SOCIOECONOMIC ATLAS OF RIO GRANDE DO SUL STATE: FIFTEEN YEARS MONITORING STATE'S TRANSFORMATIONS

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Abstract:
This article aims at recovering the building process of the Socioeconomic Atlas, as well as addressing some transformations undergone by state economy and society that may be identified in the fifteen-year trajectory of the publication. Initially, a background on the Atlas development is made, and methodological elements that characterize the different editions are presented. In a second moment, it is made an approach on the themes that point to the changes that have occurred in the state economy and society along these fifteen years. Following come the closing remarks and references used.

Key-words:
Territorial planning; Socioeconomic Atlas; Rio Grande do Sul State

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1. Introduction

The year of 2013 marks the fifteenth anniversary of a pioneer initiative developed by the State Secretariat of Planning, Management and Citizen Participation of Rio Grande do Sul State (SEPLAG/RS): the launch of the **Socioeconomic Atlas of Rio Grande do Sul State**. Within a context that has many discontinuities the publication has remained an important reference for government agencies in policy-making, students of different levels of education, researchers and other actors seeking information about the State.

During these fifteen years the Socioeconomic Atlas recorded important economic, demographic and social transformations that supply subsides for understanding the present situation of the State. Alterations in the economic matrix, in the export basket and in the demographic profile, as well as the evolution of health and education indicators are examples of changes recorded in the pages of this publication.

The publication has also evolved from the point of view of its methodology, and the change to digital media facilitated access to and dissemination of information. However, the Atlas has kept its main feature of offering a socioeconomic synthesis, containing the essential elements for a first approach towards understanding the State's reality. The information is presented primarily through maps and, complementarily, graphs and tables, always with analysis of the different subjects addressed.

This article aims at recovering the building process of the different editions of the Socioeconomic Atlas, as well as addressing some transformations undergone by state economy and society during the fifteen-year trajectory of the publication. Initially, specificities on the construction of the different editions, and methodological elements that characterized them are presented. In a second moment, it is made an approach on the themes that point to the changes occurred in the state economy and society along these fifteen years. Finally, considerations are made about the publication and the changes that occurred in these fifteen years.

2. Different editions and their methodological aspects

The Atlas' first edition was published in 1998. Its origin is linked to the construction of a geographic overview that would allow presenting Rio Grande do Sul (RS) in its main socioeconomic aspects, both from the point of view of its internal dynamics based on its municipalities as of its external dynamics, by comparison with other federation units, Brazil and some selected countries. The initial project had as reference the ***Atlas Économic et Social de La Région Rhône Alphes***, brought to the State after an international mission of the Planning Secretary of that time, Mr. João Carlos Brum Torres.

The Atlas' first edition had its origin in 1996. It was elaborated by a multidisciplinary group coordinated by the geographers that worked in the Regional and Urban Development Department of the then Secretariat of Coordination and Planning. Geographers Antonio Paulo Cargnin and Silvia Maria Berwanger Profes participated in its elaboration, together with pedagogue Ana Pujol Vieira dos Santos and economists Antonio Carlos Coutinho Fraquelli and Pedro Silveira Bandeira (RIO GRANDE DO SUL/SCP, 1998).

The absence of a Geographic Information System framework in the Secretariat caused the thematic maps of such edition to be jointly produced with the managing company of the *Programa para o Desenvolvimento Socioambiental da Região Hidrográfica do Guaíba* – PRÓ-GUAÍBA (Program for the Socio-Environmental Development of Guaíba Hydrographic Region). Technicians Cláudio Ruschel, Eloísa S. de Moraes, Íria M. Garaffa and Lígia M. Pinto participated in the elaboration of the Atlas on behalf of the company. The Atlas was completed in 1998, having been released at the 44th Book Fair in Porto Alegre. The publication was structured in five chapters, beginning with an introduction on the general features of the State, continuing with the areas of infrastructure, population, life conditions and economy. In that edition several data sources were used, especially data from the 1996 Population Census conducted by *Instituto Brasileiro de Geografia e Estatística* – IBGE (Brazilian Institute of Geography and Statistics) and from *Fundação de Economia e Estatística* – FEE (Economics and Statistics Foundation), as well as data obtained directly from various state entities.

In 2000 the project for the publication of the Atlas' second edition started. It was also published in print in 2002. In such edition the whole work began to be

prepared and implemented by the team of geographers who worked in the Regional and Urban Development Department. The technical team was formed by geographers Antonio Paulo Cargnin, Ana Maria de Aveline Bertê, Herbert Klarmann, Sílvia Maria Berwanger Profes and Suzana Beatriz de Oliveira. The group was responsible for the project elaboration, selection of themes, collection and analysis of data, elaboration of texts and execution of cartography in digital media. The publication kept the characteristic of presenting, by means of theme maps, graphs and tables, data organized in different scales. Besides, it expanded the approach with the inclusion of new themes and more detailed analysis. Therefore, the second edition was structured in six chapters, beginning by an introduction in which the general characteristics of the State are described. Following were the themes of environment, infrastructure, population, social indicators and economy (RIO GRANDE DO SUL/SCP, 2002).

The maps were generated from the digital cartographic base 1:1,000,000 and made available in various scales for printing, in Polyconic Projection, using the Horizontal Reference System WGS 1984. From such edition onwards, digital cartography was predominantly made using ArcGis software family, employing different grouping levels of geographic information.

Since 2003 the Atlas began to be totally elaborated in digital format, maintaining the same layout of the printed edition, and available in its entirety by a link at SEPLAG/RS webpage as a permanent product of the institution[1]. Since then, it began to be maintained and updated by the technical team that works with the Governmental Planning Department of the Secretariat. At present the team is formed by geographers Antonio Paulo Cargnin, Ana Maria de Aveline Bertê, Bruno de Oliveira Lemos and Suzana Beatriz de Oliveira. Laurie Fofonka Cunha, analyst of planning, budget and management, also worked with the team between 2010 and 2013[2].

Themes approached have been expanded and information updated as new data are disseminated. In 2013, the website and layout were remodeled and modernized, aiming at maintaining the relevance of the publication, facilitating access for users and, mainly, deepening existing analyses. The publication uses several geographic bases.

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[1] The Atlas is available at www.seplag.rs.gov.br/atlas.

[2] Since the Atlas' first edition, Gisele Banda de Magalhães, Anderson de Jesus Nunes, Iara Rejane Gross, Eduardo Marques Martins and Lucas Stanislawski Silva have contributed as interns.

The municipal base, with 496 municipalities (2003) is the most used one. The bases of de 333 municipalities (1991), 427 municipalities (1992), 467 municipalities (1995) and 497 municipalities (2013) were also used. The most widely used regional divisions were the *Conselhos Regionais de Desenvolvimento* – COREDEs (Regional Councils of Development) and the *Regiões Funcionais de Planejamento* – RFs (Functional Regions of Planning). Data are obtained from public banks implemented by different institutions, with emphasis to IBGE, FEE, *Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira* – INEP (National Institute for Educational Studies and Research Anísio Teixeira) and the database of the Ministry of Health – DATASUS.

3. Changes in the state demographic profile in the period 1998 – 2013

The demographic profile of the population of Rio Grande do Sul presented significant alterations in recent decades in its different aspects. Some of these changes may be found in the editions of the Socioeconomic Atlas of RS released during these fifteen years, and their impacts surpass the demographic analysis and influence the state economy and society. Examples of this can be seen through the analysis of population characteristics such as the pace of population growth, alterations in the fertility profile, population distribution according to the household situation and alterations in population structure by age and gender[3].

In the last fifteen years the total population of Rio Grande do Sul increased 1.1 million inhabitants, going from 9.6 million to 10.7 million. Taking into consideration the data from the last Population Censuses, the annual growth rate in the State in the period 1991-2000 was 1.21%, and in the period 2000-2010, 0.49%, well below the previous decade and the lowest rate among Brazilian states. If we take into consideration that in the beginning of the XX century the State presented values around 3%, such values are very low. This phenomenon is not recent, since 1960 the population growth rates of the Sate and the Country have been decreasing gradually, as presented in Figure 1, following the tendency already observed in countries that have achieved demographic transition[4].

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[3] Data from the Population Censuses of IBGE of 1991, 2000 and 2010, of the Population Census of 1996 and of FEE's Projections for 2030 were used.

