

# Governance and APL in Brazil

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## 1 - Introduction

This report is the result of the work conducted by the international consultancy team, composed by Mrs. Silvana Parente (Brazil) and Mr. Leonardo Piccinetti (European Union), in regards to the project “Governance: Exchange Management Cluster - DPME0002”.

The project, which is sponsored by the Brazilian Ministry for Development, Industry and Foreign Trade, is aimed at promoting the Cluster to Cluster cooperation between Brazil and European Union, specifically sharing information, experiences and tools in the promotion of excellence throughout clusters, as well as strengthening and promoting business cooperation in the field of research and innovation between the EU and Brazil.

The specific objectives of the project were:

- Creating technical cooperation links between European and Brazilian institutions responsible for the regional policy
- Conducting joint technical missions to the selected Arranjos Produtivos Locais (APLs)
- Organizing a workshop on the Cluster Governance in the EU and Brazil
- Constructing a survey on successful governance experience in both the EU and Brazil, with the potential for the development of technical cooperation projects
- Exploring the possibilities for further progress in the governance of the visited APLs
- To spread the project’s results within different stakeholders groups (the Brazilian government, various local actors, and EU representatives)

The expected results were:

- Conducting Technical Mission to Brazilian APLs which had cases of successful governance arrangements.
- Organizing a workshop concerning the cluster governance EU-Brazil
- Establishing a cooperate relationship between Brazilian and EU institutions involved in cluster governance
- Dissemination of the results of the project to different actors.

During the project the international consultancy team has visited and analyzed five Brazilian clusters in five different sectors:

1. Porto Digital, the ICT cluster of Recife in the State of Pernambuco
2. Casa Apis, the agri-food Cluster of Pico-Teresina in the State of Piauí
3. APL EMHO, the cluster of Medical Equipment of Ribeirão Preto in the State of Sao Paulo
4. APL Metalmecânico Paraiba Médio Fluminense, the metal-mechanic cluster of Resende in the State of Rio de Janeiro

## 5. The Biotechnology cluster of Belo Horizonte in the State of Minas Gerais.

Within the following pages the methodology and results conducted by the consultancy team will be presented in order. This is to provide recommendations for a better and stronger cooperation between Brazil and the European Union in terms of cluster governance and among Brazilian and European clusters in terms of business opportunities.

## 2 - Work Methodology

This project's main aim is to analyze the Brazilian clusters so that we may find ways to strengthen them, improve their Research and innovation capabilities as well as their international dimension. In order to achieve this objective the project aims to create cooperation opportunities between European and Brazilian clusters. The consultancy team, made up by Ms. Silvana Parente and Mr. Leonardo Piccinetti, has analyzed the governance issue which is one of the main aspects to understand the cluster's evolution and to foresee ways of potential development.

After the creation of the consultancy team involving a national expert, who knows the Brazilian business environment very well, and an European expert, who knows the European environment and has much experience in innovation projects within Latin America, the second step of the project was the selecting five Brazilian cluster to be deeply analyzed.



After a review of the literature regarding clusters in Brazil, namely the Arranjos Produtivos Locais, and a review of the statistical material about Brazilian economy, the consultancy team has chosen the five APLs. The choice was based upon the ability to analyze different clusters, in different economic fields, which were from different states of Brazil.

The following clusters were chosen by the consultancy team:

1. The ICT cluster of Recife, State of Pernambuco, in the North-East of Brazil
2. The Agro-Food cluster of Picos-Teresina, State of Piauí, in the North-East of Brazil
3. The Metal-Mechanic cluster of Resende, State of Rio de Janeiro, in the South-East of Brazil
4. The Medical Equipment cluster of Ribeirão Preto, State of Rio de Janeiro, in the South-East of Brazil

5. The Biotechnology cluster of Belo-Horizonte, State of Minas Gerais, in the South-East of Brazil.

There are different reasons to believe that these five clusters represent a good set to analyze, first of all because their importance in the State and region, second for the difference in their evolution, and last but not least for the difference of stakeholders involved in their management.

The cluster analysis has been based both on official documentation and literature reviews as well as on the direct experience of the consultancy team in each cluster. This was conducted through 5 study visits and meeting with the main cluster's stakeholders and with the clusters' management boards.

A preliminary research for gathering more information has been conducted before performing the study visits in the clusters. The research was aimed at outlining the clusters' history and highlighting the different and most important development phases. Furthermore the scope of the analysis was to underline the differences among the contexts in which the clusters developed. Through the analysis of the various web sites and official documentation the consultancy team has profiled the main stakeholders in the different clusters.

After this preliminary research, the consultancy team created a set of questions to ask the different stakeholders in order to determine what were the best practices and potential problems in the cluster management.

The consultancy team has conducted the five study visits with a proper set of questions. This has enabled them to determine which cluster governments have been the most well run and most profitable. The results of the visits conducted between them has compiled into the SWOT analysis.



With the information gathered through the preliminary research and through the study visits, the consultancy team has been able to outline the potential ways for cooperation between

Brazilian and European clusters. The consultancy team used the information for matching Brazilian and European clusters.

Through the analysis of the data collected, and thanks to the SWOT analysis, the consultants have created an elaborate strategy plan for improving the cluster governance and overtaking the difficulties the Brazilian clusters are facing nowadays.



### 3 - Governance and APL in Brazil

When we discuss APL supporting policy we mean the mobilization of producers within their associations and inside a systemic perspective aiming at modernizing and strengthening the production, while at the same time involving the marginal region and industries and supporting the local development.

There are 3 main causes at the origin of such a cluster systemic policy in Brazil:

1. *Studies and proposals on rural development policies which will then incorporate the territorial approach.*

In Brazil the territorial development has been gaining importance both in the scientific community and in the political community. This is due to national circumstances and due to the influence of other countries and international bodies, such as the EU, and to a stronger will for international cooperation (ARNS 2009, PARENTE 2009).

Since 2000 the policies and institutions have been translating into practice the studies and the experiments related to the local development. The agricultural policy was losing relevance despite a more holistic and territorial approach. The concrete sign of this change was the creation of the LEADER Program- Ligações entre Ações de Desenvolvimento das Economias Rurais, in 1991, that nowadays represents the main reference for the territorial plan for rural development (FAVARETO, 2010).

The innovation was mainly related to the territorial approach that overturned the old sectorial approach addressed to the rural areas. Also the strategy proposed was multi-sectorial and integrated.

This new idea of handling the rural development exploiting its interdependences and its regional peculiarities gained importance with Wanderley(2000) and Veiga (2001). At first they gave some visibility to the problem in a report in Brazil on changes in the European Rural areas and the changes in the relation between rural and urban environments. The second author recalculated the dimension of Brazilian rural areas demonstrating how the demographic dynamism was the same in these areas and in the urban ones.

From this moment on, the debate on territoriality and rural development has been translated in a rural development public policy, reaching its peak in 2003 when the National Strategy for Rural Territories support was launched. This strategy has evolved becoming the Citizens' Territory Program with a National Secretary for Territorial Development devoted to coordinate the program execution.

2. *The initiatives and the Local economic development and Employment Program.*

After the first phase based on the debate about the rural development, due to the international cooperation the territorial approach became more relevant. Everything happens in a historical phase of changes and realignment of the traditional

instruments for the development support. For example the Cooperation Project stipulated by the Banco do Nordeste and the PNUD, called *Programa de Capacitação e Transferência de Metodologia para o Desenvolvimento Econômico Local* developed locally because despite of globalization, the global production changes and the reforms occurring at the national level.

In order to promote this territorial approach the project created a new methodology called GESPAR (Gestão Participativa para o Desenvolvimento Local) with 3 different actions: I) training for organizational strengthening of the territory through moments of mass mobilization and training aimed at enhancing the participation of various segments and assistance for the creation of a system of a public-private governance; ii) training aimed at developing production and businesses of small producers and their organizations; iii) institutional training for development of municipalities and other local institutions, with a view to incorporate the territorial approach in governance.

The external final evaluation of the project highlighted the success of the cooperation. In 1998, the project won the prize *Gestão Pública e Cidadania*, given by the *Fundação Getúlio Vargas*, thanks to its innovative methodology aimed at supporting the local development in the fight against poverty. Due to the projects' success in 2000 the BNDES contacted the PNUD in order to spread the GESPAR experience in 15 other territories of Brazil with the objective of finding sustainable strategies for the less dynamic regions of the country. The new project between BNDES and PNUD had great results above all in the creation of territorial identities and strategic projects of territorial scope, but also planned joint actions and accompanying territorial dynamics.

Nowadays, the GESPAR methodology represents a reference for the action of the *Instituto de Assessoria para o Desenvolvimento Humano* IADH that works in the training of people and organizations in order to support the territorial development, and its network of professionals helped the national Government include the territorial approach in its policies.

Development policies are territorial and regional instruments used to promote development through innovation strategies, joint socio-productive, productive development, attracting investment and knowledge management, among others. Due to these characteristics its similar to APLs' promotion policies.

The National Policy for Regional Development – PNDR that is coordinated by the national Ministry for National Integration since 2004 includes also the APLs promotion. The PNDR gives priority to the Semi-arid Region of North-East Brazil and to the area on the borders with other countries, facing a lower economic dynamism. The priority is given to 13 meso-regions through two basic actions: economic stimulation (promoting APLs) and strengthening of the social base (with the creation of meso-regional forums).

3. *Analytical and proactive approaches centered on the concept of clusters and industrial districts*

In Brazil understanding clusters approaches emerged from studies conducted by the Academy, especially with the formation of the RedeSist coordinated by UFRJ: "Rede de Pesquisa em Sistemas e Arranjos Produtivos e Inovativos Locais". Since 1999, RedeSist has been supported by institutions that promote productive development and innovation, such as CNPq, FINEP, IPEA, SEBRAE, BNDES and OAS. La RedSist empirical research has also been developed for analysis of the APLs in Brazil. This approach came to be priority. APL programs are located in different development organizations and agencies at national, state and municipal level. (We can include the pioneering actions of SEBRAE in this)

Indeed, it appears that the term APL "arrangements and / or core Local Production" has spread rapidly in the country by becoming more prominent in the terminology of policy agendas, along with other similar terms (clusters, districts, etc..).

APLs have been defined as clusters and other actors (government, business associations, credit institutions, teaching and research), located in the same territory and having specialization and that keep a joint link, cooperation and learn from one another (Cassiolato (2003). It is considered that the basis of the work of building the APLs "is the matrix sector / territory: a sector in any territory. "(Zitz 2005).

The APLs support is explained by the Government's industrial policy coordinated by the Ministry of Development of Industry and Trade (MDIC) since 2004, as presented in the following part.

### **3. 1- The MDIC policy for APLs**

Because of the need to coordinate government actions with a view to the adoption of integrated support to APLs, in 2004 was instituted the Permanent Working Group - GTP APL by Portaria Interministerial No. 200. It involved 23 governmental and non-governmental institutions. In October 2005, 10 more institutions were integrated (Portaria Interministerial nº 331.). Currently the group is made up by 33 members.

The Group is coordinated by the MDIC through the Department of Industrial Competitiveness. The GTP APL has the authority to develop and propose guidelines for coordinated action by the Federal Government in support of APLs across the country.

The GTP action consists of:

- 1) In keeping the issue on the public agenda: participation and implementation of national and international events on the subject;
- 2) In supporting the Rede de Núcleos Estaduais in:
  - a) Outreach programs, meetings and events;
  - b) Consolidation and availability of Productive Development Plans (PDPs);
  - c) Crossing institutions deals with the demands of PDPs, and
  - d) Development of Information System and Monitoring Plans.

The MDIC identified 957 APLs in the country. With the intent to prioritize some APLs a list of 10 priority APLs for the State was ratified by state partners. The existence of such a significant number of APLs was instrumental in the development of the Strategy for Enlargement Performance of APL GTP through the core state. To fulfill this role, the MDIC state expects that core or similar organizations in the States pass inducing APLs demands and the analysis of their proposals and promote institutional joint defendant with a view to supporting each Plan Development.

Since 2003/04 SEBRAE's promotion of the APLs has become one of the priority areas for action - National Small Business Support which supports the Apls and was defined as one of the main priorities by the core state. The performance of SEBRAE is focused on business and technology training for small businesses in the APLs and on the APLs planning and management. Furthermore SEBRAE takes part in the APL management board u and has arranged a tool, the SGOR- Results Oriented Management System.

