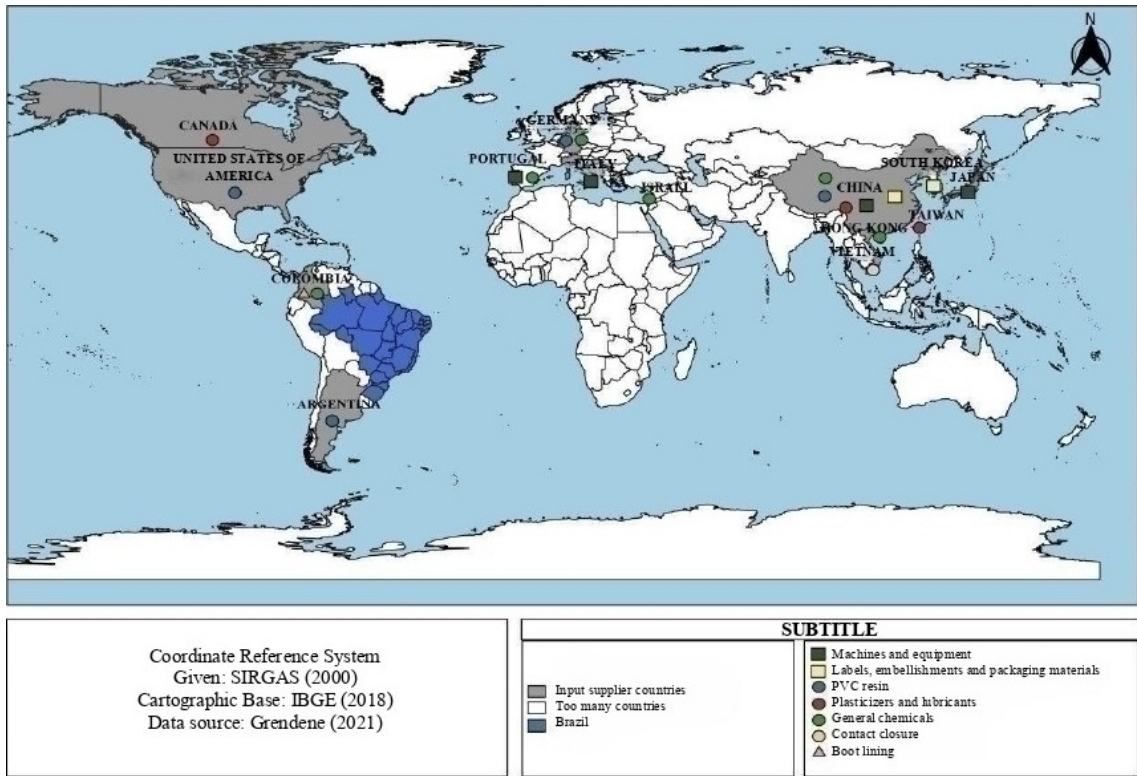


Figure 3 - Origin of Grendene machines, equipment and raw materials. Source: Field work. Prepared by the authors.

In addition to machinery and equipment, Grendene also imports from China, the United States, Germany and Argentina the main raw material used in the manufacture of its products, PVC resin, which since 2020 has also been produced at the Sobral plant. Plasticizers and lubricants, used together with resin for the production of PVC compounds, come from China and Taiwan. The other general chemicals used in pvc production come from China, Germany, Portugal, Colombia and Israel.

Grendene also establishes relationships with contact closure suppliers that are located in Vietnam and the lining for boots, obtained from Colombia. The packaging ornaments, labels and packaging materials the company buys directly from China, depending on the costs of the product. The scaling joints engendered by Grendene on a global scale show the level of reach achieved by the company in ensuring advantages in the production process, since the search for the materials is mainly based on the search for a raw material with lower costs, being, therefore, an important strategy of the company.

On a national scale, the material flows in the acquisition of raw materials articulate Sobral to virtually all regions of Brazil, forming a corridor to Grendene's production units, which shows the untying of the company in relation to the territory where it is located and the intense participation of the region concentrated in the supply of the raw material, that is, as well as the strategic sectors, the raw material still remains distant from the new territories of production. The states of Rio Grande do Sul, Santa Catarina, Paraná, São Paulo, Mato Grosso of Sul, Goiás and Bahia are incorporated into the production circuit, as shown in figure 4.

In Brazil, Grendene has as its largest supplier of PVC resin in the country, Braskem, a petrochemical company with administrative headquarters in São Paulo and industrial units in Bahia, Alagoas, Rio of Janeiro and Rio Grande of Sul. The plasticizers and other chemicals needed for pvc composting come from several companies located in the states of Rio Grande of Sul, Paraná, Santa Catarina, São Paulo, Goiás and Mato Grosso of Sul.

