The Clusters Phenomenon in the Selected Central European Countries

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By

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Magdalena Bialic-Davendra would like to dedicate this book to her beloved husband, and thank him for his infinite support in this journey.

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INTRODUCTION

Ever present in all spheres of our life, starting from countries and economies competing for leadership in the global context, up to individuals challenging one another, the phenomenon of competition constitutes the driving force of development. Competitiveness can be characterised by many layers. In the field of economy, it can be described by numerous theories and economic concepts; however defined, the most concise and genuine appears to be that of Porter's (2008) view describing competition as "one of the society's most powerful forces for making things better in many fields of human endeavour". Competitiveness is an indispensable element of the extremely complex and multi-dimensional phenomenon of clusters.

The cluster building process began during the 1990s in various European Union countries. The main reason was to strengthen industry's ability to innovate and increase national competitiveness. While the global economy became increasingly influenced by entire industries and branches, clusters turned out to be an effective tool facilitating and stimulating entrepreneurship progress, stimulating and maintaining competitiveness, and a mechanism for a competitive strategy. They became an approach for fostering innovation, co-operation and internationalisation among companies and regions to succeed in global competition.

Popularisation, as well as the vivid and growing presence of the cluster phenomenon over the last 20 years, has contributed to the induction of numerous researches focused on the issue of clusters and their development around the world with particular attention to European countries.

This book presents the current results of research conducted in the area of clusters and cluster policy development in Central European countries with a focus on Poland, the Czech Republic, the Slovak Republic and Austria. Austria is shown to be a country with an advanced economy, with a developed cluster policy and a significant proportion of established clusters. Other countries are part of a territory which experienced similar political and economic development over recent decades. Clusters in the Czech Republic, Poland and the Slovak Republic are largely at the stage of embryonic clusters, where the government is in the process of setting up the conditions for effective cluster support.

The aim of this book is to map and compare the conditions influencing cluster development in the selected countries from both the macro (policy, government) as well as the micro (cluster organisation) level, analyse good practices and propose a framework for cluster development in this region. In this context, the book serves as a guide for successful cluster development and a source of valuable thoughts aiming to broaden the horizons of knowledge in regard to the issue of clusters in the selected region.

The research presented within this book brings a new perspective on the cluster issue and extends the investigation which had been carried out within cluster-oriented projects implemented by the Department of Finance and Accounting and Centre for Applied Economic Research, at the Faculty of Management and Economics (FaME), Tomas Bata University in Zlin (TBU). The very first, leading project was entitled "Cluster Performance Measurement and Management" (project No. 402/06/1526) implemented under the support of the Grant Agency of the Czech Republic in the years 2006-2008 and conducted by Drahomíra Pavelková. Within it, the set of data depicting the status of cluster development in the Czech Republic and worldwide was collected in 2007, constituting the initial data for further cluster-oriented research at TBU. Data was collected using a questionnaire survey and structured interviews.

The outcomes of conducted research build on the findings introduced as part of the results of consecutive research projects implemented under the support of the Internal Grant Agency of the Faculty of Management and Economics at TBU, the International Visegrad Fund, Technology Agency of the Czech Republic and the Operational Programme for Education and Competitiveness. The investigation was conducted within the following projects:

- Internal Grant Agency of FaME TBU No. D/09/5: "The analysis of clusters' background based on Central Europe countries of Poland, Czech and Slovak Republics" (2009) conducted by Magdalena Bialic-Davendra;
- International Visegrad Fund No. 50910431: "Clusters performance measurement and management in Poland" (2009/2010) conducted by Magdalena Bialic-Davendra;
- Internal Grant Agency of FaME TBU No. DP 9/10: "The investigation of a new concept of World-Class Clusters in Central Europe" (2010) conducted by Magdalena Bialic-Davendra;

- International Visegrad Fund No. 51000656: "Clusters performance measurement and management" (2010/2011) conducted by Magdalena Bialic-Davendra;
- Internal Grant Agency of Tomas Bata University in Zlin No. IGA/61/FaME/10/A: "The Development and Evaluation of the Performance of Cluster Policies, of Clusters and their Members with the Usage of the Principles of Benchmarking" (2010-2012) implemented by a project team with the project leader Eva Vejmělková (Jirčíková);
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The evidence as depicted in this book are based on the findings presented within the doctoral thesis entitled "Identification of Factors Influencing the Cluster Development Process in the Czech Republic" defended by Eva Vejmělková (Jirčíková) in 2008 and "Proposal of a framework for a cluster development in selected Central European countries" defended by Magdalena Bialic-Davendra in 2011, both at Tomas Bata University in Zlin.