[4] Demographic transition may be understood as a pattern of changes in the behavior of population growth and in its age structure, mainly resulting from a process of reduction in its fertility and mortality levels. As a result, at first an increase in population growth rates may be observed (a demographic explosion),

Figure 1 – Evolution of Growth Rate in Brazil and RS – 1950-2010
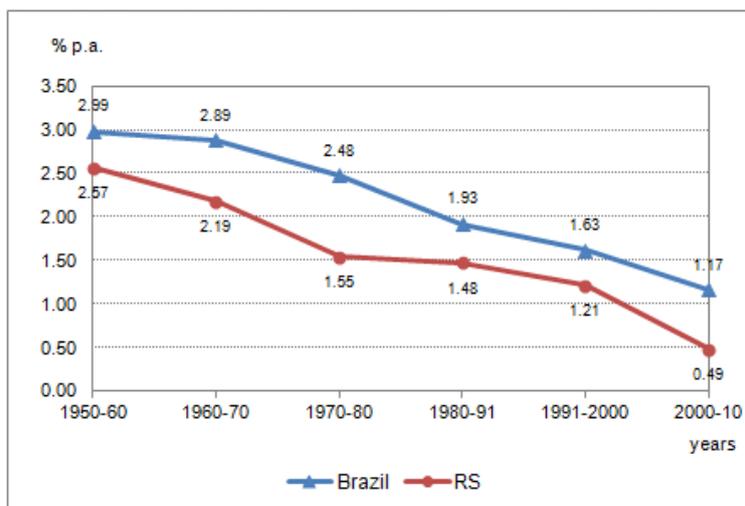
Source: IBGE

In Rio Grande do Sul growth rates present great variability. Even with reduction in the pace of growth, there are regions in the State that increased their population significantly, as in the case of Serra and Litoral that presented growth well above the state average. Concerning the municipalities of Xangri-lá (4.3% p.a.), Arroio do Sal (3.9% p.a.), Balneário Pinhal (3.8% p.a.), Imbé (3.7% p.a.), Capão da Canoa (3.3% p.a.), and Tramandaí (3.0% p.a.), are among the ten municipalities with higher population growth in the State. The municipality of Caxias do Sul, in Serra region, even having presented a lower growth than in the previous decade, showed the largest absolute increase of population, surpassing even the capital, Porto Alegre, and the municipalities of *Região Metropolitana de Porto Alegre* – RMPA (Porto Alegre Metropolitan Region).

With the exception of Pelotas, in the southern state, and Santa Maria, in central region, the most populous municipalities in the State are also located in the axis between RMPA and Caxias do Sul, confirming the tendency already observed at the late 1990s, when the largest area of urban continuity in the State already existed in that region.

On the other hand, an increase in the areas that have undergone depopulation may be observed. In the period 1991-2000 the municipalities that have lost more population were located in the northern state. The results of the last Census show an

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although with the decline of birthrate, the growth rate of the population decreases over time, tending to stability or even reduction of the absolute population (BANDEIRA, 2010).

overall decline in the pace of growth and expansion of such tendency towards the west and some places in the south, as may be observed in Figures 2 and 3.

Figure 2 – Population Growth Rate in RS, per municipality – 1991-2000
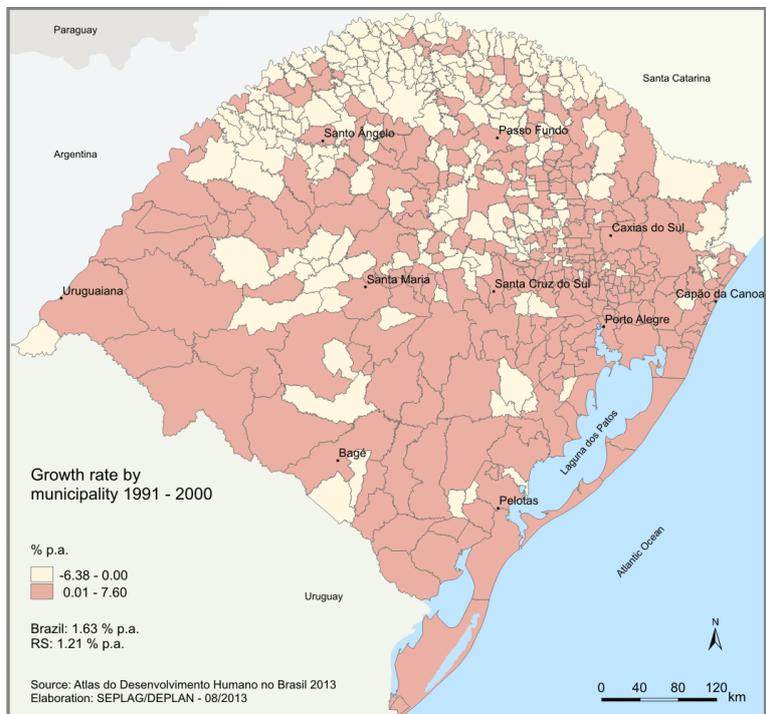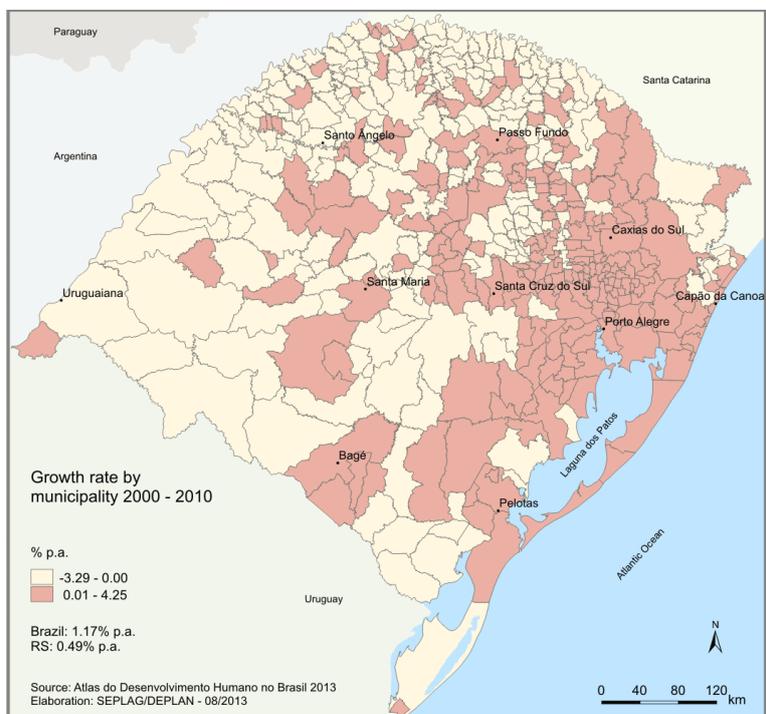

Figura 3 - Population Growth Rate in RS, per municipality – 2000-2010

One of the leading factors in the process that has resulted in the dramatic decrease in the population of many municipalities is the sharp drop in fertility rate, that corresponds to the average number of children that a woman of a hypothetical cohort would have (15 to 49 years of age) at the end of her reproductive period. In Rio Grande do Sul in 1998, the average was 2.1 children per woman and, at present, according to data of the Population Census of 2010, such number is 1.8 children.

By analyzing a longer period, it may be observed that fertility rate was already decreasing steadily in Rio Grande do Sul, as well as in Brazil. In 1960 the fertility rate in the State was 5.1 children per woman. Since then, the reduction occurred gradually: 1970 (4.3), 1980 (3.1), 1991 (2.4), 2000 (2.2) until reaching the latest figure of 1.8 children per woman, as shown in Table 1. This average is already below the population replacement rate, and such decline was very quick when compared to the one experienced in Europe, for instance, where these figures have taken at least 150 years to reach similar levels.

Table 1 – Fertility Rate in Brazil and RS – 1960-2010

| Ano	Brasil	Rio Grande do Sul
1960	6.28	5.11
1970	5.76	4.29
1980	4.35	3.11
1991	2.85	2.39
2000	2.38	2.17
2010	1.90	1.75

Source: IBGE

Among the factors that contribute for the decline in fertility rate may be highlighted: the process of urbanization as consequence of the increased industrialization, the increase in educational level, the access of women to the labor market, the dissemination of contraceptive methods and the improvement in health conditions, among others, were instrumental in this change.