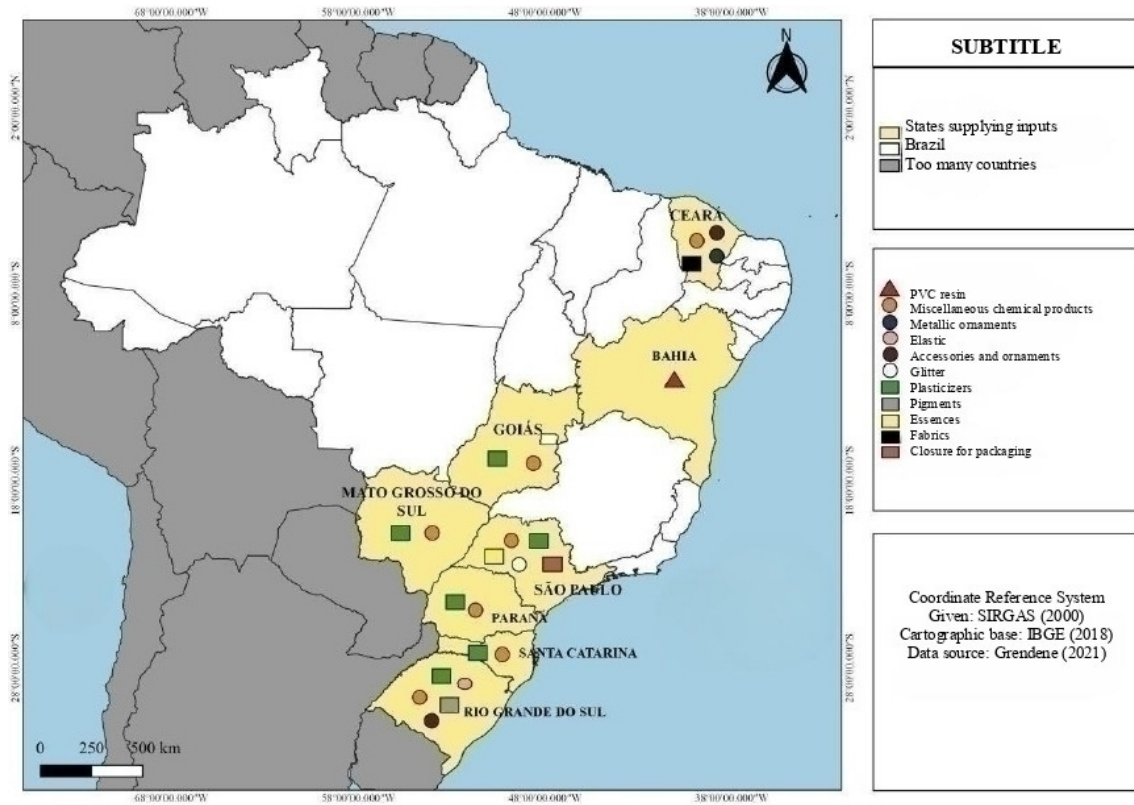


Figure 4 – Grendene: Flow of insumper unit of the federation. Source: Fieldwork (2021). Prepared by the authors.

When observing the spatial distribution of Grendene suppliers, we highlight the role played by São Paulo and Rio Grande do Sul, before the spatial circuit of production, specifically, in the first phase of the production process, the first with the establishment of material relationships and the second with participation in both material and immaterial flow, since the spatial circuit of production and the circle of cooperation predominate.

It is from the State of São Paulo that leaves all the essence, glitter and clasp for packaging consumed by Grendene in its production units of Ceará. The essence is provided by the multinational Frutaron, installed in the Industrial Park of the Municipality of Porto Feliz - São Paulo. The glitter and the closing, respectively, come from the companies Uniplast and Tupi-Cação, both located in the city of São Paulo. In the case of essence and glitter, only these companies supply this product to Grendene.

The elastic is acquired from the company Mercur, located in Santa Cruz of Sul, while the pigments originate from Rio Grande of Sul. They come from the "cradle" of Grendene – Rio Grande of Sul – fabrics, accessories and ornaments. Moreover, as already mentioned, the State also commands, through the administrative headquarters in Farroupilha, the entire production process of the Sobral production unit, that is, we see that both flows, materials and immaterials have as headquarters the State under command.

In Figure 5, we listed the raw material flows in Ceará, where we found that the raw material consumed by Grendene is limited to the municipalities of Fortaleza, Maracanaú, Itapajé, Massapê and Sobral itself. From these municipalities, the company receives fabrics, packaging materials, chemicals, pigments and packaging.

In Ceará, Grendene receives the fabric from unitextil. Unitextil is a Ceará spinning and weaving company responsible for supplying the fabric to Grendene's production units in the state. Also in the Metropolitan Region of Fortaleza, the metal ornaments of the branch (the company's headquarters is in Birigui /São Paulo) of Filveltec, installed in the Industrial District of Maracanaú, are obtained. This company specializes in the production and marketing of accessories in metals and plastics.

