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A Comparative Study of Tirana Technological Park: A proposal Tirana Technopark Locator Model

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ABSTRACT

Economic enhancement through stimulating and managing the knowledge based flow is one of the main concerns of the globalized world. To restore regional vitality, most countries have focused their policies on technological innovation. This study is focused in the role of the Technological Park as a crucial tool for regional development.

The main aim of this study is to appraise the Technological Park impact on the Albanian Economy and to provide a detailed model for its location within the city of Tirana. First, an overview of Technological Park phenomenon is presented. Then, the actual scene of innovation progress in the Balkan Region is indicated. In order to define a Technological Park area, two main proposed plots for the construction of Technological Park are given. Therefore, a comparative analysis based on the Technological Park accessibility, physical infrastructure and proximity to the interest groups is used. Taking in consideration the results and discussions from the analysis, the best suitable area for the construction of Technological Park is provided. To conclude, creation of small technology-based firms, generation of new jobs, and the revitalization of the local economy are discussed.

KEYWORDS: techno-park locator, knowledge-based economy, development strategies, spatial planning, policy

1 INTRODUCTION

Innovation and technological progress has evoked a rapid transformation in all aspects of human's life. The 21st Century challenge for many countries was to address innovation and technology development as a toolkit for regional economy. According to FIDIBE (2010) a Techno-park is a property-based initiative, which provides businesses with high quality premises on a site in close proximity to a knowledge base (university or a complex of research institutions). Generally is described as a "physical property" positioned near a university or research centre, often laid out like a park, managed by specialized professionals that aim to provide an attractive environment for new or existing research-based of small or larger companies approach" (Mohannak, 2008). Ownership, source of funding, operation type and the location are crucial factor for the implementation of the Technological Park (Roersen, 2008).

Since the success of Stanford Research Park in the heart of Silicon Valley, techno-parks have played a huge role in economic expansion zone, or revival towards economic growth (Rhee, Hassan and

Saitova, 2010). International experiences evidence techno-parks as catalyst for creating entrepreneurships and new job opportunities for highly qualified people. According to Eurostat (2011) almost 62 million people in the EU were employed in science and technology occupations in 2010 that makes about 30% of the total employed population. In addition, Techno-parks act as a tool for fostering business development. The case of Russian techno-parks, Korean, Kazakhstan and Turkish Technological Parks (Ustimenko, 2011), (Rhee, Hassan and Saitova, 2010), (Radosevic and Myrzakhmet, 2006) (Kaplan, 2011) indicate their overarching role in attracting foreign international investors. Another important fact is the role of Technological Parks in the improvement of physical infrastructure in the surroundings. Establishment of a techno-park creates a stimulating environment in which high quality of life and good services are provided.

The success of techno-parks is strongly related with their spatial characteristics such as i) developed plots ii) Multi-Tenant buildings iii) specialist facilities iv) Ancillary facilities v) services offered(Gábor Vadász 2010, UNIDO 2005). The Techno-parks need to be located near to an urban center or placed in suburban areas near universities campuses premises with adequate amenities, good public transport connections system, linkage with universities and research centers and have extensive cooperation between them, friendly environment to instil a park-like ambience, cost of land and possibility of later expansion. Seo (2006) suggests that there are various successful factors for the science parks such as the presence of excellent universities, an adequate physical infrastructure, and a strong supportive policy (Seo 2006). Although, some of the success factors referring to Vucic (2010) referrers as successful factor the strong science base, supportive policy environment, effective networks, skilled workforce, entrepreneurial culture, and growing firm base, ability to attract stuff, premises and infrastructure, availability of finance and support services.

In the last years, Technological Parks are expanded widely in the Middle East, like in Egypt, Morocco, Kuwait, Oman and Qatar, as a way to enhance the economy (Stanković, Gocić and Trajković 2009). Even though developing countries have small, fragmented, and imperfect markets, innovation and technological development can also result in accelerated catch-up based on the ability to absorb and creatively adapt international technology without bearing all the costs and risks of investment in new knowledge (Szirmai, Naudé and Goedhuys, 2011).Considering the success of techno-parks and their development, the European Commission has promoted the scientific and technological co-operation with the Western Balkan countries, aiming firstly to reinforce the research capacity of these countries, and secondly to integrate the region in the European Research Area (Koumeri et al. 2009). In addition, the World Bank (2010) report stresses the need to develop immediately the science systems in these countries. Key socio-economic indicators for these countries indicate that Albania has the lowest rates in unemployment and rules of law.

