

HARVARD UNIVERSITY

Agroindustrial Cluster in Goiás' Southwestern Region – Brazil

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1. EXECUTIVE SUMMARY

The agribusiness is a Brazilian national economic force, with quantitative and qualitative leaps, an average performance greater than the Industrial Sector and a huge employment capacity. Agribusiness is a force leveraging the economic progress and pushing other sectors, bringing development to small and big municipalities generating income and other benefits for the country.

Agribusiness is compounded of various interdependent activities with center in farming and cattle raising. On one side are the suppliers of machinery, agricultural supplies and equipment; on the other side are activities such as distribution, industrial processing and services. Thus, there are three sectors in this economic activity: primary (agribusiness and vegetal extraction), secondary (industry) and tertiary (distribution and commercialization). In the state of Goiás, the agribusiness is the most explored sector. The fast growth started through differentiated policies concerning fiscal incentive, which occurred in the 1990's. As show the figures in the agricultural activities, the state of Goiás is leader and is presenting good results in the production of coffee, corn, wheat, garlic, rice, cotton, soybean, sugar cane and tomato.

In the Brazilian agribusiness growth scenario, the municipality of Rio Verde, located in the Southwest micro region of Goiás, encloses a huge agro-industrial infrastructure which is the result of the agriculture modernization due to public policies implemented in the last four decades. An important player of the local agro-industrial blossom came up at the beginning of the 1970's, COMIGO, a cooperative which had and still has a very strong supporting role in research, diffusion and technical assistance. Rio Verde also has other agricultural enterprises such as Brejeiro, Grupo Cereal and Cargill. The municipality is an important producer of cotton, beans, sun flower, soybeans and corn. Another sector which gets the benefit of the inflow of visitors to the city due to the agribusiness is the sector of tourism which has experienced a greater utilization of hotel accommodations, food and beverages.

The diamond of the agroindustrial cluster of southwest Goiás (Brazil) has strengths in all elements. Factor conditions include favorable soil and climatic conditions, as well as provision of equipment, capital and human resources. Demand conditions include local, regional and global demand for products of the cluster. There are several related & supporting industries acting in the cluster area. The companies express future oriented strategies and show a certain level of competition. The main challenges are related to low awareness of local society regarding environmental issues, dependence of a weak logistic system, availability of skilled workers for operational activities and existing services related to laboratorial analyses. Looking into the future, the cluster is tackling all those issues and it is expectable that soon most of the challenges will be overcome. However, it remains unclear how far the expansion of biofuel oriented agriculture (mainly sugar cane) may endanger this important agriculture based cluster in Brazil.

2. BRAZIL

2.1. ECONOMICAL AND HISTORICAL CONTEXT

Brazil is today the sixth-largest economy of the world according to the Guardian (2012) ahead of the United Kingdom. The country is located in the Eastern of the South American continent, with a territorial extension which comprehend a total area of 8,514,876 square kilometers which includes 8,456,510 square kilometers of earth surface and 55,455 square kilometers of water; according to the Brazilian Institute of Geography and Statistics (IBGE) Brazil has 192,376,496 inhabitants.

Historically the agricultural sector has always been one of the main Brazilian economic bases, since pre-colonial period, when subsistence agriculture was practiced, through the colonization period with monocultures, up to contemporary diversity of production where technology and mechanization is predominant (Seibel, 2007).

Agricultural production always existed in Brazil, since its primordial when natives consumed local food and planted as source of livelihood, until the arrival of the European who introduced the cultivation and exportation of Brazilwood (*Caesalpinia echinata*). Not very promising in terms of natural responses, sugar cane monoculture was started in the Northeast region, in the XVII century, using slave work which did not promote social nor technical development (Calmon, 1939). The sugar produced in Brazil was the cheapest and it did not reach to the world's market.

By the end of the colonial period coffee was introduced becoming a strong culture after the country's independence in 1822, mainly in Southeast region. Coffee export, in the decades of 1880 and 1890 jumped from 19% to about 63% of the total country export (Baer, 2003).

Along the twentieth century and especially after World War II, the growing demand for food in emerging urban centers was not adequately supplied and there were shortages of basic products such as sugar, wheat, beans and others. These problems persisted in the 1960's and only could be relieved in the following decade. At the time of the military regime in Brazil, in 1973, it was created the Brazilian Agricultural Research Corporation (EMBRAPA); it has been responsible for studies which promoted the development and the agricultural diversity in many regions of the country (Baer, 2003).

With the monetary stabilization which came with the Real Plan, after 1994, the Brazilian agricultural model went through a drastic change. The state participation was reduced and the market started financing agriculture pushing the development of products for a globalized market, with a great increase in productivity, technology and professionalization (Baer, 2003).

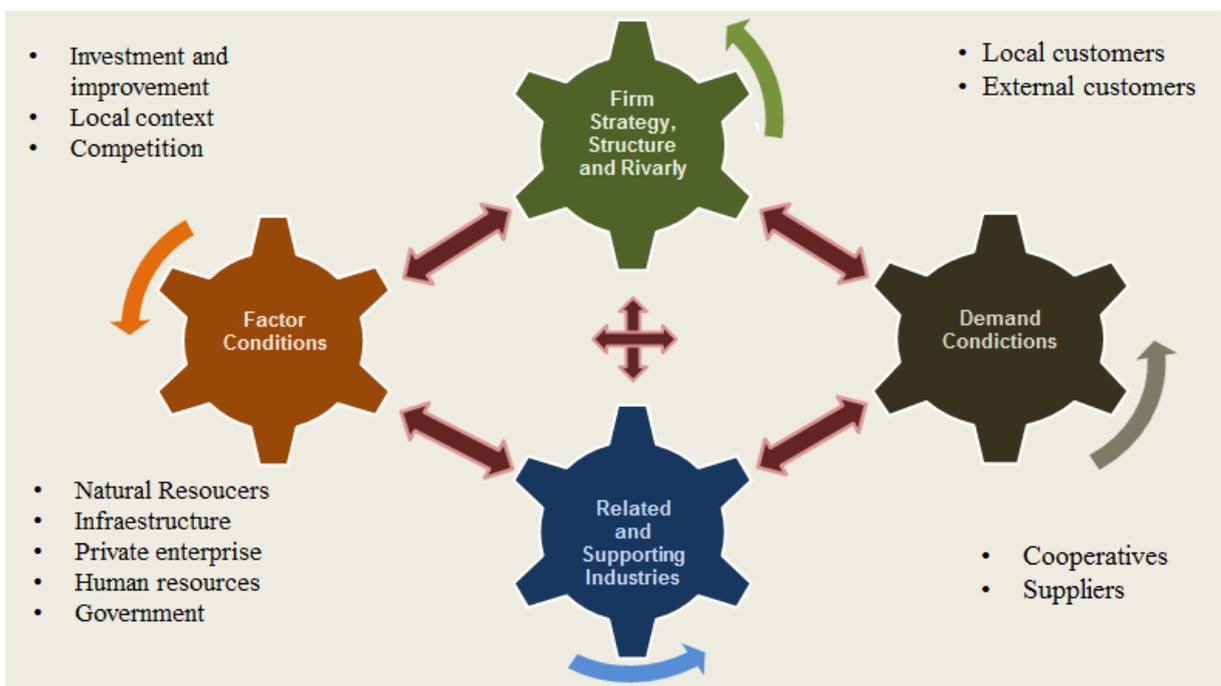
Today the most important producing regions are the Central-West with 69.8 million metric tons, the South Region with 56.7 million metric tons and the Southeast Region with 19.1 million metric tons. According to the July 2012 issue of the Systematic Agricultural Production Survey (LSPA), done by IBGE, there is an area to be harvested of 49.4 million of hectares. The three main cultures are rice, corn and soybean which corresponds to 84.7% of the area to be harvested and together represent 91% of the 2012 production.

The agricultural sector is a natural vocation in the country and notably contributes for the Brazilian economic growth, as seen in its history. It puts the country in a highlighted position in the international landscape, justifying the expression “Brazil the barn of the world”.

2.2. NATIONAL DIAMOND ANALYSIS

Porter’s Diamond Model (Porter, 1990, 1998) shows as a schematic solution in the diamond form which links points or responsible factors for a cluster competitive advantage creation. Picture 1 helps to better understand the history of the evolution of the cluster in the State of Goiás, showing its conditions and opportunities.

Picture 01: Diamond Model Definition



2.2.1. FACTOR CONDITIONS

Brazil is the country with the greatest geographical potential for agricultural expansion; it has approximately 550 million of hectares which may be used in agriculture. Of this volume only 4% is being used according to the Food and Agriculture Organization of the United Nations (FAO, 2012). Although not as strong as the USA, Brazil is on the avant-garde in the production agricultural technology. Another important factor and differential when faced with other nations is the abundance of cheap labor. But basic problems are still around: logistics infrastructure and inefficiency in storage strongly limits the competitiveness power of the soybean trade mainly in the Central-West region, which is far away from export ports (IBGE, 2012).

2.2.2. DEMAND CONDITIONS

Regarding grains, exporting is more attractive than internal consumption due to reduction in taxes on exported raw materials and also other factors such as inefficient local processors and political protectionism from developed countries prioritizing the import of raw material instead of processed products.

For the soybean bran, the average growth is more balanced when one compares the internal consumption and exportation. This happens because internally the soybean bran is directed to the animal feed and meat processing industries, but it is important to highlight that the internal consumption is directly linked to the performance of these industries.

Analyzing soybean oil and its byproducts, the internal consumption shows two variables: the first one is related to the food industry products, such as margarine, vegetal creams, mayonnaise and salad dressing; this market has been constant through the years. Soybean oil has also been used for energy production; it is used in the production of biodiesel, with a growing use. Export of these products has been growing at 33% yearly rate.

Generally, these three products, soybean, soybean bran and soybean oil, have high level of international consumption, and there is a strong demand for them in the international market. In 2008, for instance, 50% of the internal production of these products and their subproducts were directed for the external market (Lazzarini, 1998).

2.2.3. CORRELATED AND SUPPORT INDUSTRIES

Going to the analysis of the correlated industries, the fertilizer industries are the most important in the soybean business. Besides financing the production, it also provides nutrients for soybean production. This mechanism is important in the grain production capacity, that is, the fertilizer producing companies provide fertilizers to the producers of grain in exchange for certain

quantities of soybean grains in the harvest time. This helps to overcome the financing shortage for the soybean producers.