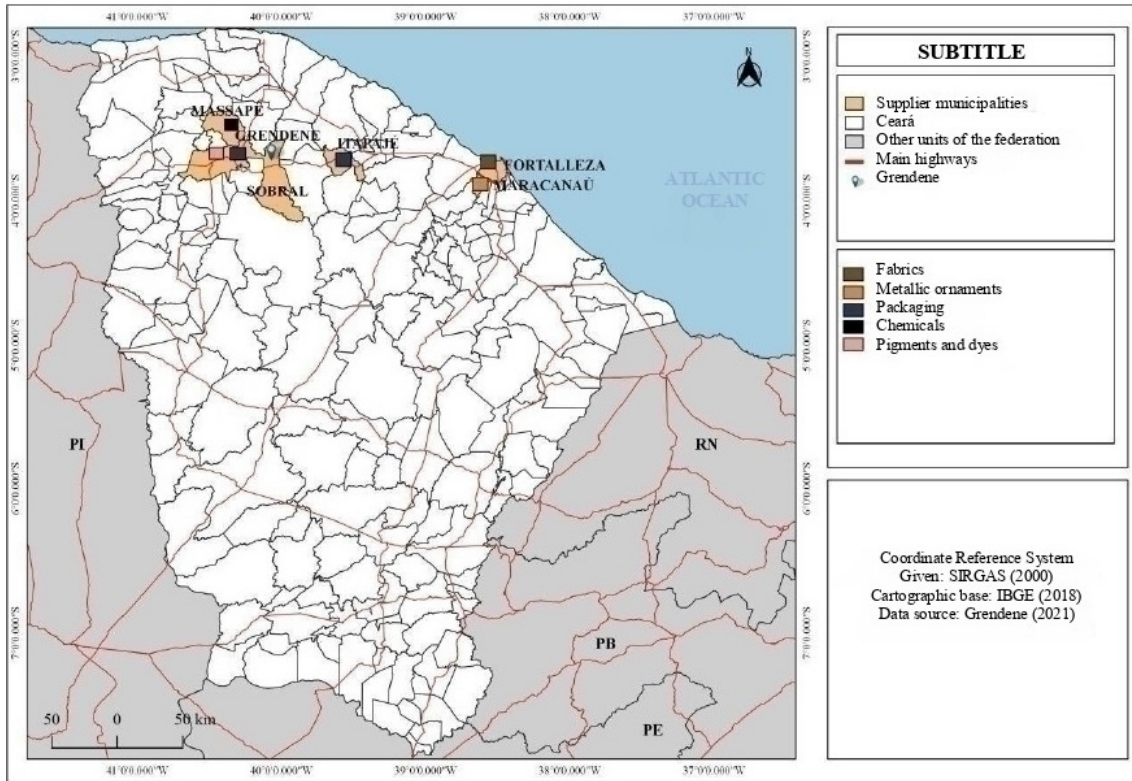


Figure 5 - Ceará: Flow of Grendene's insums. Fieldwork (2021). Prepared by the authors.

Itapajé and Massapé appear as suppliers of materials for packaging and chemicals. América Artes Gráficas LTDA is a supplier of packaging and cardboard papers, while the paints come from dikka industrial's subsidiary in Massapé, a company that operates in the manufacture of paints and has industrial facilities in Franca, São Paulo, and another important hub of footwear production.

Like Dikka, Grendene attracted two other important partners, Bepplast and Embacel, but these companies were set to be even closer to the Grendene complex when they settled in Sobral.

Bepplast is a Rio Grande of Sul company active in the production of pigments and dyes that migrated to Sobral shortly after the installation of the first Grendene units in the city. The second and latest company to be attracted by Grendene to Sobral was Embacel, belonging to the Carton Pack group, based in Sapiranga, Rio Grande of Sul. In total, Embacel has four industrial units in Brazil, two of them in Ceará, in the municipalities of São Gonçalo do Amarante and Sobral, and two others in Rio Grande of Sul. Embacel is the leading supplier of the packaging used by Grendene of Sobral.

THE GRENDENE PRODUCTION ORGANIZATION

With eight plants installed, Grendene of Sobral has a production capacity of up to 250 million pairs of shoes per year for the women's, male and children's segments. In the Grendene industrial complex are arranged the sectors of manufacturing PVC, raw material transformation, shoe assembly, distribution, among others. In fieldwork and interviews with workers and former workers, we outline the functions of each production unit and its specifications.

In Figure 6, we demonstrate the location and functions of industrial units.



Figure 6 - Grendene-Sobral: location and functions. Source: Google Earth, 2021. Own elaboration, based on field work.