### **3.2 - The cooperation project between the IDB and the CNI-FUMIN National Industry Confederation**

At this point it is important to mention the cooperation project between the IDB-FUMIN and CNI - National Industry Confederation is the national coordinating body of the state federations of industrial companies and assumed the role of national enforcer. The project, called Program CNI / BID Support to local Competitiveness Initiatives , is serving initially with the following industry segments / states: metal-mechanic in Pernambuco, ornamental rocks in Espírito Santo, wood and mobiles in Acre and automotive and in Goiás.

The specific object of the program is to develop a model of actions integrated by the entities that are part of the Industry System. These actors together with regional stakeholders, corporations and institutions (public and private) help promote the competitive advantages of the territories identified and small enterprises from the strategic sectors". "This is a Project for the Promotion of Local Competitiveness that aims at fostering the development of small and medium enterprises in a region, strengthening its territorial assets and enhances the development potential. It is a conception that considers territorial development as a process that can be done "bottom-up", if you can articulate the efforts of companies, civil society organizations, the scientific and technological system and other actors with policies and programs of different scales of the state." We need to underline that the CNI is facing difficulties in implementation the project through the methodology proposed by the IDB.

### **3.3 - Policy Initiatives for State level APLs**

Some state governments joined APL approaches in their policies to promote production and employment. RedeSist, with support from BNDES, developed mapping study and analysis of state policies for APLs.

Currently, the Bank signed a loan agreement with some state governments to develop the program of support to selected APLs. In this report upon the governance we will analyze the state program with BID support: the example of the Minas Gerais Government and the example of the Pernambuco Government.

### **3.4 - Background and policy conclusions for APLs in Brazil**

The theme of APLs in Brazil has its origins and influences from 3 different areas:

- In the development of studies and proposals on rural development policies which came to incorporate a more systemic and integrated territorial approach;
- From the experiences and initiatives to promote Local Economic and Employment Development, supported by international cooperation and national institutions such as UNDP, the Banco do Nordeste and the BNDES, influencing mainstreaming in public institutions and governments;
- From the Academy (RedeSist-UFRJ) that developed the conceptual and analytical framework on the subject besides case studies, especially influencing industrial policy and technological innovation.

The focus of APL is present in various Ministries and government institutions, industrial policy is the responsibility of the MDIC and science, technology and innovation policies are among the MCTI's competences. Both of the Ministries use the APL approach in a very weak way without defining tools for promotion, the main problem is the lack of proactive mechanisms for financing the governance structures and collective innovation projects. The university-industry relationship from APL approach is also emerging.

The MDIC has made great efforts to coordinate national policies to support APLs, but remain still unproven. The core state is still forming and there is little political force at the state level. In many cases the coordination of the Core State is exercised by the Ministry of Development, Industry and Trade of the State Government, which focuses its industrial policy in attracting large foreign companies. It is used as a main instrument for tax incentives, without focusing on instruments for APLs promotion.

En general las políticas de educación, formación profesional y ciencia y tecnología en ámbito estadual están desarticuladas del segmento empresarial y no utilizan su potencial para promover la innovación de los APLs. Otras secretarías estaduais han experimentado iniciativas de fomento productivo pero con objetivos específicos de reducción de la pobreza e inclusión social.

In general, policies on education, training, science and technology at the state level are not linked with the enterprises and don't use their potential to promote innovation of APLs. Other State's departments have experienced development initiatives but the only aims were poverty reduction and social inclusion.

## **4 – Analysis of Cluster Selected**

### **4.1 - APL Recife – Porto Digital**

#### **4.1.1 - History**

Porto Digital is an information and communication technology (ICT) Cluster located in Recife, the capital of the state of Pernambuco, which has been historically one of the poorest State in Brazil. Today, Recife is one of the most important hubs for business, politics and higher education in the North-East of Brazil<sup>1</sup>.

The State of Pernambuco is the fastest growing State in Brazil. These aforementioned features make Recife an ideal place for an ICT Cluster.

ICT is one of the most important economic sectors in Brazil. The ICT sector in Brazil has been growing by an annual rate of 10% since 2000 and it generates sales of \$10 Billion per year.<sup>2</sup>

The importance of the sector can be explained by mentioning the recent history of Recife and its ICT cluster, Porto Digital.

Due to both the local Pernambuco and Brazilian Government investments and the incentives offered by the city of Recife, such as tax incentives and cheap loans, Recife became the main center of ICT sector in Brazil.

Porto Digital represents the best experience in Brazilian ICT sector.

To understand why Recife became the most important ICT center in Brazil and one of the most important centers in South America knowledge of the origins of Porto Digital is necessary. The creation of such a great experience started in 1985 when a group comprised of young professors named Professors at Federal University of Pernambuco (UFPE) committed themselves to strengthen the Informatics sector of their university. Their idea was to have at least 20 PhDs lecturing and to enter the top ten of Brazilian ICT higher education institutions by 2000, results achieved 8 years earlier in 1992.<sup>3</sup>

By that time the problem was that the Pernambuco job market wasn't able to welcome the UFPE alumni, which were then forced to emigrate. This wasting of resources was resolved by the UFPE Professors through the creation of CESAR, the Center for Advanced Studies and Systems, in 1996, the same year the UFPE began teaching programmers to use Sun Microsystems Inc.'s Java language.

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<sup>1</sup> Porto Digital website <http://www.portodigital.org/>

<sup>2</sup> Bloomberg Businessweek magazine, *Brazil: a hot incubator for tech startups*, <http://www.businessweek.com/stories/2005-07-24/brazil-a-hot-incubator-for-tech-startups>

<sup>3</sup> Harry Cruz, *Examples of Successful ICT Park: Porto Digital (Brazil)*, in World E-Business Initiative website <http://www.worldbusiness.org/example-of-successful-ict-park-porto-digital-brazil-13/>

The Centre offered great job opportunities for the alumni, avoiding the intellectual flight of the members. CESAR also became an incubator for IT-startups and represents the embryo of the current Porto Digital.

In July 2000, at the city of Recife, in the northeast region of Brazil, a joint venture involving Government, Academia, and the Private Sector, created the Porto Digital Science Park. Porto Digital was created with the goals of launching the local ICT industry in global markets, reshaping local economy, and, at the same time, reviving the historical port area of Recife, which had been for centuries the city's cultural and economic heart.<sup>4</sup>

The creation of Porto Digital was also helped by the establishment of a Softex office in Recife. This private, non-profit organization fostered the competitiveness of the Brazilian software industry both at the regional and international level.<sup>5</sup>

The government of Pernambuco was clever enough to take advantages from the excess of high-quality human capital, CESAR and the presence of Softex. After a discussion with different actors the Government of Pernambuco decided to invest R\$ 33 million to establish the Porto Digital. In addition to the governmental initiative, private telecommunication companies were also involved with a pledged investment of R\$ 10 million for infrastructure projects.

First of all, the creation of Porto Digital needed a requalification of the historical district called Bairro do Recife. An area of 149 ha was provided with 8Km of fiber optics and 26 Km of cables making it the only region in Brazil to harbor this advanced technology. The government also provided companies within Porto Digital with tax incentives in addition to a public funded account that provides up to 70% of collaterals in loans (public banks) for software companies.

Porto Digital made Recife and Pernambuco the center for ICT sector in Brazil and one of the most important in all of South America. Porto Digital is now considered the best Brazilian cluster by several different entities, including A.T. Kearney. It is comprised of 192 entities, 143 of which are companies, and 6,500 IT professionals. It has an annual turnover of R\$700 million, around US\$431 million. It also had a huge impact on the region: in 2001, IT represented 1.6% of Pernambuco's GDP. It now weighs 4% of a GDP that grew even faster than Brazil's GDP during the same period. Porto Digital's goal is to reach 10% by 2020.

It has deeply transformed the area of Recife it is based in: it is an urban cluster based in an area where there are also restaurants, shops and other activities. But at the time Porto Digital was created it was extremely devalued because the nearby Suape's port had become much more important than Recife's urban port. In 2001 only three companies were based there; Porto Digital has participated greatly in the revitalization of this area.

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<sup>4</sup> Fabio Queda Bueno da Silva, *A city and its Science Park: building a local innovation system for urban and economic development*, in [http://www.oremi.com.br/artigo/arquivos/081016150819\\_030-BRA\\_Proceedings.pdf](http://www.oremi.com.br/artigo/arquivos/081016150819_030-BRA_Proceedings.pdf)

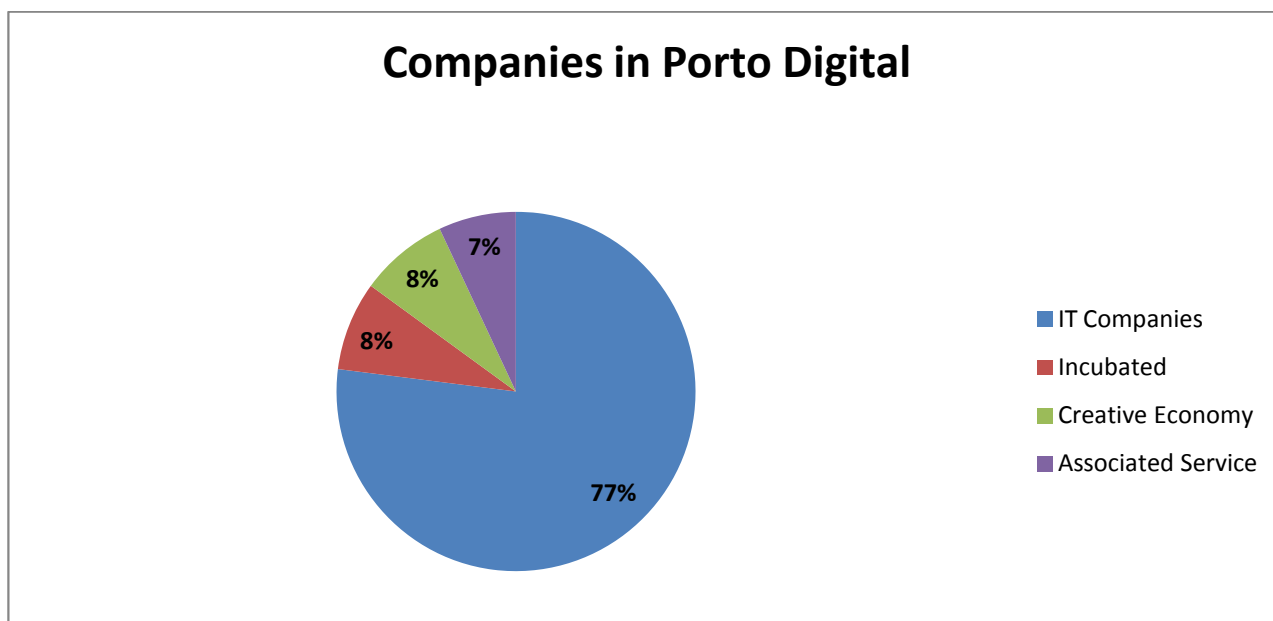
<sup>5</sup> Harry Cruz, *Examples of Successful ICT Park: Porto Digital (Brazil)*, in World E-Business Initiative website <http://www.worldebusiness.org/example-of-successful-ict-park-porto-digital-brazil-13/>

Besides its highly positive impact on Recife and Pernambuco, it is also very beneficial for Brazil: the country has not been fully exploiting its potential if everything is centralized in Sao Paulo and Brasilia.

### 4.1.2 - Stakeholders

The vision behind Porto Digital was that Recife would become a global player in the ICT sector. In this vision, Porto Digital has a role of catalyst articulator and animator of the different actors of the business ecosystem, supporting and stimulating the establishment and consolidation of corporations and collaborations among companies and organizations in a competitive environment.