The situation with technology or science parks in Albania is not satisfactory as there are no parks in operation at the moment. Also two business incubators established in Albania in late 90' and the Business Innovation Centre (BIC), based in Tirana, are not operating anymore (Jana and Elke, 2008).Based on these facts, Albania seems to have a potential climate to support such kind of investments in the field of innovation. Therefore, this study aims to define the best suitable area for the creation of a Technological Park in Tirana. In order to carry out the study, first characteristics and basic requirements of Technological Parks are given. In the second section, a methodological model is developed to compare and analyse both options in order to define the most appropriate and profitable area for the construction of techno-park. In the third section the results of the Technological Park Locator Model are given. The appropriate option for the creation of the Techno-park is provided. In addition, is discussed how this current physical land in a few years will generate new jobs and will have a more neutral impact on improving the surrounding area and mostly the local economy. The last section concludes with the summary of the study and recommendations for future works.

2 METHODOLOGY

2.1 General overview of Tirana City

Tirana is the capital city of Albania situated in the heart of the country. It is the most potential economic and social centre. Approximately 30% of the total population is living in the district today. As its population may indicate, Tirana is also the most important economic centre for the numerous companies operating on. According to INSTAT, the population of Tirana at the end of 2011 was 620,000 habitants and it is estimated to reach 1 million in 2020. In terms of employment, 57% of the country's total active work force is located in Tirana (MoT, 2012). In terms of economic activity, approximately 50% of the total number of the active entrepreneur-ships and 72.5% of the total number of the foreign owned companies are established in the Tirana District (ITALFERR 2012).It is also the centre of education as it offers the best educational infrastructure in the country. The most important, qualified, public or private universities, colleges and research institutions are established in Tirana. An important fact is that Tirana has the highest rate of student population in the region of Balkans, about 9% in 2012. However, many young educated people are leaving Albania for better opportunities abroad.

One of the strategic objectives and project for the territorial development policy of Tirana Municipality is the development of a new technology centre to accommodate new high tech- and ICT-based industries. In fact there are a large number of ex-industrial zones that provide opportunities for supporting such industries. Redevelopment of these areas requires special attention, because of the risks and potentials they represent. To carry out the study, two proposed areas are selected for the establishment of techno-park. In regard, comparing and analysing both options in order to define the most appropriate and profitable area for the construction of techno-park achieve a comparative methodology.

2.2 Case study general Information

The Techno-park is expected to be built on formerly industrial land along the Tirana River Side and will attract new businesses in the form of Technology Park. It will be the first of its kind in Albania and will attract national and international companies investing in Technological, Research & Development and Scientific projects. Improving the cooperation and linkage between Universities and Enterprises is the main aim of this project. According to the Municipality Strategic Projects, this park will occupy 3-8ha with a total built up space up to 100,000m^2. The Park area will be equipped with the entire necessary infrastructure and relevant incentives to encourage the start-up phase of enterprises that will generate employment. The financing scheme that will be applied for this project is a soft loan from one or more international Banks and it will be operated as a PPP project (MoT, 2012).

This Techno-park will include business incubator concepts (shared services, business assistance). Certain incentives from the Municipality (tax incentives etc.) will be available to the businesses locating in the Techno-park (MoT, 2012).

Its close proximity to the proposed Outer Ring Road will offer excellent road access to the Tirana - Durres highway and the thriving industrial zone to the west. It will also be located in a prime location for access to Rinas International Airport. In accordance with the Proposed Land-use Plan 2013 for Tirana, two optional plots for the establishment of the Techno-park are given (as indicated with the red line in Figure 1). The first plot or model A corresponds to the Grimshaw TNBRP proposed plan. While, model B is the second plot chosen as an appropriate area for the development of this study. Based on the "Hoxha-Dervishi" model, in the next section both models will be analysed and compared identifying the best option for Tirana Technological Park establishment.