In unit 1, the sectors of Plastisol components and footwear assembly are located, in addition to the screen printing sectors present in virtually all production units of assembly. Unit 2, a former distribution center, now allocates the development, innovation, maintenance and *E-commerce* sectors. The injection sectors and the "matrix" of repairs are concentrated in unit 3, being also there that are produced the toys / gifts of the *Grendene Kids line*. Unit 4 concentrates the PVC quality laboratories, where pvc formulas are made, which total up to 300, and is also the factory supplying the raw material used by the injection sectors. Unit 4 is the starting point of the production itself, as well as houses the warehouse of products used in pvc composting, such as resins and plasticizers.

Unit 5 is identified as a component factory, in which the cutting, sewing, metallizing and assembly sectors are located. In this unit, the insoles, strips and metalized ornaments are produced. Units 6 and 7 are characterized as factories where both the transformation of the raw material and the assembly of footwear are carried out. Both units (6 and 7) have expanded injection sectors and assembly sectors, differing only in terms of the location of a quality and resistance laboratory that is in factory 6 and the warehouse in factory 7.

Unit 8 is located the Distribution Center (CD), grendene's newest production facility in Sobral, inaugurated in 2015. In an area of 63,621 m², the CD is the flow channel of grendene's large-scale production, it is where all the volume produced in the industrial establishment is directed, as shown in Figure 7. According to one interviewee, the "Grendene CD is one of the most modern in the country, with technologies coming from several countries in the world, being also the largest footwear distribution center in Latin America". In what corresponds to the production process, Sobral is responsible for all Grendene production, remotely commanded by the company's administrative headquarters in Farroupilha. The spatial organization of the production articulates the center and the periphery of Brazil and both to the world, through the spatial circuit of the production of footwear. In

Farroupilha, all strategic sectors of the company are located, such as the Presidency, financial sector, commercial, as well as the sectors of research, creation and development of products, "matrixarias", among others.



Figure 7 - Access entrance to the Grendene Distribution Centre. Source: Fieldwork (2021).

With all strategic sectors in Farroupilha, the Sobral complex is called to execute the orders of production and the commercialization of products. With the lot already sold, Grendene's administrative headquarters sends to the Sobral industrial plant the package of information that will drive all stages of shoe production. This includes the volume, the model, the method, the raw material and the time for the manufacture of the products, that is, the entire organization of the production process is unrelated to the city of Sobral, which, as a result, becomes receiver of the determinations departing from Farroupilha. The function of Grendene de Sobral is that of the production itself, which includes transformation, assembly and distribution of the requested batches.

With contribution to the interviews we elaborated a flowchart to illustrate the flows that permeate the production of shoes of the company, from the conception of the product in Farroupilha, to the manufacture and distribution in the sobral industrial plant, as shown in Figure 8.

Grendene shoes are created and developed at the company's technical center in Farroupilha. All stages of market research, development and design, development of headquarters and pilot lot production are performed at Grendene's administrative headquarters. Soon after the development of the products, the dies (molds of the products) that are used in the injection machines are organized, that is: soles, insoles, leathers, forks and other props. In addition, the seat also produces a small reference batch (pilot lot) of the product to be manufactured in Sobral.

With the product already developed and marketed, the regulations for large-scale production and the selection of the Sobral manufacturing unit for demand production are created. Subsequently, the production flowchart, the matrices (molds), templates and then forwarded to Sobral are generated. The documents and protocols are like a "manual" of the production of Grendene shoes and that aim to ensure

that "[...] large-scale production has the same efficiency as when only one pair are produced" (ENTREVISTADO Y, 2021). In addition to the "manual" and other documents are also sent a physical model of each footwear (pilot lot), which is exposed in the sectors and at the end of each treadmill where the footwear is being assembled.