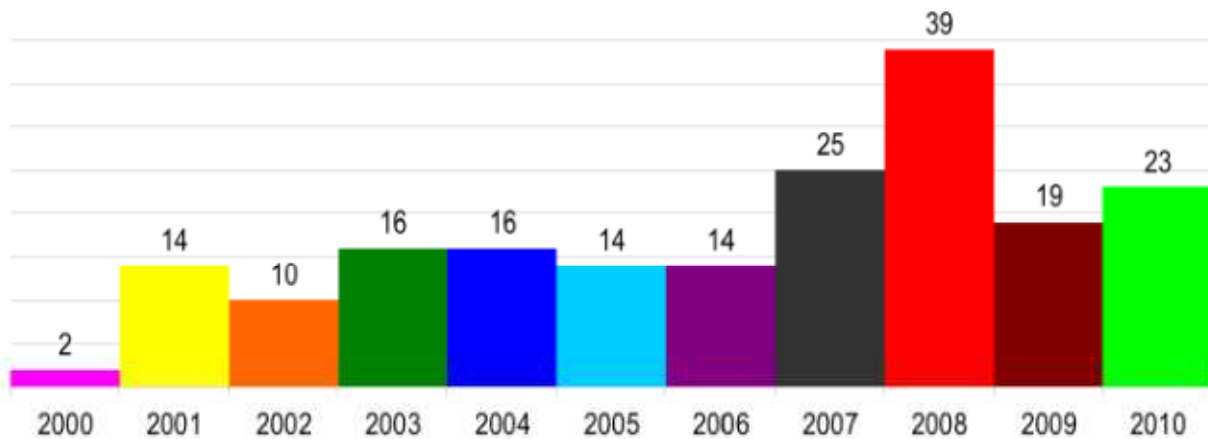
After 12 years of development, Porto Digital, resides on an area of 149 ha, hosts nearly 200 organizations and enterprises, has two business incubators and employs 6,500 people. The cluster is composed mostly for small and medium businesses, but multinationals like IBM, Motorola, Samsung and Microsoft are also present in Porto Digital. IBM has shifted to the island IBM'S regional headquarters. Motorola and Samsung have partnered with CESAR, which is considered the best R&D institution in Brazil, to develop embedded software for mobile devices.<sup>6</sup>



Since the year of its foundation, the number of enterprises has been growing continuously as shown in the following figure.

<sup>6</sup> Porto Digital website <http://www.portodigital.org/>





In ten years of operation Porto Digital was consolidated with the investments made in improving the development processes and software with the installation of dozens of companies coming from other parts of the metropolitan area of Recife, in other states and even other countries.

The segments of ICT consist of the production of management software, solutions for the financial system and health, games, software for the security industry, systems for managing traffic and transportation, usability of software and integrated solutions to development portals, extranets and intranets.

Most of Porto Digital's companies work with developing business management systems, urban mobility, games, animation, mobile phone applications, neural networks and artificial intelligence for finance and banking, data security, e-learning, e-entertainment and outsourcing.

The main challenge after the launching Porto Digital project was to gain acceptance and support from important local actors: local government, local ICT companies, other universities and academic institutions, the National Heritage Institute (that regulates development of heritage protected areas, like where Porto Digital is located), syndicates and associations all contributed as well as others.

The central strategy at this stage was to create territorial conditions for the beginning of the Park's operation and the incentives to attract companies to the Park area. To support this strategy, institutional communication was carefully planned and executed to inform stakeholders and local business and citizens about the Park's development.

Regarding the governance of the park, the idea was to have non-governmental organizations (NGOs) to manage Porto Digital's implementation and operation in a continuous basis. This NGO, called Porto Digital Management Unit (NGPD), was founded in December 2000 by the main stakeholders (State of Pernambuco) of the project, as well as members of public, academic, and private sectors, and other NGO's. In April 2001, NGPD received the qualification of "Social Organization" at the State level, which "provides a private framework for the

implementation of public policies” allowing NGPD to celebrate contracts with State Government to manage most of the public investment in the Park.<sup>7</sup>

NGPD has a steering committee formed by 17 members (originally 19) representing several sectors of the local society. Below the committee, NGPD is managed by a Board of Directors. This governance structure provides agile management as well as an important point of communication contributing to the acceptance and support of the project. At this point the founders of Porto Digital were deeply involved in its management, being part of the Board of Directors, as well as developing policies and strategic activities on the steering committee and on key in positions in the State Government.

After the launch of the park the management’s main goal was to increase the number and quality of those comprising Porto Digital . The strategy for achieving this result was based on a continuous communication strategy with all the stakeholders in and out Porto Digital. A change of management was necessary to implement this strategy.

The strategy of Porto Digital today is being reshaped in two complementary ways: First, to improve the business environment to achieve more innovation and competitiveness in companies and second, to extend the influence of the Park to other regions of the State of Pernambuco.

As aforementioned, today Porto Digital is a big project involving different stakeholders. The attraction strategy has been based on a mix of incentives, organizational diversity and territory qualification.

The incentives for attracting new companies in Porto Digital was planned and coordinated by the NGPD with both the state and municipal government, associations of companies, syndicates, and universities. There were territorial incentives, fiscal incentives and financial and funding incentives.

To support the creation of an environment that stimulates innovation Porto Digital invested in attracting organizations with complementary roles regarding the intangible assets necessary for innovation: linkages, learning, and investment .

Porto Digital has the support of several public and private partners. The most important stakeholders in Porto Digital are:

- ***The Federal Government with its institutions:***
  - **MCT** -Ministry of Science and Technology
  - **Finep** - Research and Projects Financing –
  - **CNPq** - National Counsel of Technological and Scientific Development –
  - **MDIC** - Ministry of Development, Industry and Foreign Trade
  - **MinC** - Ministry of Culture
- ***The State government of Pernambuco with its institutions:***

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<sup>7</sup> Fabio Queda Bueno da Silva, *A city and its Science Park: building a local innovation system for urban and economic development*, in [http://www.oremi.com.br/artigo/arquivos/081016150819\\_030-BRA\\_Proceedings.pdf](http://www.oremi.com.br/artigo/arquivos/081016150819_030-BRA_Proceedings.pdf)

- **SECTEC** – The State Department of Science and Technology is the Pernambuco State Government authority responsible for defining and developing the state policy for science and technology. Porto Digital is one of the projects designed within the framework of this policy and SECTMA was the first and key public institution to invest into the Porto Digital Local Innovation System. Its role in developing and fostering science and technology related initiatives makes Sectma a major anchor of Porto Digital. A remarkable building in the Old Recife Quarter was chosen as premises for the Department. Built in the first half of the 20<sup>th</sup> century, the grand building has been greatly restored by Porto Digital.
- **SAD** - State Department of Administration
- **SDEC** - State Department of Economic Development
- **SEDUC** - State Department of Education
- **SEI** - Special Secretariat of Press
- **SJE** - State Department of Youth and Employment
- **SEPLAG** - State Department of Planning and Management
- **ATI** - Information Technology State Agency of Pernambuco
- **AD Diper** - Economic Development Agency of Pernambuco
- **Facepe** - Foundation of Support for Science and Technology of the State of Pernambuco
- **PGE** - State Attorney General Office
- **CGE** - Office of the Comptroller General
- **Arpe** - Regulatory Agency of Pernambuco
- **The Centre of Informatics of the Federal University of Pernambuco (CIn-UFPE)** The Centre of Informatics (CIn) is among the three largest academic institutions in ICT in Brazil. It is the main organization responsible for the production of world class science, technology, innovation, and human capital in ICT in Recife. CIN pioneered the process of industry university linkages in the region through entrepreneurship teaching (since 1996), academic spin-offs (over 20 companies), and joint R&D and innovation projects with large multinational companies. The Centre has part of its activities, related to R&D laboratories in co-operation with ICT companies, located at Porto Digital.
- **Municipal Government of Recife-Municipal Department of Science, Technology and Economic Development**
- **Partner Institutions:**
  - **Assespro Pernambuco** - Association of Brazilian Companies of Information Technology, Software and Internet of Pernambuco
  - **Sebrae Pernambuco** - Brazilian Service of Support for Micro and Small Enterprises of Pernambuco
  - **Itep** - Technology Institute of Pernambuco
  - **Fiepe** - Industry Federation of Pernambuco
  - **IEL** - Institute Evaldo Lodi
  - **FCAP/UPE** - Administration Sciences College of Pernambuco
  - **Iaupe** - Institute of Support for Pernambuco University
  - **Apex** - Brazilian Agency of Export and Investment Promotion

- **Federal congress group of Pernambuco**
- **SOFTEX Recife** Technology Center for Software Exports (SOFTEX Recife) is a business association that congregates over 50 enterprises. Its role in the Science Park is to support, stimulate, and promote the development of software projects for export. SOFTEX is responsible for the redevelopment and operation of a business building located in the center of the Science Park area. This digital condominium with over 5,000 square meters, will host companies in the ICT sector, most of them with a special focus on the export market.
- **C.E.S.A.R** Created to promote technology transfer between universities, the market and society, the Recife Center for Advanced Studies and Systems (CESAR) is one of the anchors of Porto Digital. In association with the IT Center of the Federal University of Pernambuco (UFPE) the institution develops technology solutions as well as organizes and structures business units. CESAR was the starting point for dozens of companies, among which InForma Software, Radix and Vanguard.

The features mentioned before makes Porto Digital a really good environment for business as shown in the following figure.

<b>Revenue</b>	R\$ 870.837.585,00
<b>Number of employees</b>	6,135
<b>Number of entrepreneurs</b>	498
<b>Average salary</b>	2,606,22
<b>Re-urbanized area</b>	35.000Km <sup>2</sup>

### 4.1.3-Analysis

This part is dedicated to the SWOT analysis of Porto Digital.

#### A. Strengths and Opportunities

- a. The policy for the ICT support has been a great incentive for the cluster creation
- b. The presence of an actor like CESAR has helped to develop a strong ICT cluster
- c. The initiative to create an ICT cluster starts in the University, the private enterprises decided freely to join the initiative and the State supported the process
- d. International acknowledgment of Porto Digital as a center of excellence for ICT in the Latin America
- e. Brazil is will host the next Football World Cup and Olympic Games. The two events will give an acceleration to the country's economy, particularly to the creative industries and, consequently, also for the whole ICT sector.
- f. Development of new sectors linked with ICT such as e-tourism and mechatronic

#### B. Weakness and Threats

- a. Lack of skilled workers

- b. Lack of local methodology for the technological transfer
- c. Lack of a proper regulation and an organization for the technological activities (IPR)
- d. The relationship University-Enterprises is still based on personal reference, still lacks an institutionalized relation system
- e. There is an unbalance between the intervention offered by the Federal State and the State of Pernambuco, with the second one much more involved than the first one
- f. The cluster can rely much more on the privates than on the public support
- g. China represents the biggest competitor for Brazil in the ICT sector

## **4.2 - APL Picos – Casa Apis**

### ***4.2.1 - History***

Casa Apis - Central de Cooperativas Apícolas do Semi-Árido Brasileiro is a center of beekeeper cooperatives and is the pilot initiative of a national program Projeto Apis (Apis Project) created by SEBRAE to develop and support beekeeping activities in the poorest rural areas of the country.

The umbrella organization Casa Apis unites several honey producing cooperatives in the northeastern Brazilian states of Piauí and Ceará. This region is characterized by great economic and social issues including poverty and hunger, high infant mortality rates, low wages and a disproportionate concentration of income and land.

In this semi-arid region plagued by droughts, agriculture is still the main source of family income. But the inability to sustain family livelihoods through agriculture causes many people to migrate to large cities. Locals suffer the most during the hot and dry summers. Several NGOs and local universities have identified beekeeping as an opportunity to improve life standards in this area.

In 2003, the cooperatives met for the first time at a gathering organized and funded by the Brazilian Ministry of Agriculture. Beekeepers faced many difficulties at this time and competition amongst themselves for the same market dramatically decreased the value of their honey. Middle men in the regional honey trade also weakened cooperatives, purchasing honey directly from the producer and at very low prices just to guarantee them an immediate, and meager, income. Also at this time, honey production methods were not in line with the Brazilian Ministry of Agriculture's requirements.

There was an obvious need to unify cooperatives in order to improve conditions and after months of discussion, analysis, and the creation of a technology center, Casa Apis was founded in 2005. Since then, the organization has trained a myriad of beekeepers and inspected their apiaries. In May 2008, the institution received the Federal Seal (SFI) from the Ministry of

Agriculture which guaranteed honey production accorded with government requirements. In March 2009, the organization received both Fair Trade and organic certification.<sup>8</sup>

In the beginning Casa Apis united 9 cooperatives of small beekeepers. Currently Casa Apis processes and commercializes honey productions for more than 700 rural families, distributed in 27 counties of the states of Piauí and Ceará. The cooperative's infrastructure benefits the members through 20 well-equipped honey extracting facilities and a very modern industrial processing unit.