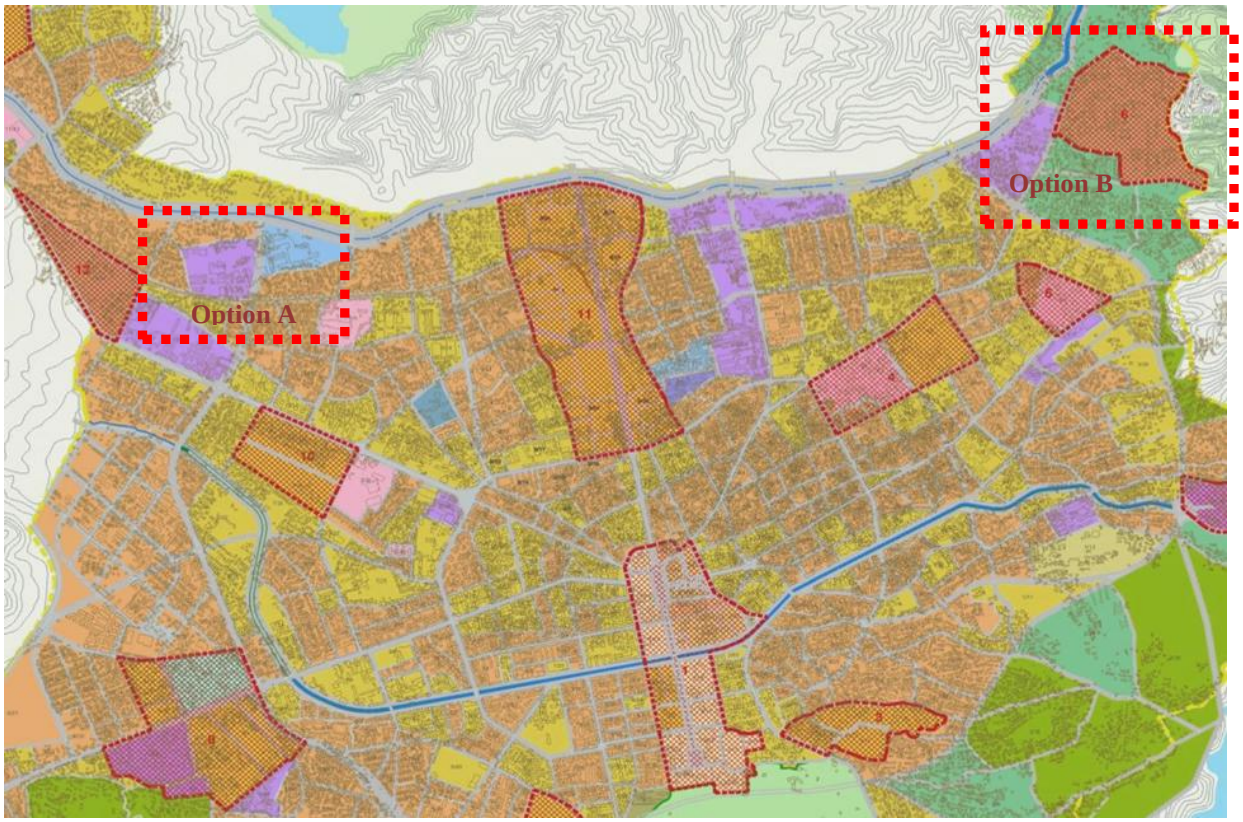

Figure 1: Proposed Land Use Plan –January 2013
Source: Local General Plan, Municipality of Tirana

2.3 Comparative Methodology

In order to compare the two cases, a Hoxha & Dervishi Technopark Locator Model is generated. The models will be compared to decide for the most appropriate place for its location. The parameters used in the model are i) Location, ii) Public Transports Accessibility, iii) Airport Connection, iv) Proximity to Educational and Scientific Institutions, v) Size of the Plot, vi) Possibility for further development, vii) Cost of the Land; viii) An extra value would give a beautiful Panorama from the Site. All of these data have been modelled and accompanied with a Weight Factor for each parameter. The relation of these parameters is indicated in the following formula:

$$M\alpha = V_{L\alpha} + V_{T\alpha} + V_{E\alpha} + V_{A\alpha} + V_{S\alpha} + V_{C\alpha} + V_{G\alpha} =$$

$$(W_L * I_L) + (W_T * I_T) + (W_T * \frac{I_{E1} + I_{E2} + ... + I_{En}}{n}) + (W_A * I_A) + (W_S * I_S) + (W_C * I_C) + (W_G * I_G)$$

$$M\beta = V_{L\beta} + V_{T\beta} + V_{E\beta} + V_{A\beta} + V_{S\beta} + V_{C\beta} + V_{G\beta} =$$

$$(W_L * I_L) + (W_T * I_T) + (W_T * \frac{I_{E1} + I_{E2} + ... + I_{En}}{n}) + (W_A * I_A) + (W_S * I_S) + (W_C * I_C) + (W_G * I_G)$$

Where,

M(SYMBOL) = Techno park Model
W = Weight Factor

I = Input Value
V = Value
W(SYMBOL) = Weight Factor of the Symbol
I(SYMBOL) = Input Value of the Symbol
V(SYMBOL) = Value of the Symbol
L is Urban Location (WL IL VL)
T Public Transport Accessibility (WT IT VT)
E Educational institutions Proximity (WE IE VE)
A International Airport Proximity (WA IA VA)
S Site Development Ratios (WS IS VS)
C Land Cost (WC IC VC)
G Green Neighbourhood (WG IG VG) (1)

2.3.1 Option A

The first plot Option A (Figure 1) is located in the Northwest of Tirana City. The total area is 22 ha and is surrounded on the North by the Tirana River and other sides by residential units. Referring the new proposed Local General Plan for Tirana, the location of option A is favourable in accessibility terms. It is located 500m away from the new Terminal and 4.4 km from the city centre (see Figure 2). On the east side of the area the Outside Ring Road will be constructed. With the construction of the new Terminal, the zone will be easily accessible as it will serve as a transport node for all public transport systems as national and local bus lines, train, tramlines etc. A focal point is proximity with the National Airport "Nene Teresa" for its close location with the exit node of the city. Thus, this zone has a good public transport access. Some of the universities that are near the Zone A are: Polis University, American University, National Geosciences Institute etc. Referring to the last plan of land assessment for Tirana 2008 (Decision of Council of Ministers No.555) the total land cost estimated for the techno-park establishment in this zone is 36.3 million Euro (1m2=165 EUR). In this cost is calculated the cleaning of site from amortized buildings and the cost of 22ha land. This area can stimulate the three phase development starting with 2 ha in the first phase, 8 ha by second phase and reserve 12 ha for future potential developers.

2.3.2 Option B

The second plot Option B (Figure 1) located in the Northeast of Tirana City and has a total area of 38ha. Currently it is a military zone composed by various military units. This area is surrounded: On the North by different industrial factories, on the South by low-rise residential units and on the East by Dajti Park having a great view of the landscape nearby. Option B is positioned about 4.7km away from the city centre and 9km from the new Terminal and the exit node of the city. The site is bordered by the new potential Axis of the "Arbri" Road that is supposed to be completed on 2015. Referring to new proposed Local General Plan for Tirana, the Outer Ring Road will be only 500m away from the plot area (see also Figure 2). Regarding the public transport only two local public bus lines such as the "Tufine-Center", "Kombinat- Kinostudio" and the proposed tram line of Kinostudio pass by. The National Airport "Nene Teresa" is not as easily accessed as Option A and the time to arrive there from Option B is almost duplicated due to the traffic in the city roads.

There are many educational institutions located near the Zone B such as Military Academy "Skenderbeg", Multimedia and Film Academy "Marubi", Veterinary Research Institute, Public Sanitary Institute, Regional Health Agency, Nuclear Physic Institute etc. The establishment of the techno-park in this zone has a great importance for all this educational institutions by supporting with its infrastructure and facilities.

The total cost of the land for option B is estimated to be 41.8million Euro ($1m^2$=110 EUR) higher than option B. In this case the plot area is 28 ha. Only 22 ha of this area will be occupied from the

Technological Park. The other part will be left for military purpose by obtaining some of the existing military buildings and by installing most needed military units that cannot be moved immediately. In this cost is calculated the initial investment for the demolishing of amortized buildings and the cost of 28ha land. Like in option A, three phases of development of the plot are proposed. The first phase consists in the development of 2ha, the second phase 8ha and 18ha are left intentionally for future extension depending on the Technological Park progress.