2.2.4. STRATEGY, STRUCTURE AND COMPANIES RIVALRY

The Brazilian competitiveness becomes evident with the participation of multinational grain traders such as Bunge, Cargill, ADM and Louis-Dreyfus; these companies help to coordinate the integrated mechanism of financing, processing and delivery of the production, guaranteeing the good functioning of the production chain.

Many changes have occurred in this financing model until it got to today's efficient version. At the beginning, agreements were signed by means of green soybean contracts, that is, instead of taking loans at a bank, the farmer used to establish agreement with the cooperatives or companies, where he would get raw material or supplies in exchange for a quantity of soybean grains after harvest. However these agreements were very often broken by the farmers due to the high prices soybean would reach; it did not offer any security or guarantee to the companies. In 1994 the Rural Product Bond was created, becoming a fixed guarantee through a bank or an insurance agency. Contrary to the green soybean, the Rural Product Bond was a contractual guarantee recognized by the Brazil's Central Bank and registered in the Agribusiness Custody Bond System (ZOONEWS, 2012).

3. STATE OF GOIÁS

3.1. GOIÁS ECONOMIC ORIGIN

In the middle of the XVIII century, more precisely around the years 1726 and 1778, the economy of the State of Goiás was based on mineral exploitation, with prominence of gold. However, the gold richness did not stay in Goiás; the biggest part of it enriched the Portuguese crown. But not only gold made the region's economic activity, it also had a not so expressive business turned to mining, subsistence agriculture and cattle raising.

Due to a mining crises in XIX century, cattle raising got strong the economy of Goiás. However this economic activity had some fundamental problems, and one of the most serious was the weak transportation system (bad conditions of road system). The cattle transportation was less dependent of this system since it transported itself, thus initiating the activities linked to cattle raising. This way it was possible to expand the consuming market.

The development of capitalism in Goiás was slowed because of the precarious communication means. It was very difficult the connection of the Center-West region with other Brazilian states. The

economy did not grow due to the inefficient road system and the answer to this problem was to use the railroad's already installed in the state.

What was missing in the state of Goiás was a solution for its transportation system so that it could supply the national demand. Notwithstanding, the railroad pushed the cattle raising production and gave notoriety to trade. The state economy got projection all over the country. Cattle raising and business in the twentieth-century was concentrated in the Southern part of the state of Goiás, where is located the main cities of the state (SEPLAN, 2012)..

3.1.1. THE GREEN REVOLUTION

According to what was supported by Wagner de Cerqueira and Francisco (Equipe Brasil Escola, 2012), "... the expression Green Revolution was created in 1966, in a conference in Washington, but the agricultural modernization process which stated it has occurred in the end of the 1940's". The program idea was to increase agricultural production through research for the development of seeds, soil fertilization and use of agricultural machinery which could increase productivity. This would be done through the development of seeds for each specific type of soil and climate, soil adaptation for the seeding and development of machinery. The modified seed developed in laboratory has high resistance to different types of pests and diseases. This seed planting, along with pesticides, fertilizers, agricultural implements and machinery, increases significantly agricultural production.

After this initiative, there was an increase in food production; however the hunger problem was not solved, because the grain production in the developing countries is for rich and developed nations, such the United States of America, Japan and the European Union countries.

The agrarian structure has changed after the modernization process in the country and the small producers got hurt. Those who did not adapt to the new techniques or did not have money to buy them were not able to stay in production. This way, many rural producers were forced to sell their properties to pay for bank loans taken to finance their activities.

On one hand the Green Revolution was positive in the way that it brought efficiency and specialization to the agricultural production. On the other hand it was a disaster for the small producers who did not adapt to the "new model". It also did not bring a solution to the problem defended by the Rockefeller Foundation, which was bring to an end the world hunger; it only showed that there are new technologies for the agricultural activity.

3.1.2. GREEN REVOLUTION CONSEQUENCES FOR BRAZIL

During the military regime in Brazil (it started in 1964), it was discussed which way the country should increase its agricultural production and two alternatives were then considered: the change of the agrarian structure and/or the acquisition of new technological packages (mechanization) by rural producers. The government opted to maintain the existing structure and adopted the Green Revolution model. This decision was strongly criticized by society because it was seen as very conservative.

Initially the most affected regions were the Southeast, South and later on the Center-West. The subsidy to the expansion of the new agricultural frontier occurred through private corporations, but with government support. It was observed that monoculture such as soybean, corn, cotton and rice, had preference because they were exportable. Sugar cane production expanded with subsidies that came from Proálcool Program (Brazilian Ethanol Program) launched in the 1970's to reduce the external monetary dependence due to changes in oil prices in the international market. With this initiative there was an improvement in the sector's productivity; however the environment and society were gravely affected.

The environment was affected due to the genetic erosion, animal and vegetal species disappeared, deforestation, intensive use of pesticides, ecosystem contamination and irrigation difficulty.

For society the greatest consequence was on health due to inadequate manipulation of pesticides causing irreversible diseases. The main problems occurred in the respiratory tract, mental disturbance, renal and hepatic lesions. Social exclusion was also a consequence of the Green Revolution, because its benefits were for a minority, the big producers. The human labor was gradually substituted by machinery which brought about the rural unemployment. This social exclusion caused by the country modernization brought about migration to big cities, especially São Paulo and Rio de Janeiro; these urban centers would receive these emigrants paying for their low labor wages.

The agrarian concentration appeared at this time, where the main part of the assets belonged to large farms. Thus, the land conflict and mobilization for land had started, where the workers fought for the Agrarian Reform. One of these movements with international expression is the Landless Rural Workers Movement called `MST`.

3.1.3. PRESENT TIME GREEN REVOLUTION

The crises brought about by world hunger nowadays, if compared to the ideals of the Green Revolution, could be seen as an opportunity to create conditions and alternatives to bring this problem

to an end such as the adoption of precision farming, the use of biotechnology in the production of seeds, modern production using technology, expansion of the agricultural boundaries and public-private partnerships to help the small and medium producers, who also contributes for the evolution of the agribusiness (Equipe Brasil Escola, 2012).

3.1.4. GOIÁS STATE IN THE NATIONAL CONTEXT - 2008

The state of Goiás is located in the Brazilian Center-west region and occupies an area of 340,087 square kilometers. When compared to the other Brazilian states, it has 3% of the country population and is 7th as far as territorial extension is concerned. It borders the states of Minas Gerais and Mato Grosso do Sul (to the South), Tocantins (to the North), Mato Grosso (to the West) and Minas Gerais and Bahia (to the East).

Goiás has a significant participation in the grain economy. It accounts for 8.52% of national production. The evolution in this sector from 2000 to 2007, when the production of the state of Goiás jumped from 8.7 million metric tons of grain (a national production participation of 9.97%) in 2000 to 11.3 million metric tons in 2007, bringing the state to the 4th place in the national ranking. In the classification by production, the state of Goiás assumed the 1st place in the production of sorghum, 3rd place in the production of cotton, 4th place in the production of soybean, 5th place in the production of beans and corn, 6th place in the production of sugar cane and 7th place in the production of rice.

Table 01: Grain Production, comparing to the states - 2000, 2007 - 2008

| State | 2000 | | | 2007 ¹ | | | Variation (%) 2000 / 2007 | 2008 ¹ |
|---------------------|------------------------|-------------|-----------|------------------------|------------|-----------|------------------------------|-------------------|
| | Grain Production (ton) | Part (%) | Ranking | Grain Production (ton) | Part (%) | Ranking | | |
| Brazil | 87.572.919 | 100 | | 135.462.213 | 100 | | 54,69 | 147.880.852 |
| Centro-Oeste | 25.975.687 | 29,66 | | 44.026.244 | 32,5 | | 69,49 | 50.673.196 |
| Paraná | 16.471.297 | 18,81 | 1º | 29.441.776 | 21,73 | 1º | 78,75 | 31.503.866 |
| Rio Grande do Sul | 15.098.405 | 17,24 | 2º | 24.461.263 | 18,06 | 2º | 62,01 | 22.753.918 |
| Mato Grosso | 12.964.791 | 14,8 | 3º | 23.752.814 | 17,53 | 3º | 83,21 | 28.362.410 |
| Goiás | 8.727.474 | 9,97 | 4º | 11.378.951 | 8,4 | 4º | 30,38 | 13.214.484 |
| Minas Gerais | 8.145.011 | 9,3 | 5º | 10.412.692 | 7,69 | 5º | 27,84 | 11.696.033 |
| Mato Grosso do Sul | 4.006.174 | 4,57 | 8º | 8.405.631 | 6,21 | 6º | 109,82 | 8.615.620 |
| São Paulo | 5.225.961 | 5,97 | 6º | 6.464.928 | 4,77 | 7º | 23,71 | 7.385.121 |
| Santa Catarina | 5.025.534 | 5,74 | 7º | 6.398.742 | 4,72 | 8º | 27,32 | 6.501.038 |
| Bahia | 3.729.048 | 4,26 | 9º | 5.291.864 | 3,91 | 9º | 41,91 | 6.214.073 |
| Maranhão | 1.536.457 | 1,75 | 10º | 2.335.757 | 1,72 | 10º | 52,02 | 2.517.566 |
| Tocantins | 660.120 | 0,75 | 14º | 1.283.232 | 0,95 | 11º | 94,39 | 1.560.965 |
| Pará | 1.021.181 | 1,17 | 13º | 1.159.890 | 0,86 | 12º | 13,58 | 1.188.482 |
| Piauí | 642.458 | 0,73 | 16º | 859.045 | 0,63 | 13º | 33,71 | 1.465.573 |
| Rondônia | 652.438 | 0,75 | 15º | 785.501 | 0,58 | 14º | 20,39 | 916.174 |
| Espírito Santo | 1.182.859 | 1,35 | 11º | 734.005 | 0,54 | 15º | -37,95 | 727.323 |
| Ceará | 1.025.452 | 1,17 | 12º | 577.637 | 0,43 | 16º | -43,67 | 1.144.234 |
| Distrito Federal | 277.247 | 0,32 | 17º | 488.848 | 0,36 | 17º | 76,32 | 523.022 |
| Sergipe | 147.839 | 0,17 | 20º | 314.557 | 0,23 | 18º | 112,77 | 478.264 |
| Pernambuco | 268.008 | 0,31 | 18º | 270.785 | 0,2 | 19º | 1,04 | 383.022 |
| Paraíba | 242.034 | 0,28 | 19º | 147.982 | 0,11 | 20º | -38,86 | 228.506 |
| Roraima | 70.500 | 0,08 | 24º | 139.758 | 0,1 | 21º | 98,24 | 139.258 |
| Acre | 92.737 | 0,11 | 23º | 94.238 | 0,07 | 22º | 1,62 | 64.472 |
| Alagoas | 120.212 | 0,14 | 21º | 83.200 | 0,06 | 23º | -30,79 | 123.602 |
| Rio Grande do Norte | 112.165 | 0,13 | 22º | 71.133 | 0,05 | 24º | -36,58 | 112.596 |
| Rio de Janeiro | 67.631 | 0,08 | 25º | 51.569 | 0,04 | 25º | -23,75 | 48.870 |
| Amazonas | 57.952 | 0,07 | 26º | 51.373 | 0,04 | 26º | -11,35 | 48.554 |
| Amapá | 1.934 | 0,002 | 27º | 5.043 | 0 | 27º | 160,75 | 6.144 |

Source: IBGE. Elaborated by: SEPLAN-GO / SEPIN / Socioeconomic Statistics Manager – 2008 (1) Preliminary data.