#### **4.2.2 – Stakeholders**

The base organization of the APL is Casa Apis, the central cooperative.

Casa Apis was constituted in 2005 and in 2007 created installing its units for honey production.

Before 2007 every single cooperative commercialized its own production by itself. The main problem and eventual objective of the APL was organizing the production and commercialization and at the same time how to gather resources for creating a honey production plant.

Another important actor in the APL is SEBRAE that is keeping people in the Picos region in order to provide support to the APL.

There is also the Incubator of People Cooperatives of the Piauí Federal University which has developed in 2009/2010 a project for Casa Apis institutional reinforcing with 3 main focuses:

- 1) Participative elaboration of the strategic plan which constitutes the most important reference for Casa Apis and its affiliate's management. According to this internal regulation, the Casa Apis general Assembly it is constitutes by 36 farmers, 4 from each singular cooperative, that elect an executive board with 9 members, one for cooperatives that elects a president. Casa Apis has a National Consulting Council and a local one.
- 2) Promoting communication and mobility
- 3) Involving the local actors in the APL's initiatives and project.

Another important actor is the Fundação Banco do Brasil (FBB) which that financed the houses for honey production. The FBB, in partnership with SEBRAE, it is financing 21 agents for the local development providing technical assistance to the farmers' families.

The public Banks are supporting the APL financing the enlargement processes: the National Bank for the Economic and Social Development, the Bank of Brazil and the Bank of North-East.

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<sup>8</sup> Fair trade USA website, <http://www.fairtradeusa.org/producer-profiles/casa-apis-cooperativas-ap-colas-do-semi-arido-brasileiro>

There are enough finances for families but Casa Apis claims a lack of funding for the cooperatives.

CODEVASP, which financed CENTAP the main infrastructure of Casa Apis, in 2012, was constituted as “social organization” in order to promote the CENTAP activities.

The Brazilian Ministry for the National Integration is an important stakeholder. In fact it has given money to CODEVASP that will be addressed to an investment project for the honey sector in Piauí. It is foreseen the purchasing of equipment for the families and the reform and other action for supporting the sector development.

The last important stakeholder is EMBRAPA working in the research in order to help the producers.

### **4.2.3 – Analysis**

It is important to conduct a SWOT analysis of the cluster.

#### **A. Strengths and Opportunities**

- a. Great importance of the beekeeping for the region and the regional vegetation is favorable for the honey production
- b. The model of government is based on solidarity and involves several families in different municipalities. This model make the development socially sustainable
- c. The production of house-bees for the APL producers is based on technologies less expensive with a specific regulation for the wood used
- d. Certification for the honey.
- e. In 2010 Casa Apis received the certification of Fair Trade, a guarantee in terms of quality
- f. In partnership with the government Casa Apis is working for introducing honey in the pupils’ breakfast according to the law n, Fundação Banco do Brasil (FBB) that establishes that at least 30% of the resources for the pupils’ breakfast have to be used for buying products from familiar agriculture without any bid.
- g. Investment project of the Ministry for Integration (CODEVASF) for the activities enlargement and innovation
- h. The State hosts a technical school for agriculture
- i. The creation of CENTAP that could represent a good instrument for the social innovation
- j. The aim of the APL to enter the Arabic market

#### **B. Weakness and Threats**

- a. Leadership concentration. Casa Apis maintains the leadership and there are no opportunities for other actors to develop leadership skills for the entrepreneurial and strategic management
- b. Low level of articulation of the private sector in Casa Apis, in other enterprises in the region and in the other APLs.

- c. The innovation strategy is not structured yet. CENTAP is still not working properly.
- d. The Federal University of Piauí is little involved in the APL. The University holds just one Phd in the sector and the graduates from the Piauí University are leaving to work in the honey sector of other Brazilian states.

### **4.3 - APL Ribeirão Preto (São Paulo) - APL EMHO - Cluster of Medical, Hospital and Dental Equipment**

#### **4.3.1 - History**

Brazil has the largest medical equipment market in South America. Last year the Brazilian medical market was valued at US\$ 4.4bn. The sector is growing worldwide but the Brazilian sector is still oriented to the internal market.

The Brazilian medical equipment sector is considered to be quite innovative, regarding the high demand for high-tech products and the development of new technologies in different sectors, such as electronics, IT, and precision mechanics. Moreover, the development of these new technologies comprises a considerable mix of different products and involves both multinationals and small specialized companies.

Geographically, the medical equipment sector in Brazil is concentrated in Sao Paulo region. The region of Ribeirão Preto (SP) is the main center for commercial medical equipment activities, hosting the largest Brazilian cluster in this sector.<sup>9</sup>

Today the region of Ribeirão Preto in the sector of medical and hospital instrumentation, precision and automation is the third of the state, surpassed only by metropolitan area of Sao Paulo and Campinas Administrative Region.

In Ribeirão Preto's region, according to data from Development Department of São Paulo, there are 69 companies in EMHO's sector, mostly micro, small and medium companies. These companies employ more than two thousand employees and make Ribeirão Preto a reference in production and technology to the health sector. Ribeirão Preto has the biggest concentration per capita of companies in this sector around the country. In absolute numbers, Ribeirão ranks fifth in the nation in this sector.<sup>10</sup>

In 2008 the industry of medical equipment, hospital and dental (EMHO) formed a local productive arrangement (APL) supported by SEBRAE, SENAI, ABIMO (Brazilian Association of Industries Dental Supplies and Equipment, Hospital and Laboratory) and FIPASE Institute Foundation (Advanced Pole Health of Ribeirão Preto) in order to support the development of this supply chain. The project APL-EMHO aimed at improving competitiveness among

<sup>9</sup> Hans-Günter Lind, Pedro Gouveia, *The Life Sciences Industry in Brazil Working Paper 2012*, in [http://www.moez.fraunhofer.de/content/dam/moez/de/documents/Working\\_Paper/WP2012%20Nr.5\\_The%20Life%20Sciences%20Industry%20in%20Brazil-final.pdf](http://www.moez.fraunhofer.de/content/dam/moez/de/documents/Working_Paper/WP2012%20Nr.5_The%20Life%20Sciences%20Industry%20in%20Brazil-final.pdf)

<sup>10</sup> Advanced Pole Institute of Health Foundation – FIPASE website <http://fipase.com.br>



companies of the EMHO sector, especially by implementing technological functions into these companies. In order to do so, it considers the analysis of the companies' needs, the qualification of their managers, the support to the organizational refitting, and problems solution.

The objective of the APL EMHO project was the technological training of twenty companies of the sector, implementation of technological functions in these companies.

APL EMHO goals:

- To implement the Best Manufacturing Practices in at least 75% of the companies.
- Certifying 100% of the companies with ANVISA.
- Increase in at least 20% of income
- Increase in at least 10% of export
- The implementation of technological function in at least 40% of companies<sup>11</sup>.

Since the project commencement the 20 small companies succeeded in their activities and are still cooperating. From this project the initiative among entrepreneurs emerged to create the internal rules to the group and elect a management committee.

In the second half of 2009 a second project was launched by the Development Department of São Paulo, SEBRAE-SP and FIESP, in partnership with IDB (Inter-American Development Bank) which aims to strengthen the competitiveness of Local Productive Arrangements of São Paulo. Ribeirão Preto with APL EMHO, was one of the chosen cities by the program, creating the Innova Saúde Project. In the first project phase, it was executed as a regional chain diagnosis. In the second project phase, after some trips to find reference and interviews with demanding buyers, it was established as strategic segments that represented an opportunity for the sector.

From Innova, the Competitiveness Improvement Plan has been initiated. The plan has the same goal as its predecessor, supported by the same agents, having FIPASE as its Local Partner. CIP's actions contemplate the execution of forums about competitiveness looking for sensitization of companies and stakeholders, consultancies and training courses. Besides that, FIPASE supports companies in projects to raise resources through funding agencies.<sup>12</sup>

Another action to strengthen the position of Ribeirão Preto as center in the sector of Hospital and Dental Equipment was the creation of CEDINA- Center of Development and Applied Innovation in Medical, Hospital and Dental Equipment that, thanks to its laboratories, allowed the production of high quality tests and product development.

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<sup>11</sup> Gustavo Barbieri Lima e Dirceu Tornavoi de Carvalho, *Internationalization Of Companies In Industrial Clusters: A Study Of Medical, Dental And Hospital Supply Industries In Ribeirão Preto – Sp*, in <http://www.regeusp.com.br/arquivos/1053.pdf>

<sup>12</sup> Advanced Pole Institute of Health Foundation – FIPASE website <http://fipase.com.br>

### 4.3.2 - Stakeholders

As mentioned before the APL EMHO was an action developed by FIPASE in partnership with different players, among them: SEBRAE-SP, City Hall of Ribeirão Preto, Development Department of São Paulo, SENAI, CIESP, FIESP, ABIMO, ABDI and SEBRAE.

This action followed a trend in showing how the medical equipment sector was so important in the area of Ribeirão Preto. In fact, today there are nearly seventy firms in the sector and Ribeirão Preto has the biggest concentration per capita of companies in this sector around the country.

The pivotal role in the creation of the APL has been through FIPASE. The Advanced Pole Institute of Health Foundation acts in industry development of equipment and production in the health industry in Ribeirão Preto, contributing to the integration of many links in the supply chain, encouraging cooperation, contributing to the expansion of this industry in local and international markets, encouraging the creation of new technology-based companies in this area, as well as the transformation of knowledge created in universities and centers research in productive activities. FIPASE has two main fronts: to support companies in the health field which already are working and supporting and managing the business incubator.

So, on one side, FIPASE is supporting the APL, and on the other side is managing business incubators.

The other important actor in the creation of the APL has been the SEBRAE because it provides both federal and state of the São Paulo office. SEBRAE is the Brazilian agency for small and medium enterprises support.

Obviously the Ribeirão Preto City Hall and the São Paulo State Development Department played an important role in promoting the creation of the APL because it would have meant a greater amount of employment and development.

Other important actors have been:

- CIESP the Centre of Industries of the State of São Paulo, a non-profit organization founded in 1928 which gathered the industrial enterprises in Sao Paulo, with the main objective of supporting the Paulista Industries<sup>13</sup>
- SENAI the national service of industrial learning<sup>14</sup>
- FIESP the Sao Paulo industrial federation the main representative of industrial sector in Brazil, representing more than 130 thousands firms in different fields. Its objective is to defend the market economy and the private economic initiative<sup>15</sup>
- ABIMO the Brazilian Association of Industries of Medical, Dental, Hospital and Laboratory Equipment. Founded in 1962 offers support to the health production chain. Today, the association represents 320 companies nationally and internationally, and

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<sup>13</sup> CIESP website <http://www.ciesp.com.br>

<sup>14</sup> SENAI website <http://www.sp.senai.br>

<sup>15</sup> FIESP website <http://www2.fiesp.com.br>

the companies associated with ABIMO are responsible for about 90% of sales in the Brazilian industry.<sup>16</sup>

- ABDI the Brazilian Agency for Industrial Development. The agency was created in 2004 with the aim to promote the industrial policy execution in coordination with Science, Technology and foreign Trade policy.<sup>17</sup>

Beside these main actors, there are the companies involved in the APL:

- AD Instrumentos Cirúrgicos
- BRASMEDICAL Indústria e Comércio de Produtos para a Saúde
- DABI Atlante Indústria Médico-odontológica
- DENTSCLER Indústria de Aparelhos Odontológicos
- EGMONT
- ESSENTII - Arede e Escudeiro
- FIGLABS Pesquisa e Desenvolvimento
- GIGANTE Recém-Nascido
- GNATUS Equipamentos Médicos e Odontológicos
- HELSE - Capelli & Fabris Desenvolvimento e Pesquisa
- KASTEC Peças e Acessórios Odontológicos
- LABTOOLS
- LAFIX Indústria e Comércio de Móveis Hospitalares
- MARTEC Equipamentos Médicos
- MEDPEJ Equipamentos Médicos
- MICROEM Produtos Médicos
- MIDETRONIC
- MS Medical
- MZ Indústria e Comércio
- OLIDEF CZ Indústria e Comércio de Aparelhos Hospitalares
- PRO BIO Pesquisas e Desenvolvimento
- QSG
- RAD TECH Sistemas Médicos
- SIGMED Equipamentos Eletrônicos
- XDENT.
- IS Metrologia
- CEDINA
- INDRAx Industria e Comércio de Aparelhos Radiológicos
- DEXTRONN Equipamentos Eletrônicos
- ALT Equipamentos Médicos
- Odontológicos Ltda
- Q2TEC

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<sup>16</sup> ABIMO website <http://www.abimo.org.br/>

<sup>17</sup> ABDI website <http://www.abdi.com.br/Paginas/Default.aspx>

### **4.3.3 - Analysis**

After presenting the history and the stakeholders of the APL-EMHO of Ribeirão Preto, it is useful to analyze the strengths, the weakness, the opportunity and the threats of the cluster. This analysis will help for suggestions for a further development of the cluster.