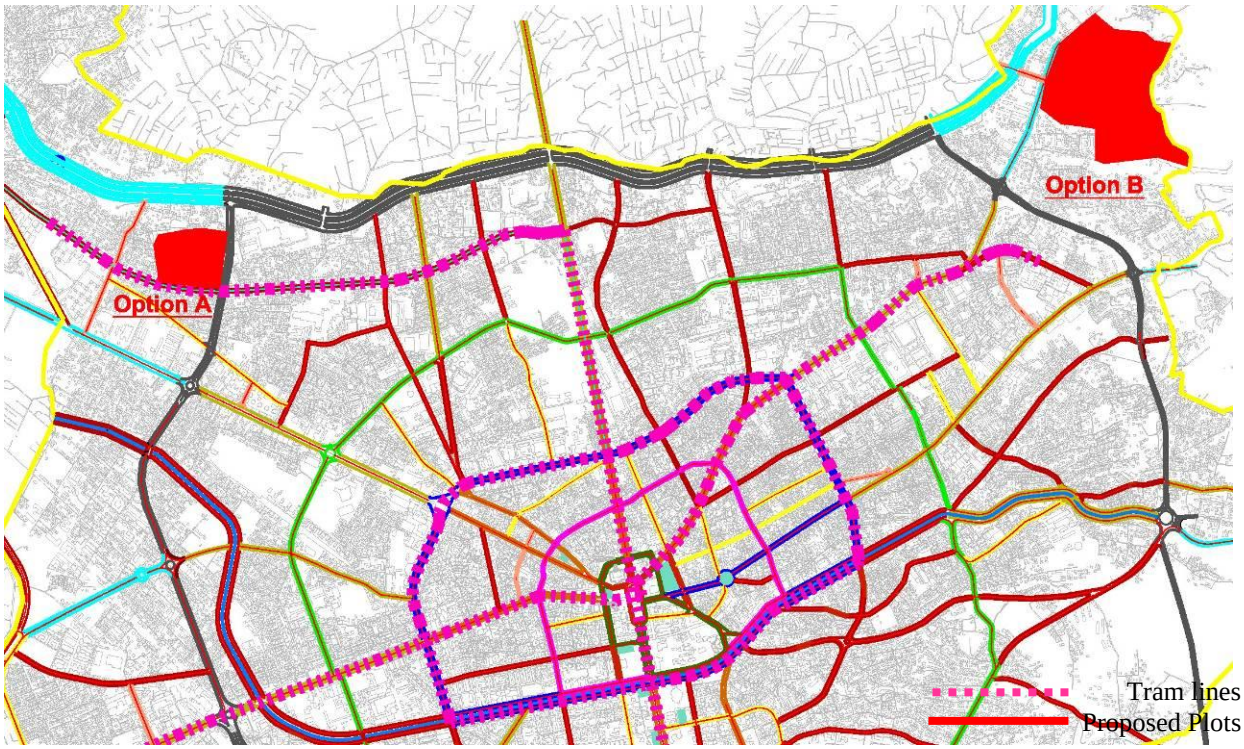

Figure 2: Map of Accessibility for both Options A & B

3 RESULT AND DISCUSSION

The final result of this study is to define the most appropriate area for the techno-park establishment. To carry out the study a comparative analysis based on Techno-park Locator "Hoxha - Dervishi" model is applied. As previous explained this model consists of several parameters. The results of the model are shown in the following table 1

Table 1Overview of the results

	Type of Parameter	WF	Option A	Option B
1	Location in suburban areas nearnewly built university premises Proximity to an urban centre with adequate amenities including education, housing, and entertainment, shopping and health care.	5%	3	1.5
2	Linkage with public transport connections system and close to major road arterial system.	15%	9.75	9.75
3	Proximity to institutions of higher learning universities and research centres so that they can have extensive cooperation between them.	30%	10	13