In order to obtain specific information regarding the present stage of development of the cluster concept and cluster-based policies in the selected countries, the survey with the use of tools such as telephone interviews (as the first contact) and questionnaires were conducted. The survey was directed at managers of a cluster/cluster initiative and representatives of institutions/agencies supporting cluster development. All the questionnaires were prepared in three language versions of English, Polish and Czech in order to enable easier availability and increase the efficiency of the conducted research. The questionnaire survey was supported through structured interviews with managers and/or representatives of the chosen clusters and representatives of the institutions supporting cluster development. Those, in turn, were not only the source of broadened knowledge regarding the current situation concerning the cluster concept and its development but also an inspiration

for undertaking further steps and deepening research devoted to this issue. Data was collected in three waves from 2007 to 2011.

The results of both the critical research of the information sources based on professional publications, professional studies and case studies primarily devoted to the selected countries as well as practical research based on the survey and face-to-face interviews are presented in a total of five chapters. The sixth chapter constitutes the conclusions.

The first chapter is devoted to introducing the issue of clusters and their concept. For the purpose of the book, both the definition of a cluster and a cluster initiative are clarified. Furthermore, cluster characteristics and attributes are depicted. In addition, attention has been directed to the importance of cluster evolutionary growth i.e. the cluster life cycle and its activities following a certain path of cluster development.

In the second chapter, attention has been given to the dimension of policy based on clusters, where the term "a cluster policy" is defined. In addition, the development of cluster policy in the European Union over a span of time is described. The character of the cluster policy is also depicted with the example of selected European countries i.e. Poland, Czech Republic, Slovak Republic and Austria, with their comparison being conducted.

The importance of clustering for companies and other entities involved in the cluster is presented in the third chapter. As joint activities of cluster members are inseparably connected with the development of the cluster as an entire organisation and serve as a trigger for the realisation of its goals, the conducted research focused its attention on their specificity (also in connection with the country of origin of the clusters). Furthermore, examples of cluster best practices are depicted. On a basis of critical literature research and practical research (interviews and questionnaires) conducted within this book, (key) factors considered the most significant in creating an ideal environment for clustering were identified and the framework for cluster development in selected Central European countries was formulated in chapter four. Additionally, special attention has been devoted to the activity of benchmarking as an example of a tool for assessing the performance of clusters and their members.

As globalisation and internationalisation processes have a profound influence on the perception of competition and co-operation, thus on clustering itself, chapter five devotes its attention to new concepts of inter-cluster co-operation and World-Class clusters featuring their aspects.

Finally, the sixth chapter summarises the outcomes of the conducted research presented in this book.

Last but not least, we would like to use this occasion to thank everyone who supported our research, i.e. cluster managers and cluster representatives as well as representatives of institutions and agencies supporting clusters, for their dedicated time and co-operation.

In advance, we would like to thank you all for sharing your valuable comments, thoughts, experience and any further ideas connected with the published topic with us (at the following e-mail addresses: bialic.davendra @gmail.com or bialic@fame.utb.cz).

CHAPTER ONE

THE NATURE OF CLUSTERS

The phenomenon of clusters embraces Alfred Marshall's (1920) concept of industry districts dating back to the end of the 19th century. This British economist noted that particular industries tended to concentrate locally on small companies with similar or complementary profiles thus bringing substantial benefits from the externalities for the region and the industry itself (Bialic-Davendra and Pavelková 2010).

Other approaches such as Perroux's theory of growth poles, the theory of industrial location of Weber and Hoover, or the path dependence theory have also influenced the development of the cluster concept (Błasiak-Nowak 2007).

At present, the cluster phenomenon is growing in popularity, becoming prevalent in supranational and national policies and strategies for the economic development of countries. It is perceived as an important development tool by world organisations such as the Organisation for Economic Co-operation and Development (OECD), the United Nations Industrial Development Organisation (UNIDO), the World Bank and the European Union (EU), amongst others.

Defining a "cluster" does not seem to be a simple task. As its concept refers to a variety of business structures and reflects various purposes, numerous definitions have been formulated including a cluster initiative, industrial clusters, regional clusters, knowledge clusters, research-driven clusters, cross-border clusters, world-class clusters and many others (Anderson et. al. 2004, Blien and Maier 2008, European Commission FP7[1], Evers 2008, Sölvell, Lindqvist and Ketels 2003). Regardless of the definition, clusters are depicted as an effective tool stimulating the development of their members and the surroundings.

[1] http://cordis.europa.eu/fp7/capacities/regions-knowledge_en.html (accessed May 5, 2011).

