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BUILDING INNOVATION HABITATS: A CASE STUDY ON THE REGIONAL TECHNOLOGICAL PARK OF LONDRINA, PARANÁ STATE, BRAZIL

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ABSTRACT

This paper discusses the development of the Londrina Technological Park, emphasizing the previous experiences of ADETEC, the NGO in charge of the studies and negotiations related to it. ADETEC has the expectation that the participation of its staff in the Conference will allow the exchange of important ideas on technological development with specialists from all over the world. Although the development of the Londrina´s Park has just started, the knowledge acquisition from other experiences will be of great importance to the ripening of the Londrina Technopolis Program and also to shape up our own model for technological development in a countryside area.

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INTRODUCTION

The objective of this paper is to describe the context in which the Londrina Technological Park was conceived, emphasizing the recent history of the Londrina Technopolis Program and the recent studies carried out to support the park implantation as well. While the Technopolis Program is broad in scope and has the regional development as its major target, the Londrina Technological Park can be seen as one important element to strengthen the innovative actions already undertaken by ADETEC (Association for the Technological Development of the Londrina Region) as part of the mentioned Program.

Presently, regional development is becoming progressively dependent upon knowledge acquisition, organization, use and transference. When this important asset is transformed into innovation, it leads to competitive advantage for enterprises and regions enabling them to enlarge their market share in the worldwide scenario. Regarding to the development of regions, the major challenges posed to local governments are related to the creation or enhancement of innovation friendly environments, by changing the dominant cultural patterns in academia as well as in society as a whole. According to Cassiolato & Lastres (1999, p.13), both innovation and knowledge play a key role in the competitiveness and development of nations, regions, economic sectors, companies and even individuals. In order that these two key factors can be effectively assimilated, according to the Knowledge Society paradigm, such regions have to create adequate innovation environment by promoting cultural changes and approximating researchers from universities and R&D institutions and enterprises in such a way as to induce the creation of innovative and marketable goods and services.

The existence of regional policies to enhance innovation assimilation as part of the enterprises working philosophy is necessary in this environment. Both the effective use of the enterprises´ tacit and explicit knowledge and the use of adequate instruments for entrepreneurship enhancement, such technological parks, are indispensable.

Therefore, it has been observed worldwide that, in general, all the pre-conditions for development of innovation habitats very often are not in place altogether. An analysis of this situation in the context of
An analysis of this situation in the context of EEC, done by Landabaso & Mouton (2003, p. 8 and 9), suggest two types of complementary conditions:

“The “necessary” conditions, based on basic infrastructures (land, air and sea transport, telecommunications, energy, the environment etc- physical capital) and human resources with a minimum level of training (human capital). The “sufficient” conditions are based on “intangibles” and more directly related than the former to the competitiveness of business base – the capacity for innovation, a business culture that encourages co-operation, the quality of management, a minimum level of R&D capabilities, the availability of business services etc, and an institutional framework that promotes co-operation between the public and private sectors and between enterprises (related to the concepts of social capital and the so-called “ institutional thickness”). The two types of conditions are intimately related and must be present in the required proportions to maximize the impact of regional development policies”.

Setting forth a similar way of thinking, Bortagaray & Tiffin (2000, p. 12) proposed a model on innovation clusters for Latin America emphasizing both tangible and intangible elements, as follows:

"Our model stresses both tangible and intangible elements. The tangible are:

- *knowledge-based firms*
- *knowledge inputs*
- *specialized consulting services*
- *specialized inputs*
- *markets*
- *cluster support*
- *financing*

The intangible elements are:

- *supportive social climate*
- *links and interactions among individuals and organizations*
- *quality of life for people working in the community where the cluster operates.*

According to ANPROTEC & SEBRAE (2002, p.80) the Technological Park concept has two complementary approaches: (i) a planned scientific and technological based industrial complex, formally structured, concentrated and cooperative by definition, that aggregates enterprises whose products encompass a high context of intellectual capital, that is technological research developed at R&D institutions located in the park or in its neighbourhood but colligated to it as part of an innovation system; (ii) a business that promotes the culture of innovation, the enterprises competitiveness in the market place as well as the intellectual capital based on the common ground of technology transfer and the creation of wealth.