Regarding urbanization, over the past twenty years, although at a less accelerated pace than in previous decades, it kept growing steadily in the State. In 1991 the percentage of the population that resided in the urban area was 76.6%; in 1996 this figure rose to 78.7%; in 2000, to 81.7%; and in 2010 it reached 85.1% of the citizens living in cities, as shown in Figure 4. Besides, there was a significant increase in the

number of municipalities that, following the tendencies, increased their urban rates in the period.

Migration is also a component that interferes in the behavior of population growth. The migration balance in Rio Grande do Sul has been negative over recent years, what contributed, though with lower weight, for the decrease of intensity in growth rates. The loss of absolute population by migration, mainly to other states of Brazil between 1995-2000, was 39,495 inhabitants, and between 2005-2010 it almost doubled, increasing to 74,650 inhabitants. Nevertheless, the pace of growth of the net rate of migration, i.e., of the proportion of people born in Rio Grande do Sul that resided out of the State (not included those residing out of the Country) in relation to the total of the population that were born in the State has remained constant in these last twenty years.

Figure 4 – Evolution of Urban and Rural population in RS – 1940-2010
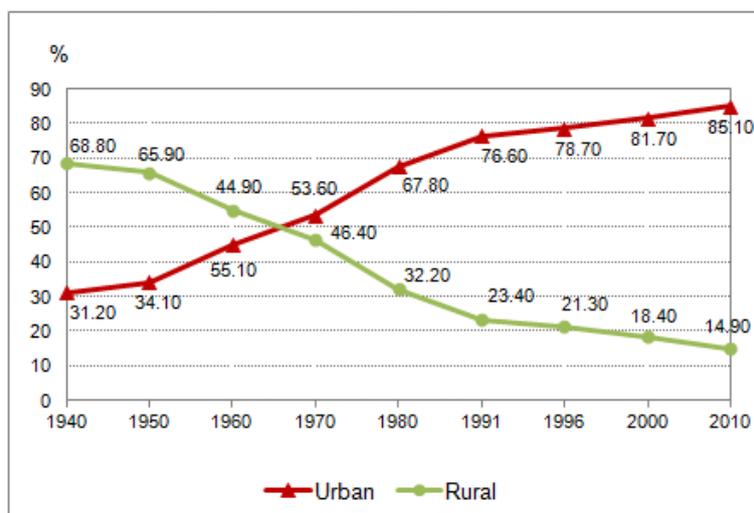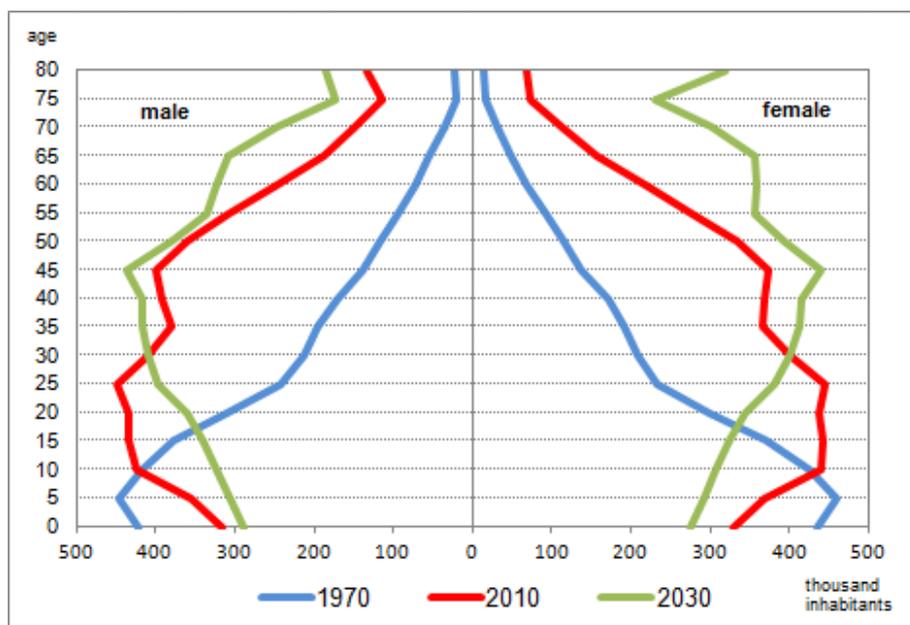

Source: IBGE

The decline in fertility rate, decrease in mortality and increase in life expectancy of the state population directly affected the age distribution of the population. There was a narrowing of the population pyramid base as opposed to a broadening of the top, as may be observed in the age pyramids shown in Figure 5. In 1991 the widest layer of the age pyramid corresponded to the interval between 5 and 9 years; in 2000 it was between 15 and 19; and in 2010, between 25 and 29 years. With respect to the pyramid top, that corresponds to the group above 80 years, it increased in the last 20 years.

The population in older age groups in Rio Grande do Sul has shown an increasing participation in population quota. The life expectancy of the state population increased from 71.1 years in 1991 to 75.9 years in 2010, while the share of those over 65 years increased from 5.8% to 9.3%. The evolution of the aging index demonstrates this phenomenon[5]. The index was 19.4 in 1991, it was doubled in 2010, indicating that for every 100 children between 0 and 14 years, there were 40.7 people 65 years old or older. Following these standards, the State shall have approximately 2.1 million inhabitants over 65 years and 118.5 elderly for every 100 children in 2030. Thus, while in 1991 children and elderly represented 36% of the state population and adults 64%, in 2010 the proportion was 30% and 70%.

Figure 5 – Composition of total population, by gender and age groups in RS,
in the years 1991, 2000 and 2010

Source: IBGE

If the projections of IBGE for the next decades are confirmed, Rio Grande do Sul would already be at the height of this relation, since in this decade that proportion would rise, as may be observed in Figure 6. Brazil would reach this level only by 2020. Therefore, the State would be in a period that scholars call Demographic Bonus that, according to Jardim (2010), may be considered as the period in which the economically

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[5] Aging index is the ratio between elderly and young people in a population, i.e., the number of individuals over 65 years for every 100 individuals younger than 15 years.

active population (15 to 65 years) is proportionally more numerous than the inactive (0 to 14 years and 65 years and older).

Figure 6 – Proportion of economically inactive population in Brazil and RS –1960-2030
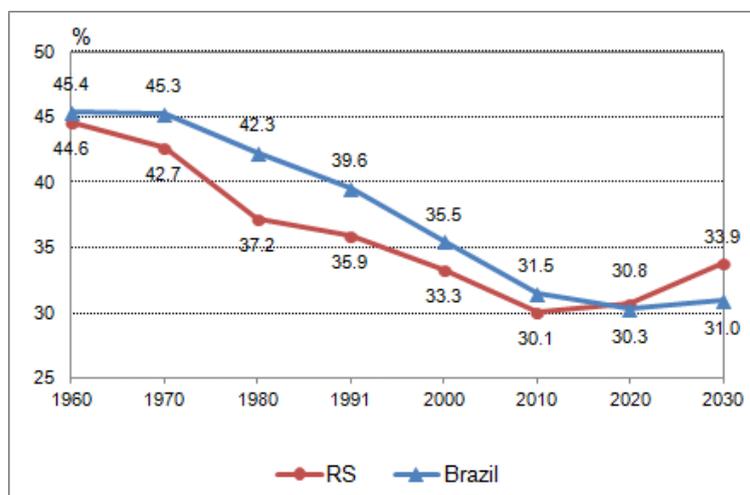
Source: IBGE

Such condition, also advocated by scholars, would indicate an advantage for development, since the population would act as a lever for social and economic growth. However, it cannot be disregarded that the elderly population will increase in number, what will result in enormous challenges to society, mainly in matters relating to health and social security.

4. Aspects of life quality in the period 1998-2013

The Socioeconomic Atlas followed the changes in the profile of state health and education, emphasizing some aspects of the process and monitoring some of the major indicators – in the area of health: life expectancy at birth; infant mortality and overall mortality; and in the area of education: literacy rates, school attendance and educational attainment of the population aged 25 years or older.