#### **A. Strengths and Opportunities:**

- a. First of all is important to underline that because of the presence of the Educação e Saúde de alto Padrão Científico the APL has a good demand of goods
- b. The transportation infrastructure (such as airports and other routes) and very developed
- c. FIPASE is managing the cluster in a participative way in order to involve public and private stakeholders
- d. Proactive action by FIPASE which is providing technical services for laboratories by CEDINA
- e. Proactive action by FIPASE regarding the innovation project drafting and the fundraising. The strategy in this field follow 3 actions: the creation of Technological Innovation Group, the 3 incubators and the support to stimulate business plans in biotech and health fields.
- f. The presence of the University of Sao Paulo Innovation Agency which is supporting entrepreneurship, technological initiatives, protecting the intellectual property and bridging university and enterprises
- g. The presence of people with great expertise in biotech and medical field in the APL management board
- h. The vision and the development of ICT research in the EMHO industry
- i. The project of a new Technological Park will gather different actors from different level of government

#### **B. Weakness and Threats:**

- a. A low level of cooperation between enterprises due to a low level of confidence related with problems occurred in the past. There is not a horizontal partnership in marketing strategy or in processing new products.
- b. The SMEs face great problems in attracting customers. There are not the opportunities for hiring professionals focused in management and business development. Another problem is that professors are not allowed to work for private enterprises at the same time they have a contract with a University.
- c. SMEs face difficulties in finding loans. The banks didn't create financial instruments specifically dedicated to the APL.
- d. The enterprises in the EMHO sector don't know the sector regulation. Low level of internationalization. The SMEs are developing new products through the CNPQ support and don't know how commercialize these products.

## **4.4 - APL Resende - APL Metalmecânico Médio Paraíba Fluminense**

### **4.4.1 - History**

The metal-mechanical sector is one of the most important in the State of Rio de Janeiro. It represents 25% of the whole Rio de Janeiro GDP.

The metal-mechanic sector started developing with the foundation of the public company Companhia Siderúrgica Nacional, in 1946 in Volta Redonda. The Company was privatized in 1993. Other than this company the sector comprises many others as well, namely the Vale and the Votorantim Além. In the area there is also a good automotive sector comprised of different firms such as Volkswagen and Peugeot. Other firms plan to start producing soon (Nissan and Hyundai being the most prominent examples). A relevant phenomenon is constituted by professionals coming out from the big firms and starting up their own firms.

The development of this sector in the State is demonstrated by the increase in the enterprises' affiliates in Metalsul, the syndicate of the sector. Indeed, in 2001 there were just 21 enterprises' affiliates, whereas today the syndicate comprises 136 affiliates. The total of enterprises making up the metal-mechanic productive chain is 471 firms in the metal-mechanic sector and 79 firms in the plastic sector. These enterprises are localized in 13 municipals in an area of 180 km of radial. It is estimated that the sector represents 75% of the State GDP and offers jobs to 3305 people.

In 2004 SEBRAE pushed the discussion about the opportunity of creating an APL. There were several meetings between SEBRAE and Metalsul, the pivotal actors of the APL creation, with the government and the university. Only in 2008 a cooperation agreement was signed by 4 actors, constituting the management board of the APL: Metalsul, SEBRAE, FIRJAN and SEDEIS.

The main strategy of the management board is supporting the dialogue between the anchor enterprises and the SMEs that produce small good for the productive chain.

### **4.4.2 - Stakeholders**

As aforementioned the main actors in the APL are:

1. METALSUL - Sindicato das Indústrias Metalmecânicas do Sul Fluminense is located in Volta Redonda and is comprised of 136 enterprises representing the metal-mechanic sector.
2. FIRJAN – Federação das Indústrias do Estado do Rio de Janeiro which owns a regional representation in Volta Redonda. It is the body representing the industrial sector in general and in this case represents all the industries localized in Volta Redonda region
3. SEBRAE – Serviço Brasileiro de Apoio à micro e Pequenas Empresas do Rio de Janeiro. This federal institution has an office in each Brazilian state and is taking part in the APL management through its regional office in Volta Redonda responsible for the policy action in Médio-Paraíba

4. SEDEIS - Secretaria de Desenvolvimento Econômico, Energia, Indústria e Serviços, the agency for the Economic Development, energy, industry and services of Rio de Janeiro state.

### **4.4.3 – Analysis**

In this part the objective is to conduct a SWOT analysis to understand strength, weakness, opportunities and threats of the metal-mechanic APL of Médio Paraíba Fluminense.

#### **A. Strengths and Opportunities:**

- a. There is a formalized agreement between 4 governmental bodies with a strategic plan built up in a participatory fashion and monitored through the SGOR System, the management system oriented towards the results. The first agreement has been in place from 2008-2011 and there is a new agreement for 2012-2015.
- b. Promoting joint actions for entering the market such as participating in fairs, entrepreneurial missions for taking part in fairs organized by other states and providing a dialogue platform for big enterprises and SMEs
- c. The anchor enterprises have a transparent purchase system
- d. There is an office dedicated to the firms financing.
- e. There is a training center and different universities are holding courses with the main focus in the metal-mechanic sector. SENAI is the main responsible for the technical training
- f. In terms of socio-environmental sustainability the APL is promoting the creation of a certificate containing the main rules to guarantee the safety of the workers and to analyze the environmental impact of the processes.

#### **B. Weakness and Threats:**

- a. Low innovation capacity. The enterprises don't have any branch dedicated to the development. There have been three attempts to create the Foundation for supporting the research in the State of Rio de Janeiro but only 7 enterprises took part (despite 50 enterprises being invited). The relation between enterprises and universities is at the infant stage. The universities (one federal, one State and the other 3 private) are teaching good professionals for the sector, but the sector is not capable of absorbing them. There is a technological incubator but it is not involving the metal-mechanic sector and the plan, thought by Man (a truck company) to create a Centre for research and development.
- b. The most of enterprises are old and are family based, facing difficulties in internationalizing themselves.
- c. There are serious problem for the environmental certification due an inadequate industrial localization
- d. Lack of a clear state strategy for solving the energy problem. Every single firm is looking for its own solution

- e. The infrastructure is not adequate to guarantee the development of the sector.

## 4.5 - APL Belo Horizonte-Biotechnology Cluster

### 4.5.1 - History

Biotechnology is an important sector in the Brazilian economy. The three most important centers are: Belo Horizonte, Sao Paulo and Rio de Janeiro.

When we speak about biotechnology we refer to a number of technological activities aimed at breeding or modifying biological organisms to address human needs. It is associated with a variety of microscale technological processes such as genetic engineering, vaccine production, genetically modified crops, bio-pesticides and biological treatment of waste. In general, biotechnology combines biochemistry, molecular science and genetics.

As mentioned before, Biotechnology is important in Brazil. Of the 27 States, 11 have biotechnology companies, but only 6 of them have more than 10 companies. The state which host the most companies is Sao Paulo (40% of the total), followed by Minas Gerais (24,5%) and third, Rio de Janeiro.<sup>18</sup>

The State of Minas Gerais, and particularly its capital, Belo Horizonte, is the second important biotechnology center in Brazil. The history of the biotech sector in this state starts with the beginning of biotechnology research in Brazil in the early seventies when the first biotech firm, the Biobras, was established in Minas Gerais.<sup>19</sup>

Since then it is possible to identify 3 phases of the biotech sector. In the first stage is the Brazilian government who started funding different research activities through a specific agency. As soon as the first biotech company emerged a legal framework and a system of incentives was created. This initial period for the cluster is characterized by protectionism.

The second stage started in 1990 when a period of liberalization began in the Brazilian economy and the cluster saw the entrance of multinationals and the increasing in competitiveness due to a tariffs reduction. This is an important phase because the government and companies' mindset changed from protectionism to competitiveness.

The recent years have brought both challenges and opportunities for the cluster. Due to the increased competition, the number of companies have stopped growing. The existing companies have been forced to upgrade their process, achieving international certification

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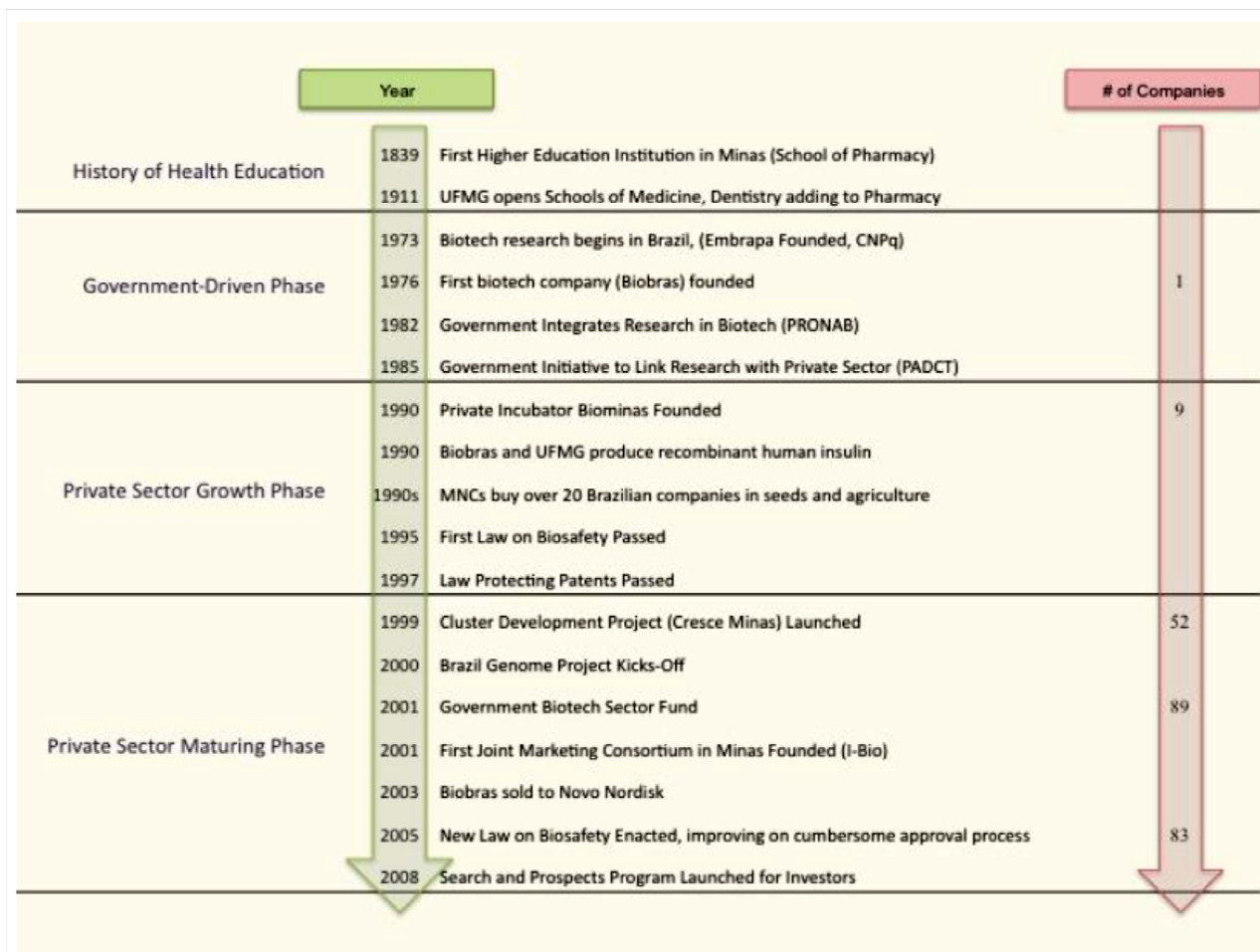
<sup>18</sup> Brazil Biotech Map 2011 in [http://www.clustercollaboration.eu/documents/270120/0/Brazil\\_Biotec\\_Map\\_2011.pdf](http://www.clustercollaboration.eu/documents/270120/0/Brazil_Biotec_Map_2011.pdf)

<sup>19</sup> Dimova M. , Mitnik A. , Suarez-Buitron P. , Siqueira M. , *Brazil Biotech Cluster: Minas Gerais. A Cluster Analysis*, in *Macroeconomics of competitiveness*, spring 2009  
[http://www.isc.hbs.edu/pdf/Student\\_Projects/Brazil\\_Biotech\\_2009.pdf](http://www.isc.hbs.edu/pdf/Student_Projects/Brazil_Biotech_2009.pdf)

and became more export oriented. Also the government has modified its strategy focusing on cluster development as one of its main priorities.<sup>20</sup>

Today the biotechnology cluster is mainly active in the following sectors: human health, agribusiness, animal health and environment.