The Park´s proposal was accomplished as a result of a community movement oriented to assembly ongoing S,T&I initiatives and expectations that started back in mid-nineties and grew up in importance in 2000. Leading actors from NGOs, academia, R&D institutions and the productive sector played an active role in both cases. Sendin (2002), describes the role played by ADETEC, the NGO that was the leading player in this movement. An important action coordinated by this player that was decisive for the definition of the present framework of the Londrina Technopolis Program was a study carried out by Ruiz et al. (2001) that resulted in a strategic plan for the technological development of the Londrina region. This plan was based on the analysis of the local innovation system and its connections with the productive sector.

As it regards to the Londrina Technological Park, it is an asset that was not previously envisaged as the major goal of the Londrina Technopolis Program. However, at the present time, ADETEC and its partners widely recognize that the Park implantation is a key instrument for the success of the Technopolis Program, since the principal objective of its structuring actions is to create a fertile environment for the proliferation of new ideas in the local innovation system. The Park not only does give visibility to the Technopolis Program at both national and international levels, but it also creates a synergic environment for the attraction of technology based enterprises and specialized services.

CONTENT

The Northern region of Paraná State is by far above average when compared to a number of other developing areas in the countryside of Brazil, but it still has a long run to go in order to improve its economic and social indicators. It is expected that in a 10-year horizon, the Londrina Technopolis Program will provide the means for technological dissemination in favour of the well being of society at the regional level. In this regard, efforts to create effective instruments to attract technology-based enterprises are underway.

Some development actions in which ADETEC was previously involved and that effectively deserves attention are related to the implantation of two incubators in the city of Londrina. The first one refers to the implantation of a traditional enterprise incubator named INCIL (Londrina Industrial Incubator) that was formally opened by ADETEC in 1994. Up to 2001, when this incubator was shut down, it housed around sixty newborn enterprises from several industrial sectors such as information technology, food processing, dentistry equipment and others. The second one refers to a technology-based enterprise incubator named INTUEL (International Incubator of the State University of Londrina - UEL) that was inaugurated in April 2001.

According to Ruiz et al. (2000), the idea *of "… structuring an innovation system in the Londrina region was first introduced in mid-1992 by Professor Ivan Lupiano Dias, a Physics professor from UEL. Innovation system refers to an environment in which there is a continuous interaction between S,T&I institutions and industries, so that favorable conditions to foster innovation can be created. This idea grew up in importance as leaders from both the public and private sectors pointed out that investments in S,T&I would be the one possible way to promote social and economic development in Northern Paraná. A number of local organizations and institutions altogether created a pro-technological development movement in 1993. Later on, the growing of this movement led to the creation of ADETEC in mid-1993. After the creation of this Association, discussions related to the regional technological system were implemented and, by the end of 1999, a project aimed to conceive the technological strategic planning of the Londrina region was finally designed and funded"*.

Initially, this project was financially supported by CNPq (Brazilian federal government agency), Euvaldo Lodi Institute, and Paraná Technology. In 2002, after the accomplishment of a study that resulted in the technological strategic plan for the Londrina region, the scope of this project was enlarged and it assumed the status of a Program. Since then, FINEP (another Brazilian federal government agency) became one of the major partners in the program, funding a block of seven interconnected projects.

Broadly speaking, the intention of ADETEC and its partners in the implantation of the Londrina Regional Technological Park, by and large, does not differ that much from the philosophical principles that nurtured other technological parks worldwide. One argument in favour of this assertion is the definition of technological park adopted by the Portuguese Association of Science and Technology Parks, quoted by Durão, Maltez & Varela (2000, p.2,3):

"... a Science Park ...(is)... a project promoting innovation and development and including namely the following elements:

- *Intelligent space designed to serve as interface between entrepreneurial, scientific and educational systems;*
- *Formal connection to one or more Universities and/or R&D institutions;*
- *Conceived in order to encourage creation and growth of advanced knowledge based firms, including value added services;*
- *Management staff actively involved in innovation, promoting technology transfer, reinforcing competence of installed organizations, creating networks and strategic connections."*

The importance of the existence of a local innovation environment is also highlighted by Cassiolato & Lastres (1999; p.53), as they mention that " …*the processes of generation of knowledge and innovation are interactive to each other and also localized. That is...the spatially interaction created among localized agents in the same territorial area, favors the process of innovation generation and diffusion."*

Recent Technological Development History in the Londrina Region

Still taking that publication organized by Cassiolato & Lastres as a reference, Passos (1999, p.349) considered that the structuring actions undertaken in the Londrina region, suggested that the basic foundations for a future technological park were already being settled.

The year 2002 became of utmost importance to Londrina Technopolis Program because of the financial support obtained from both federal and state governments. This thrust enabled ADETEC to effectively set up three working platforms (Information Technology, Agribusiness and Innovative Knowledge Management) as well four supporting services (Information System as a Tool for Project Development, Marketing and Communications, Integrated Management System, and Extension of the Technopolis Program to Other Neighbour Municipalities). It is also important to point out that the Londrina´s local development company (CODEL) since mid-nineties has been attempting to support a technological park project as part of the Industrial Development Plan (PDI) developed in 1995/96. A concrete action towards this goal was taken by September, 2002, when a 126,000 square meters parcel of land and a 2,500 square meters building were provided for the park installation by the local City Hall.

Discussions between ADETEC and CODEL are currently underway in order to define strategies for land use and occupation in the context of the parceling of the land as well as the way the referred building will be occupied.

Although it is still not formally decided, at the present stage of discussions, small lots of the parcelled land are supposed to be either sold or rented to technology based enterprises that, in the time being, may show up interest in moving or starting their business in the park area. The existing building, after a reform, is expected to lodge ADETEC, the Technopolis Program, a technological incubator, specialized labs and some other facilities aimed at providing technological, consulting and training services.

The local government support to the technological park project, via CODEL, is in accordance to a municipal law passed in June, 2002, that established the Londrina S&T System. In its text, this Law foresees "*…the development of projects to support technological initiatives such as incubators (both traditional and technological), technological parks and a local innovation system*." It is also important point out that even though the technological park is located in Londrina, the structuring actions of the Londrina Technopolis Program were settled in a regional perspective. The Park´s installation is expected to generate positive externalities in a geographic area comprising around 30 municipalities. In this regard, some actions presently underway in the context of the Extension Project of the Technopolis Program to Other Neighbour Municipalities (Pólos TIC) are focused on the goal of strengthening the regional innovation system. This system will have the technological park as a core element from which the development of the Northern Paraná region is expected to irradiate.

Building the Park: First Steps

At the present time there is a high expectation that the Londrina Park will positively impact the whole economy of Northern Paraná, in the coming years. The major objective of the Park is to create a S,T&I based complex that will allow the enhancement of wealth and welfare through technological innovation at a regional level. In November 2002, FINEP (federal government agency) provided a grant to ADETEC in order to support part of the Techno Center construction costs and the Londrina Technopolis Program as well. The Techno Center is one of the major

facilities of the Park that is going to lodge ADETEC, the Technopolis Program, specialized labs, a technological incubator, and an innovation technology condominium.

Some activities planned for the year 2003 in the context of the park project implementation are the following:

- Preparation and effective conduction of a urbanization plan for the inner area and its immediate surroundings;
- Partial reform of the building that is going to lodge the Techno Center in order to support adequate infra structure and a number of facilities;
- Adaptation of the strategic actions devised in the Londrina Technopolis Program to support the technological incubator, labs and specific projects to be approved in the context of the Park from 2002 onwards;
- Conclusion and implementation of a preliminary business plan whose major purpose is to analyze the necessary technical, managerial and political strategies to provide the means for the park and its facilities to become self-sustainable in a specified time horizon;
- Elaboration and implementation of the management model for the Technological Park.

The last supportive action to the Park implantation was undertaken recently by PROINTER Institute and it consisted of preparing an "umbrella plan" for the Park installation composed of both a Business-Oriented Plan and a Preliminary Technology-based Enterprise Attraction Plan. In this task, PROINTER was technically supported by the head of the Basque's Organization for S&T Parks from Bilbao, Spain. The umbrella plan defines the Parks basic building structure and its operational costs as well as the basic strategy for its economic sustainability for the next seven years. The 2003 - 2010 scenario was adopted in accordance with the time horizon of the Technopolis Program. This Program envisages the creation of a dynamic regional innovation system as a result of a number of structuring actions to be developed from 2000 to 2010.

The Business Oriented Plan take account of the three major components of the Park: the Techno Center, the Technological Incubator and the land parcels available for technology based enterprises.

(i) Techno Center – the available area for this facility is expected to be around 5,000 square meters, fully supplied with modern information technology infrastructure. Biotechnology labs and certification lab services will be provided for Agribusiness enterprises, directly or via partnerships with the regional R&D organizations such as universities and research institutes. The technical and management staff of Londrina Technopolis Program will also be housed at the Techno Center. This Center will also provide training courses to enterprises and other public and private organizations.

(ii) The Technology Based Enterprise Incubator – it will be an important asset of the Techno Center and it is going to be headed by a specific manager that will be in charge of the whole incubation process and also closely interact with the managers of the other Park´s assets. Both the incubator and the Park will have as their major focus the areas of Information Technology and Biotechnology, but it does not mean that technology-based enterprises will not be accepted to take place in this innovation habitat. The selection criteria for having enterprises in the technological park will include factors such as: (a) degree of innovation of its products and/or processes; (b) the competence of the new entrepreneurs and the chances of success of their start-ups; and (c) the impact of the enterprise project in the regional development.

(iii) Housing Space and Land Parcels Available for Enterprise Installation - There will be a built area available at the Techno Center for housing around 20 Information Technology small enterprises in an innovation condominium. In the area surrounding the Techno Center it will be possible to house at least 50 enterprises in land parcels of 1,000 square meters size on average.

Whether the lots will be provided to the enterprises for rent or sold for them to build their own facilities is a matter whose discussion is still not over.

Short Term Perspectives and Actions Already Taken

Since the installation of the Park is expected to begin in the second half of 2003, it is adequate to analyze the structure devised to it in a broad perspective, as part of a regional innovation system composed of a number of public and private universities, R&D institutions, incubators, Information Technology support programs (e.g. SOFTEX – a Brazilian initiative to promote software exports and GeNorP – a pre-incubation program at UEL), and innovative enterprises. In this regard, it is also interesting to analyze some concepts interrelated to innovation habitats as well the extension to which they are applicable or adaptable to the Londrina Technological Park.

The already mentioned Bortagaray & Tiffin (1999) suggested a new typology for innovation clusters organized from studies carried out in Latin America. It worths mentioning their classification provided that the Londrina´s technological development experience is mentioned as an example of innovation cluster. According to these authors, clusters can be ranked in five types, and the classification is based on their complexity level and degree of innovation (p. 7 and 8). Londrina was included in the fourth rank (p. 28; 30), as part of the so-called *Proto Cluster*. Their definition of innovation cluster and the description of the last two ranks of their typology are shown as follows:

"...an innovation cluster is an organizational structure that creates new products and enterprises by means of collective industrial production within restricted geographical boundaries, based on high concentrations of knowledge exchange, interactive learning and shared social values...
..An innovation cluster is obviously a continuum of structures which range from those that are not innovative, or involved with science and technology, to those that are so closely bound up with R&D that they drive the scientific and technological frontiers forward. This suggests the following typology which will be important to apply when considering the Latin American situation:

Proto innovation: An innovative industrial cluster which is aware of world markets, the need to be at international best, is focused on rapid acquisition of cutting edge technology to create new products and supports a limited growth of new knowledge-intensive firms. Some key stakeholders typically missing and not clear will continue to develop in medium term.

Mature innovation: A cluster which defines the social structure of community it is in, creates a dynamic, expanding group of firms based on cutting edge scientific knowledge, sucks in talent from around the world, generates venture capital and drives the place and direction of scientific and technological research. "

Although the classification of Londrina as a *Proto Cluster* sounds somewhat optimistic, it is possible to agree with the authors when they say that (p.28) *"... it is very likely that there are candidates for agro-industry innovation clusters, for example in Londrina, Southern Brazil, where in addition to the strong agro-industry cluster, there is a committed community will to create a techno pole"*.

The conditions envisaged by Bortagaray & Tiffin (1999) were, in a way, confirmed by Zouain et al. (2002). These last authors have made an attempt to build a model to analyze the recent "phenomenon" of technological parks installation in Brazil. As the Londrina´s case was selected out of seven experiences, these authors have identified some "best practices" in the way the Londrina

Technopolis Program is being managed. They depicted both its organizational framework and its communications activities as being the two major strengths of the Program since they lead to a better understanding of the ongoing technological development process by the regional community and outsiders.

Taking into account the financial support clearly guaranteed by FINEP (Brazilian federal governmental agency) and the manifested interest of an international park to develop a partnership with the Londrina Technological Park, a strong commitment of local authorities and leadership has been built in order to accelerate the construction of the necessary Park infra-structure and facilities.

The Londrina Park Organization

Since the Technological Park is a business-oriented project that, by its own nature, depends upon public investments, discussion focused on the management model for this innovation habitat are presently part of an ongoing process involving CODEL (public owned company), ADETEC (NGO) and leading representatives of the local private sector.

It worths noting that the Londrina City Hall Decree that created the Technological Park states that its management can be done by a not for profit organization, supported by a specific legal instrument signed by all the interested counterparts. PROINTER Institute pointed out in its recent study that an NGO (possibly ADETEC) due to its dynamic and flexibility would fit quite well in this position.

The Park Board of Directors will be the maximum instance in which all the policies and operational strategies of the Park will be defined. This Board comprises twelve members that are discriminated as follows: (i) Local and State Government – 4 representatives; (ii) R&D Institutions and Academia – 2 representatives; (iii) Private Sector – 6 representatives.

The proposed organizational structure of the Park is shown in the figure bellow.

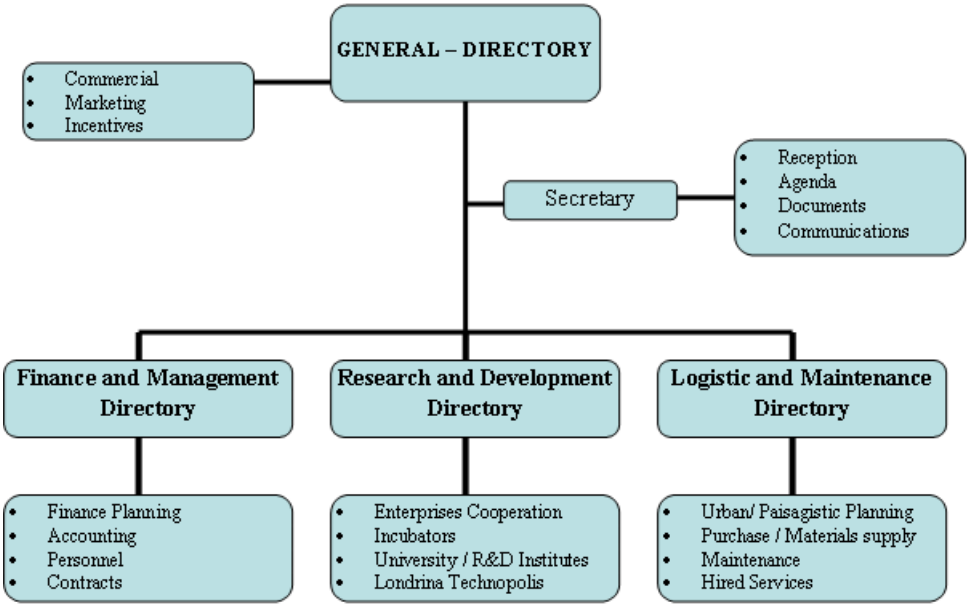

Figure 1: Preliminary management organizational structure of the Londrina Technological Park

Business Plan and Sustainability

Considering that the vast majority of the investment on technological parks similar to the one to be installed in Londrina is public, the mid to long-term returns are not expected to be assessed only in monetary terms. This means that the intangible values as it regards to the creation of new jobs and welfare, at a regional level, has also to be taken into account. According to the recent PROINTER Institute's study, a preliminary estimate on costs and revenues indicated a demand for investments that surrounds R$17.6 millions (around US$5.0 millions; early March, 2003 exchange rate). Most of this investment will be done in infrastructure, project design and implementation (parking lots, water supply, energy, air conditioning and optical fiber network systems), reform of existing facilities, and urban planning. It also includes the operational costs of the park's facilities up to 2010.

The return of investment, during the next seven years period (2003 – 2010), will be provided by both rental revenues coming from the enterprises that will be lodged in the Techno Center and revenues coming from either lots purchased or rented by the enterprises that are expected to move in or begin their operations in the Park.

Fees to be charged on the use of the Techno Center facilities as well on specialized services provided to the enterprises will also be summed up to this expected revenue. Other revenues, classified as intangibles, cannot be disregarded in this context. They include: (1) the external positive effects on land value in the surroundings of the Park; (2) the income generated by jobs created within the Park area; (3) grants obtained from both government agencies and private sources to fund R&D project development.

CONCLUSION

As final remark, it is possible to say that the development of the Londrina Regional Technological Park is reaching a strategic phase as it regards to both the political negotiation among the major actors that can play an important role in the building of facilities and in the definition of its implementation steps in the technical arena. In this regard, it is important to emphasize that the current Brazilian technological park "phenomenon" (Zouain, 2002) is occurring in the midst of a political turmoil since the country has already faced a government transition both at federal and state levels (2002 to 2003) and is expected to have another one, at the local level, in the turn of 2004 to 2005. Such situation imposes a number of constraints regarding funding and recurrent negotiations with newcomer representatives at different government instances.

A number of meetings and workshops has been carried out by ADETEC since November 2002 in order to sensitize major players and professionals interested on technological issues. Among these players are the local government (Londrina City Hall and CODEL), the universities and R&D institutions, NGOs (ADETEC, FAPEAGRO – Agribusiness Research Support Foundation, GPDR – Regional Development Promoting Group) and the private sector.

The struggle to tie altogether an expressive number of players interested in implementing the idea of a strong partnership to support the park construction is very important as part of a continuous learning process toward the building of a regional innovation pole. To a certain extent, the Londrina experience is showing that one major constraint to implement technological actions in Latin America, as pointed out by Borgataray & Tiffin (2000; p.11), is partially being overcome.

According to these authors: “industry, government and university tend to operate very separately throughout much of Latin America. This problem was pointed out by Jorge Sabato in the 1970’s, and the ‘Sabato Triangle’ model, with the three groups occupying each corner, has not being significantly changed in the intervening three decades. At recent Triple Helix conference in Rio de Janeiro (the Triple Helix being a re-discovered image of Sabato Triangle), many authors noted the continuing mutual isolation of the three essential partners to innovation”.

Some recent attitudes of the local government and enterprises can be seen as a result of an increasing awareness on the importance of the cumulative and progressive work carried out by ADETEC in the last ten years. The creation of a permanent committee on Science & Technology at Londrina’s City Council, the approval of a municipal law o S, T & I by the local legislative and also the creation of a municipal fund to support R&D local activities are the most relevant attitudes to be highlighted. Although this facts are not enough to draw a definitive conclusion, the can be seen as an increasing public awareness of the importance of the ADETEC’s efforts towards the promotion of the regional technological development.

Even considering that discussion on technological park issues by ADETEC and its partners were intensified only in the end of 2002, it is quite surprising that around six local information technology enterprises have already shown interest to move to the “technological innovation condominium” at the Park. An additional ongoing discussion among researchers from a local R&D institution (IAPAR – Agronomic Institute of Paraná State) concerning the creation of a “scientific city” in Londrina, focused on biotechnology, may shed new light on the ADETEC’s strategies for the future of the Technological Park and the whole Londrina Technopolis Program.

Last but not least, it is possible to say that building an innovation habitat as a result of a structured Technopolis Program is a complex and long lasting learning process that demands persistence and a great deal of energy from a number of committed partner institutions and their technical staff. In this process, the major “lesson learned” by ADETEC is that the adopted platform and support services’ structure approach as well as the continuous dissemination of information on the Program, via newsletters and TV shows, are very powerful instruments for improving the community awareness and engagement on the discussion of technological issues. Also it was learnt that as this process moves forward, it gradually imposes additional responsibility on the major players in putting in place all the “building blocks” for a technopolis construction. Fortunately, the present maturity level reached by the ADETEC’s staff on technological development has enabled it to attract other local partners attention to this issue and also induce them to become active players in the complex process of building a friendly innovation habitat in a country-side regional context.

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