One of the most relevant themes in the analysis of the evolution of life conditions from the view point of health is the assessment of life expectancy at birth. This indicator demonstrates the improvement of socioeconomic and environmental conditions and of the level of public health quality of a country or region and is closely related to the access to local health system and its adequacy in meeting the needs of the population. Its increase is mainly due to some factor as: reduction of infant mortality, increase of immunization coverage and improvement of sanitary conditions. Rio Grande

do Sul stood out for many decades for occupying one of the best positions among Brazilian states in relation to these factors.

Since its first edition, the Socioeconomic Atlas of Rio Grande do Sul pointed out that the average life expectancy at birth in the State, for both sexes, have always been higher than the Brazilian one. In 1991 and 2000, the State presented a level of life expectancy that Brazil would only reach ten years later, in 2000 and 2010. While in 1991 Brazilian life expectancy was 64.7 years, in Rio Grande do Sul it reached 68.7 years. In 2000, Brazilian life expectancy reached 68.6 years – practically the same index that the State had reached in 1991, whereas in the RS such index had already reached 73.2 years. In 2010, when Brazilian life expectancy reached 73.9 years – practically the same index that Rio Grande do Sul had in 2000, in the State it already reached 75.3 years (PNUD/IPEA/FJP, 2013).

Regarding gender, these differences are even more evident, with women always presenting a longer life expectancy at birth than men. As a result, the number of women in older age groups is at present significantly higher than the number of men. It is important to note that the progress in life expectancy of the state population is also associated with the decline of birth and fertility rates and has as a result the population aging process. Consequently, it is possible to notice the pressure on public and private pension and health systems, as well as the intensification of demands for specialized services that require public managers to plan middle and long terms public policies.

As for the distribution of life expectancy at birth in the state territory, since 1991 an array of values above the state average is observed, in the so-called Expanded Axis of Northeast that is outlined between Porto Alegre, Caxias do Sul and Passo Fundo. This vector starts in the RMPA towards Serra and Produção, extending towards north-northwest and coincides with the region of higher socioeconomic and technological development at present. Similarly, it was also observed a general increase in life expectancy levels at birth in virtually the whole territory in 2010. In 1991, there were 238 municipalities with life expectancy indexes above the state average, and in 2010 this number increased to 280 municipalities. Whereas the lowest average recorded among municipalities raised from 62.40 years, in 1991, to 70.96 years in 2010.

Another indicator of living conditions that should be highlighted is infant mortality. Such indicator is used as one of the most sensitive ones in the health area, for

death of children under one year results from various risk factors that reflect the quality of prenatal and postnatal care. Furthermore, it demonstrates the effectiveness of public policies in relation to preventive actions for maternal health and improvement of socioeconomic conditions to which the population is subject. The last Report of the United Nations Children's Fund (UNICEF) identified a global improvement of the indicator in the latest twenty years in practically all countries, with emphasis to Brazil that promoted a greater reduction than the global average, although the Country's average still remains high, according to the parameters of the institution. Rio Grande do Sul stood out for occupying, along with Santa Catarina, São Paulo and the Federal District, the best positions among Brazilian states in relation to the infant mortality coefficient in Brazil.

In the last fifteen years the Atlas demonstrated that the infant mortality coefficient in Rio Grande do Sul have always been lower than the Brazilian one. Whereas in 1991 the Brazilian coefficient was 44.6 per thousand live births, in the State it was 22.5 – practically health. In 2000, the Brazilian coefficient reached 30.5 per thousand live births, whereas in the State the coefficient was already 16.7. Also, in 2010, when the Brazilian infant mortality coefficient reached 16.7 – practically the same index of RS in 2000, the values of the State already reached 12.3 per thousand live births, according to data from the Atlas of Human Development 2013. Therefore, the drop in infant mortality in Rio Grande do Sul began earlier and was more pronounced than in Brazil for a long period, decreasing its pace in relation to the Country only in recent years. As a result there was a positive influence on the indexes of life expectancy rates at birth in the State.

The significant decrease in infant mortality that took place in the State in recent decades reached almost its entire territory. In general, a concentration of lower values may be perceived – below the state average – in the Expanded Axis of Northeast. In 1991, there were 257 municipalities with infant mortality coefficient below the average that was 22.53 deaths/1,000 live births, remaining at the same level in 2010, when the state average was 12.38 deaths/1,000 live births. On the other hand, there is still a significant number of municipalities with coefficients above the state average that should be targets for more specific public policies. However, it must be highlighted that the greatest majority of the municipalities that present very high infant mortality

coefficients are the ones with very low population and number of births; therefore, where deaths impact more intensely on mortality rates.

In Rio Grande do Sul, the two main components of the Infant Mortality Coefficient– neonatal mortality (up to 28 days after birth) and postneonatal mortality (after 29 days to 11 months) are closely related to specific causes. The first one results from birth of children with low birth weight and adverse conditions resulting from childbirth, which are strongly related to the lack of prenatal care. The second component relates primarily to diarrhea and acute respiratory infections influenced by environmental factors, although the low weight may still be present. This second component was the one that most influenced in reducing infant mortality in Rio Grande do Sul by the late 1970s (RIO GRANDE DO SUL/SES, 2010).

Since the 1980s, the decline in neonatal mortality became more decisive in the decline of infant mortality, by actions of prenatal qualification, expansion of the Family Health Program, promotion of breastfeeding and formation of milk banks, vigilance and investigation on infant deaths, besides reduction of pregnancy of teenagers with low education level.

Another aspect worth mentioning is Overall Mortality, one of the mostly used measurements in public health, which expresses the relationship between the total number of deaths in a particular location and the population exposed to the risk of dying. It may be considered a very important indicator, when associated to mortality by groups of causes, considering the general process of aging of the population and increased longevity.

In this sense, Brazil presented significant changes in cases of morbidity and mortality in the last 50 years, from a profile where there was the prevalence of typical problems of a predominantly young population to a profile in which notifications of chronic diseases are increasing, more specifically of a population with predominance of older age groups. According to the State Secretariat of Health, these changes were more strongly felt in Rio Grande do Sul, since the proportion of elderly people in the period was always higher than the Brazilian average. Various factors collaborate for this: longer life expectancy, continuous decline in infant mortality and birth, improvement of sanitation and urbanization conditions, wide vaccination coverage and prevention of diseases through greater access to health services. A higher prevalence of risk factors

result from these factors, with morbi-mortality rates and rising costs of health care due, mainly, to cardiovascular diseases, neoplasias, chronic respiratory diseases and external causes.

In Rio Grande do Sul, as may be observed in Figure 7, the groups of main causes of overall mortality for both sexes are: diseases of the circulatory system (30%); neoplasias or tumors (21,27%); diseases of the respiratory system (11.76%); external causes of morbidity and mortality (9.19%); diseases of the digestive system (4.76%); endocrine, nutritional and metabolic diseases (5.50%); and certain infectious and parasitic diseases (4.25%). And the ten main categories of diseases that lead to death are: acute myocardial infarction; other chronic obstructive pulmonary diseases; malignant neoplasm of the bronchi and lungs; *diabetes mellitus*; cerebrovascular accident; pneumonia; heart failure; unknown causes of death without medical care; ischemic heart disease and other cerebrovascular diseases.

Considering the evolution of the groups of main causes of overall mortality, it is important to emphasize the downward trend in the category of cardiovascular diseases since 1990, although it still remains with the highest indexes among the other diseases. Similarly, the exponential increase of the category of neoplasias since 1970 attracts attention, as well as the increase of mortality caused by diseases of the digestive system and endocrine, nutritional and metabolic diseases, among which *diabetes*, since the year 2000, even though in a lesser extent. On the other hand, the diminution of the share of ill-defined causes points out to a qualitative improvement in the mortality records in Rio Grande do Sul. Concerning the distribution of the Overall Mortality Coefficient among the municipalities, it attracts attention the relative concentration of indexes above the average of 7.3 deaths per 1,000 inhabitants in 2010, among the municipalities located in the center and south of the State.