Definition of a cluster concept (cluster vs. cluster initiative)

As literature has indicated, over the last 20 years numerous researchers have tried to define the term "cluster" using their own perspective (Porter 1990, Rosenfeld 1997, OECD 1999, Mytelka and Farinelli 2000, Cooke 2002, Enright 2003, Grycuk 2003, Sölvell et. al. 2003). It would appear that no standard definition has been agreed upon. Most definitions, however, underline the geographical proximity of the companies, their interactions, and the horizontal and vertical connections.

In 1990: 213, Michael Porter introduced his definition of a cluster as a:

> geographical concentration of interrelated companies, specialised suppliers, service providers, businesses operating in similar sectors as well as related institutions (like universities, normalization organisations and institutes as well as branch associations). In certain fields, these organisations collaborate and compete as well.

which undoubtedly made the greatest impact on the current understanding of the cluster concept. Since that time, the concept of clusters has begun to arouse interest amongst entrepreneurs and policy makers.

Later in 1998: 78, Porter extended his definition describing clusters as:

> geographic concentrations of interconnected companies and institutions in a particular field. Clusters encompass an array of linked industries and other entities important to competition. They include, for example suppliers of specialised inputs such as components, machinery, and services, and providers of specialised infrastructure. Clusters also often extend downstream to channels and customers and laterally to manufacturers of industries related by skills, technologies, or common inputs. Finally, many clusters include governmental and other institutions– such as universities, standards-setting agencies, think tanks, vocational training providers, and trade associations–that provide specialised training, education, information, research, and technical support.

A similar view of the cluster concept is depicted by the CLUNET Policy Guidelines Report[2] (:2) which characterises clusters as:

[2] PRO-INNO Europe. "CLUNET Policy Guidelines Report". http://observatoirepc.org/fileadmin/user_upload/Ressources/CLUNET_policy_Guidelines_080108.pdf (accessed December 8, 2010)

> flexible networks of small and large companies that complement each other, enhanced by research, development, qualification institutions and additional centres of competence that build competitiveness thanks to close supply linkages and co-operative relationships.

Additionally, they:

> occur due to proximity to markets, in the presence of specialised labour, inputs (natural resources, information) and equipment/service suppliers, and due to the availability of infrastructure[3].

The geographical range of clusters can include a group of neighbouring countries, one country, region, voivodeship, district, community or even a city (Wójcik-Augustyniak 2009).

Another cluster definition underlining the importance of networking linkages was the one introduced by the OECD in 1999, stating that:

> clusters can be interpreted as reduced-scale national innovation systems with their "focus on knowledge linkages and interdependencies between actors in networks of production". They are "often cross-sectoral (vertical and/or lateral) networks, made up of dissimilar and complementary firms specialising around a specific link or knowledge base in the value chain (OECD 1999:8).

Furthermore, UNIDO (2001: 9) defines clusters:

> as sectoral and geographical concentrations of enterprises that produce and sell a range of related or complementary products and, thus, face common challenges and opportunities.

Also, the European Commission (2005: 9), on the basis of Porter's definition, describes clusters as:

> groups of independent companies and associated institutions that are:
> - Collaborating and competing;
> - Geographically concentrated in one or several regions, even though the cluster may have global extensions;
> - Specialised in a particular field, linked by common technologies and skills;
> - Either science-based or traditional;

[3] OECD. "LEED-CEI-EBRD project on Industrial Districts and Local Clusters 2001-2002". http://www.oecd.org/document/6/0,3343,en_2649_34457_2438406_1_1_1_1,00.html (accessed February 27, 2011).

- Cluster can be either institutionalised or non-institutionalised.

Clusters specifics is also emphasised in further studies, for example, in the British report[4] from 2004: 4-5, as groups of inter-related industries where:

> the links between firms are both vertical, through buying and selling chains for example, and horizontal, through complementary products and services, the use of similar specialised inputs, technologies or institutions, and other linkages for example. Most of these linkages involve social relationships or networks that produce benefits for the firms involved.

Entities inter-related within a cluster "pursue the same development trajectory (for example target markets, technology)" (Szymoniuk 2005).

Also according to Stachowicz (2006: 28), "clusters are innovative systems in which the linkage between business and research-and-development sphere plays a crucial role".

As Gulda (2008: 8) states:

> It seems that clusters constitute one of the interesting solutions which can unite the efforts of a group of entrepreneurships, strengthen them through finding a common platform of agreement, common goals which exceed beyond competitive aims. They are a potential key aspect of regional value as they provide a unique combination of knowledge, skills and abilities significant for the competition site (Kačirková 2008: 451).

