Gemaca II

Growth Sectors / Clusters in Dublin, London, Paris and RhineRuhr: Synthesis and recommendations

Foreword

This study was conducted in the framework of the GEMACA II project (Group for European Metropolitan Areas Comparative Analysis, second project)[1], which addresses the competitiveness of the major metropolitan areas in Europe.

The different works were made possible thanks to the partnerships set up between:
- The London School of Economics and Political Science (LSE),
- The Dublin Institute of Technology (DIT),
- The Institute für Landes und Stadtentwicklungsforschung des Landes Nordrhein-Westfalen (ILS),
- And the Institut d'Aménagement et d'Urbanisme de la Région Ile-de-France (IAURIF), also in charge of the general co-ordination of the project.

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[1] http://www.iaurif.org/en/projects/networking/gemaca/gemaca_gb.pdf

Table of Contents

1. Introduction: defining Clusters and Sectors

« Local productive systems », « clusters », « industrials districts », « enterprises agglomerations » - while the terminology varies the phenomenon remains the same: all refer to geographical groupings of firms in related lines of business. A cluster can contain a small or a large number of enterprises, and small and large firms in different proportions. Some clusters, such as many of Italy's industrial districts, comprise mainly small and medium sized enterprises. In others, large firms, sometimes of foreign origin, form the nucleus of the cluster. Different clusters involve varied degrees of interaction among the firms involved, ranging from loose network of association to multifaceted forms of co-operation and competition.
World congress on local clusters, OECD – DATAR, Paris, January 2001

Since the end of the 1970s, redistribution of activity in space – internationally as well as within a single country or region – has occurred in a number of different forms (Courlet, 2001). Globalisation is occurring with the increased ability of an enterprise to source its capital as well as goods and products where their production costs are the lowest in order to enhance their competitiveness. Another trend has seen the development of some small and medium geographical entities or clusters consisting of concentrations of a number of different-sized firms from the same industry or from related industrial sectors adjacent to each other. These "clusters" often have a significant innovation capacity, and an ability to compete globally.

The economic literature about clusters dates back to Marshall (1890), the subject has attracted renewed attention recently with a recognition that they have always played a significant role in regional development and that clusters can be found everywhere. Common examples include the German Chemical Industry Cluster, the Italian Footwear and Fashion cluster (Vidal, 2001) and more notably, Silicon Valley (Saxenian, 1994).

Porter (1998, p199) gives a definition of a cluster: it is "a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalties and complementarities". This rather broad definition of a cluster first enables a cluster to include more than a single industry. Secondly this definition captures important linkages and spillovers of technology between industries, which are fundamental to competition, productivity and to innovation. And thirdly, the geographic scope of a cluster can range from one city or region to a country or even a network of regions in neighbouring countries. In essence, clusters vary in size, depth and level of aggregation.

The question remains why do firms cluster at all. The main characteristics of a cluster were put forward and summarised by van den Berg, Braun and van Winden (2001):

- "First, face-to-face contacts appear to be very important as sources of (technological) information and in the exchange of tacit knowledge. Spatial proximity greatly enhances the possibility of such contacts.
- Second the higher is the value/value added of any element in the production, the stronger is the incentive to minimise time in transit. Thus activities where the actors who have to meet face to face are more highly paid and/or where the (intermediate) 'outputs' have high value added have stronger incentives to cluster

close together. Examples are in financial services or the new media. Highly qualified professionals in both sectors are paid high salaries; a roll of tape or film on its way to editing represents an expensive intermediate product the financing costs of which have to be met until it is at the production stage where it earns revenues. These seem to be important reasons underlying the dense clustering of these sectors in major metropolitan centres.

- Third, co-operation between actors requires mutual trust. This holds particularly when sensitive and valuable information is exchanged – for instance, in a joint innovation project. Cultural proximity – i.e. the sharing of the same norms and values – is an important factor in that respect, since co-operation is a human phenomenon.

- Another relevant issue concerning the spatial dimension of clusters is how local networks relate to global networks. In the local-global interplay, transnational companies (TNCs) play a special role. If a TNC is rooted and integrated in the region and engaging in regional networks, it can act as an important disseminator of new knowledge, information and innovation from abroad into the region. This is particularly relevant for research and development activities: knowledge flows are facilitated by personal relationships, and by mobility of employees or linkages of large firms.