Figure 7 – Evolution of overall mortality by major groups of causes in RS –1970-2010 (%)
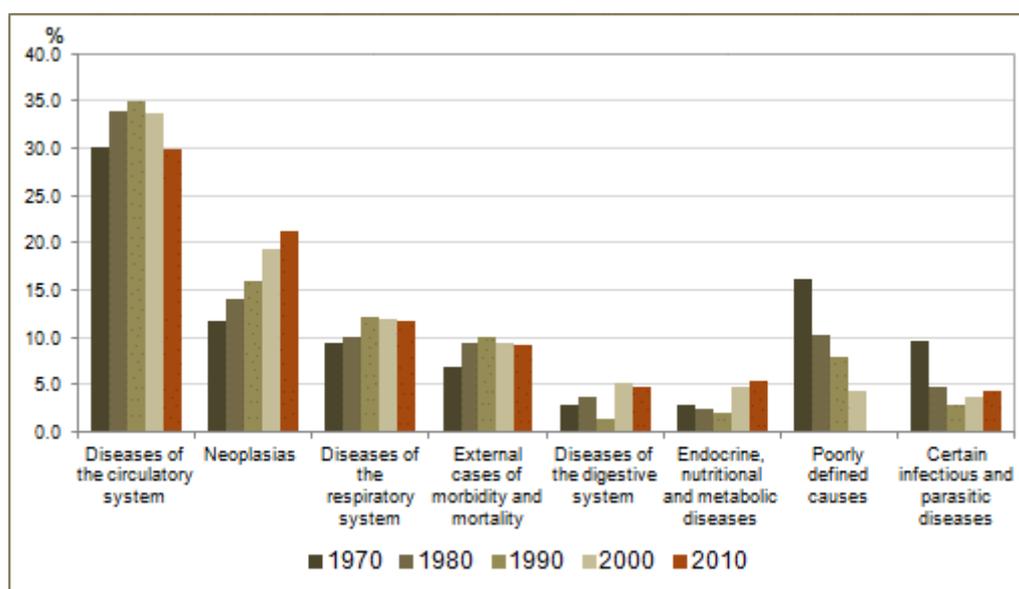
Source: SES/DAS. *Estatísticas de Saúde* 2010

Regarding education, one of the most important indicators is literacy, that promotes the inclusion of segments of the population who are totally prevented from autonomously participating of economic processes. Therefore, the increase in literacy rate is an indicator of socioeconomic conditions improvement and is closely related with access to and quality of the local education system and the suitability of such system in meeting the needs of the population in a determined country or region. Rio Grande do Sul has stood out for many decades for ranking as one of the best Brazilian states relating literacy and school attendance rates of its population, what reflected in the increase of the average years of schooling.

Since its first edition, the publication highlighted that the literacy rate of the population 15 years old or older is higher than the Brazilian one and has always been among the best of the Country. In 1991, the State already had a literacy rate that Brazil would only reach 20 years later, in 2010. Whereas in 1991 the Brazilian literacy rate was 80.60%, in the State it reached 90.43%. In 2000, the Brazilian literacy rate reached 87.06%, whereas in Rio Grande do Sul this index was already 93.72%. In 2010, when Brazilian literacy rate reached 90.39% – practically the same index of the State in 1991, the state rate was 95.48%.

Concerning territorial distribution, significant regional differences still persist in the literacy rates of Rio Grande do Sul. Although practically all the municipalities

have improved their indexes in the period, there is a great number of municipalities with rates well below the average of the State that was 95.48% in 2010. These are concentrated, mainly, in the strip of land that comprises parts of the center and south of the State and in the strip of the north, comprising a big portion of the regions of Alto da Serra do Botucaraí, Rio da Várzea and Médio Alto Uruguai and, more to the west, COREDEs Celeiro and Missões. A concentration of the values may also be perceived – above the State average – in the Expanded Axis of Northeast.

In relation to the school attendance rate, that identifies the percentage of the population of a certain age group that is attending school, the State stood out during several decades for occupying the best positions among the other Brazilian states during many decades in relation to the school attendance rate of the population ages 6 to 14, which is at present reaching universalization. Regarding school attendance rate of the population ages 15 to 17, at present it occupies a middle position. Whereas concerning school attendance rate of the population ages 0 to 5, data show that, although it has improved, there is still much to be done in order to offer a more comprehensive service. According to the enrollment in preschool by administrative dependence in the period from 1991 to 2010, municipal and private systems had a large increase, unlike the state system, and are accountable for almost comprehensive care of the population enrolled in preschool system in the State.

According to the available data, it may be said that, at present, 77% of the population from 0 to 3 years of age and 42% of the population from 4 to 5 years are not served by daycare or preschool. And, among the 496 municipalities of the State, in 2010, only 16 had service rates of more than 50% in the age group from 0 to 3 years, reaching a maximum of 61.82%, wherein the majority – 350 municipalities – had less than 10% of service. Whereas in the age group from 4 to 5 years, 383 municipalities had service rates of more than 50%, and 30 municipalities out of these presented service rates higher than 90%, what demonstrates that, at present, the preschool care is much broader than daycare in the State. Although it may be considered usual that children ages 0 to 3 be cared by their families, mainly in smaller municipalities, there is no denying that there is a higher unmet demand for daycare than for preschool that should be solved in coming years, as established in the legislation. Figures 8 and 9 show the

evolution of the school service of Childhood Education and of enrollment by administrative dependence in Rio Grande do Sul.

Figure 8 – Early Childhood Education service rate in RS and Brazil – 2000 and 2010
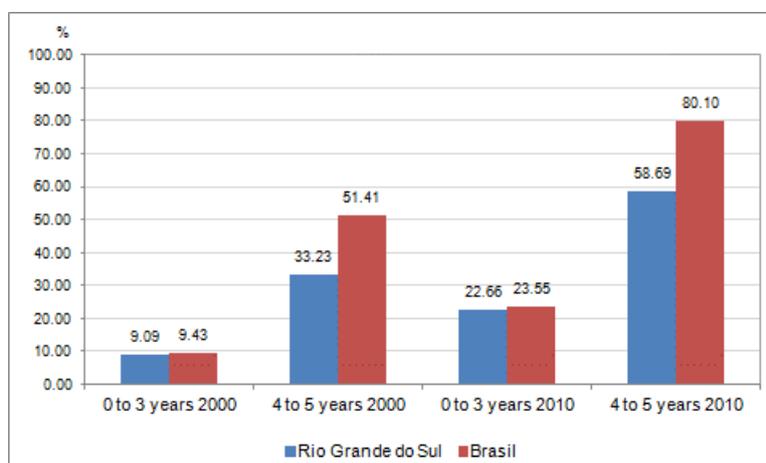
Source: *Atlas do Desenvolvimento Humano* 2013

Figure 9 – Evolution of enrollment in Early Childhood Education in RS by administrative dependence 1991, 2000, 2010
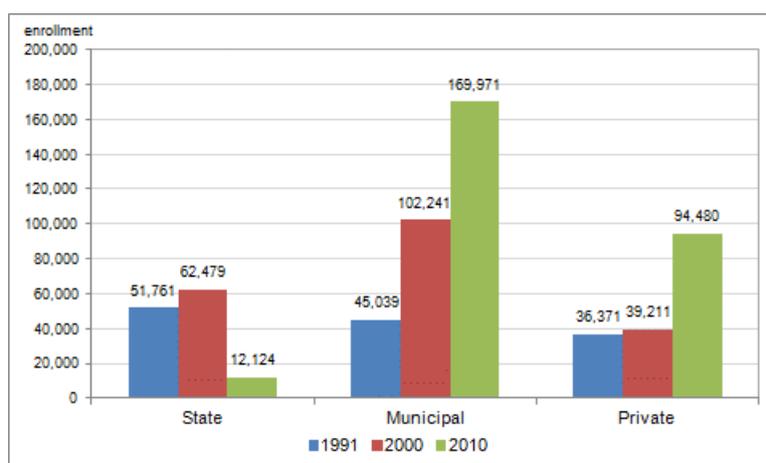
Source: FEEDADOS (SE/INEP)

With reference to the rate of schooling[6] of the population ages 25 or above with complete fundamental education, in Rio Grande do Sul there was an increase from 28.7%, in 1991, and to 52,1% in 2010, remaining above the Brazilian one, which was 50.7% in 2010. As per the rate of schooling of the population ages 25 or above with complete secondary education, it increased from 17.6%, in 1991, to 35.4% in 2010, remaining slightly below the Brazilian one that was 35.8%. Relating to the rate of

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[6] Enrollment rate is related to the ratio between the population of a certain age group that completed primary, secondary or higher education, at any of its modalities, in relation to the total of persons of the same age group.

schooling of the population ages 25 or above with complete higher education, it recorded an increase from 6.1% to 11.2% from 1991 to 2010.