The state economy consolidated in the national context due to its agricultural capacity to equilibrate the trade balance, to produce raw material for the agro-industries, to foster job generation, to the existence of fertile soils and also because of subsidies coming from the federal government. According to SEPLAN (2008) the increase in the agricultural output of Goiás was pushed mainly by productivity gains in the cultures of soybean, cotton, corn, sorghum, sugar cane, and bean amongst others.

One of the factors which made the economy of Goiás gain such expression was cattle raising. The agribusiness activity made Goiás one of the biggest Brazilian producers of cattle with herd of 20.4 million units, setting the state to the 4th position in Brazil, representing 10.25% of the national herd. In

Brazil, agriculture usually includes plant and animal production in the same farms. Goiás also occupies the 6th place in production of poultry and 7th position in the production of pork.

Table 02: Effective cattle herd, according to the states - 2000 - 2006 – 2007

| State | 2000 | | | 2006 | | | 2007 | | | Variation (%) 2000 / 2007 |
|---------------------|--------------------|---------------|-----------|--------------------|---------------|-----------|--------------------|---------------|-----------|---------------------------|
| | Bovine (Unit.) | Part (%) | Ranking | Bovine (Unit.) | Part (%) | Ranking | Bovine (Unit.) | Part (%) | Ranking | |
| Brazil | 169.875.524 | 100,00 | | 205.886.244 | 100,00 | | 199.752.014 | 100,00 | | R\$ 17,59 |
| Centro-Oeste | 59.641.301 | 35,11 | | 70.535.922 | 34,26 | | 68.088.112 | 34,09 | | R\$ 14,16 |
| Mato Grosso | 18.924.532 | 11,14 | 3º | 26.064.332 | 12,66 | 1º | 25.683.031 | 12,86 | 1º | R\$ 35,71 |
| Minas Gerais | 19.975.271 | 11,76 | 2º | 22.203.154 | 0,78 | 3º | 22.575.194 | 11,30 | 2º | R\$ 13,02 |
| Mato Grosso do Sul | 22.205.408 | 13,07 | 1º | 23.726.290 | 11,52 | 2º | 21.832.001 | 10,93 | 3º | -R\$ 1,68 |
| Goiás | 18.399.222 | 10,83 | 4º | 20.646.560 | 10,03 | 4º | 20.471.490 | 10,25 | 4º | R\$ 11,26 |
| Pará | 10.271.409 | 6,05 | 7º | 17.501.678 | 8,50 | 5º | 15.353.989 | 7,69 | 5º | R\$ 49,48 |
| Rio Grande do Sul | 13.601.000 | 8,01 | 5º | 13.974.827 | 6,79 | 6º | 13.516.426 | 6,77 | 6º | -R\$ 0,62 |
| São Paulo | 13.091.946 | 7,71 | 6º | 12.790.383 | 6,21 | 7º | 11.790.564 | 5,90 | 7º | -R\$ 9,94 |
| Bahia | 9.556.752 | 5,63 | 9º | 10.764.857 | 5,23 | 9º | 11.385.723 | 5,70 | 8º | R\$ 19,14 |
| Rondônia | 5.664.320 | 3,33 | 11º | 11.484.162 | 5,58 | 8º | 11.007.613 | 5,51 | 9º | R\$ 94,33 |
| Paraná | 9.645.866 | 5,68 | 8º | 9.764.545 | 4,74 | 10º | 9.494.843 | 4,75 | 10º | -R\$ 1,57 |
| Tocantins | 6.142.096 | 3,62 | 10º | 7.760.590 | 3,77 | 11º | 7.395.450 | 3,70 | 11º | R\$ 20,41 |
| Maranhão | 4.093.563 | 2,41 | 12º | 6.613.270 | 3,21 | 12º | 6.609.438 | 3,31 | 12º | R\$ 61,46 |
| Santa Catarina | 3.051.104 | 1,80 | 13º | 3.460.835 | 1,68 | 13º | 3.488.992 | 1,75 | 13º | R\$ 14,35 |
| Ceará | 2.205.954 | 1,30 | 14º | 2.352.589 | 1,14 | 15º | 2.424.290 | 1,21 | 14º | R\$ 9,90 |
| Acre | 1.033.311 | 0,61 | 19º | 2.452.915 | 1,19 | 14º | 2.315.798 | 1,16 | 15º | R\$ 124,11 |
| Pernambuco | 1.515.712 | 0,89 | 18º | 2.095.184 | 1,02 | 18º | 2.219.892 | 1,11 | 16º | R\$ 46,46 |
| Espírito Santo | 1.825.283 | 1,07 | 16º | 2.119.309 | 1,03 | 16º | 2.142.342 | 1,07 | 17º | R\$ 17,37 |
| Rio de Janeiro | 1.959.497 | 1,15 | 15º | 2.095.666 | 1,02 | 17º | 2.078.529 | 1,04 | 18º | R\$ 6,07 |
| Plauí | 1.779.456 | 1,05 | 17º | 1.838.378 | 0,89 | 19º | 1.736.520 | 0,87 | 19º | -R\$ 2,41 |
| Amazonas | 843.254 | 0,50 | 22º | 1.243.358 | 0,60 | 20º | 1.208.652 | 0,61 | 20º | R\$ 43,33 |
| Paraíba | 952.779 | 0,56 | 20º | 1.092.792 | 0,53 | 21º | 1.139.322 | 0,57 | 21º | R\$ 19,58 |
| Alagoas | 778.750 | 0,46 | 24º | 1.029.352 | 0,50 | 23º | 1.112.125 | 0,56 | 22º | R\$ 42,81 |
| Sergipe | 879.730 | 0,52 | 21º | 1.067.508 | 0,52 | 22º | 1.073.692 | 0,54 | 23º | R\$ 22,05 |
| Rio Grande do Norte | 803.948 | 0,47 | 23º | 1.027.289 | 0,50 | 24º | 1.010.238 | 0,51 | 24º | R\$ 25,66 |
| Roraima | 480.400 | 0,28 | 25º | 508.600 | 0,25 | 25º | 481.100 | 0,24 | 25º | R\$ 0,15 |
| Amapá | 82.822 | 0,05 | 27º | 109.081 | 0,05 | 26º | 103.170 | 0,05 | 26º | R\$ 24,57 |
| Distrito Federal | 112.139 | 0,07 | 26º | 98.740 | 0,05 | 27º | 101.590 | 0,05 | 27º | -R\$ 9,41 |

Source: IBGE. Elaborated by: SEPLAN-GO / SEPIN / Socioeconomic Statistics Manager – 2008 (1) Preliminary data.

The agro-industrial production of the state of Goiás stood out, getting to the 4th place in the national ranking in the ethanol production and the 6th place in the sugar cane production. Those results made the state go up two positions in the national ranking, once in the year 2000 it was in the 6th place. The good performance showed by the state is due to the government support through fiscal incentives, interest rate reduction, support to small producer, fomented the growth and development of this sector. The investment attraction has made possible the expansion of the industrial sector, generating more jobs (from 108 thousands in the year 2000 to 173 thousands in the year 2008) and also an increase in the average income. The sectors which generate more jobs are: services (535 thousand workers); commerce (with more than 183 thousand workers); agriculture and cattle raising (63 thousand workers); and civil construction (36 thousand workers).

Goiás stays with a positive result in the international trade, ranking nationally in the 11th position in exportations. Goiás foreign trade had its growth starting on the year 2000. From the total amount exported agricultural commodities sum up to 74% of the total. One should also highlight ferroalloys, meat, minerals and the soybean complex. The good performance of the trade balance in Goiás is due to the fiscal and tributary policies by the state government and the private sector that invested in the business and had a solid and efficient growth. The purchase of these products is done mainly by France, Iran, Russia, Paraguay, India, China and The Netherlands. Goiás buys mainly from Germany, China, Canada, Belarus, Switzerland, United States of America, South Korea, Thailand and Japan.

In 2006 the GDP of Goiás at current market price had a performance (growth) of 3.12% and reached the sum of R\$ 57 billion, surpassing the year of 2003, when it summed up to R\$ 43 billion. These figures put Goiás in the 9th place in the national ranking; Goiás participates with 2.41% in the Brazilian GDP.

The per capita GDP in Goiás also had a better performance. It went from R\$ 7,937 in 2003, to R\$ 9,962 in 2006. It represents 78.51% of the national per capita GDP, which is R\$ 12,688. It is important to highlight that the average growth of the state population was 2.04% from 2002 to 2006. Goiás showed the highest migratory rate in the country; in the same period Brazil grew 1.44% (SEPLAN, 2012).