- A last point is the prominent role played by the state or regional government, and institutions. The presence of specialised development and training programs, the presence of a university, a modern infrastructure as well as incentives and the removal of barriers to innovation, mutual co-operation and of entry barriers foster innovation, collaboration and competition.

The GEMACA project's first aim is to study how far the cluster definition as seen above can be applied to north-west European metropolitan areas such as Dublin, London, Paris and RhineRuhr. In this order, the Gemaca team commenced by studying the relevant literature on cluster development and the group has developed a framework of analysis[2] derived from existing literature.

Secondly, the GEMACA project selected some particular clusters and analysed the different dynamics that gave birth to these clusters and helped them develop. Moreover these studies provide a recent outline of each cluster and its characteristics.

Finally, the GEMACA work will consist in identifying the policies practised at a local as well as regional or even national level in order to help and sustain the development of clusters, in order to provide recommendations to the parties concerned.

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[2] See: Gollain V., Shiels P., Williams B., (2001): Framework for analysing the sectors / clusters and government policy.

2. Methodology

2.1 Clusters studied within the GEMACA II Project

This paper is based on the results of the Gemaca II comparative research project on growth clusters in Dublin, London, Paris and RhineRuhr

Each national team has studied 5 sectors / Clusters SIC[3] or non-SIC based. 3 common sectors / clusters to all partners have been chosen:

1. ICT (OECD SIC definition).
2. Pharmacy – biotechnology.
3. Creative industries.

Partners have added two of their own selected sectors, which are:
4. Finance (Dublin, London, Paris).
5. Media (London).
6. Logistics (RhineRuhr).
7. Environment industry (RhineRuhr).
8. Services to elderly (RhineRuhr).
9. Tourism (Dublin).
10. R&D (Paris).

In total, the 4 teams have made 21 surveys.

2.2 Difficulties met when studying a cluster

2.2.1 Defining a cluster: fixing its boundaries.

As mentioned previously in the definition, one of the main characteristics of a cluster remains in the concentration of firms from different industrial sectors and their horizontal and/or vertical linkages. Hence, one of the main difficulties met when studying a cluster is to determine the size or scope of the cluster in question, and to define its boundaries. Enright (2001) puts forward different dimensions along which a cluster's size may vary: geographic scope, breadth, depth, activity scope, and each one of these dimensions has to be addressed and evaluated in order to define precisely the size of a particular cluster.

There are two main approaches used when trying to fix a cluster's boundaries (Le Blanc, 2000): the first one, raised by Porter (Porter, 1998), relies on the idea that they can be drawn by determining which linkages across industries and institutions are most important to competition. Porter proposes a definition of clusters as "critical masses in one place of unusual competitive success in one field". The second approach puts forward the role of the technological changes and networks (Saxenian, 1994; Roelandt, 2000; Maskell, 2001b). This approach emphasises information exchanges (formal and informal), knowledge flows, technological spillovers between firms and innovation capacities and capabilities. Fixing a cluster's

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[3] Standard Industrial Classification (SIC); a definition of the different nomenclatures can be found in the appendixes.

boundaries is then based on determining where the knowledge diffusion finds an end or becomes too limited (and from here, what activities and firms/institutions).

2.2.2 What Data, and where to find it.

The second step of cluster analysis consists in collecting Data relative to the cluster. One must know what Data has to be collected, and where. Rosenfeld (2001) puts forward that due to the diversity of industries present in a cluster, "the only way to convert the raw Data to clusters is to select combinations of the industries to represent the desired cluster". This research proposes four sets of Data that are to be used for the analysis: (1) the number of employees, firms and institutions, (2) "location quotients" meant to compare the relative concentrations of the industry sectors present in the cluster to the regional or national levels, (3) input-output tables in order to draw the inter-firms, inter-institutions and institution-firms linkages, and (4), growth rates.

However Rosenfeld doesn't propose any method in order to evaluate the location quotients while Le Blanc (2001) found that it can be established as the ratio between the local relative employment figure in a particular sector and the national relative employment figure in this same sector). Furthermore it is obvious that amassing such Data requires time: drawing the input-output table implies a strong and deep knowledge of the cluster studied.

In most cases this Data is available through different institutions: governments as well as public or private institutions sell these Data or make them publicly available.

During the GEMACA project, the data that have been used came from the locally available statistics, the European Databank Regio has not been used because its statistics were not enough detailed when focusing on a particular industrial sector.