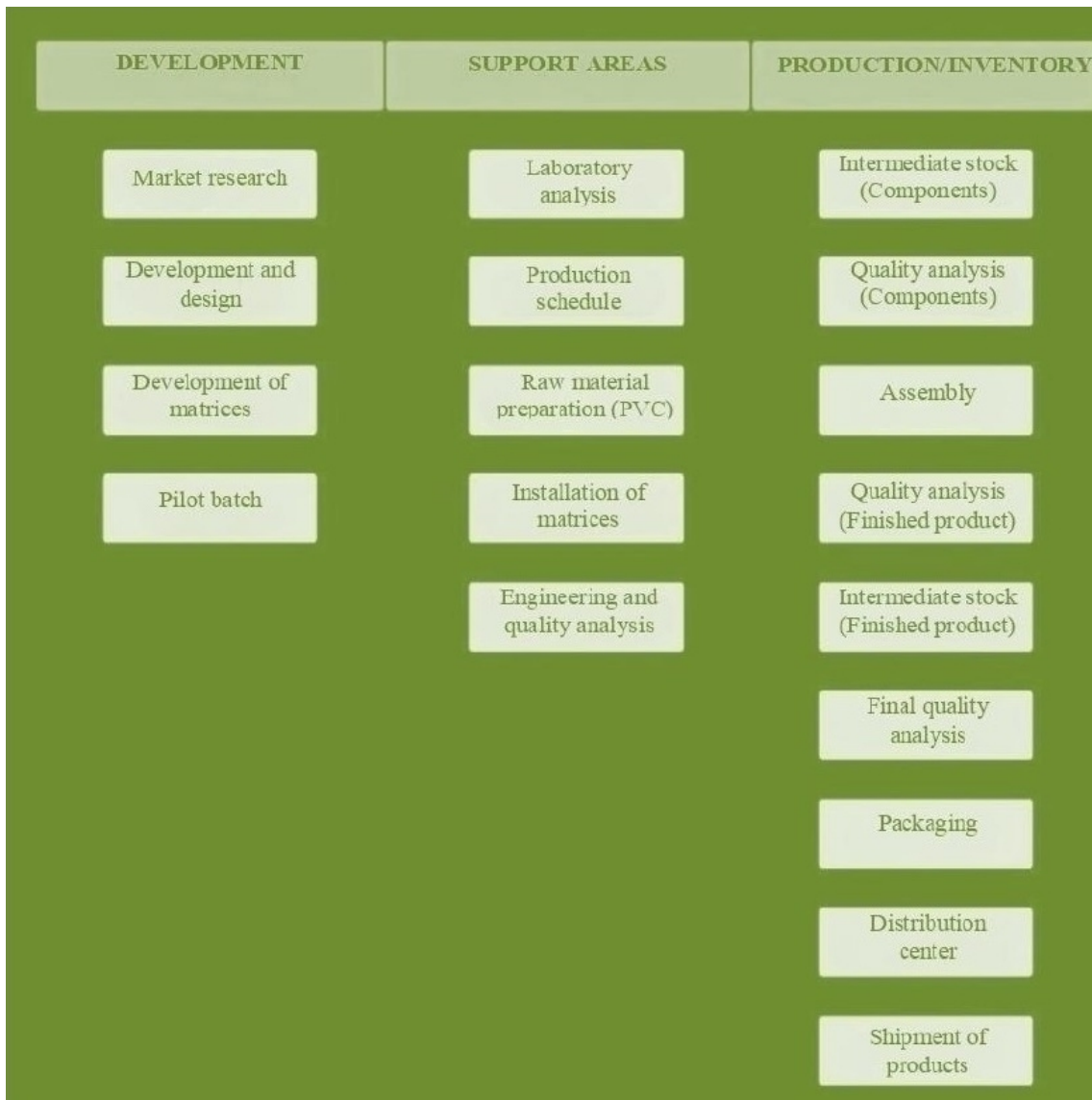


Figure 8 - Flowchart of the production process of Grendene of Sobral. Source: Own elaboration, supported by the descriptions of the interviewee "Y" and the field research.

In Sobral the information and determinations arrive at unit 2 of the complex, which is where the Production Planning and Control (PCP) sector is located, tasked with receiving orders and programming the demands on manufacturing production in the unit. Upon receipt of orders, the PCP assigns each sector of the plant a specific function in the production process, concomitant with the role of each in the production process. With this, also, laboratory evaluations are carried out, that is, various quality tests of the products are done before the manufacture of demand. The laboratory analysis will issue reports of approval or disapproval of the products. The flow of the start production is carried out in a discontinuous way, where the production of the components does not follow a linearity as occurs in the assembly process on the conveyors. Thus, each component, such as soles, forks and leathers, is produced in different production units and at different times, and may take days and even weeks before being finalized and forwarded to subsequent sectors. After programming the production in unit 2, the PVC

plant (Unit 4) begins the process of composting the raw material that will be used in the injectors. In unit 4, PVC is produced with the combination of various chemical materials, including resin, vegetable oil, calcite, talc and pigments that are placed first in a mixing machine and later in injection machines for the plasticization process, which results in the creation of PVC granules, crystallized microspheres that have no smell or coloring.

With PVC granules ready, the material is transported to units 1 (Plastisol Factory), 3 (Fork and leather factory), 6 (Insole factory) and 7 (Sole factory), specifically for the dyeing sector, where the granules go through another process before being molded, which includes the mixture of chemical components, dyeing, as well as where the reuse of the "ground" from the soles that have been crushed for reuse occurs that can join the other materials used in PVC. After this processing, the dyeing sector moves PVC to the injection machines for the production of shoe components.

In the injection stage of PVC is when the footwear gains model. In solid form, PVC is injected together with other chemical compounds in heated machines that are programmed to transform the state of the raw material, which in this case comes out of a solid state (granular) to the liquid state before being molded the footwear. For shoe modeling, liquid PVC is injected into a machine with different schedules and molds (matrices), depending on the type of component to be produced.