The municipalities that presented the highest rates of schooling, especially those that have the highest schooling indexes of the population ages 25 or above, in the three levels of education, are also concentrated throughout the Expanded Axis of Porto Alegre-Caxias do Sul-Passo Fundo in 1991, 2000 and 2010. On the other hand, areas with low schooling indexes persist over the years in almost all the municipalities of COREDEs Sul and Centro Sul; Alto da Serra do Botucaraí and Vale do Taquari; Missões and Vale do Jaguari.

5. Features of the state economy in the period 1998-2013

Rio Grande do Sul is currently the fourth Brazilian economy due to its Gross Domestic Product (GDP), having reached amounts of R$ 296.3 billion, according to the estimates for the year 2012. The State participates with 6.7% of the national GDP, values slightly lower than the 7% recorded at the late 1990s, being surpassed by the states of Rio de Janeiro and Minas Gerais[7]. It is worth noticing that both the state economic position as its share in the national economy are strongly influenced by the centralization exercised by the Southeast Region, with whom the state economy has an association above the national average. Furthermore, the strong links with agro-industrial activities, with great emphasis in the exports of commodities, and with other exporting segments cause the economic results to be strongly influenced by the changes in global economy, especially the fluctuation of the exchange rate.

The state GDP *per capita* presents a significant evolution, going from approximately R$ 1,000, in the beginning of the 2000s, to R$ 27,000, according to the estimates for 2012. Such increase followed a national tendency, in which the values raised from around R$ 8,000 to R$ 19,700 in 2010.

In the last fifteen years the sectorial framework of the state economy kept its main features, with a significant share of the services sector that at present comprises

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[7] The rank of first Brazilian economy among the states of the Federation is occupied by São Paulo, which accounts for 33.1% of national GDP, being followed by the States of Rio de Janeiro with 10.8% and Minas Gerais, 9.3%. In the last fifteen years, as a result of the process of national deconcentration, São Paulo lost about ten percentage points in the share of national economy. As a result, there was an increase in the share of Rio de Janeiro and Minas Gerais states, and Rio Grande do Sul went from second to fourth position among the federation units.

about 60% of the Gross Value Added (GVA). Besides being the most traditional segment of trade, this sector has increased its importance mainly due to the economic liberalization experienced in recent decades. Thus, an increasing number of companies and, consequently, of jobs, has been installed in the State, especially the service segments of transports, information, communication, logistics, consultancy, maintenance and equipment. Also of great relevance in the services sector is the segment of public administration, which increased its share based on the universalization of services as health and education.

Despite the sectorial framework of the VGA of Rio Grande do Sul in 2010 confirming the importance of the Services Sector in the State, considering the growth that took place in recent decades it may be said that the state economy is driven by two hegemonic sectors: agriculture and manufacturing industry. In the last fifteen years both these segments have kept a relatively steady share, with a slight decrease that was transferred to the service sector.

Figure 10 shows the share of these activity sectors in the economy of Rio Grande do Sul between 1998 and 2010. It may be noted that there were no large oscillations in the three sectors of activity in this period. The exception was the year 2005, when the agricultural sector suffered a sharp decrease (-17.4%) due to a severe draught, what reflected in a lower share of the primary sector in the economy of Rio Grande do Sul, of only 7.08%. The weak performance of the agricultural sector contributed for a drop of 2.8% in the State GDP in 2005, what shows the importance of the sector for the state economy.

In 2010, the state agricultural sector presented a share of 8.7% in the GVA's framework. These figures are even much higher when associated to agro-industrial activities[8]. It must be emphasized that the agricultural sector has been strongly impacted by draughts that, in a great extent, explain the poor results of some harvests and impact GDP negatively, as in the case of years 2004 and 2005. This conditioning tends to be repeated in 2012, when the State faced problems with the irregularity of rainfalls, especially during summer.

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[8] According to the *Estudo de Desenvolvimento Regional e Logística do RS* (Rumos 2015), if agro-industrial activities are added, this share reaches 30% of the economic framework, besides being the most decentralized economic sector in the territory (RIO GRANDE DO SUL/SCP, 2006).

Figure 10 – Participation (%) of activity sectors in the GVA of RS (1998-2010)
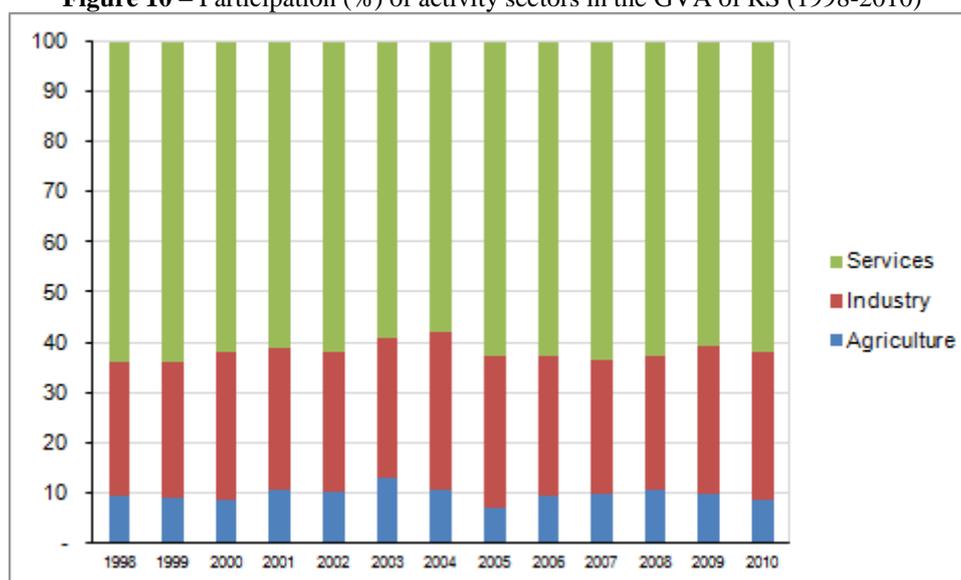
Source: *Fundação de Economia e Estatística* (FEE)

Industry is responsible for approximately 29% of the state economy, and out of this share the participation of the manufacturing industry is 21%. The extractive industry has little participation in the state economy – less than 1% of GVA – and the state mining industries are mostly dedicated to activities of extraction of non-metallic minerals.

In the manufacturing industry the State presents a diversified quantity of segments that developed from agroindustries and other segments related to the primary sector, afterwards new segments were aggregated. In the industrial matrix stand out the agro-industrial segment, that includes food and beverage industries and those that use agricultural inputs; the leather-shoe industrial complex; chemical industrial complex; and the metal-mechanic industrial complex. At present the manufacturing industry ranks third in the national industrial park (after São Paulo and Minas Gerais states), with a share about 9%.

The main genres are the mechanical, transport equipment, chemical, furniture, clothing and shoes, all linked to the export market. This link may be seen in the indexes of growth of the state industrial sector after the devaluation of the *plano real* (real plan), when these sectors presented their greatest dynamism, due to the improvement of their competitiveness with foreign countries.

The segments linked to the export market also have a high degree of spatial concentration. The Expanded Axis Porto Alegre-Caxias do Sul-Passo

Fundo polarizes these productive segments in great part. Though quite spatially concentrated, some segments, as food products, present a certain degree of dispersion throughout the state territory.

Concerning the export sector, it is worth noticing that in 1998, year of the first edition of the Socioeconomic Atlas of Rio Grande do Sul State, Brazil was experiencing a period of economic liberalization, envisaging a competitive insertion of the Country in the globalization process. This trade liberalization, coupled to the exchange rate appreciation anchored by dollar, and the dismantling of tariff and non-tariff protection mechanisms, led to a low export growth and a considerable increase of Brazilian imports, at the same time that such policy contributed for the stabilization of internal prices (BELLO, 2004, p. 297).

Rio Grande do Sul was significantly affected by economic liberalization and appreciation of currency because it presents an economy with great influence of the exporting sector, based on small companies that develop their activities with lower technological requirements. Some segments of the state economy, such as clothing, shoes and food products, were more affected by Brazilian economic policy[9]. It is in this period that Rio Grande do Sul envisaged to insert into the economic liberalization in Brazil by attracting new investments, whose major examples were the installation of a mounting unit of General Motors and of Dell factory.