Following the Gorynia and Jankowska's (2008) definition, clusters can be characterised as an example of the mezzo-economic system placed between the national (macro-system) and the entrepreneurship (micro-system), where all the essential "ingredients" are joined in order to achieve competitive success.

Along with the definition of "a cluster", the term "cluster initiative" (CI) often appears as inseparably connected with cluster oriented research. According to the Cluster Initiative Greenbook[5] (:9), CI can be interpreted as "organised efforts to enhance the competitiveness of a cluster, involving private industry, public authorities and/or academic institutions". Most

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[4] "A Practical Guide to Cluster Development. A Report to the Department of Trade and Industry and the English RDAs by Ecotec Research & Consulting", England's Regional Development Agencies, 2004, http://www.dti.gov.uk/files/file14008.pdf (accessed May 20, 2010).

[5] Sölvell, Örjan, Lindqvist, Göran and Christian Ketels 2003, *The Cluster Initiative Greenbook*. Stockholm: Ivory Tower AB.

cluster initiatives emerge in the form of a project and are converted into a more formal structure within 12 to 36 months (Ketels, Lindqvist and Sölvell 2007). CI's provide an initial platform for clusters to evolve.

Apart from these defined clusters/cluster initiatives, additional phenomena of cluster structures can also be distinguished as:

- Entrepreneurship environments, which are currently in the organising process, with no defined co-operation network among the participants;
- Platforms of co-operation with the nature of a prestigious business club;
- Projects or institutions, which are in a developing process at the present moment and are not yet clusters or were wrongly associated with a cluster organisation*.

These cluster structures were excluded, however, from the research presented within this book.

Since the clusters analysed within this book may in certain cases indicate the characteristics of a cluster initiative, it was consequently necessary to specify the term "cluster" used for the purpose of this publication.

> A "cluster" is defined as all forms characterised by an organised structure, concentrated around a dominant sector, operating both in the production, service or agricultural sectors, aware of their territorial identity, which carry out joint initiatives, and which also take into consideration those showing the characteristics of a cluster initiative.

Cluster characteristics

Each cluster is unique and has its own attributes. Nevertheless, certain common characteristics can be distinguished, which apply to clusters as a structure (organisation).

According to Porter (2008), clusters vary in size, breadth and state of development. Some consist primarily of small and medium-sized enterprises (SMEs), others involve both large and small firms; some are

centred on research universities, while others have no important university connection. The differences in their nature reflect the differences in the structures of their industries. They differ in a number of dimensions. A number of them may be found in tight groupings concentrating several companies in a small geographical area, while others spread across regions with a large density of entities. Clusters can exist with numerous linkages, activity-rich, concentrating a number of related industries, whereas others are involved in one or only a few activities in a given industry. There are science-driven clusters with high innovative capacity which focus on technological activities and those in traditional sectors with a lower innovation ability; well-established and just emerging clusters (Enright 1998 and 2003, Ketels, Lindqvist and Sölvell 2008).

In The Cluster Policies Whitebook (Andersson et al. 2004: 1), the authors describe seven elements as typical cluster characteristics:

1) Geographical concentration;
2) The specialisation or common denominator of a cluster;
3) The cluster actors;
4) Cluster dynamics and linkages: competition and co-operation;
5) Critical mass;
6) The cluster life cycle;
7) Innovation.

They underline the geographical proximity of various actors (multiple organisations), which are linked within a cluster by co-opetition[6], with their focus on a common core business (activity).

Additionally, Gorynia and Jankowska (2008) highlight the significance of relative proximity of entities, usually high density-intensity of economic activity, the presence of numerous firms engaged in the same, similar or substitution activity, and the connection of the cluster formation process with the historical conditions of the area in which the cluster emerges. Consequently, a certain level of specialisation or common denominator of a cluster, which links entities within various forms of co-operation (for example within the value chain), appears as a further attribute.

A cluster by definition consists of particular actors linking the spheres of industry, education and government, so called Triple Helix

*According to CzechInvest (2005), a cluster organisation is a specific legal body established with the purpose to manage a cluster.

[6] Co-opetition is a neologism coined to describe co-operative competition; it is a conjunction of co-operation and competition (Brandenburger and Nalebuff 1996).

(Etzkowitz 2002). According to Sölvell, Lindqvist and Ketels (2003) five sets of actors can be differentiated. Figure 1-1 presents the cluster and its actors representing different spheres of a Triple Helix.

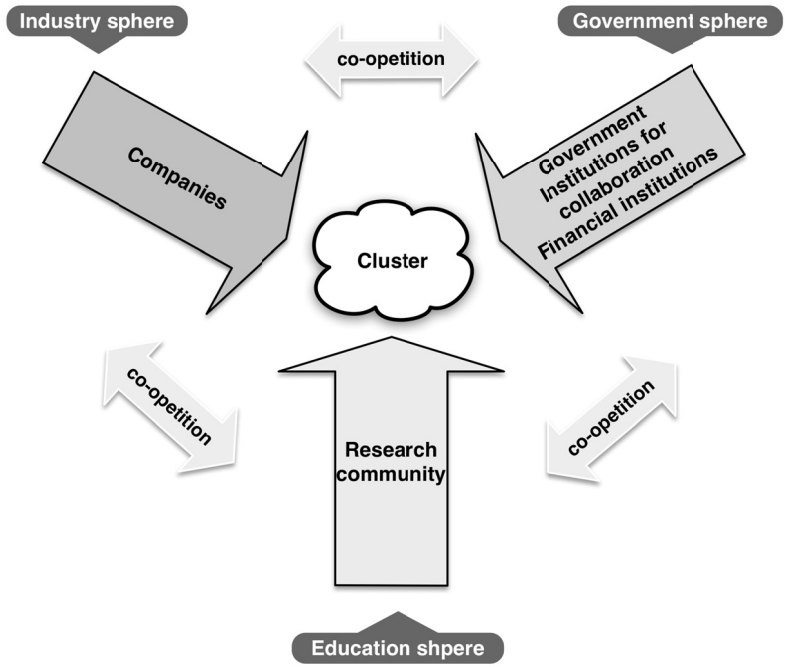

Fig. 1-1 The actors composing a cluster
Source: Own development based on Etzkowitz (2002: 4) and Sölvell, Lindqvist and Ketels (2003: 18).

The entrepreneurship sector is represented by buyers and suppliers of goods and services, companies sharing common technologies, labour skills, etc. Government includes national, regional and local institutions, agencies and other units involved in industry and economic development policies. Financial institutions encompass banks, venture capitals, business angels, etc. The research community is represented by academic actors such as universities and colleges, research institutions, technology parks, etc., and Institutions for collaboration (IFCs) constitute public agencies, public-private organisations such as formal and informal networks (Sölvell et al. 2003, Sölvell 2009).

Those actors are linked by the bonds of co-opetition within a cluster organisation. The cluster's function is based on a balance between competition and co-operation, while the co-operation amongst companies is based on trust (Bialic 2008). The linkages amongst entities result from transactions between producers and traders, manufacturers and organisations delivering business-supporting services, research and development facilities, scientific centres, etc. Companies inter-linked within a cluster organisation may bring along externalities in the form of resources or services, which would not be available for individual entities.

The clusters' regime is depicted as a relationship among its actors based on the Triple Helix model implemented by Etzkowitz (2002) i.e. linkages between industry, research (academia) institutions and government agencies, with its further expansion into the Quadratic Helix including additionally, the finance sector. The new approach of the Triple Helix (Figure 1-2) puts things into a different perspective highlighting the importance of the relationship between creativity, entrepreneurship and eco-systems (Quinn 2009).

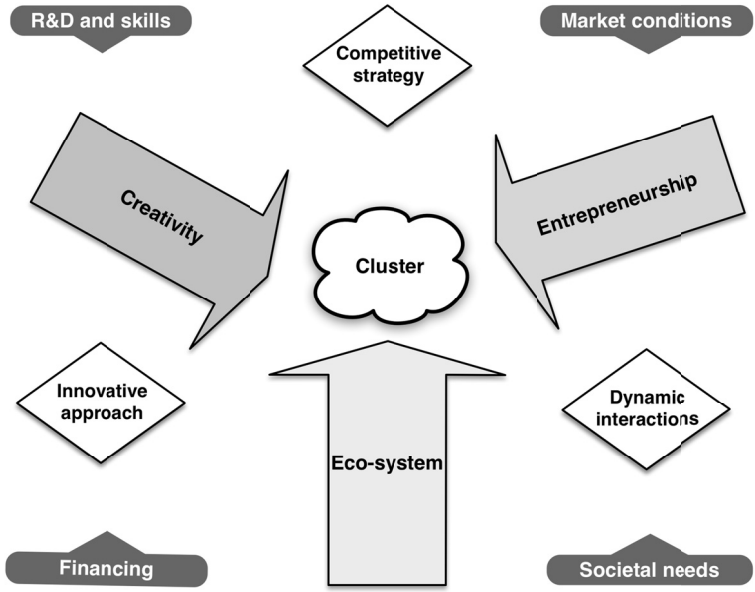

Fig. 1-2 A new Triple Helix model
Source: Own development based on Quinn (2009).