2.2.3 Relevance of the Data

Once the Data has been collected, the analysis becomes possible. Yet one must be careful with the Data: as underlined by Porter (Porter, 1998), "cluster boundaries rarely conform to standard classification systems, which fail to capture many important actors in competition as well as linkages across industries". He further states that "Clusters, then, represent a distinct way of organising economic Data and viewing the economy". Indeed standard classification systems include under the same nomenclature particular industries, which, in a cluster, are occupying different roles from what a classification would expect them to.

The GEMACA Group experienced this difficulty because the statistical data that have been used were based on the Standard International Classification (SIC). Sometimes adjustments were necessary and have been made in order to evaluate more precisely the size of the clusters studied.

Finally a last problem resides in the geographical scope of a cluster. A cluster may spread within a city, a region, a country, or even sometimes within neighbouring countries. Since geographic Data is often administratively organised and since administrative geographic boundaries are not always relevant of a cluster's own

boundaries, one may have to use different sources and different systems, subsequent reworking of the Data obtained becomes necessary. Fortunately, many governments are becoming aware of the clusters phenomenon and are beginning to provide cluster based Data.

As for the GEMACA case, the statistic data have been reassembled at the FUR-level (or FUR approached level) in order to limit this difficulty.

2.2.4 Conclusion – a general cluster methodology framework

Studying a cluster implies first establishing its boundaries, in its geographical scope and other dimensions. Then, within the cluster, one will have to draw the different links between the actors, firms as well as institutions, in order to understand its functioning, i.e. what links are the most important to competition and how knowledge flows from one actor to the other. Most often the available Data sets are based on standard classifications that don't represent the true nature of a cluster. As a conclusion, in most cases, the approach will have to be designed depending on the individual cluster and the specific factors relating to its competitiveness.

3. Results

The studies try to understand the particular conditions favouring clustering in that/those activities.

3.1 The common interrelated elements that influence the growth of clusters

One of the main GEMACA findings is that that not every large European region has the same chance to develop a certain cluster, due to the large influence of local factors on the birth, growth and development of clusters.

Indeed, cluster development is attributable to several key factors that have been studied and analysed in the cluster literature. Porter included them in his Diamond Model (Porter, 1998) and divided them into 4 categories, called Factor (Input) Conditions, Related and Supporting Industry, Context for Strategy and Rivalry, and Demand Conditions[4], insisting particularly on the local competition as a stimulation. Meanwhile, Krugman (1991) emphasised the role of the knowledge spillovers and the labour market. And other authors (Bekar and Lipsey, 2001; Maskell, 2001a and 2001b; Roelandt et alii, 2000) put forward knowledge diffusion, innovation and learning as major influential factors.

Here is a list of the most common and cited factors[5] (some of them have already been cited before):

- The capacity to innovate and the learning process: the most cited advantage of clusters relies on the knowledge spillovers. The proximity of its participants allows informal, face-to-face contacts that lead to the creation and diffusion of information as well as technology among and between different firms, which is critical for innovation.

- Cultural similarities and the share of norms and codes within the cluster community both limit opportunistic behaviours and reduce transaction costs.

- Within clusters, firms have access to a large skilled labour market, to specific and local inputs from equipped suppliers in a greater variety and at a lower cost, to complementary firms, to institutions, to information, and to a shared infrastructure, thus lowering the entry barriers.

- They also have access to a strong local demand that perceives more rapidly and more clearly the needs of customers elsewhere, and promotes innovation through buyer-producer linkages.

- Another relevant point is the collaboration between local competitors (like for example the creation of networks of suppliers and buyers) which results in more efficiency in case of lobbying or competing against foreign competitors through the share of information and activities.

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[4] One must notice that chance and government action have been included as well in a fifth category called "others" but that wasn't one of the cornerstones of the diamond.

[5] This list is based on the following readings: Becattini (1992), Bekar and Lipsey (2001), Courlet (2001), Enright (2001), Garofoli (1992), Globerman (2001), Humphrey and Schmitz (2000), Krugman (1991), Krugman, Fujita and Venables (1999), Maskell (2001a, 2001b), Meyer-Stamer (2001), OECD (2000), Porter (1998), Roelandt et alii (2000)

- Last but not least, the strong competition between direct local rivals act as a pressure and a stimulation on them and pushes them to enhance their productivity and their innovation capacity, to increase their investments and to upgrade the manufacturing and service delivery.