### Cluster Timeline

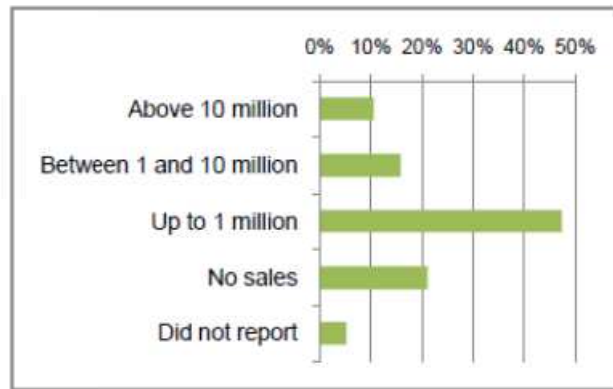


### 4.5.2 - Stakeholders

The Minas Gerais Biotech Cluster is relatively small and young. In fact, about 25% of the companies are less than 4 years old. 75% of the companies employ less than 20 people. 66% of the companies have a close relation with universities and more than 10 companies are currently incubated in Habitat. More than 2/3 of the companies generate revenues between 1 and 10 million R\$.

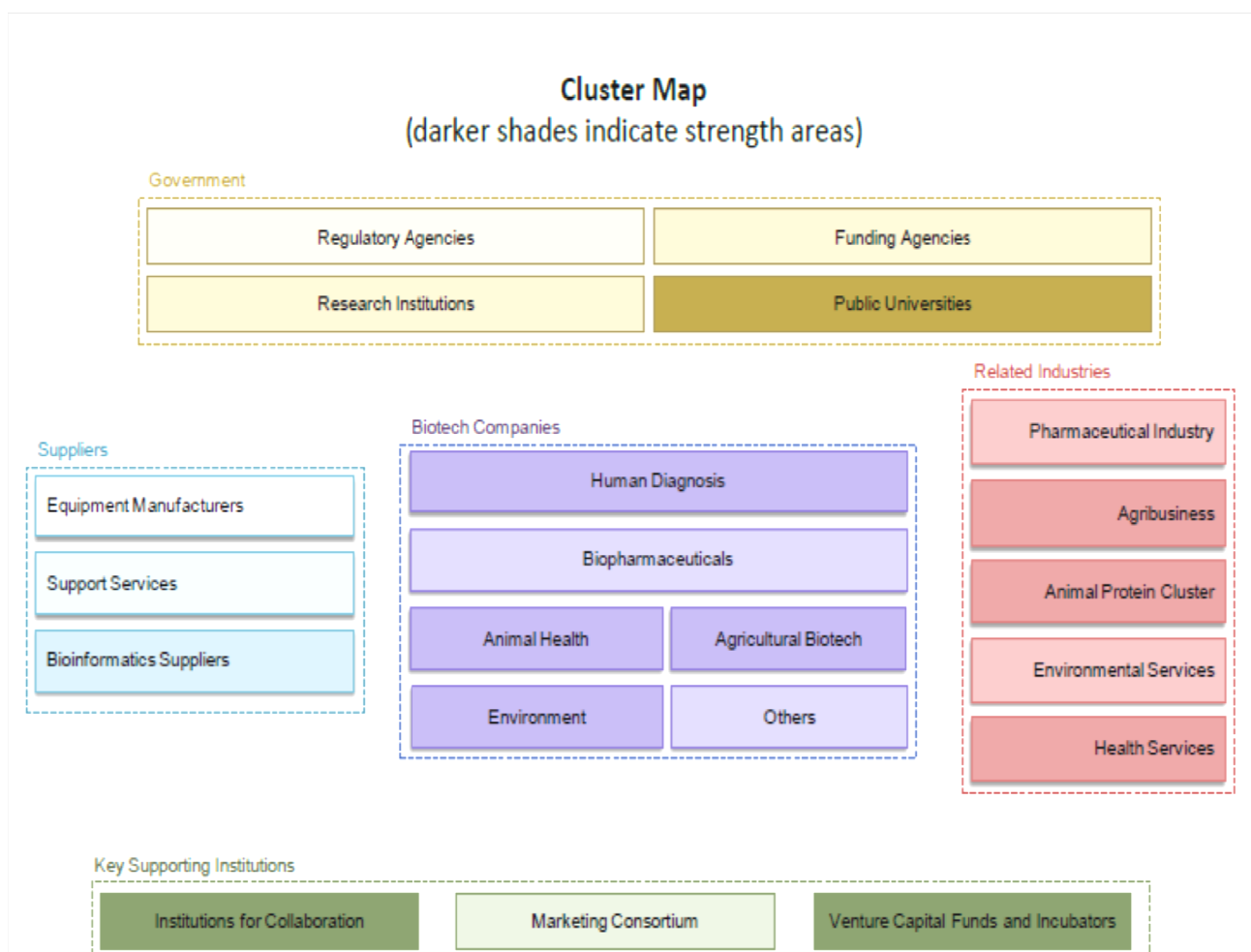
<sup>20</sup> Dimova M. , Mitnik A. , Suarez-Buitron P. , Siqueira M. , *Brazil Biotech Cluster: Minas Gerais. A Cluster Analysis*, in *Macroeconomics of competitiveness*, spring 2009  
[http://www.isc.hbs.edu/pdf/Student\\_Protects/Brazil\\_Biotech\\_2009.pdf](http://www.isc.hbs.edu/pdf/Student_Protects/Brazil_Biotech_2009.pdf)





It is important to note that the cluster activities do not limit themselves to Belo Horizonte but we can find biotech companies also in other cities such as Uberlandia, Uberaba and Monte Carlos. In the latter the city government has been able to attract big companies, namely Bio Bras and Valle, through a good package of local incentives.

Despite its age and dimension, the cluster has a very strong and complete structure, as shown in the picture below.



The first thing to underline is that the presence of the cluster in Minas Gerais is due to the presence of large and high-quality state financed university.<sup>21</sup> Only in the Federal University of Minas Gerais (UFMG) are 161 Biotechnology experts.

Research & Development is the heart of the Biotech sector. The government plays a pivotal role in the cluster development, because not only does it finance universities but also agencies and other research institutions.

Furthermore, the state of Minas Gerais has a good number of supporting industries that strengthen the cluster. The industries can benefit from the well trained experts coming out from the university.

The cluster faces two problems the scarcity of venture capital and the difficulties in obtaining the proper equipment. In regards to the first problem the venture capital is becoming increasingly available and thus may be a short lived problem.

These aforementioned problems are just one side of the coin. On the other side we have the strong institution for collaboration created to foster the cluster.

At the beginning of 1990s, a group composed by nine companies created the Biominas Foundation that represents a very important piece in the cluster structure. Biominas is a private institution dedicated to growing businesses and promoting business opportunities in Brazil's life sciences sector.<sup>22</sup>

Another important step to strengthen the cluster was taken in June 1997 when a joint venture composed by Biominas, UFMG, the city of Belo Horizonte and the State Government created a business incubator called HABITAT. In its 15 years' existence, HABITAT has been responsible for preparing and launching 47 start-ups onto the market. While they were being incubated, these companies jointly earned revenues of R\$ 120 million and paid over R\$17 million in taxes. Currently their combined turnover is R\$ 477 million and they generate R\$ 63 million in taxes.<sup>23</sup>

Another key institution in the cluster is the Federation of Industries of the State of Minas Gerais (FIEMG), important because has an open channel of communication with the State Government, and the Minas Gerais Innovation Network. Biotech companies started also a cooperative enterprise to enhance their marketing capabilities and access new markets.

The state government has also responded to the requests of the industries through a program launched in 1999 called Cresce Minas. The program mixed the funds from the Inter-American Development Bank, the expertise from UFMG, the Biominas' experience and resources from

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<sup>21</sup> Dimova M. , Mitnik A. , Suarez-Buitron P. , Siqueira M. , *Brazil Biotech Cluster: Minas Gerais. A Cluster Analysis*, in *Macroeconomics of competitiveness*, spring 2009

[http://www.isc.hbs.edu/pdf/Student\\_Projects/Brazil\\_Biotech\\_2009.pdf](http://www.isc.hbs.edu/pdf/Student_Projects/Brazil_Biotech_2009.pdf)

<sup>22</sup> Biominas Brasil website <http://www.biominas.org.br>

<sup>23</sup> Biominas Brasil Website <http://www.biominas.org.br/conteudo.php?idicod=2&paccod=20> and Habitat website <http://incubadorahabitat.org.br>

FIEMG. The Biotech Cluster was chosen in the cluster development program with the goal to increase employment. 75% of the result was obtained after 2 years.

Despite these good aspects of the cluster, there are still several problems related with regulation.

To summarize we can say that the Biotech Cluster is integrated well in the state economy and can rely on the great support received by several related industries such as agriculture, animal health, food processing and human health.

Minas Gerais' diversified industry represents a strong supplier platform for the cluster but still lacks the presence of equipment manufactures.<sup>24</sup>

### **4.5.3 – Analysis**

This part of the report is dedicated to a SWOT analysis of the Biotech – Cluster.

#### **A. Strength and Opportunities:**

- a. The enterprises are Brazilian and the influence of the foreign companies is weaker than in the Sao Paulo biotech APL.
- b. There are great opportunities for cooperation
- c. There is an aim to strengthen the organization becoming syndicated in the field FIEMG in order to become more influent in the policy-making
- d. Joint participation in national and international events
- e. A potentially great market
- f. It is an ongoing project to create a private technological center to bridge the knowledge acquired in the universities with the enterprises' needs.
- g. In the State there are 2 other APLs specialized in the field of animal and vegetal health that are taking into consideration the opportunity to join the Biotech-cluster
- h. There are other firms producing medical equipment eager to join the APL
- i. There is the possibility to attract Brazilians living abroad

#### **B. Weakness and Threats:**

- a. The enterprises were created by scientist without an entrepreneurial background
- b. Potentially too much influence of the great pharmaceutical groups
- c. There are difficulties in the internationalization processes due to different regulations

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<sup>24</sup> Dimova M. , Mitnik A. , Suarez-Buitron P. , Siqueira M. , *Brazil Biotech Cluster: Minas Gerais. A Cluster Analysis*, in *Macroeconomics of competitiveness*, spring 2009  
[http://www.isc.hbs.edu/pdf/Student\\_Projcts/Brazil\\_Biotech\\_2009.pdf](http://www.isc.hbs.edu/pdf/Student_Projcts/Brazil_Biotech_2009.pdf)

- d. There is not an innovation policy addressed to APL. Almost all the research is conducted by universities with little innovation. There is still a gap between university and enterprise
- e. There is a gap between the enterprises' needs and the bureaucracy's knowledge of these needs.
- f. The regulation for setting up a company in the sector is still long and complicated.
- g. The financial institutions do not lend large amounts of money
- h. FINEP demand environmental licenses but almost all the enterprises do not have one
- i. Every enterprise is localized in different area of the metropolitan region
- j. Still lacks a specific innovation policy for the biotech sector.