4	Proximity to a good airport, preferably an international airport.	10%	6	3
5	Cost of land	25%	10	15
6	Should offer the best balance between buildings and open area with scope for landscaping to instil a park-like ambience	10%	6.25	7.5
	Land availability of later expansion			
7	Is there any panorama or a bigger green area?	5%	3	4
	Results	**100%**	**47.6**	**53.6**

The Techno-park Locator model indicates that Option B with 6 points of difference from Option A is the most appropriate location for the creation of the Tirana Techno-park. The first column presents the type of parameters to be considered before establishing a new techno-park. The weight factor for each parameter is given in accordance with its importance and priority. Moreover, rate of parameters are given relating with the input of parameters, in order to define the value for each options.

As the overall aim of the study, the establishment of the Techno-park is expected to have an important impact and role in restoring Tirana's region vitality. This Techno-park will enable business activity in the area, by activating incubation (shared services, business assistance, price-attractive premises, administrative services, etc.) and stimulating the creation of new innovative enterprises. The innovative activity will cover the current development activities in the fields of: commercial and business services, electronics, technologies connected with food production, textile and leather, agriculture, biotechnologies, as well as information technologies or energy technologies. Competitive environment, products and services has to be provided.

Based on techno-park parameters, on the completion of the first phase it is foreseen to create 800 new jobs (20 m^2/employer) for qualified people working in its premises and much more from indirect employments. Qualified employers such as students, professionals and specialists are the main target. Also collaboration with the numerous institutes and universities will be provided. The second phase of the park development can merge to a science park due to its available land for future expansion. In this case we may predict much more indirect employment since the innovative ideas that can emerge from the companies operating there can lead to new manufacturing competitive products.

4 CONCLUSION

Innovation and technological competitiveness are being central to the global market progress today. A rapidly growing phenomenon and a particular tool used for economic development is the Techno-park. Therefore, this study explores Techno-park nature and its important role in the local and regional economy. They are seen as catalytic mechanism that foster business development by setting-up new firms; creating entrepreneurships and new job opportunities for highly qualified people; improving the physical and technological infrastructure; attracting foreign investments; restoring regions vitality and by creating a stimulating environment in which appropriate facilities and good services are provided. International experiences of developing countries have emphasized the potential opportunities linked to techno-park development. However, lack of skilled qualified manpower, lack of physical and technological infrastructure, insufficient legal and policy framework, insufficient funds, and lack of techno-park vision are the main challenges for these countries.

In order to carry out this study, first an overview of definition, characteristics and types of techno-parks is given. Then, physical facilities and service requirements are pointed out. Moreover, the local

economic situation and developed plans for Tirana city are explored to emerge two appropriate plots for the techno-park. These proposed plots are bothsituated on the Northern part of Tirana, along the Tirana River. Based on physical infrastructure and criteria, a methodological model "Hoxha-Dervishi" for the Techno-park location is developed to analyse and compare both proposed models. The results of this models indicated that option B is the most favourable plot where to develop the techno-park. Good accessibility, good proximity to research institutions and universities, larger area available for future development and expansion perspective are some of the core reasons that gave priority to this option.

This model can be applied as a useful sample for other cities around the world to define the appropriate location for the establishment of a techno-park. The parameters and the weight factors and rates cannot be changed, while the input value ranges can be adjusted in accordance with the size and population of that city. In each case the distances should be modified in ratio with Tirana's city parameters.

In conclusion, this study appraises the role of techno-park as a stimulating tool for the local and regional economy development; to increase the awareness of public interest and industry, towards research and technology development, innovation and entrepreneurship and to address companies toward the collaboration with universities. In order to achieve this, first the government and responsible actors must support development of innovation culture and immediately increase the technological competitiveness of the country. Further step to be undertaken is the promotion of the Techno-park in the region and to enhance the interest of foreign partners for future expansion or transfer to act as catalysts.

This study is expected to be useful research for the local government (the Municipality of Tirana) to achieve its aspirations for new job creation; the Ministry of Technology and Innovation to shape (concrete) its strategies; the government to arrange the Law for Technology& Innovation; the Ministry of Economy Trade and Energy to support its policies, foreign investors that are interested in new opportunities for investments in Albania, and all other policy makers.

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