However there are limits to these factors: a first, as shown above, the demand conditions and therefore the structure and the size of the region are fundamental to the creation and the functioning of a cluster. As Harrisson and Glasmeier wrote: "cluster development is more appropriate in areas where there is already an existing diverse economic base, which can support new markets and diversification". These fundamental economics conditions explain why a lot of growth clusters / sectors are born in London, Paris and RhineRuhr. But, in specific cases, growth clusters could be developed in middle-sized cities such as Dublin.

3.2 The 3 common sectors / clusters: an overview

3.2.1 Information and Communication Technology (ICT)[6]

Over the past years the Information and Communication Technology Sector (ICT) has been a top focus on the agenda of business firms and politicians. Although recent developments on market stock exchanges have opened a more realistic view of the sector, there is no doubt that the ICT has been an important factor during the last years in the context of regional development and structural change.

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[6] ICT in the NACE classification: 30.0; 31.30; 32; 33.2; 33.3; 51.64; 71.33; 64.2; 72 (see Gollain, Williams, Shiels, 2001).

ICT in Dublin, London, Paris and RhineRuhr

	Dublin	*London*	*Paris*	*RhineRuhr*
Definition	SIC based	SIC based	SIC based	SIC based
Firms	2 100	N.A	7 500	10 257
Employees	65 900	364 000 (1)	376 700	122 000
Take-off	1990s	Mid 1980s	Late 1980s	Late 1980s
Stage of development	Established	Established	Established	Established
Cluster development	Growing	Growing	Growing	Growing
Depth	Deep	Deep	Deep	Deep
Strengths	- Low corporation tax for ICT firms - Ireland is a global leader in software production	- Strong demand for computer services - Proximity to clients - Leisure software - - Financial software	- National and Inter-national Leaders are part of the cluster - Proximity to clients - Software	- National Leaders are part of the cluster
Weaknesses	- Increasing competition from emerging low cost countries (e.g. India) - Emerging skills shortages and rising wage costs	- Competition is increasing - High property values and space constraints	- Telecommunication cost for Internet - US competitors - High wage costs	- Companies Culture - Lack of sector-building - Problems in integrating different functions
Spatial aspects	- Central Business District ; - Industrial area situated around the M50/Naas Road axis ; - the Sandyford business park ; north of Dublin city	- Software industry is heavily concentrated in London and South East	- Core in Paris, Hauts de Seine and in the south-west part (Velizy, Saclay, …)	- Core companies along an axis Cologne, Bonn, Duesseldorf, Essen
Future prospects	- Dublin is currently evolving from a production centre to more specialised activities such as e-business	N.A.	- Ile-de-France could become the software and multimedia capital of Europe within 5 years.	- Depends more and more on demand-side factors like societal acceptance, value change and implementation capacity.

(1) Estimation. Addition of London (Computer related services) and SouthEast (ICT) and Eastern (ICT). Year 1999.

Source: GEMACA II reports.

3.2.2 Pharmacy and biotechnology[7]

Significant scientific progress over the last ten years in the area of life sciences has led to the emergence of biotechnologies, creating a new human capacity to control the process of cellular reproduction.

Biotechnologies cover all techniques of life sciences and involve using living organisms or their cellular components, either singular or combined, to produce goods and provide services for research and industry.

In this area, Ernst & Young describes a biotechnology company as "a company with the aim of producing and commercialising/marketing products or services:

- uses life sciences ;
- uses high technology tools ;
- Undertakes highly innovative research."

In 2001, the company Ernst & Young compiled a register of 1 560 European companies specialising in biotechnology (not including biomedicine and pharmaceutical companies), employing 62 800 employees, with a revenue of 8.6 billion Euros[8].

Panorama of biotech companies in Europe

	Number of companies	Number of employees	Revenue (per million Euros)
United Kingdom	280	18 400	2 066
Germany	340	10 700	786
France	240	4 500	757
Switzerland	110	5 600	1 313
Rest of Europe	590	21 904	3 757
TOTAL Europe	*1 560*	*62 854*	*8 679*

Source: Ernst & Young, *Life Sciences in France – 2001*

The United Kingdom ranks first with 23.8 % of the total revenue and 29.3 % of employees of European companies, followed by Germany (22 %) and then France (15.4 %).
Over the last three years, Germany and France are the two countries in which there has been the largest increase in the number of biotechnology companies. The number of companies has remained stable in the United Kingdom, but in France and Germany it has doubled over the last four years.

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[7] Pharmacy: NACE code 24.4. