Quality in improvement of production and service processes

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Jerzy Lewandowski
Marek Sekieta

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SCANNING OF THE SUSTAINABILITY OF POLISH AND ROMANIAN ECO-INDUSTRIAL PARKS

B. Van Zwam, G. Van Eetvelde, A. Marcinkowski, A. Doniec, C. Block, C. Vandecasteele

1. Introduction

In the last decade industrial ecology has emerged as a basic approach to facilitate environmentally sustainable economic development. Graedel & Allenby (1995) define the term industrial ecology as "*the means by which humanity can deliberately and rationally approach and maintain sustainability, given continued economic, cultural and technological evolution. The concept requires an industrial system to be viewed not in isolation from its surrounding systems, but in concert with them (...)*".

The concept of industrial ecology is put into practice by the development of eco-industrial parks (EIP), being defined by Lowe et al. (1997) as "*a community of manufacturing and service businesses seeking enhanced environmental and economic performance through collaboration in managing environmental and resource issues including energy, water and materials. By working together, the community seeks a collective benefit that is greater than the sum of the individual benefits each company would realise if it optimised its individual performance only*".

Eco-industrial parks mainly focus on the linkage between economy and environment. A network of companies and stakeholders choose to interact by exchanging and (re)using materials (byproducts) and/or energy (Lowe, 1997) while less attention is being paid to the social or community dimension of sustainability (Côté & Cohen-Rosenthal, 1998). In that respect the statement of Elkington (1997) is quoted, i.e. '*business is sustainable when it lives up to the 'triple bottom line' of economic prosperity, environmental quality and social justice*'. In order to transform an industrial park into a more sustainable entity it is imperative to balance the economic, environmental and social pillar.

For more than a decade, the research group Environmental and Spatial Management (Ghent University) studies eco-industrial parks from a broader perspective than industrial ecology alone. As interfirm cooperation (IFC) is considered a preceding and essential condition in evolving towards an eco-industrial park, Van Eetvelde et al. (2005) set up a conceptual framework to analyse and evaluate joint projects of business clusters. Through a pentagonal inquiry, a SWOT analysis of the business cluster is made from a legal, economic, spatial, technical and social (LESTS) perspective.

This paper presents the results of the LESTS scans and SWOT anal formed on four industrial parks in Poland and Romania: Boruta Zgierz I Park (Zgierz - Poland), Industry and Technology Park Bełchatów Kl (Belchatów - Poland), Carfil Industrial Park (Brasov - Romania) and R Industrial Park (Constanta - Romania). All four business parks are inv the pilot project 'Material, energy and water management in industri industrial symbiosis', a project in the co-operation programme between and Central and Eastern Europe.

2. LESTS instrument

Since sustainability should be the main aim in the organisation industrial parks, a sustainable approach on all organisational levels is i sable. In the progress of evolving towards an eco-industrial park, the fa decisions concerning the business park are intertwined is crucial; he corporate management is a catalysing factor. It concerns e.g. building tions, open space planning, mobility infrastructure, production of gree exchange of byproducts, etc. In this process it is essential that the c collaborate, as well on the business park as with (common) stakeholder authorities, local residents, workers, customers, suppliers, etc.

In view of the importance of such interactions on evolving eco-i parks, either among businesses or between businesses and stakehol assessment should focus on the efforts –made and to be made– on busin ters that aim at igniting cooperation from a sustainable point of view. for a tool to visualise the type of interfirm collaboration, Van Eetvel (2005) established the LESTS concept from a pentagonal academic per Far too often cooperative activities fail due to legal (L) inconvenience tail disagreement and dispute. Moreover, no joint activity proves to be v doesn't cause value for money (E). Spatial care (S), technical feasibili cluster projects and stakeholder management (S) today make up the points of the experimental polygon and nourish the multidisciplinary re interfirm collaboration.

From the LESTS perspective, a pentagonal inquiry is developed air SWOT analysis of business clusters and eco-industrial sites. The inve tool attempts at evaluating the organisational input of IFC, whilst e contextual aspects too. The tool is managed as a multitheme checklist th to be answered by the park developer or manager. Upon collection, the gation results are transposed through a matrix system to proportional scores, yielding IFC scans. From the IFC scan a SWOT analysis is indicating strengths and weaknesses and thus inducing opportunities a lesser extent, potential threats.

The scanning method is tested on a variety of industrial sites, from newly developed business parks over settled industrial clusters to harbour communities. The scans clearly demonstrate the potential to corporate sustainability, based upon the sec interfirm relations, as well as the actual status of the sustainability process in all five angular points (Van Eetvelde et al., 2007).

3. Scanning of Polish and Romanian industrial parks

The LESTS tool is used to analyse and evaluate the interfirm collaboration on the Polish and Romanian industrial parks mentioned supra.

3.1. Boruta Zgierz Industrial Park

Boruta Zgierz Industrial Park is situated in the Lodz Region (Poland) on the area of the former 'Boruta' Dye Industry Plant. The surface area of the industrial park is 175 ha. The 15 companies, large as well as medium-sized enterprises, on the Boruta Zgierz Industrial Park employ about 500 employees.

The LESTS tool is performed on the legal, economic, spatial, technical and social parameters of the industrial park, yielding the IFC scan given in Image 1.

The best scores for the Boruta Zgierz Industrial Park are the legal and economic aspects, while the social and especially the technical aspects need to be improved.

Scoring aspects e.g. are the entity that is responsible for the park management, TEMS (Town Enterprise of Municipal Services); the fact that formal and informal contacts between companies on the park and with local authorities exist; as well as the availability of a leaflet to promote the park. On the other hand there are no concrete initiatives for cooperation between companies and there exist no design nor issuing plan for the business park, despite the fact that the plans are in course of preparation.

To improve the sustainability of the park, an analysis of the park needs should be performed. Hence the companies' aspiration towards corporate support of cluster activities will be revealed. The Town Enterprise of Municipal Services (TEMS) is encouraged to:

- start and enhance the process of cooperation between companies and with (local) authorities;
- enhance the existing formal or informal consultation to initiate some bottom-up cluster initiatives.

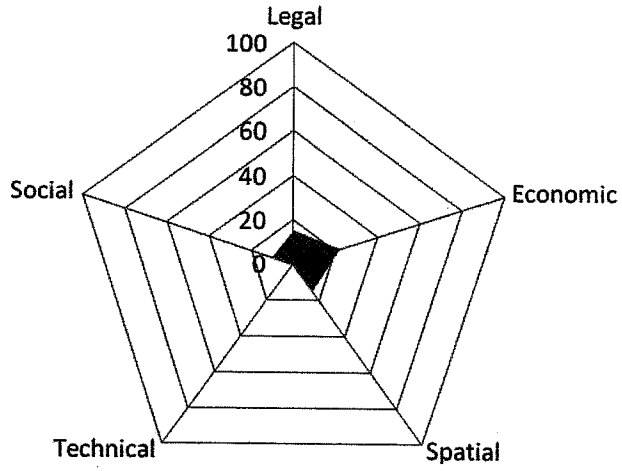

Image 1. IFC scan Boruta Zgierz Industrial Park

The commencing consultation of firms on the park is promoted, yet it i park management's duty, if not the stakeholders' enforcement, to foster the laboration process. The need for a 'leading partner' role has proven mandato the EIP process. Boruta Zgierz Industrial Park is encouraged to proceed be the negotiation stage.

3.2. Industry and Technolgy Park Bełchatow Kleszczow

Industry and Technolgy Park Bełchatow Kleszczow is located in the tow Belchatów, i.e. in the Lodz Region (Poland). The companies on the indus park focus on production as well as service activities. The 15 businesses primarily small and medium sized; they employ about 600 employees.

Again, the LESTS tool is performed on the legal, economic, spatial, tec cal and social features of the industrial park, yielding the IFC scan draw Image 2.

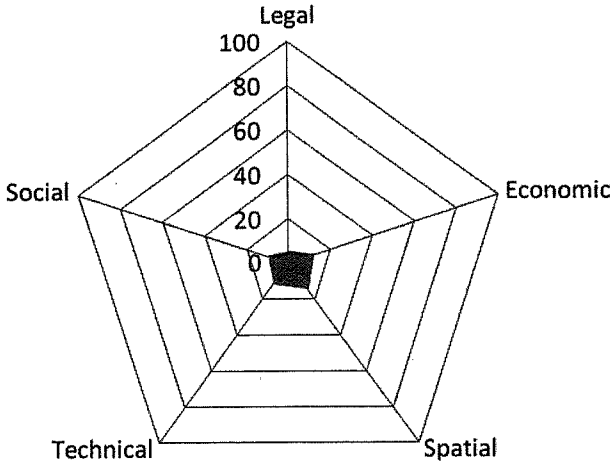

Image 2. IFC scan of Industry and Technology Park Bełchatow Kleszczowski

On the Industry and Technology Park Bełchatow Kleszczow the spatial component is worked out reasonably well. The design plan pays attention to some aspects of sustainability: measures that lead to intensive and flexible land use, implementation of the industrial park in the landscape, etc. Yet there is no issuing nor management plan, although both plans are being prepared anno 2009.

The management organisation ITPBK (Industry and Technology Park Bełchatów Klesaczów) brings a positive dynamism in the region. Moreover ITPBK aims at a greater economic and social coherence in the Lodz Region, as well as an improved economic activity and efficiency, and the creation of social benefits.

From the social point of view, the monthly consultation of the employers is clearly mentioned as a positive aspect. Furthermore the local authorities, some companies, as well as the Technical University of Lodz, as a shareholder of the ITPBK, closely interacts with the industrial park.

In spite of all those positive aspects, a dedicated focus on interfirm collaboration seems to be lacking. There are formal and informal contacts between the entrepreneurs on the Industry and Technology Park Bełchatow Kleszczow, but tangible cluster actions are not yet set up. Hence the Industry and Technology Park Bełchatow Kleszczow is persuaded to focus on initiating and stimulating cooperation between the firms and with the local authority and other stakeholders.

3.3. Rompetrol Industrial Park

Rompetrol Industrial Park is located in the city of Navodari in the county Constanta (Romania). The industrial park has a surface area of 50 ha and mainly designed for industrial investment. The 15 small and medium sized enterprises offer employment to ca. 150 employees.

Again, the LESTS tool is performed on the legal, economic, spatial, technical and social qualities of the industrial park, yielding the IFC scan drawn in Image 3.

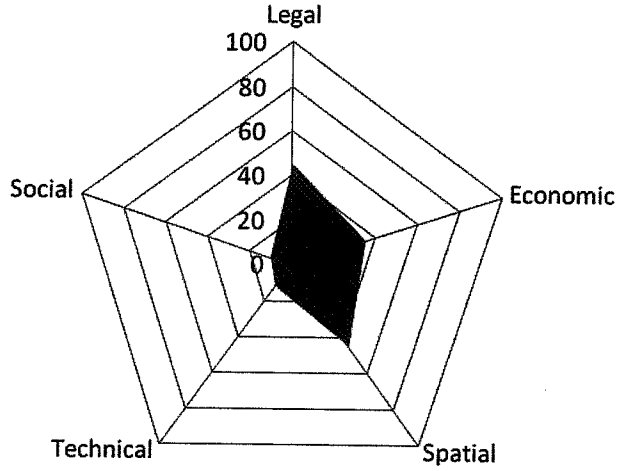

Image 3. IFC scan Rompetrol Industrial Park

Rompetrol Industrial Park has good scores for legal, economic and spatial aspects. Although, as was the case for the Boruta Zgierz Industrial Park, technical and social aspects can be improved.

Strengths of the park are the spatial development (design plan, issuing plan and management plan have been drawn up), the cooperation on a contractual base between the firms, as well as the fact that Rompetrol Industrial Park (as a member of Rompetrol Group) takes care of the park management and consequently may initiate further cluster initiatives.

On the other hand, the opening up of the park seems to be a bottleneck; the industrial park is only accessible by car, not by bicycle nor public transport. Likewise, the number of cluster initiatives is still limited and the negotiations between the company managers and with local stakeholders such as authorities and residents is considered not sufficient.

Rompetrol Industrial Park is supported to further work out its role as a park manager to intensify the negotiations between company managers and with various stakeholders, so that the number of collaborative initiatives that benefit the

sustainability profile of the park increases. Together with Rompetrol Industrial Park, the local entrepreneurs can combine efforts and put pressure to the authorities in view of the mobility issues, e.g. through providing public transport.

Since Rompetrol Industrial Park is the coordinating organisation for a variety of industrial parks in the region, it is persuaded to pay attention to the individual character of each park and to the commitment of the local entrepreneurs. Without the latter, the continuity of the cooperation initiatives can be under review again.

3.4. Carfil Industrial Park

Carfil Industrial Park, located in Brasov (Romania) originated in 2003. About 32 small and medium sized enterprises have leased business spaces. The production activities of those companies focus on thermal chemical treatments, the production of component pieces and industrial assemblies, metallic fabrications, electric installations and automatisations, etc. The total number of employees has reached 530.

Here too, the LESTS tool is performed on the legal, economic, spatial, technical and social characteristcs of the industrial park, yielding the IFC scan drawn in Image 4.

Carfil Industrial Park has rather good scores for all aspects, especially the spatial, economic and technical aspects; the social aspect scores the lowest.

First of all, the spatial part of the park is well developed: a design plan, issuing plan and management plan have been drawn. Moreover the firms cooperate on different levels: mobility, safety, waste collection, etc. This interfirm cooperation provides a positive dynamism for the park and is even enhanced by the presence of a park management (entity) as well as a park manager (person). All of this is resulting e.g. in infrastructure works and other cooperation initiatives. However, a legal structure that formally unites the entrepreneurs is still missing. It is endeavored to establish a legal structure so as to guarantee the continuity of the cooperation and to maintain the commitment of the entrepreneurs.

Carfil Industrial Park can further extend its role as a park manager by enhancing the dialogue and the cooperation between entrepreneurs and with various stakeholders, so as by strengthening the cooperative initiatives that increase the sustainability of the park.

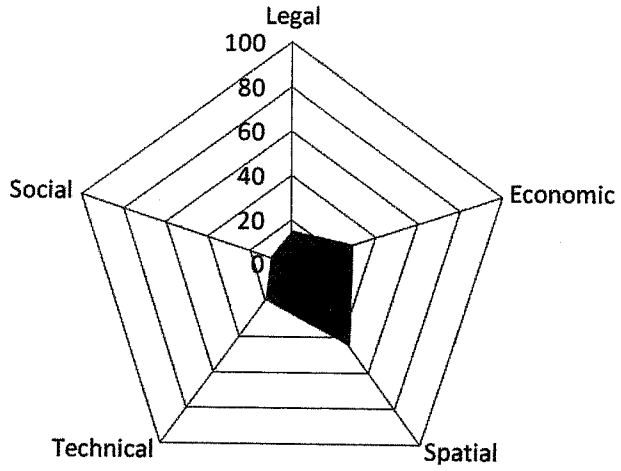

Image 4. IFC scan Carfil Industrial Park

The Brasov County, represented by the County Council, is responsible the park management. It is of high importance that the authorities offer financ and administrative assistance to the park. Still the continuity of the interfi cooperation can come to an end if the local authorities do not succeed to enla the involvement of the entrepreneurs in the interfirm cooperation.

4. Summary

The LESTS concept has proven to be simple and accurate in revealing d terminant scores, partly contingent in nature, that indicate the IFC status of industrial site. The IFC pentagons of the four Polish and Romanian industr parks outline the potential of the different business clusters to contribute to t sustainability of the industrial site.

It may be clear that the business clusters revised in this paper are only on first phase of clustering and park management. It is perceived that a first seri of cluster initiatives often initiates in an organic way. Yet these embryonic clu ters are regarded as a matrix for synergetic effects, since they yield the opport nity to embark the hosted companies in new activities that entail planet a profit. The results of the SWOT analyses of the industrial parks will b used to propose future scenarios to improve their sustainability.

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