The depreciation of the Brazilian currency that took place in January 1999 brought new possibilities to the exports of Rio Grande do Sul, mainly in agro-industrial sectors and other ones focused on foreign market. The bond of the state economy with agriculture, that showed a strong growth, led to a quicker economic recovery than the Brazilian one. Such recovery was reflected in the growth of production and employment levels, as well as in the increase of the share of the economy of Rio Grande do Sul in the Brazilian one in the period 1999-2002.

From 2005 onwards, a new exchange recovery and expansion of Brazilian international trade took place. The appreciated exchange rate brought new difficulties for the state economy, mainly the shoe sector that began to compete with the low price of Chinese and Vietnamese products. The share of the state economy in Brazil suffered a significant drop in 2005, mainly due to the drought of that year, when it began to

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[9] For a deeper discussion on the theme, please consult Calandro & Campos (2004).

stabilize between 6.6% and 6.7% until 2012, without recovering the participation it had between 1999 and 2002.

In the period 1998-2012, the economy of Rio Grande do Sul presented a retraction of the Gross Domestic Product in the years 1998 (-0.9%), 2005 (-2.8%), 2009 (-0.4%) and 2012 (-1.8%[10]). In these four years, the state Gross Domestic Product followed the negative performance of Brazilian economy in 1998, when Brazil grew only 0.1%; in 2009, with a 0.6% decline of Brazil's GDP; and in 2012, when Brazilian GDP grew only 0.9% (CEPAL, 2013). The year 2005 was the only one in which the state economy did not follow the growth performance of Brazilian economy[11], due to the weak performance of the state agricultural sector. The years 2004 and 2008, strongly affected by droughts, presented lower growth than the Brazilian one.

The year 2012, when the state economy had a performance of -1.8%, was also marked by a severe drought that decreased by 27% the soybean exports to China and had its repercussions in the industrial sector. It was also influenced by the drop in global demand for state products caused by the economic crisis, and by embargoes imposed by Argentina, especially on shoes, machinery, equipment and chemicals, and by Russia, on beef, pork and chicken. The only sector whose performance was considerably positive in 2012 was tobacco, of the processing industry, as consequence of the demand from China and the United States. However, the impacts of the drought of 2012 in the state economy were not as intense as in 2005 due to the maintenance of agricultural prices in 2012 (CALDAS, 2013, p.53).

The big soybean harvest 2012-2013 added to the recovery of the agricultural sector and the development of new segments indicate a recovery of the state GDP in 2013 and, according to preliminary data, its growth should be above the national average.

Considering such aspects, it is emphasized the importance of exports from Rio Grande do Sul for its economy and public accounts. In the last fifteen years, the economy of Rio Grande do Sul has presented oscillations in its share in the exports of Brazilian economy. In such period, the State reached the second largest share (value in

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[10] Preliminary estimates.

[11] The study RS 2010, carried out in 1998, pointed to the same tendency of Rio Grande do Sul's economy following the national one between the years 1985 and 1995 (RIO GRANDE DO SUL, 1998, p. 11).

US$ Free On Board) in exports from Brazil in 2003, with 10.97%, and in 2012, it was the fourth largest exporting economy among Brazilian states, with 7.17%.

In the last fifteen years, changes in the trade partners of Rio Grande do Sul may also be observed. The main destination of exports from Rio Grande do Sul has ceased to be the United States to become China, reflecting the rise of the Asian country in this century. In 1999, the United States represented 25.52% of the exports from the State, followed by Argentina, with 11.42%. China represented, in 1999, only 1.72% of exports from Rio Grande do Sul. In 2002, the year of Atlas' second edition, the United States bought 28.51% of the exports from RS, China already represented 6.97% of the exports from the State, whereas Argentina, facing an economic crisis, represented only 3.3%. In 2011, China was already the main buyer from Rio Grande do Sul, with 17.4% of the exports from the State, followed by Argentina, with 10.2%, and the United States, with 7,1% (BRASIL, 2013),

Figure 11 shows the share of the three most important countries in the exports from Rio Grande do Sul in the period 1999-2012. The higher participation of China in the exports is consistent with the data for Brazil, that has the United States as its second biggest importer, followed by Argentina. In 1999, MERCOSUR was the destination of 17.48% of the exports from Rio Grande do Sul; in 2002 its percentage was reduced to 6.35%; and in 2011 it was 15.93%. The crisis of MERCOSUR in the period 1999-2002, together with the economic crisis in Argentina, in 2001, and Uruguay, in 2002, reflected in the exports from Rio Grande do Sul to the countries of the bloc, what led the State to search for new markets for its products.

Figure 11 – Share (%) of China, United States and Argentina in exports from RS (1999-2012)
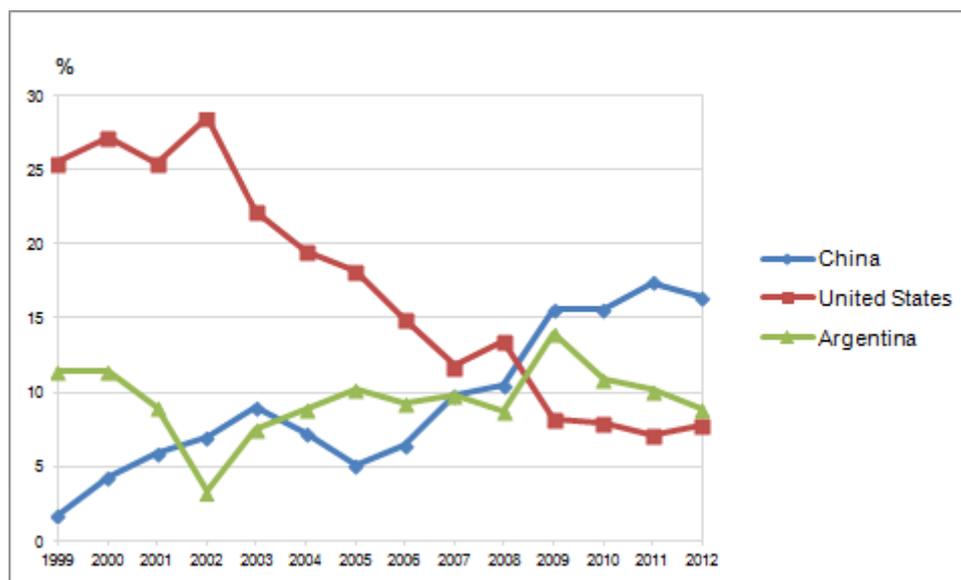
Source: MDIC

Concerning imports, in the year 1999, Argentina was the origin of 28.73% of foreign products bought by Rio Grande do Sul, followed by the United States (17.83%), Uruguay (6.17%), Algeria (5.85%) and Germany (5.35%). In 2002, by occasion of the second edition of the Socioeconomic Atlas of Rio Grande do Sul State, Argentina continued to be the biggest exporter country to Rio Grande do Sul (23.63%), followed by the United States (13.01%), Nigeria (11.81%), Algeria (7.52¨%) and Germany (7.37%). In 2011, Argentina had increased even more its share in the products sold to the State, with 25.9%, followed by Nigeria (14%), Algeria (9.8%), the United States (6.7%) and China (6.4%) (BRASIL, 2013).

During this period, Argentina remained the main supplier of products to Rio Grande do Sul, while Nigeria and China showed a steady growth, and the United States a strong drop in the share of the state imports. In the case of Brazil, the origin of the main imports is China, the United States and Argentina. MERCOSUR, in 1999, was the origin of 35.06% of the imports of Rio Grande do Sul; in 2002, it was 28.25%; and, in 2011, 28% (BRASIL, 2013).

In short, it may be said that during this fifteen year period, China represents an increasing role in the state economy, being the main purchaser of Rio Grande do Sul's products and increasing significantly the selling of its products for the State. At the same time, it may be observed the diminution of the United States' share both in state exports as in imports. Argentina has a more prominent space in the exchange with Rio

Grande do Sul when compared to its trade with Brazil, being the main supplier of products to the State, whereas in the case of Brazilian economy, Argentina comes as the third country of origin of Brazil's imports.

The performance of the State exports is closely linked to the behavior of the primary sector of economy. Concerning sectoral participation in the State economy, between 1998 and 2010 the sectors of agriculture, industry and services showed a relatively constant participation.

Regarding agriculture, soybean cultivation was one of those that had the greatest territorial expansion in Rio Grande do Sul in this period. The demand by the product increased at the same time that China became its main purchaser. For example, in 2012, China purchased 86.6% of the soybean exported by Rio Grande do Sul. When Taiwan is also considered as a Chinese destination, the percentage reached 94% (CALDAS, 2013, p. 54).

Soybean production, which still has its highest concentration in the regions of COREDEs Rio da Várzea, Noroeste Colonial and Alto Jacuí, notably in the municipalities of Palmeira das Missões, Cruz Alta, Santa Bárbara do Sul and Tupanciretã, has undergone expansion towards the south of the State. In this period, the soybean production of Rio Grande do Sul increased from 5,237,840 tons (average between the years 1998-2000) to 10,074,299 tons (average between the years 2009-2011), a growth below the Brazilian one, that more than doubled its production in those years, from 31,705,247 tons to 66,972,391 tons. Competition with soybean produced in other states, as Mato Grosso and Paraná, with major advantages in production, may explain the lower productivity in Rio Grande do Sul. Figures 12 and 13 show the territorial expansion of soybean production towards the south of the State.

The performance of the State's exports has reflected on the balance of trade and public accounts of Rio Grande do Sul. In general, it may be asserted that state exports are closely linked with agricultural and agro-industrial activities. China's demand for the soybean of the State has been one of the main causes of the expansion of this product in the period 1998-2013.

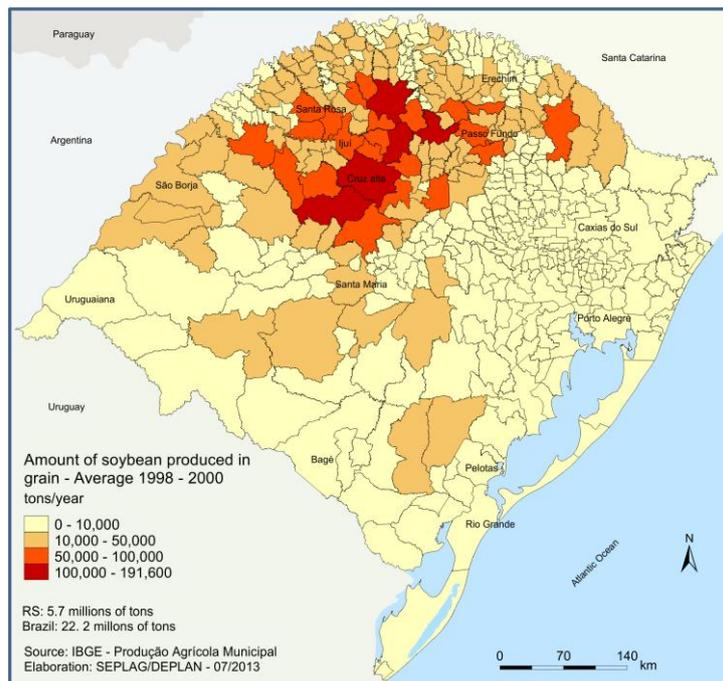**Figure 12** - Amount of soybean produced in grain in RS, average 1998-2000
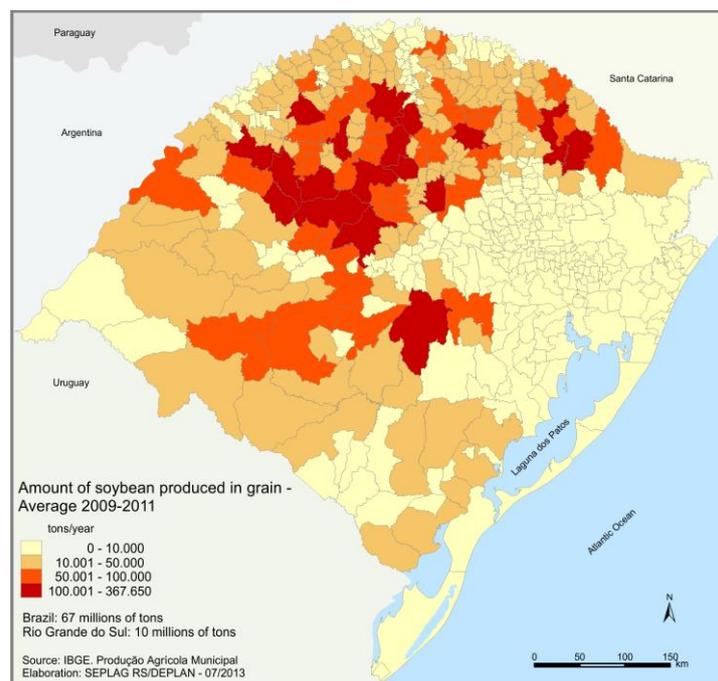

Figure 13 - Amount of soybean produced in grain in RS, average 2009-2011

However, it may be affirmed that some items of the State's exports and imports agenda have been positively influenced by the development of existing and new industrial segments that have been incorporating new technologies and processes to the state industrial park. Such is the case of the industry linked to the naval hub, segments

of metal-mechanic, agricultural machinery and implements, wind power, oil and gas. The result will soon be observed in the balance of trade, which already includes outcomes of the exports of oil platforms, truck bodies and equipment for wind power industry.

6. Final considerations

The Socioeconomic Atlas of RS has established itself in the last fifteen years as a differentiated tool for knowledge and territorial analysis of Rio Grande do Sul State. The publication is characterized by selecting raw data and indicators that allow a comprehensive vision of the State, in its aspects of history, geography, environment, infrastructure, social indicators and economy. The importance of the tool may be verified by its large use as basis for the elaboration of public policies, by quotes and references in researches, and by its use in different levels of education.

Since its first printed edition the Atlas has been qualifying its contents by texts, graphs and maps and facilitating its dissemination by its availability in digital media. This work was facilitated by the dissemination of new data platforms made available by different primary research institutes and by the proliferation of geographic information systems which became easier to operate, using different formats of spatial data.

Concerning demography, this article realized the advance of the demographic transition that started at the end of the 1970s, expressed in the decline of fertility and mortality rates, in the drastic reduction of vegetative growth and in the increasing urbanization. As a result, at present the State has a differentiated population profile that may be verified by analyzing age pyramids, whose trajectory indicates an ongoing process of aging of the state population, which tends to lead to an increasingly smaller vegetative growth. Rio Grande do Sul experiences the demographic bonus with a high number of active population, phenomenon that postpones for the future the challenge of dealing with an increasingly aged State, what reflects on the labor market, educational, health and social security systems.

These transformations in the population demographic profile are also the result of improvements in the health area that contributed for the advance in diagnostic, prevention and treatment of diseases. Nevertheless, the aging process of the population

and its increasing urbanization challenge the health system to deal with a profile of diseases increasingly more complex and exerts greater pressure on the health system.

Also, in the education area there was a significant growth of the literacy indexes and school attendance rates relating to the three levels of education – fundamental, middle and higher, that cooperate for the improvement of the overall schooling of the population. There are challenges concerning the qualification of the education in the three different levels and the school attendance of the population ages 0 to 5, where there is an unfulfilled demand for the service.

Regarding the dynamics of economic activities, it was observed that the State has followed the Brazilian development process, presenting more significant alterations as consequence of exceptional events, as those resulting from the unbalance in the balance of trade, protectionist measures adopted by importing countries, periodic draughts or harvests above the average. Therefore, regardless the great share of the service sector, the state economy is significantly affected by the dynamics of the agriculture and manufacturing industry sectors.

In the last fifteen years, the state industrial park has been complemented with the insertion of new segments, as the automotive, that contributed significantly for the expansion of the metal-mechanic segment. This shall be stimulated by the future results of the naval hub, recently installed in Rio Grande municipality. From the viewpoint of the exports, a general tendency of recovery was observed, as a result of the balance increase of the balance of trade and of the expansion of new segments.

Finally, it is worth highlighting, concerning territorial distribution that significant regional differences in the state territory still persist as consequence of the concentration both of the population and the development. On one hand, a large number of municipalities located along the Expanded Axis of Porto Alegre-Caxias do Sul-Passo Fundo stand out by gathering economic activities and presenting the best social indicators and, on the other hand, a great portion of the state territory, located mainly in an arc along the state border line, faces economic problems which are reflected in the population impoverishment and depopulation of these areas.

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