Table 03: Per capita GDP, according to the states - 2003 - 2006

| State | 2003 | | 2006 | |
|---------------------|-----------------------------|------------|-----------------------------|------------|
| | GPD <i>per capita</i> (R\$) | Ranking | GPD <i>per capita</i> (R\$) | Ranking |
| Brazil | 9.498 | | 12.688 | |
| Centro-Oeste | 12.228 | | 15.551 | |
| Distrito Federal | 28.282 | 1º | 37.600 | 1º |
| São Paulo | 14.788 | 2º | 19.548 | 2º |
| Rio de Janeiro | 12.514 | 3º | 17.695 | 3º |
| Santa Catarina | 11.764 | 4º | 15.638 | 4º |
| Espírito Santo | 9.425 | 8º | 15.236 | 5º |
| Rio Grande do Sul | 11.742 | 5º | 14.310 | 6º |
| Paraná | 10.935 | 6º | 13.158 | 7º |
| Mato Grosso | 10.347 | 7º | 12.350 | 8º |
| Amazonas | 8.100 | 10º | 11.829 | 9º |
| Minas Gerais | 7.937 | 11º | 11.028 | 10º |
| Mato Grosso do Sul | 8.772 | 9º | 10.599 | 11º |
| Goíás | 7.937 | 11º | 9.962 | 12º |
| Roraima | 7.455 | 13º | 9.075 | 13º |
| Amapá | 6.220 | 15º | 8.543 | 14º |
| Rondônia | 6.594 | 14º | 8.391 | 15º |
| Sergipe | 5.718 | 17º | 7.560 | 16º |
| Tocantins | 5.784 | 16º | 7.210 | 17º |
| Acre | 5.278 | 18º | 7.041 | 18º |
| Bahia | 5.031 | 19º | 6.922 | 19º |
| Rio Grande do Norte | 4.626 | 21º | 6.754 | 20º |
| Pernambuco | 4.774 | 20º | 6.528 | 21º |
| Pará | 4.448 | 22º | 6.241 | 22º |
| Ceará | 4.145 | 23º | 5.636 | 23º |
| Paraíba | 3.998 | 24º | 5.507 | 24º |
| Alagoas | 3.805 | 25º | 5.164 | 25º |
| Maranhão | 3.112 | 26º | 4.628 | 26º |
| Piauí | 2.978 | 27º | 4.213 | 27º |

Source: IBGE. Elaborated by: SEPLAN-GO / SEPIN / Socioeconomic Statistics Manager – 2008 (1) Preliminary data.

3.2. GOIÁS STATE DIAMOND

3.2.1. FACTOR CONDITIONS

Cerrado, a tropical savanna ecoregion of Brazil, has some disadvantage such as tropical climate and a weak soil in terms of nutrients. However, Embrapa (Brazilian Agricultural Research Corporation) has solved most of them through research. Notwithstanding, Cerrado has the advantage of a sufficient quantity of rain and does not need to use irrigation during the harvest period (The Economist, August 26, 2010).

At the state of Goiás, the passenger transportation as well as goods transportation is done by road based systems. In a study published in 2002 by the extinct Brazilian Company of Transportation and Planning (GEIPOT), the main problems of roads in Goiás are: the roads in their natural bed, not only in the state, municipal as well as federal network. Added to this, the federal road network since the year of the study up to now is in precarious situation. Goiás needs investment in its road network as well as recovery of the existing roads. Today the highest cost of production is exactly with logistics and transportation.

According to GEIPOT's prevision (in 2002), the river based transport should constitute in a modal of great importance in the state of Goiás for delivery of its production, mainly grains. In some areas river transportation is a reality. In the city of São Simão (Southern Goiás) there is a private port terminal in Paranaíba River where grains produced in Southwest Goiás are loaded. Through the rivers Paraná and Tiete grains are transported along the state of São Paulo for industrialization and / or export through the Port of Santos. The river transport is also used for bringing in inputs. All the way along Araguaia River there is high potential for goods transportation, mainly grain, due to its influence area.

Currently Goiás has an area, south of the Federal District (Brasília) and West of Goiânia which is supplied by train. Centro-Atlântica Railway which has connection with the ports of the state of Espírito Santo (Ports of Vitória and Tubarão) and the port of Sepetiba, in the state of Rio de Janeiro, going also to the port of Santos in the state of São Paulo; to get there, it is necessary to use the railways of the state of São Paulo. The loads commonly transported in this railway are soybean bran, petroleum derivatives, cement among others.

In the airway transport, the Southwest region (city of Rio Verde) has a local airport, with a paved runway of 1,500 meters long by 30 meters wide (with plans to enlarge it). It has night flights and passenger terminal with lines for Brasília and Goiânia (GEIPOT, 2012).

The state of Goiás is considered the heart of Brazil, it also has a dry port, with a customs station, and is strategically located in the city of Anápolis where a multimodal platform is been constructed which will speed up transportation of goods from/to Goiás state.

The customs station got the title of Customs at the end of the 1990's, giving to the Center-West region a very important logistic alternative strategically located; nowadays the customs station has a fundamental function and action in the development of the state of Goiás and all the Center-West, connecting the region with the global market.

The Porto Seco Centro Oeste S/A (2012), as it was registered and constituted by local entrepreneurs who won the public tender to deliver the custom services, thus becoming a public use customs terminal, with a modern structure offering all necessary means for export, storage and goods

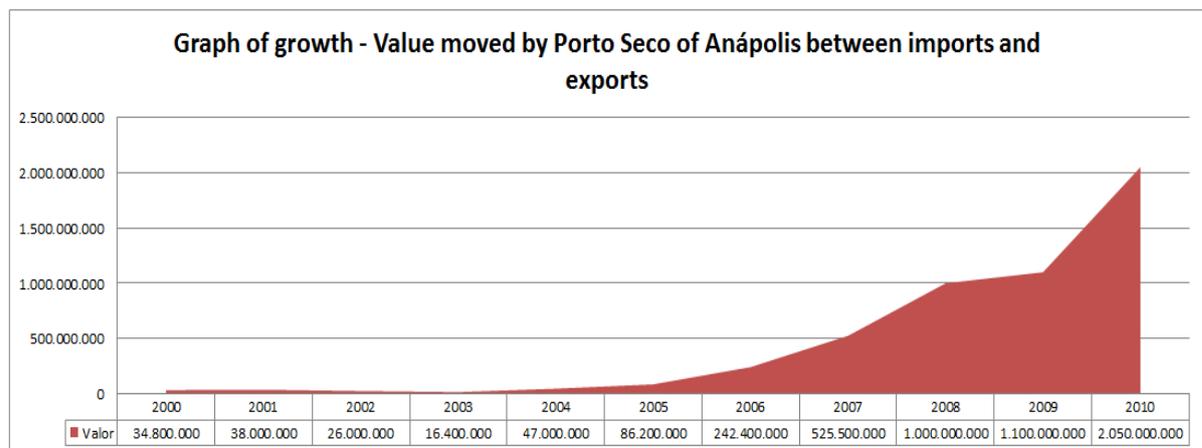
movement also for those coming from overseas; it has been used to make foreign trade movement easier.

The Porto Seco Centro Oeste has conquered prominence position amongst the companies of the same segment in the interior of Brazil, mainly due to its privileged location. It is strategically located at what is known as the "Brazilian Clover" at the town of Anápolis – Goiás state. The town is located next to the big economic centers of the country with easy access through roads, rail and air, which means a remarkable cost reduction in the transport of goods for the local and international markets, bringing more clients and users to the region. This privileged location for delivering the most diverse types of goods make the city of Anápolis and its Dry Port, a direct link to all productive markets of the Center-west and many logistic points all over the country, that is why Anápolis has won the title of "Brazilian Clover".

The user of the Dry Port find in a single place all means to make it easier to deliver and or receive imported goods, because besides the logistic and storage structure, one will also find the customs services necessary: Brazilian Federal Revenue, Ministry of Health, Federal Sanitary Agency, Ministry of Agriculture, Livestock and Food Supply. The Dry Port is the private company with the highest investment in logistics in Center-West, attracting many companies to the region.

According to the Dry Port site, in 2007 more than USD 520 million in goods went through the Dry Port terminals which corresponded to 22,000 metric tons of goods per month; this volume represents 40% of the Brazilian goods transported by the Express Train Railway Centro-Atlântica (Porto Seco Centro Oeste S/A, 2012).

Picture 02: Import and export growth in Anápolis - Dry Port



Growth of 8850% in the last 10 years

Source: Porto Seco Centro Oeste S/A (2012)

Considered as the "Foreign Trade Corridor", the Dry Port Center-west aggregates competitiveness to the industries in the region with a modern infrastructure and offers a different portfolio of services. In 2000 it was launched by the government a project along with the private companies; this project is still being implemented. It will make it possible the cargo transport in the state and will set Anápolis as one of the main distribution centers in the country, and the Dry Port became anchor in this government project. The project is a Multimodal Logistic Platform. This platform will give a rapid access to all Brazilian Ports in a fast and economic way. The project foresees a specialized pole of services (Dry Port), and airway terminals administration, since the project counts with an international cargo transportation terminal, road cargo terminal and a railway cargo terminal; this project is budgeted in R\$ 250 million (SEPLAN, 2012).

Picture 03: Goiás Transport Logistics



Source: (IMB – Instituto Mauro Borges)

According to a study done by IMB (2012) in 2010 the soybean planted area in the state of Goiás reached 4.5 million hectares, which means a growth of 1.5% in the agricultural production when compared to the year 2009; this growth has been benefited by the weather in the year 2010, which was very favorable to soybean. The production increase was influenced by the use of new technologies, soil studies in the area to be planted more investment by the farmers and their partnership with EMBRAPA and private companies.

The Economic Active Population in the state of Goiás is composed of 3.3 million workers and 15.65% of the total had been in the agricultural activity (IMB, 2012).

As in almost all agricultural countries in the world, Brazil is divided between producers with huge and productive plantations and those who have smaller areas and sometimes are less efficient. In the state of Goiás it is not different. The small producers work as the local employee for sub employment, but the bigger modern enterprises are much more productive.

The Farming and Cattle Raising cense of 2006, done by IBGE registered 12.3 million workers linked to the family farming (74% of the workers). The professional rural companies occupied 4.2 million workers, which represents 25.6% of the employed workers (IBGE, 2102). The last comparative study between the family production and the big producers show clearly this difference.