It is during the injection that, in addition to the "design" of the model and numbering, the footwear also receives the essence and pigmentation according to the collection produced. Upon completion of the injection process, all components are transported to an intermediate sector (Intermediate Stock) in each production unit, which is where the separation and distribution of the parts of the footwear to the assembly plants (Units 1, 5 and 7) take place.

The destination of the components depends on the flow chart established in the flowchart organized in unit 2, and can be directed to any of the assembly sectors, that is, either units 1, 5 or 7 can be allocated to perform the assembly process of the products. In the assembly sector are the traditional production mats, which concentrate the largest share of the company's workers.

In the assembly sector, with all the parts of the shoes already produced in the above mentioned factories, there is the distribution of operations among the workers who perform the function of assembling the shoes. On the treadmill, each worker collaborates with the assembly of the components, which can be in screen printing, gluing, sewing or revision. At the programmed pace of the treadmill, in a few minutes, the components turn into pairs of shoes.

At the beginning of the treadmill, there are those responsible for the screen printing of the products, a step in which the footwear receives the authentication of the brand in the insole. In each treadmill are at least two workers at the same rhythms, "stamping" the soles, while the other operators, in frantic rhythms, occupying the right and left sides of the treadmill follow in the assembly of the various parts of the shoes. After screen printing, the products are assembled interspersedly, when each worker becomes responsible for the joint of the sole and the fork/leather of the shoes. At this stage the product is already practically finished.

On site, we observed that, in the course of the production process, both fordism and elements of flexible accumulation are present in the production of Grendene footwear. In this stage, the elements of fordism are arranged, represented by the treadmill and the computerization of the information control, in which the control and quality commands are accompanied by a computer coupled to each treadmill, representing toyotism. For every four tracks, one worker is responsible for the process of controlling the technical specifications of what is being produced.

After all assembly, the shoes undergo a thorough analysis/evaluation, also performed alternately between those allocated on the treadmill, in which the quality of the assembly performed and the possible defects are evaluated so that the footwear conforms to the specifications and the physical model that is on the treadmill. The analysis/review includes evaluating the most diverse aspects of the finished shoes, before packaging. Finished, still on the mats, the shoes are packed and deposited in the intermediate stock of finished products and from there are forwarded to the CD (Unit 8).

The last stage of the production circuit within the confines of the Grendene de Sobral industrial complex occurs with the transposition of the already finished product of the assembler units destined to the CD. In some production units, the transport of production to the CD takes place through a modern treadmill, called "Caracol", due to the spiral shape that the machine has, similar to the shells of the

mollusc. In these mats, the boxes with the shoes pass through barcode readers to identify the destination of the product.

The snail is characterized as the most modern equipment found in the Grendene of Sobral plant, being another technical element inserted by the flexible accumulation in its most recent form, in which the equipment is all computerized and programmed according to the demands. For the operation of the snail, there is no direct need for workers, only in the process of programming the layout for the definition of the speed and transport time of the boxes.

When leaving the snail, the boxes go to storage. Lots are stacked in "streets", places identified by the letters of the alphabet, as noted in (Figure 9). Upon arriving in this sector, the boxes are organized, by forklift machines, which reach more than 10 meters high, handled by men and women, up to the large shelves, remaining in stock until the period of shipment of the order to the customer. The workers who handle the forklifts are qualified to carry out the activity.



Figure 9 – Grendene Distribution Center and batch organization by supplier in the distribution center.
Source: Field research (2021).

On the CD, there is a technical responsible for the sector, which delegates the function of organizing the flows of boxes from the shelves to the box where the trucks responsible for the delivery of the products are parked. In this sector, the technician accompanies, by a software that controls in real time the flow of outflow of the boxes with the shoes of Grendene, the batches released for shipment and destination of all production that leaves Sobral. Until the arrival of the carriers, the boxes are stacked, for up to two months, on the shelves of the CD until the landing of the products. With the release of shipment, the boxes are moved from the shelves to the boxes where the trucks they transport to the customer, either through the port or highway, the products.



Figure 10 - Worker transporting lots to the landing box

The trucks responsible for transporting the production, in turn, are funded by the customer, except in some situations where Grendene itself is also responsible for transport. Parked in the pits, the trucks that transport Grendene products to the consumer market line up to organize the cargo. Each truck is allowed to remain in the complex for up to two hours, for the purpose of a larger organization in the circulation of cargo transport through the internal area of Grendene. In possession of the cargo, the exit of these trucks, as well as the access of the trucks to the complex, takes place through the gate of unit 8.

THE MULTIESCALATION OF DISTRIBUTION AND CONSUMPTION

The distribution circuit engendered by Grendene goes beyond the national scale and connects Sobral to a global market that interacts with the places in the logic of an increasingly integrated and globalized production-distribution.