## **5. International Workshop EU – Brazil**

### ***5.1- Background and objective of the Action***

In Brazil the Local Productive Arrangements (LPAs) have been gaining more attention in several R&D Institutions, both national and international, and are also becoming more important for the federal and local governments. Despite this it still is not well-known what role each actor should play in order to support the development of these clusters.

Furthermore, it is known that each APL has its own unique history and culture, which implies that governance structures should also be differentiated. The policy-making for supporting the APLs should consider the cultural and historical aspects of their training and their stages of development and maturity. This is why the analysis of governance is so important.

It is known that there are distinct governance structures in each cluster, differences in the ways each cluster is organized and differences in the relations between business actors and public bodies.

This action aimed to promote, through fact-finding mission to five (5) Brazilian APLs, greater awareness of the role that the governance has in the local development process and greater insight into the experiences that Europeans and Brazilians have on this subject.

This action aimed to promote greater awareness of the role that the governance has in the local development process and greater insight into the experience that Europeans and Brazilians have on this subject through various fact-finding missions to five Brazilian APLs.

### ***5.2-Description of the actions***

A consultancy team composed of two experts (one Brazilian and the other the EU) conducted a study visit to five clusters within five states of Brazil in order to meet local realities in terms of governance and issue a report on the subject:

- TIC - Recife PE;
- Equipamentos Médico-Hospitalar -Odontológico-Ribeirão Preto SP;
- Biotecnologia- Belo Horizonte MG;
- Metal-Mecânico- Oeste Fluminense RJ;
- Apicultura e Mel - Picos PI.

The team has also identified three European clusters that, due to their experience, could offer a great contribution to the workshop held in Brazil:

- cluster TIC MFG Innovation Agency in Germany
- cluster Biocat in Catalunya-Spain,
- cluster Mecatronica in Reggio Emilia – Italy

From the Mission Study and Seminar the final report of the action is being produced. It takes into consideration the study visits as well as the discussion on the cluster governance accrued at the Workshop, including recommendations for the exchange of experiences between Brazil

and the European Union in the cluster2clusters management, specifically with respect to clusters administration managers.

### 5.3 - Discussion during the Workshop

The analysis of the governance of Brazilians visited LPAs can be summarized as follows:

1. They need to catch up on concepts and governance indicators in APLs
2. Each APL has built its governance structure due to its corporate structure and its historical and cultural evolution
3. Three aspects were analyzed and systematized according to the chart below: the corporate structure of the cluster coordination mechanisms - how to organize and manage relationships between companies and the public sector and public policy with a focus on APLs.

	TIC	EMHO	Metal-mecanico	BIOTEC	Apicultura
<b>Estrutura</b>	- 200 pequenas empresas; - 4 grades internacionais; - CESAR; - Segmentos especializados; - Elevada Cooperação.	- 69 empresas; - 80% pequenas; - 20% médias; Baixa Cooperação.	- CSN; - Empresas âncoras automotriz + 471 metal-mec. + 79 plástico Cooperação específica: fornecedores e empresas âncoras.	- 57 empresas pequenas; - Segmentos especializados. Média cooperação	- 1.600 agricultores cooperados+ - Unidade Institucional+CENTAP - Cooperação vertical
<b>Coordenação</b>	- OSCIP; - Núcleo de Gestão do Porto Digital (NGPD);	Fundação Municipal; FIPASE (CEDINA+3 Incubadoras+Núcleo Tecnológico).	- Sindicato; - METALSUL+ SEBRAE+ FIRJAN.	- AMBIOTEC (30 empresas); Associação Civil de direito Privado + FIEMG+ SEBRAE+ SEDE (MG).	- CASA APIS; - Cooperativa Central +9 - Cooperativas - Conselho Consultivo - Camara Setorial de Apicultura.
<b>Política Pública</b>	- Governo PE; Porto Digital Revitalização urbana APL TIC + APL USP. Economia Criativa; - Programa PRO APL com BID.	- Prefeitura; - Governo SP; - Parque Tecnológico	- SEDEIS - RJ; - Problemas de infraestrutura e Meio Ambiente.	- Governo MG tem Superintendência de APL e Programa com o BID.	- SEDEC - PI; de FBB; Sebrae; CODEVASF.

4. The APL ICT in Recife, which was born as a spin-off of the University and, due to the high level of entrepreneurship and market segmentation of the ICT sector, has a high level of cooperation that generates several public-private partnerships. Small businesses have their space and cooperate with large companies. The public sector started supporting the APL afterwards, creating an environment conducive to entrepreneurship, urban infrastructure and gave large tax incentives, beyond the territorial marketing and industry segment.
5. In APL EMHO Ribeirão there are already existing small and medium enterprises. Small businesses have been the result of the turnover of professionals, many of whom have opened their own businesses, creating personal conflicts that hinder the development of horizontal cooperative relations. The municipality created a management body to support the cluster. This body encourages joint action, fundraising, university-industry

approach and coordination with other governmental actors such as the State Government, SEBRAE, FINEP and CNPq .

6. The Belo Horizonte Biotechnology APL, which is composed of small technology-based companies that were born from the university's incubator and academic professionals retired from University, has a horizontal business structure. Recently it began organizing the creation of an association of companies in the biotechnology field, within the Federation of Industries. The State Government has encouraged the biotech industry with its Programme of Support to APLs. Initially even SEBRAE supported the segment, but no longer supports them, claiming that such companies already have high revenues and no longer fit the focus of their action.
7. The Metal-mechanic APL Médio Paraíba Fluminense, which was created from the National Steel Company (CSN) and then by major automotive companies that were attracted to the region, has a peculiar governance structure. There isn't an example of a formalized governance, there is only an agreement among key actors (FIRJAN, SEBRAE, Secretary of Economic Development of the State and RJ Metalsul, which represents small businesses), which excludes large companies. However, these actors together have managed to attract large companies in negotiating rounds with small suppliers. But the key players have not had the strength to solve crucial problems related to infrastructure and environmental sustainability.
8. The Piauí honey APL has a different corporate structure. It was formed by nine cooperatives of family farmers which constitute the central structure of the APL the central cooperative. The farmers cooperatives provide the honey that is processed by the central cooperative (Casa Apis). The Central Cooperative owns the industrial structure for processing the honey. This is so that the cooperatives could maintain a capital and labor ratio differentiated and characterized by principles of social economy. Still, the APL is still very dependent on the support services provided by the government. It receives support from the Bank of Brazil Foundation, technical assistance from SEBRAE and specialized infrastructures (buildings and equipment) by the Ministry of Integration, by CODEVASF. The State Government recognizes the important value of the APL and supports it with the joint action at federal and state level. It still lacks a relation between Universities and honey producers.
9. During the analysis of APLs in terms of legal-institutional model and coordination bodies, we found different levels of organization: i) Two examples of more professional management are NGPD-Core Management of Recife and Porto Digital FIPASE-Polo Foundation for Advanced Health Services. Both have high level professionals (managers APL), both from the point of view of management and the degree of knowledge of the specific segment. Both are legally formalized, the first in the form of OS (social organization) that holds a management contract with the State Government and has developed several other projects with partners in the public and private sector with management autonomy. The second, FIPASE, was formalized as a public foundation under private law on the initiative of the Municipality which has been responsible for the maintenance of basic activities of the entity (incubator and

laboratory) and mobilization of other governmental and private sector leaders. These two clusters, not coincidentally, are clusters of high technological level.

10. Two clusters of traditional industries – Metal-mechanic RJ and beekeeping in Piauí - have not formalized coordination bodies and, consequently, not professionalized in terms of management of APL. The coordination of the metal mechanic APL is led by RJ Metalsul, a union of enterprises which is an affiliate of FIRJAN, and thanks to an agreement with the State Government and SEBRAE, is developing actions to support the APL. Large companies are not part of this Agreement and are not affiliated with the Union Metalsul. Since the APL beekeeping has its level of governance led by the central cooperative, which coordinates the other cooperatives and works in partnership with the public partners through an advisory board at local level and another at national level (which includes representatives of federal government entities). Business decisions are still highly centralized in the Central Board of the cooperative, particularly in the figure of their elected president.
11. Last but not least, is the governance model of APL Biotechnology BH. The entrepreneurs of this field decided to create a specific business association which is different from the pharma-chemical sector within the FIEMG. This association is AMBIOTEC. The organization is still young and wants to become a union to have more power within the FIEMG and be more effective in influencing the foreign policy. The AMBIOTEC is starting its process of professionalization, it has already hired a professional manager who has organized thematic committees to undertake joint action for supporting the development of projects in the area of training and innovation. The AMBIOTEC still relies heavily on the support of the State Government which in partnership with FIEMG is developing a Plan for supporting local cluster that includes the segment of Biotechnology BH.
12. To summarize, although we know that the legal model is not the most important factor for creating good governance model for APLs, its constitution should encourage private cooperation and partnership with the public authorities including the transfer of public resources to privates which has been a problem in Brazilian legislation in the past.
13. The relationship between universities and businesses and the existence of joint projects of innovation is still fragile in most APLs. There are problems related to the intellectual property which is demanding a more professional approach in the management cluster.
14. The challenge of internationalization for the APLs wishing to internationalize also requires more professional management of clusters and public-private partnerships.
15. Likewise, public policy pro-clusters (those that take into account the collective and the specifics of the cluster) are still incipient in Brazil at the federal, state and municipal level.
16. Even though the presentations of the EU clusters have not focused on the issue of governance itself, during the discussions at the workshop it was perceived a greater professionalization of clusters presented would have been useful in terms of cluster management.



17. In terms of pro-cluster policies, although the EU clusters have more experience than the Brazilian ones, there exists the same problem of governance hindering SOMETHING.

Considered all the points mentioned we present the following recommendations for future cooperation between Brazil and the European Union.

## 6 - Final Results and Recommendations

Here are the results and the recommendations for better cluster governance that were accumulated after the research and study visits conducted by the consultancy team and discussion held at the international workshop in Brasilia:

1. Two issues may be the subject of cooperation: managing cluster (local initiatives) and cluster pro-public policies (national and state).
2. First the discussion on two topics should be promoted through the GTS APL: the experiences of governance in Brazil and the challenges of professionalization of cluster managers, the experiences of public policies and pro-cluster, the training needs of managers pro-cluster, the involvement of the partner institutions at the federal level, the identification of a need for cooperation. Likewise the presence of state bulks.
3. On the policy topic, it is necessary to exchange experiences through seminars in Brazil with the participation of policymakers from Europe and through study visits in European clusters for the public managers. Furthermore, it was agreed the need to empower both public managers at strategic level and public administrators at the level of policy implementation.
4. On the topic of cluster management at local level, while it is not possible to set a single model of excellence the consensus seems to be that is better to benchmark management cluster with a checklist of indicators to measure best practices in governance in Brazil and its dissemination. Likewise, there is consensus on the need to promote the empowerment of cluster managers, in order to contribute with its professionalization. Where as RedeSist and Brazilian universities already have experience of management training cluster in Brazil , it is recommended that the activities of cooperation will strengthen and expand these initiatives in Brazil, with joint action and training of multipliers.
5. The Industry System in Brazil is still working and is organized by sector and thus it seems necessary to include the cluster approach and the territorial development within the organizations of the industry, involving its professionals and business leaders in cooperative action identified above.
6. Regarding the results of the study mission it is important to underline the experiences of the Government of the State of Minas, which has a Superintendent and a Program of Support for clusters in the state which is developed in partnership with industry system. Together with the initiative of the Municipality of Ribeirão, these two cases represent exceptions and constitute good practices to be encouraged. Likewise, the union organization united with the APL approach, as is the case with AMBIOTEC, could be stimulated within Industry System in Brazil.
7. When there are particular situations in a productive segment the cooperative approach should be strengthened and supported, such as in the case of Piauí where the organization is made up of different individual cooperatives with a central cooperative Casa Apis, owning the production plant. Small producers in rural areas still need the support of government actors to build a proper support service for the sector. It is necessary to set up a proper regulation, to set up cooperation

agreements, public-private partnerships matching the specific needs of the APLs from a technical and financial point of view in order to stimulate the creation of Business networks and Innovation; it is also important a cluster focused training for enterprises' management.