Table 04: Familiar versus non familiar Agriculture – Goiás, 2006.

| Selected variables | Family farming | Large scale commercial farming |
|---------------------------------|----------------|--------------------------------|
| Number of farms | 919 | 3,643 |
| Production amount (metric tons) | 138,571 | 5,375,701 |
| Average yield (tons/hectare) | 2.69 | 2.71 |
| Harvested area (hectares) | 51,607 | 1,985,960 |
| Value of output (R\$) | 56,034,957 | 2,305,693,953 |

Source: IBGE / Agricultural Census of 2006

The farmer worker in Goiás has gone through professionalization, helping lever the state agricultural production and new technologies. The illiteracy rate for people of 10 years old or more has felt from 10.8% in 2000 to 7.3% in 2010, according to IBGE data, reflecting a good increase in the level of education. Statistical studies also show an increase in the higher education, where, according to IBGE, the data shows an increase in the number of colleges and universities from the year 2000 to 2010 an increase from 35 units to 80 units (in the state of Goiás), and the number of enrolled students from 27,769 to 173,003 in the same period (IBGE, 2012).

Due to its location and its proximity to the Federal District, in Goiás the students have an easy access to professional qualification; it is easy and disposable for practically all areas in the agribusiness. The Federal University of Goiás (UFG) has its main campus in Goiânia and a campus in

the cities of Jataí, which is located in the Southwest of Goiás, and in Catalão, located in the south of the state; from UFG graduates annually an average of 350 students in Agronomy (UFG website, 2012).

In the city of Rio Verde, another town located in the Southwest of Goiás, it is located the Rio Verde University FESURV, a higher education institution offering several subjects trying to supply the demand of qualified workers in the region. FESURV offers subjects in Business Administration, Biology, Agronomy, Economics, Animal Production, Mathematics, Accounting, Law and Computer Science, qualifying local and state workers (FESURV website, 2012).

The government participates indirectly in the agriculture; however, the resources and development are mainly from the private investors. The government investment in agriculture is not much, mainly when one speaks of research and development in the field, what brings better technology for the producers and consequently an income increase.

The Brazilian government should take as priority infrastructure investment, since it is through betterment in infrastructure that the country will reduce losses in production, lower the commercialization costs and generate income, what is fundamental to create incentives for people to stay in rural areas.

Brazil and Goiás need a strategic production development plan, with an integrated and continuous public policy. Policies should not change at every government election. The ministries need to talk, plan and give continuity to what has been planned. Financing has to be ready at the right time. Also the roads, integrated logistics, the storehouses need to be built, the ports enlarged and bettered. Goiás and Brazil have had disperse policies and that has cost us very high.

3.2.2. RELATED & SUPPORTING INDUSTRIES

Since the government participation in the agribusiness is small, in the state of Goiás, agricultural cooperatives were setup to support the growth of the agribusiness and the agricultural cluster in the state. COMIGO, one of the many existing cooperatives in the state has been getting prominence in the state and in the Southwest region, due to the work it has been developing and the benefits it has been giving to the agriculture in Goiás. It was funded in the city of Rio Verde, Southwest of Goiás in 1975, by a group of 50 rural producers. Initially the objective was to attend the storage demand for rice and corn, the main products in the region in the 1970's, and also to supply basic agricultural inputs such as fertilizers, packaging material, seeds among others.

Currently COMIGO cooperative has 4,500 members and 1,600 employees and is classified as one of the six biggest cooperatives of the country; it is the first one in the Center-west. In this scene, the technological center has a special role. It has actually 800 researches going on, some of them along

with big companies of the supply sector as well as universities and research centers. COMIGO cooperative participates directly in research in the region. Since the 1980's it was one of the responsible for the elaboration and implementation of an income generation program (the Programa Renda Real, 1997 to 1999), the National Agricultural Forum (FNA), and it was during this time that it signed a partnership with Embrapa and Rio Verde University (FESURV) amongst other research institutions. The income generation program brought together several institutions like official banks (Banco do Brasil), farmer associations at local and state level and local governments of Rio Verde and Montividiu municipalities (COMIGO, 2012).

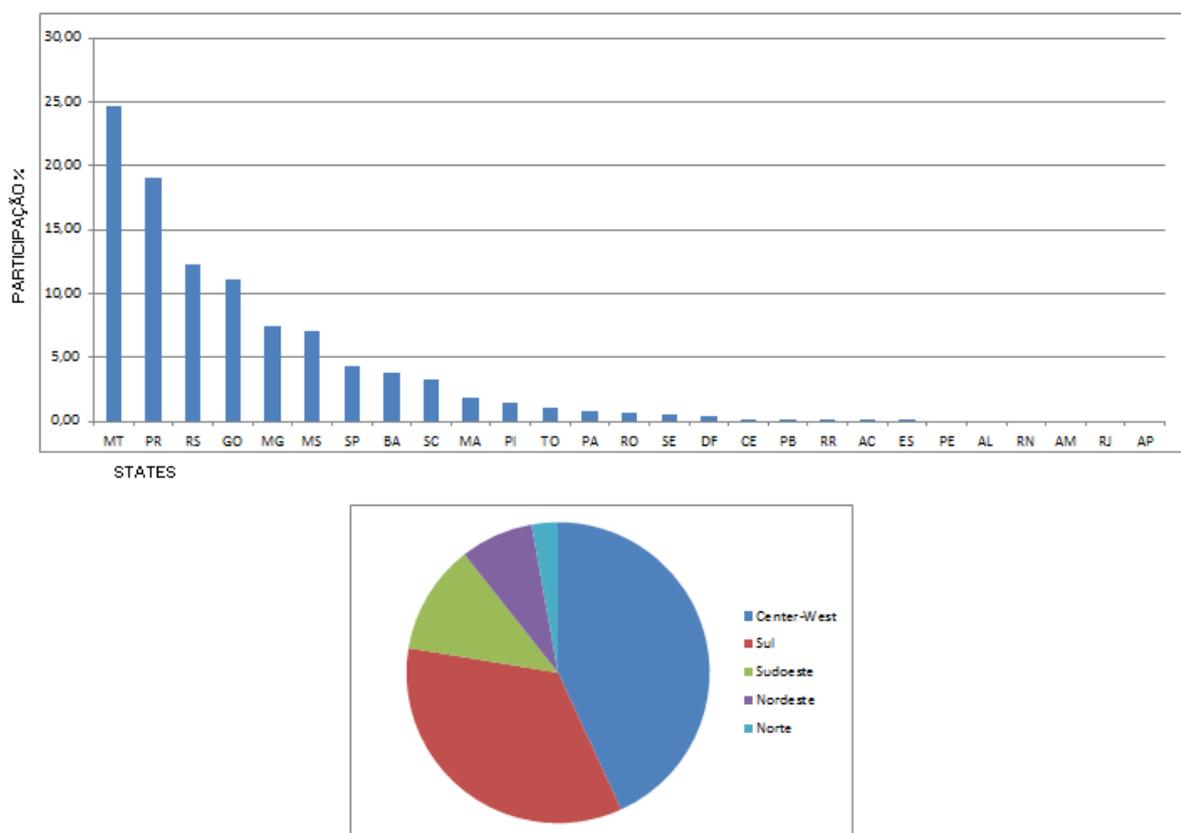
3.2.3. DEMAND CONDITIONS

Since 2011 Goiás occupies the 4th place in the national production of soybean. It is behind the states of Mato Grosso (also in the Center-West), Paraná and Rio Grande do Sul, respectively. The state supplies the internal demand and yet is able to supply part of the demand of other states and still has part of the production for export. Today's biggest client for Goiás' soybean is China.

For three consecutive years (2008-2010) China was the main importer of soybean from Goiás, totaling USD 707 million which corresponds to 17.5% of the total soybean export by Goiás. Following came Holland with USD 476 million (11.8%), India with USD 311 million (6.5%), United Kingdom USD 205 million (5.1%), Iran USD 188 million (4.7%), Saudi Arabia USD 103 million (2.5%), Thailand USD 99 million (2.4%). According to SEPLAN (2012) and IMB (2012) in 2010 Goiás did business with 157 different countries.

How to explain the productive capacity and the expansion of the fertile land in the Cerrado from Goiás? "In five years, the production increased almost 50%, while the planted area grew 22%. This is productivity and it was driven by soybean", said José Mário Schreiner, president of state level farmers association FAEG (The Reuters Brasil, 2012)

Picture 04: Product participation: cereal, leguminous and oilseeds, in the Brazilian Regions and States of the Federation (September 2012)



Source: IBGE (2012)

The best results in soybean production also have support to the producer through rural credit given by the financial institutions (Agronegócio Goiano Site, 2012). The rural producer need to keep his feet on the ground, planning and acting with caution in relation to his/hers production, even when it is necessary to take risk. Planting depends on the climate and it requires much attention. The Cerrado is not the best type of soil and does not have the ideal climate for soybean growth; the soil and the plant were adapted so it could develop well.

In the United States of America, for instance, the producer has huge support from the government. Even when the USA is going through its worst drought, the producers are not alone; they have more government support and will suffer less. Otherwise, in Brazil and in Goiás, the producer does not count with this type of government support. For this reason the producers in Brazil prepare themselves far ahead, planning and following a specific agricultural calendar; doing so, they reduce the chance of losing money and yet can keep the internal demand. In Goiás, this work is done among the producers and rural cooperatives and financing agricultural institutions raises the growth of each harvest, going up in internal and external production rank. Goiás is becoming more representative in

the national production, and consequently, the country is getting more space in the international market.

3.2.4. FIRM STRATEGY, STRUCTURE AND RIVALRY

Goiás has been in an outstanding place in the industrialization process from the 1960's until the 1980's, and has been showing a positive dynamic development, becoming a major player in the production and export of agribusiness. Actually the state is moving into the globalization process of the world economy, constantly diversifying and intensifying its commercial relations with big players in the world's commodities business.

Goiás has had a good performance because it has a dynamic agribusiness and it has been consolidating in the last decades, diversifying its agricultural production, increased the cultivation area, thus notably increasing the production in the state and the country. In the trade balance there was an increase in the sales of the soybean complex, minerals and meat. In job generation Goiás was the first one in the country. The state also supplies other states of the nation; its expansion shows the favorable economic time for agriculture.

In 2009 the per capita GBP got to R\$ 14,447, according to IBGE. Goiás moved from the 12th position in 2008 to the 11th position in 2009. This move in the scale is important for the state, because it is reference to show the state and municipality economic development. In the last three years Goiás has improved the standard of living of the state population in terms of income and education.