As the last stage of the productive spatial circuit, the distribution represents the movement of movement of the goods and the articulations between different territories from consumption. Grendene's production departs from Sobral to the domestic and international market transported by outsourced transport companies funded by both Grendene and customers.

The logistics of circulation of Grendene's production is multimodal, and its products are transported by both road and sea routes. Throughout Brazil, the shoes are transported in the trucks in charge of the delivery of orders.

The shoes produced in Sobral and marketed in Brazil are distributed among commercial representatives - however, no customer exceeds 4% representation in the company's revenue. Grendene's products are distributed among almost 70,000 customers and sold in approximately 65,000 points of sale throughout Brazil (GRENDENE, 2021).

As the main destination, the Southeast region is the main destination, and, more expressively, the states of São Paulo and Minas Gerais. We emphasize that the central position of São Paulo in the purchase of footwear manufactured in Sobral is due to the state being expressive in the number of commercial representatives of the brands produced by Grendene in Brazil, because they are also responsible for the sale of the products to department stores and other consumption centers throughout the country - Although Grendene has some commercial representatives in Ceará, the largest distributors are still concentrated in São Paulo.

For this, we highlight, according to information obtained in the interviews, that part of the shoes consumed in Ceará, necessarily, are not purchased directly by Grendene multichannels, but through various commercial representatives located in centers of the Southeast region, that is, even with the merchandise produced geographically close to the consumer market, it is destined for the concentrated region - which, in turn, it also participates in the Grendene distribution circuit. The material flow leaves Sobral to distributors located in São Paulo and, later, through these agents, returns to be marketed in retail and wholesale stores, department stores, supermarkets and franchises in Ceará.

To supply the global footwear market, Grendene has installed sales offices in several countries through the subsidiaries Grendene USA, Grendene UK Limited and Grendene Italy S.R.L. based in the United States, United Kingdom and Italy, respectively. On the other hand, in addition to its subsidiaries, footwear is also marketed and distributed through distributors from various regions and countries, including South Africa, China, France, Paraguay and others.

In 2019, at least 80% of Grendene's production was absorbed by the domestic market, while the other 20% of the products were distributed in 90 countries, which is equivalent to the export of approximately 31 million pairs of footwear in the male, female and child segments (GRENDENE, 2019). With regard to Grendene's footwear exports in Ceará, according to the company's industrial director, Mr. Nelson Rossi, in a projection of 100 exported shoes, 33 are produced in the Sobral industrial unit, a fact that shows the position that Sobral, as productive territory, exercises in interactions with the global consumer market served by Grendene.

Figure 11 identifies which countries link Sobral to the import of Grendene products. In 2019, the export of footwear produced in Sobral was made to 90 countries located in Latin America, Central America, North America, Europe, Africa, Asia and Oceania. Of the total exports, in 2019, South America was the main destination for production, accounting for 52.02% of the company's exports, followed by Europe (19.5%), Asia (16.09%), North America (6.5%), Central America and Africa (2.9%) and Oceania (0.09%).

Of the ten largest importers of footwear, five are countries in South America (Colombia, Paraguay, Bolivia, Peru and Argentina), one from North America (United States), three from Europe (Spain, Hungary and Italy) and one from Asia (Myanmar). The largest share of Grendene's production was directed to Colombia, which imported about 17.81% of the footwear manufactured in Sobral that year, followed by Paraguay, which had a 12.10% stake in Bolivia, Bolivia with 5.39%, while the United States consumed 5.29%, Peru 4.52%, Spain 3.21%, Argentina 2.66%, Hungary 2.52%, while Italy and Myanmar accounted for 2.19% and 2.04%, respectively. For the distribution of footwear to the international market, Grendene hires carriers who are responsible for the shipment of lots in unit 8 in Sobral and the disembarkation at the Pecém Port Complex; this, in turn, heads towards the final destination. With the arrival of Grendene products to the importing country, Sobral also arrives in the world. Grendene's production circuit – production, circulation and consumption – presents us with the main characteristics that permeate the inclusion of flexible production, whose parts of the whole are likely to be located in different regions and even countries and, even so, maintain different relationships with the place that the manufacturing units are located.