8. Finally, the actions for future cooperation should take into account the differences between clusters from different regions and different segments of industry and agriculture in Brazil. We also recommend seizing the opportunity to use the cluster approach to increase the social inclusion of the Brazilian economy. At the same time the EU could adopt a similar cluster approach which could represent a good solution in fighting regional poverty which has become a large problem since the economic crisis.
9. Regarding cluster management, the main task lies in the harmonization of the interests of different members of the cluster. This underlines the importance of finding appropriate, professional management tools and instruments which should be applied on a permanent basis. The recruitment of highly skilled cluster management personnel plays a very important role and should be supported for this reason.
10. Often clusters are driven by the existence of available public funding and the problem of the sustainability becomes a critical one. In that respect the state should provide digressive financial incentives combined with the attraction of the private funding (e.g. venture capital)
11. While improvement of labor qualifications and skills remains one of the important topics, the qualification of real cluster managers represents a critical issue and should be supported both at cluster level as well by public programs.

## Annexes

### PORTO DIGITAL - ICT CLUSTER

<b>Study Visit</b>	24th September 2012
<b>Strategic Focus</b>	<ol style="list-style-type: none"> <li>1. Increasing Porto Digital's capacity to attract new investment and strengthening the competitiveness of the Park's companies</li> <li>2. Involving Porto Digital in other economic sectors in the State that lack information and technology</li> <li>3. Expanding Porto Digital nationally and internationally</li> <li>4. Strengthening Porto Digital's brand and consolidating its image and reputation</li> <li>5. Promoting social responsibility and digital inclusion</li> <li>6. Strengthening governance and the technical capacity of the Porto Digital Management Unit.</li> </ol>
<b>Main Area</b>	Recife – Pernambuco
<b>Regional Information</b>	<p>Porto Digital is located in Recife, the capital of the State of Pernambuco (More than 8 million inhabitants), a city which is one of the most important hubs for business, politics and higher education in Northeast Brazil. Pernambuco is the fastest-growing of Brazil's 26 States, with a rise in GDP of 9.3% in 2010. The State of Pernambuco is the main logistical center in the northeastern region, with 98 units for outgoing and 112 units for incoming goods. Other important economic activities are: energy sector, mining and extracting raw materials, and shipbuilding.</p>
<b>Action of APL</b>	<p>Porto Digital is run privately by a not-for-profit organization called the Porto Digital Management Unit (NGPD), to which the government has entrusted management of the park. Its management structure takes the form of an Administrative Council, with 18 members representing the firms sited on the park, companies from other sectors which have relations with PD, the university, Recife City Hall, and the State Government. The Council makes the main decisions regarding Porto Digital's development policy and strategy and has the freedom to appoint the directors of the NGPD. In the initial stage during the first two years of its existence, NGPD was in charge of structuring the tools, the laws and incentives to enable companies to set up office at Porto Digital. Construction works for the recovery of historical buildings were also performed. In the second stage of operation, NGPD is working for the ongoing development of the business environment through technical cooperation agreements and technology transfer, as well as encouraging integration between companies. In addition, it promotes both nationally and internationally the image of the Local Production Cluster as an island of excellence in the ICT field.</p>

**CASA APIS - AGRO FOOD ORGANIC CLUSTER**

<b>Study Visit</b>	27 <sup>th</sup> September 2012
<b>Strategic Focus</b>	Casa Apis aims to strengthen the cooperative bee farming, streamlining production, quality, processing and marketing of bee products, adding value and generating profit.
<b>Main Area</b>	Picos – Piauí
<b>Regional Information</b>	<p>Casa Apis is located in Pico, the third largest city in the State of Piauí and is the most economically developed city in the region. The city's financial prosperity, combined with its geographical location, gives Picos a "commercial hub" status, especially for fuel and honey (Picos is known as the "capital of honey"). As of 2010, the population was approximately 75,000. Piauí is one of the poorest states of Brazil (more than 3 Million inhabitants). The service sector is the largest component of GDP at 60.1%, followed by the industrial sector at 27.3%. Agriculture represents 12.6%, of GDP (2004). Piauí exports: essential oil 19.5%, soybean 17.1%, woven of cotton 15.1%, cashew 12.6%, crustaceans 12.4%, leather 8.3%</p>
<b>Action of APL</b>	<p>Casa Apis is run by a Diretoria Executiva elected by the representatives from all the cooperatives associated. The main action of Casa Apis is to commercialize the whole honey production of it's associate. Casa Apis' charter ordains that the resulting value of sales is divided among all the affiliates proportionally to their shares in Casa Apis after the payment of all the expenses related to production. The other task of Casa Apis is to manage and to divide among the associated the funds given by the State.</p>

**APL EMHO - CLUSTER of MEDICAL, HOSPITAL and DENTAL EQUIPMENT**

<b>Study Visit</b>	1 <sup>st</sup> October 2012
<b>Strategic Focus</b>	The APL EMHO is a project that aims to canalize efforts to empower, qualify and strengthen Medical, Hospital and Dental Equipment sector of Ribeirão Preto, looking for economic and sustainable municipal development and its region.
<b>Main Area</b>	Ribeirão Preto - São Paulo
<b>Regional Information</b>	Ribeirão Preto is a municipality and city in the Northeastern region of the state of São Paulo in Brazil. The State is the major industrial and economic powerhouse of the Brazilian economy and contains the largest population, industrial complex, and economic production in the country. It is the richest state in Brazil. In the State of Sao Paulo the service sector is the largest component of GDP at 47.2%, followed by the industrial sector at 46.3%. Agriculture represents 6.5% of GDP. São Paulo (state) exports: vehicles 17.2%, airplanes and helicopters 11.6%, food products 10%, sugar and alcohol based fuel 7.8%, orange juice 5.2%, telecommunications 4.1%. São Paulo state is responsible for approximately a third of the total Brazilian GDP. With 605,114 inhabitants, Ribeirão Preto is the ninth largest municipality in the state. Since the city is relatively far from other major Brazilian urban centers it founded a new economic vocation in the services and commercial sector which was developed to attend to the local and regional demands. The second economic boom in the history of Ribeirão Preto occurred after the oil crisis (1973 and 1979) of the 1970s. The increase in the oil price obliged Brazil to look for alternative means of fueling and the solution found was the alcohol fuel program. Contrary to what happened during the city's first economic boom (after the economic crisis in 1929), this time Ribeirão Preto farmers and entrepreneurs did not concentrate themselves exclusively on a single crop and diversified their investments making the city one of the most important agribusiness centers of Brazil. Besides sugar and alcohol, Ribeirão Preto's major products are orange juice, cotton, rice, meat, dairy products, textiles, machinery, steel, furniture, building materials, agrochemicals, pharmaceuticals and beer.
<b>Action of APL</b>	The APL EMHO is an action developed by FIPASE in partnership with different players, who consist of: SEBRAE-SP, City Hall of Ribeirão Preto, Development Department of São Paulo, SENAI, CIESP, FIESP, ABIMO, ABDI and SEBRAE. In Ribeirão Preto's region, according to data from the Development Department of São Paulo, there are 69 companies in EMHO's sector. Aware of being a sector with a huge innovative and strategic dynamism, not only for the city, but for the whole of Brazil as well, they have executed many actions to increase companies' competitiveness. One of the best examples of this is the participation in fairs and promotion of consultancy beyond managerial and technological training courses. CEDINA's creation – Center of Development and Applied Innovation in Medical, Hospital and Dental Equipment contributes to the strengthening of Ribeirão as a center in this sector by creating laboratory infrastructure that allows producing quality tests and product development.

### APL METALMECÂNICO MÉDIO PARAIBA FLUMINENSE

<b>Study Visit</b>	2nd and 3rd October 2012
<b>Strategic Focus</b>	<ol style="list-style-type: none"> <li>1. Spreading the associative culture and putting into contact big enterprises with the metal mechanic productive chain in order to facilitate business opportunities</li> <li>2. Strengthening the enterprises competitiveness through technical assistance and training activities while taking into account sustainability values</li> <li>3. Development and implementation of an integrated marketing plan for APL</li> <li>4. Setting up a system for financial and fiscal incentives, fiscal regulation, environmental regulation and a training system through the collaboration among government, schools and universities, private and non-governmental institutions</li> </ol>
<b>Main Area</b>	Resende - Medio Paraíba (Rio de Janeiro)
<b>Regional Information</b>	<p>Resende is a municipality located in the Brazilian state of Rio de Janeiro, the second richest State of Brazil behind São Paulo. The industrial sector is the largest component of GDP at 51.6%, followed by the service sector at 47.8%. Agriculture represents 0.6% of GDP. The state of Rio de Janeiro exports: petroleum , fuel, siderurgy , chemicals , not ferrous metals , vehicles . More precisely Resende is situated in Médio Paraíba, an area made up of 12 cities with a population of more than 800.000 inhabitants. The population of Resende is upwards of 100.000. In Médio Paraíba the main economic sectors are: metal-mechanic, automotive, iron and steel industry and tourism. Resende's main economy is coffee and milk in the agricultural sector, uranium refining, vehicle manufacturing, which includes factories of Volkswagen Truck &amp; Bus.</p>
<b>Action of APL</b>	<p>Involving more than 400 small and medium enterprises APL Metalmecânico Médio Paraíba Fluminense is carrying out the following actions:</p> <ul style="list-style-type: none"> <li>Promoting the entrepreneurship in the metal mechanic sector</li> <li>Organizing workshops</li> <li>Creating credit advancements for the enterprises</li> <li>Networking Activities</li> <li>Strategic Information</li> <li>Consulting and training courses</li> <li>Expo and Congress</li> </ul>

### BIOTECHNOLOGY CLUSTER

<b>Study Visit</b>	4th October 2012
<b>Strategic Focus</b>	The APL Biotec was created with the aim of strengthening the Biotechnology sector in the Metropolitan Area of Belo Horizonte. It involves 6 municipalities which comprise a total population of more than 3,5 million people. The Biotec activities are divided as follows: 71% in human Health, 12% in animals health, 2% in agribusiness, 6% in the environment and 6% in other fields.
<b>Main Area</b>	Belo Horizonte - Minas Gerais
<b>Regional Information</b>	<p>Belo Horizonte the capital and largest city in the state of Minas Gerais and is located in the southeastern region of the Brazil. Minas Gerais ranks as the second most populous state, the third wealthiest by GDP and the fourth largest by area in the country. In the State the service sector is the largest component of GDP at 47.1%, followed by the industrial sector at 44.1%. Agriculture represents 8.8% of GDP. Minas Gerais (or simply Minas, as it is commonly called) is a major producer of milk, coffee and other agricultural commodities, as well as minerals. Electronics are also produced in Minas. The automakers Fiat and Mercedes-Benz have factories there. Tourism is also an important activity for the state. With a population of 2,475,440 inhabitants, Belo Horizonte represents the third largest metropolitan area in the country. The service sector plays a very important role in the economy of Belo Horizonte, being responsible for 85% of the city's gross domestic product (GDP), with the industry making up for most of the remaining 15%. Belo Horizonte has a developed industrial sector. It has traditionally been a hub of the Brazilian siderurgical and metallurgical industries, as the state of Minas Gerais has always been very rich in minerals, specifically iron ore.</p> <p>Belo Horizonte is the distribution and processing center of a rich agricultural and mining region and the nucleus of a burgeoning industrial complex. Production is centered on steel, steel products, automobiles, and textiles. Gold, manganese, and gem stones mined in the surrounding region are processed in the city. The city hosts several big enterprises and there are also a large number of small enterprises in the technological sector with regional to national success, particularly in the fields of computing and biotechnology. Because both governmental and private funding has diversified diversification the economy the city has become an international reference in Information Technology and Biotechnology and is also cited because of the advanced corporate and university research in Biodiesel fuel. The number of jobs in the Information sector has been growing at annual rates above 50%. The Belo Horizonte Metropolitan Area, composed of 33 cities under the capital's direct influence, is home to 16% of the country's biotechnology companies.</p>
<b>Action of APL</b>	<p>Involving 57 enterprises and more than 4000 workers APL Biotec in Belo Horizonte is carrying out the following actions:</p> <ul style="list-style-type: none"> <li>Knowledge Management</li> <li>New roads in Research and Development</li> <li>Fund-raising</li> <li>Development of projects</li> <li>Networking Activities</li> <li>Strategic Information</li> <li>Consulting and training courses</li> <li>Expo and Congress</li> </ul>