Table 05: State of Goiás, Center-west and Brazil: GDP total and per capita at current market prices, 2005 – 2009.

| Where? | GDP at current prices (billion R\$) | | | | | GDP per capita (thousand R\$) | | | | |
|-------------|-------------------------------------|---------|---------|---------|---------|-------------------------------|-------|-------|-------|-------|
| | 2005 | 2006 | 2007 | 2008 | 2009 | 2005 | 2006 | 2007 | 2008 | 2009 |
| Goiás | 50.5 | 57.1 | 65.2 | 75.3 | 85,6 | 8.99 | 9.96 | 11.55 | 12.88 | 14.45 |
| Center-West | 190.2 | 206,3 | 236.0 | 279,0 | 310.8 | 14.61 | 15.55 | 17.84 | 20.40 | 22.36 |
| Brazil | 2,147.2 | 2,369.5 | 2,661.2 | 3,032.2 | 3,239.4 | 11.66 | 12.69 | 14.46 | 15.99 | 16.92 |

Source: SEGPLAN-GO / SEPIN / Gerência de Contas Regionais – Regional Account Manager. Elaborated by: SEGPLAN - GO / SEPIN / Socio Economic Statistics Manager – 2011.

Goiás has many sources of investment for agriculture; it gives the state some prominence. Goiás is the state with the highest volume of new investment. The National Development Bank BNDES showed a growth of 281% in five years (2006 to 2010). The investments from the special regional development fund FCO, only in 2010, reached R\$ 1.6 million. Out of this, 29% has been invested in Goiás state, generating an average of 55,000 direct and indirect jobs. The state government of Goiás also has specific programs to foster industrial development based on tax policy, attracting investors to the state, focusing on processing agricultural products.

4. THE AGROINDUSTRIAL CLUSTER OF GOIÁS SOUTHWEST REGION

4.1. HISTORICAL CONTEXT

The micro region located in the Southwest part of Goiás is constituted by the municipalities with characteristics similar or complementary, showing specific factors and conditions for the development of the agricultural sector, and consequently, the consolidation of the agro industrialization process.

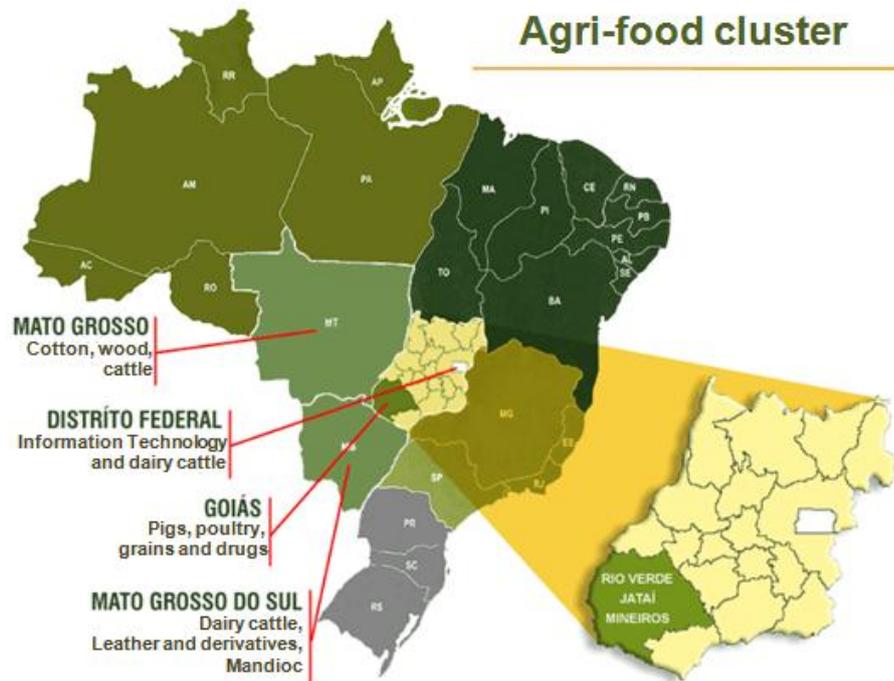
Southwest region of Goiás is a micro region of the state of Goiás with an agro-industrial economy based in the productive arrangement of grain, poultry and pork. It comprehends 18 municipalities, with a population of 344,377 inhabitants and within the municipalities with the highest population are Rio Verde, Jataí, Mineiros and Santa Helena de Goiás. Starting in 1980, soybean and corn became the major agricultural products of the region, having a surplus to export. The development of poultry and pork production is also a reality in the region (Paiva, 2004).

The history of growth and development of the agribusiness and the consolidation of the agricultural cluster in the Southwest region of Goiás was based on the agro-industrialization of the productive chains of poultry and pork. In this context the following cities are prominent: Rio Verde, Jataí, Mineiros, Montividiu, Chapadão do Céu and Acreúna; these municipalities became outstanding producers and articulated the sustainability conditions in the productivity chain.

In this universe of regions, one can observe strongly the policy of agricultural cluster formation in the municipality of Rio Verde, which consolidated this process in two distinct periods. In 1983 with the installation of a soybean crushing unit constituted by COMIGO cooperative, and in 1984 with the setup of a soybean oil refinery also by the same cooperative. With these investments the soybean chain was consolidated in the region.

Running away from the exhaustion of the agricultural frontier in the south of the Brazil, in the second part of the 1990's, Perdigão (today BRF Foods) setup a productive complex in the municipality of Rio Verde, where this firm was originally founded. The coming of Perdigão to Rio Verde was of great importance to the town, since it made possible the production of corn as well as its industrialization. At the same time it constituted the production chain of poultry and pork, which also improved the production of soybean and corn, the basis of the food chain for the above mentioned livestock.

Picture 05: Brazil Map detaching the Southwest region of Goiás



Source: SEPLAN/Maps – adapted by the authors of the case

At that time the growth of agriculture became a reality and this industry started conquering the market space once occupied by the cattle raising. There were many aspects to justify the growth of the agriculture in the region; the climate, the soil, the geographical position of the municipality within the state, the high technological density and many other aspects that in a direct or indirect form were very important to support this growth.

The agrarian sector, the private and public companies had distinct and important roles in this process, through "regional incentive and developing support by government programs and the private sector necessity for competitive advantages, such as strategic location factors and natural resources availability and raw materials, deriving from globalization" (Alves & Abreu, 2004:2).

The locational advantage of Rio Verde municipality makes it different from the others which are not privileged. Its territory size is expressive, it is endowed with high technological density such as tractors, agricultural equipment, auto parts, modern laboratories, health facilities, IT, electronic material and R&D centers (Alves & Abreu, 2004). These facilities contributed to attraction and setup of new development centers mainly in the countryside agribusiness.

Among the advantages of the Center-West region described by Falcão & Medeiros (2001) it comes out: a) infrastructure, made of a flat or slightly waved surface, making it easier to maintain the roads, allowing the traffic of heavy trucks and government program to extend the electrical power grid

to rural areas; b) favorable climate, at an altitude of 800 meters above sea level, low variation of temperature and a defined rainfall regime; and c) environment and agrarian structure, with sanitary advantage due to the absence of similar activities of big size, availability of rivers and large agricultural areas to distribute the manure generated by livestock production.

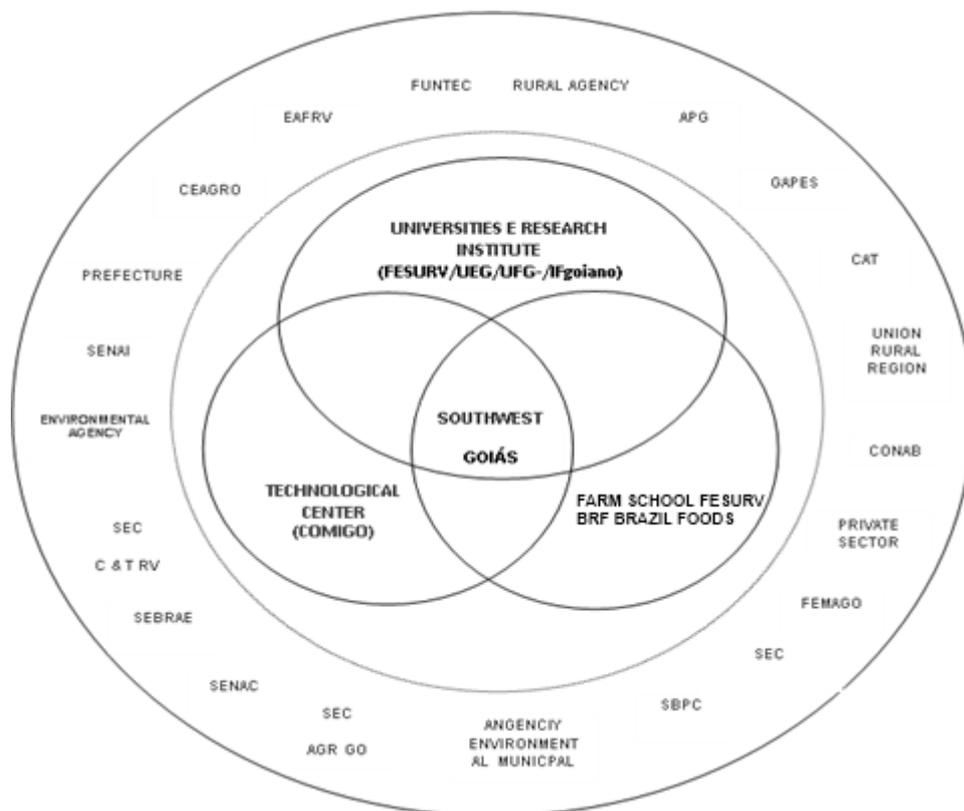
4.2. CLUSTER DIAMOND MODEL

4.2.1. FACTOR CONDITIONS

In Goiás' Southwest region, the factor conditions are predominant to guarantee the sustainability of the agroindustrial cluster, since this sector is dependent of all aggregated sectors distributed between the organizational and institutional environment present in the region. The state government played an important role in the development process and growth of the production chain. The state government also benefited from the cluster development.