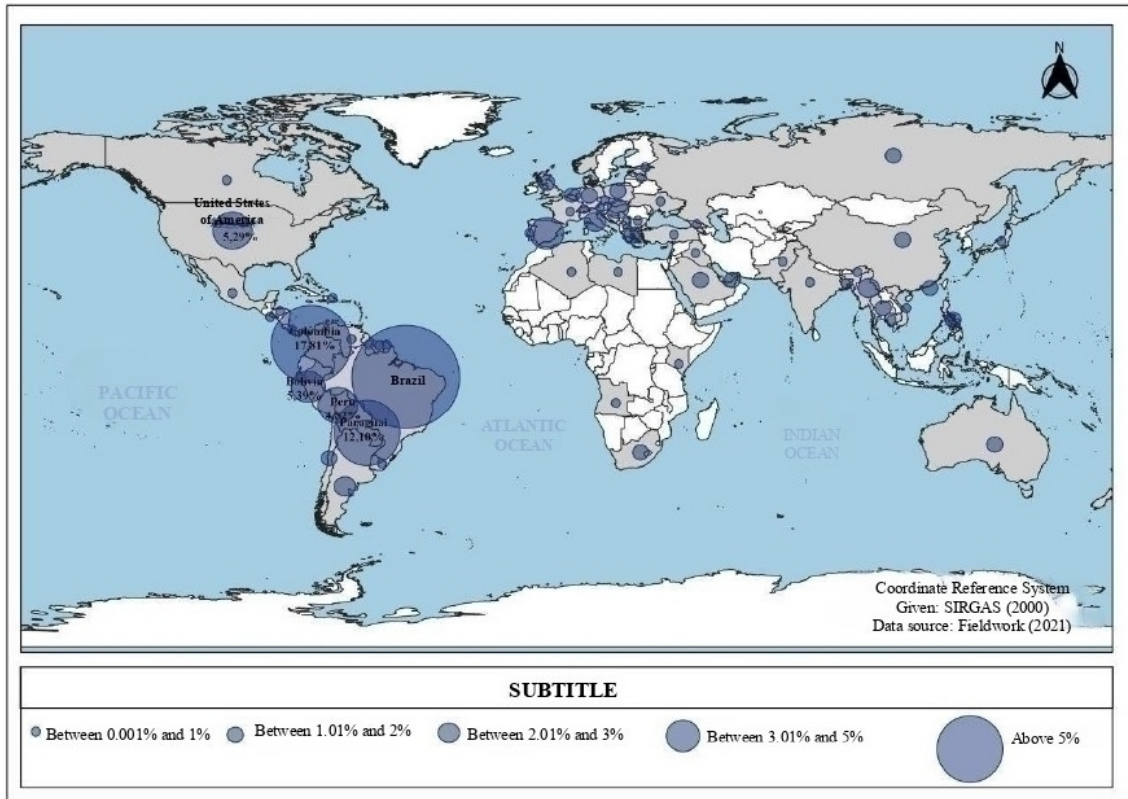


Figure 11 - The consumption of Grendene-Sobral footwear. Source: Fieldwork (2021). Prepared by the authors.

Grendene reaches from places near the most distant places, through the productive circuit it commands, and also become a space circuit. We realize that, although it produces its raw material, Grendene does not cease to depend on the supply of supplies acquired from other states and countries, making even denser the joints it governs.

Meanwhile, in production it aggregates from the more traditional elements, coming from Fordism, to the most modern elements of flexible production, such as the work organization itself and the modern machinery used in the most diverse stages of the production process. The level of reach of Grendene's production also presents the predominance of multi-scaling processes of footwear production occupied by Sobral.

CONCLUSION

As noted, Grendene is responsible for almost the entire production process, from market research, model creation and production. Although Sobral is the most complete industrial unit, Rio Grande of Sul still stands out as Grendene's headquarters, with Farroupilha responsible for housing all strategic sectors of product creation and development, while the city under examination is in charge of accepting orders and producing the predetermined by the centralizing territory of the institution's capital.

Sobral receives all orders and production determinations, characterizing itself as a used territory (SILVEIRA, 2008) for the production itself. Therefore, the product is idealized in the South, produced in Sobral and distributed to the national and global consumer market. For Grendene, the city of Sobral expresses itself as the most important productive territory, because it is synonymous with profitability.

For this, it moves an intense spatial circuit of production, articulating in a multiscale way the territories to the logic of footwear production. Through the spatial circuit of production, Grendene articulates Sobral to Brazil and the world, in which the central regions that appear as the main suppliers of the raw material consumed in the industrial complex. It is perceived that Grendene takes the world to

Sobral and this one, through the import of production and the export of production. In the context of production, through a visit to the Grendene industrial establishment, we realize that, even with the use of technologies in the production process, it does not cease to have an artisanal character, because it has an army of workers in the assembly of footwear that still occurs manually. In its *modus operandi*, still predominate some elements inherited from Fordism, such as the timing of production time and the rhythms imposed by the Fordist feature. In another aspect, the multipurpose/multifunctional work and territorial segmentation of the production, previously restricted to only one territory, were seized from the flexible production standard. The large number of workers employed by Grendene is also expressed as a typically Fordist configuration.

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Teles, G. A. - The author collaborated with the construction of the theoretical contribution and final review of the article.

Costa, M. P. S. - The author was especially responsible for the development of the theoretical framework, for the acquisition of primary data, field research, cartographic elaboration and its interpretations and analysis.

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