Considering the municipality of Rio Verde, as a development pole and strengthening the agricultural cluster in the region, picture 6 presents the organizational and institutional structure, created and consolidated through the participation of different public and private institutions that in common agreement guarantees the functioning of the regional cluster.

Picture 06: Agribusiness Excellence Center in Goiás' Southwest region. Created by Prof. José Marcelo de Abreu, 2005.



All institutions mentioned in picture 06, have their particularities and correlated importance to guarantee the local cluster dynamics. The dynamics of the complex production chain has been strengthened by individual and group action. This generated benefits and facilitated the development of the region as a whole. Even though the condition and institutional factors being present in the municipality of Rio Verde, it is easy to see that the micro region of Southwest Goiás is benefited by the policies and models developed in the region; it facilitates the expansion of the productive chain to other localities consolidating the strategic methodology of development, through the creation of local and regional clusters.

The region is a strong grain producer in the State of Goiás, characterized by strong infrastructure through the diversity of financing agencies which facilitates and at the same time guarantees the access to credit as well as to government benefits. Currently in the region there are branches of several banks and supporting institutions.

For the human factor, there are many public and private educational institutions acting from high school level, professional (technical), graduate and postgraduate level degrees (MSc and PhD). These educational institutions provide skilled labor, which represented an important limiting factor at the beginning of the cluster. On the other hand, it is an important competitive factor when compared with other regions of the country.

According to Brum & Wedekin (2002), the competitive advantage is measurable by the greater productivity of the production factors and the competitiveness is a determinant factor for the success of a cluster. This represents an appropriated concept for the productive chain of grain, poultry and pork.

The factors land and technology put the region in an important position in the national scene. In farm land the production is diversified thanks to the quite flat relief, which facilitates mechanization of larger areas of grain like soybeans and corn. Those crops require large scale production in order to keep costs low and thus ensure sustainable supply of grain to pork and poultry chains.

Technology is a fundamental factor to guarantee the competitiveness and dynamics of the cluster. Several companies provide inputs like seeds, fertilizers, pesticides, machinery, and equipment representatives available in the cluster. Additionally, there are R&D institutions which develop products and support services to the local productive chains. These institutions also provide knowledge and technologies through working day in the field, technological fairs, cattle raising and agribusiness discussion in events such as seminars, congresses, forums etc.

4.2.2. DEMAND CONDITIONS

In the demand conditions, once more it is perceptible the presence and participation of the government in the federal, state and local levels. Besides providing development of public policies, fiscal and monetary incentives, these public institutions organize themselves in a way to create conditions of support for the attraction of new investors to the region,. Additionally, they create industrial districts for small and medium enterprises. Those small emerging companies supply specific products and services to the regional cluster.

4.2.3. RELATED AND SUPPORTING INDUSTRIES

The agro-industrial activity is in the root of the development process and strongly contributes to generate income, job, goods for export and development of the countryside. The state of Goiás and the Southwest region and more specifically the municipality of Rio Verde have shown economic figures which indicate a significant increase in the productive activities. In the agro-industrial area four industrial districts were created, two of them belonging to the municipality and two pertaining to the state. In these four districts there are 534 industries installed, 1,556 services companies, 1,426 companies linked directly to the agribusiness and 2,814 commercial stores (IBGE, 2010).

These districts guarantee the option for clustering companies, once they were developed with the objective of offering products and services to bigger companies. The bigger companies need a large quantity of products and services related to the agroindustrial production. Thus, in these districts the companies are setup in an organized form to offer from inputs to administration and planning software.

4.2.4. STRATEGY, STRUCTURE AND RIVALRY AMONG THE COMPANIES

The agroindustrial cluster of Southwest Goiás, in its strategic condition and structure for investment attraction counts with an important government participation in the reduction of the taxes once it makes the fiscal policy as an attraction factor as described in table 6. This model of policies summed to federal financing program conducted by representative public finance institutions, has earned emphasis and at the same time consolidated a financial structure sufficient to constitute the companies conglomerate present at the cluster.

Table 06: Agribusiness products with reduction of sale taxes

| Sector | Domestic Tax Burden | Interstate operations |
|---------------------|----------------------------------|------------------------------|
| Meat ^{1,2} | 3% | 3% |
| Milk | 10% | 9% |
| Cotton | 4.25% to 8.5% | 3% to 6% |
| Rice | Exemption (Producer to industry) | 7% |
| Soya | Exemption (Producer to industry) | 7% (Oil and Offal) |
| Corn ³ | Exempt domestic shipping | - |
| Leather | Total exemption | - |
| Animals | Exemption in internal operations | - |

Source: SEFAZ/2010

⁽¹⁾ Cattle, buffalo, pork, poultry and fishes

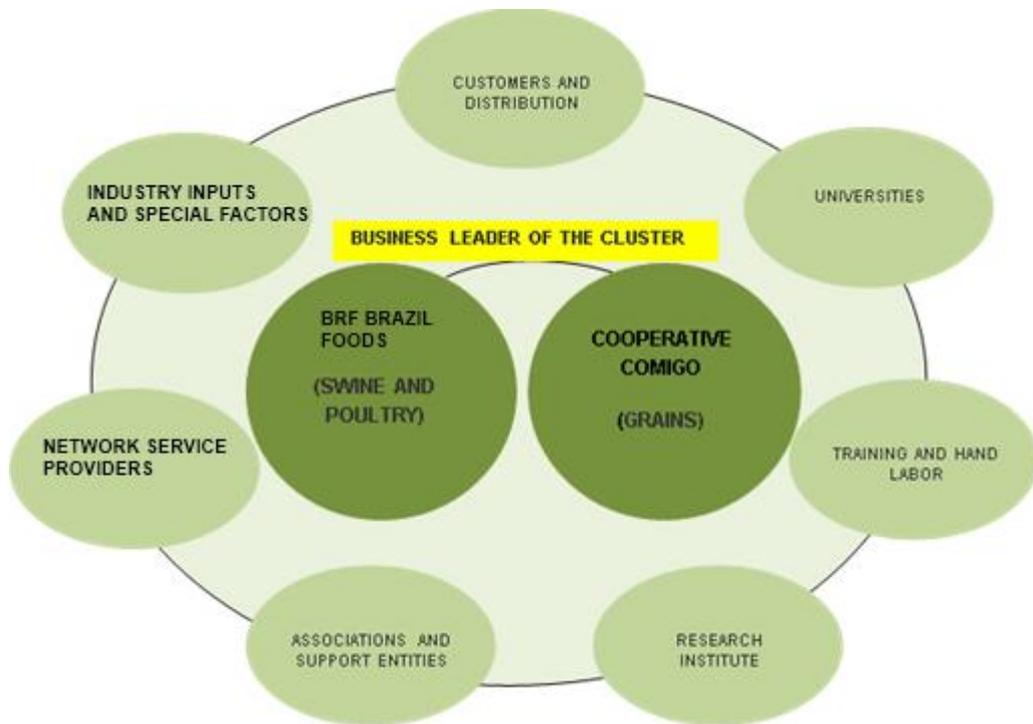
⁽²⁾ The benefit giving to fish meat is only valid for internal circulation

⁽³⁾ It includes wheat, sun flower and sugar cane

Support companies in diverse sectors have used the strategy of getting fiscal, financial and structural benefits offered by the public sector. The sectors rivalry is understood as beneficial, since the great part of the productive agents identified within the cluster have the same opportunities of access to the benefits. The positive competition created pressures the agents to look for improvement in their products and services benefiting every link of the productive chain as well as the final consumer who has access to products of high quality and competitive price.

The constitution of associations, organized groups and class representatives is another characteristic of the region. This contributes to strategic actions in distinct areas strengthening the entrepreneurs and at the same time professionalizing the offer of service and products. Among the actions one can observe the organization of business fairs, forum, commercial interchange and delivery to the international market, enlarging the local and regional market borders, thus giving greater competitiveness to the implanted cluster.

Picture 08: Center-west of Goiás Agroindustrial Cluster Analysis Source: RCW Consultores, adapted by the authors of the case.



4.3. CLUSTER CHALLENGES IN THE AGROINDUSTRIAL SECTOR

There are many challenges to be faced to guarantee betterment and efficiency in the regional cluster, due to the speed with which the basic conditions of the region were structured. Some factor and demand conditions became the main bottleneck of the sector, that is, natural resources, infrastructure, technological capacity, services and entrepreneurship capacity.

- **Natural Resources:** the awareness of the population regarding environmental preservation is low. There are signs of vulnerability in the environment showing erosion in some regions. One also observes pollution in streams and rivers, also deforestation in riverheads. The rivers, in some regions, are silt up.

- **Infrastructure:** the roads, in their majority, are very poorly maintained. Vicinal roads are not paved, and very weary during the rainy season, contributing to increase costs for their users and government. The region will soon be contemplated with the railroad Ferro Norte which may facilitate the logistics and at the same time reduce the weariness of the roads. The storage sector shows deficiency in their operational process, mainly because it has to move the products around many times, which causes losses and damage to the products. It is necessary to revise the legislation which

regulates the storage activity. The farms have low storage capacity weakening their position within the cluster. The big warehouses do not have agility in the reception of the agricultural products; they cannot stay in the farms because they do not have storage capacity, thus the time between harvest and freight and the delivery to the warehouses and for unloading reduces the quality of part of the produced grain. The electrical power supply in rural areas is insufficient for the actual demand. Many producers cannot store their production in their own property because there is not enough electricity to supply their necessity. The region also suffers because of the low quality of the electric energy supplied, once the constant blackouts are harmful to the industrial plants in the regional cluster.

- **Technological Capacity:** the investment in technological capacity and R&D is still insufficient for the real necessities of the cluster. The research lines are scattered, needing a better concentration to guarantee faster results within the established priorities set by the region interested community.

- **Services:** In the regional cluster there are constant shortages of parts for machinery and cattle raising and farming equipment. Sometimes there are shortages of inputs, once the supplying companies' stocks are low. There is also a need for laboratories to help producers in soil and product analysis, mainly meat and grain.

- **Entrepreneurship Capacity:** It is not observed in the region a research and development effort directed to the industry, storage or transport areas, which are the three fundamental points. And the main local companies are branches of big companies from other states or from international groups, which train their personnel or invest in new technologies used in other units.

4.3.1. TODAY'S APPROACH TO FACE THESE CHALLENGES

It is very important to understand the promoted activities to the development of the region. They have as their bases the local furnishing and also a guaranteed market. It is necessary to have high quality in the final product and competitive prices. The first premise is assured due to the proximity to the raw material suppliers and by the presence of high quantity of superior level technicians, some of them with master's degree or even with doctorate degree. However, none of the industrial companies are moving to the region thinking only in the local market, since in the majority of the cases it is not sufficient.

In the region one can see actions based in three main goals, which should be reached and had as a sustainable bases to overcome the Agro Industrial Cluster challenges:

- Substantial increase in productivity;

- Increase in employment and growth of the social well being, with the access of the population to the citizenship consumption (food, clothing, health, housing, transport and leisure).
- Preservation of natural resources, amplifying the surrounding resources of the region.

This way it is possible to verify the strengthening of three big areas, with the strategic power of multiplying results, this equation and entrepreneurship touches the local necessities for a more efficient development of the region:

- Productive activity diversification
- Expansion and improvement of the economic and social infrastructure
- Technological development and workers capacitation

4.3.1.1. Productive Activities Diversification

All actions trying to stimulate drives for diversification of the productive base affect the productive chain this way making it possible the investment multiplication increasing income and employment. The investment in the textile industry should be followed by investment in clothing and bed, bath and table linen industry, sacks and cotton production. Brazil is the third producer of cotton in the world rank, and Goiás is the second state producer in Brazil. Southwest micro region has started to appear with the city of Chapadão do Céu as the second producer in the state of Goiás. In the same form there is production in the municipalities around such as Acreúna, actually the biggest state producer.

Hotel investments should give priority to the rural inns, farm-hotels, trying to explore the huge regional potential, existing in the eco and adventure tourism. Another important factor is the local cattle raising and farming and the use of advanced technology which may become a tourist attraction. This is a permanent action in the region based on the long event calendar with important events linked to the tourism sector, which generated new investments in hotel industry, bars and restaurants which improve the local business.

All incentive programs already in place need a larger enhancing power looked for the existing institutional program. The programs had to be linked to a specific funding scheme. This is a very common form used by the government, what gives the local entrepreneurs a reduction in the investment risk, major guarantees to the financing agent and higher security and return to the businessmen. In this way, the presence of public banks was necessary for the proposed investment success, where the financing agent reduces the red tape in the process.

4.3.1.2. Expansion and Improvement of the Economic and Social Infrastructure

The region is well served of Industrial District, which has received total infrastructure for its perfect functioning: all paved roads and streets, fixed and mobile telephone structure, industrial sewage system, water supply and mainly guarantee of sufficient electric energy, according to the planned demand. All supplying companies are fully prepared to fulfill the demand. For that it is necessary to go through the necessary planning.

In the case of state level energy supplier CELG, it has total interest in the state industrialization and its capacity to fulfill demand depends only in the planning. It is possible to set up small hydro-power plants, once the local rivers are adequate for that. There is also the possibility of importing electricity from other providers available in the state area.

The transportation logistic should go through a quasi-revolution, due to the enormous losses normally occurred during postharvest time. The vicinal roads, linking farms, should receive permanent maintenance notably in the rainy season. The Federal Road BR060 is in its duplication process in the interval between Goiânia (state capital) and the municipality of Jataí. This will give dynamism and reduce transportation costs in the region.

Considering that great part of the actual production goes to the Southeast and South of the country the Federal Government along with the state and municipality approved and initiated the construction project of the North-South railway. It will link the region to the main exporting ports; this will solve a good part of the transport of goods produced in the cluster region and will guarantee a greater local and regional competitiveness.

In the transportation context it is inserted the storage, a sector of fundamental importance, once it works with incoming and outgoing products. In this way it has increased the investment conditions by the producers through specific federal government financing lines, giving the producers opportunity to build their own warehouses. This would bring down a semi monopoly existing in the storage sector and at the same time pave the way to a commercialization strategy increasing the efficiency and effectiveness of the market.

4.3.1.3. Technological Development and Personal Capacitating

This area is fundamental and yet there are many local necessities. The Cluster is well equipped for the development of this activity. Many steps in this way have been given and efforts undertook by local players. COMIGO's growth in the last years, the installation of BRF Foods and the growth of the education institutions, totally devoted to the local development, form a strong pillar of technological support.

The existing structure (EMBRAPA and private research units) with support from State Secretary of Science and Technology and R&D funding agencies in the region, make an extraordinary net capable of developing any program or project turned to the technology necessary to sustain the regional growth.

The colleges and universities offer highly skilled labor – as much as masters of science and doctors – who should use their knowledge to develop important research to the region. The need for trained workers should be supplied using these specialized technicians. In this way it is also possible to use available professional and technical schools and training centers sponsored by industry associations.

4.4. RECOMMENDATIONS TO THE CLUSTER

4.4.1. GENERAL ASPECTS

The Southwest region of Goiás, which forms the Agro Industrial Cluster in the condition of productive chain of grain, pork and poultry, looks for sustainability and attraction of capital and people and are in real development conditions, in all ways. The development way may then be pursued in a rational and conscientious form, going for the well-being and happiness of the population, through taking advantage of the potential or created opportunities, and the solution of problems that may endanger the continuity of the progress of the social and economic elements, already established or yet to be promoted.

The above mentioned municipalities as great articulators and inducers of the Agro Industrial Cluster formation are pioneers in the region and always were ahead of the others in infrastructure and economic development. And being relatively far away from the big consuming centers, normally the states capitals and their surroundings, ended up creating their own growth opportunity and sustentation. The region has today the best perspective of development, not only by the great economic development already shown, but also by the conditions developed by its people very integrated when they need to overcome the difficulties and answer to problems.

4.5. FOUND THREATS

- There is not enough electrical power available to sustain the industrial growth. If it comes to happen in an accelerated form, the lack of investment in the sector and the sector obsolescence may threaten the development;
- Low local labor skills, in operational functions, due to the low and sparsely diversified industrial park, as well as the concentration of small business which requires few or no specialization;

- In relation to pork and poultry, there is risk of disease and consequently the spreading of it due to the high animal concentration and the negligence in the adequate treatment of manure, because of the high costs and the low average revenues in the sector;
- If it is confirmed the stagnation tendency in the cattle raising production or even its reduction in the next years, with the agriculture expansion in all regions or other animals which have greater support from the research institutions or applied technology;
- Development of pests in the agriculture due to the huge concentration in the production of soybean and corn and the widespread of no tillage seeding, also the use of pesticides specific for the activity, which changes the ecosystem in a significant way;
- Vulnerability in the local production of goods with international prices, such as soybean, corn and meat, which may suffer difficulties in their productive chain due to the disordering of the relative prices;
- Disordered deforesting with the opening of new areas without legal reserve, due to the absence and unavailability of areas and the high price of land, because of its speculative over valuation;
- Soil erosion, silting up of rivers and riverhead pollution, due to the bad land utilization and the lack of respect to nature, justified by the high costs of preservation and the producers lack of money;
- The animal production manure show a high pollution potential and very harming to the environment. If they are not correctly treated in the production sites and or channeled to be transformed in fertilizer, with an incorrect use, the animal waste may cause irreparable harm to the environment, mainly in the rivers. The higher risk occurs because of the huge production of pork;
- Pockets of poverty are developed around the urban centers, because of the migration of unskilled workers attracted by the euphoric economic growth, having as consequence the increase in violence and criminality, forcing the government and the companies increase security costs;
- Social risk of unordered growth, once the migration of people usually is greater than the migration of capital, causing urbanization problems to the cities, and in the future, to attend the collectivity, mainly with public services.

4.6. OPORTUNITIES CONCEPTION

- Support of the science and technology funding and executing institutions, linked to the sustainable regional growth, under coordination of titled researchers present in the colleges and universities in the Cluster;
- Technological development already existent in the production of soybean, corn, poultry and pork, is a factor which can be used in the development of other activities, based on the knowledge already existing and that can be used in other activities, from a look back in the activities already developed and which were successful or failed;

- Great knowledge accumulated with the professors in the local schools, in quality and quantity, who may be directed to participate in big projects, from a better definition of the region real priorities;
- Huge quantity of school and research centers existent in the two municipalities, with a long list of work already done and others still under development, be them on the local reality, or about generic knowledge, anyway, useful for equating and understanding the local problems;
- Potential investment capacity in the agroindustrial area, mainly in the food processing, textile and inputs for cattle raising and farming, due to the abundance of raw material and, in the case of the inputs for cattle raising and farming, also for the existence of a strong market, still not very well supplied by the local business;
- Excellent investment opportunities in the ecological and adventure tourism, because there are a high number of natural interesting sites all over the Region and the growing demand for this type of activity in the country and in the world, which may even attract tourists from abroad;
- Fertile land, abundant rain, rivers for irrigation in the various hydrographic basin well defined which give the Region a favorable situation for its agriculture expansion, giving record harvests and good position in the productive ranking in the state and country;
- The animal waste may be transformed in efficient fertilizers for the grain and forage production, it just need to be adequately stabilized before it is used. The economic benefit of the system of grain production with the use of animal dejects are greater than the costs. The dosage of the animal deject should obey the suggested one.
- Abundance of support services to the productive capacity, such as planning and assistance, in its majority, for the agricultural production, represented by the private offices of accounting, planning and control and of technical assistance, as well as by the associative entities and cooperatives and by the public institutions;
- Strong and close union of the local community, between producers and associated, school and research and municipal public institutions, in research work, data gathering and activities applied in the solution of local problems, mainly those which interfere in the level of knowledge and economic production;
- Rich mineral reserve, making it possible to be commercially explored, needing only a better knowledge of the market and the necessary resources to explore and process them;
- Existence of finance opportunities through the entrepreneur and federal public funding schemes, with very attractive interest rates for Brazilian context, in average 10.2% per year and advantageous maturity for the entrepreneur, with up to 3 years of time to liquidate the first installment and 12 years to pay the total loan;
- Fiscal benefits, in starting a new company or for expanding one already existent. The programs are operated by the State Government of Goiás. The benefited company effectively uses 65.7% of the generated sale taxes, as payment for the financing costs at 2.4% per year, and mortgage

with discounts of 30% to 100%, during 7 up to 15 years, depending on the activity and the social and economic benefits generated by the business.

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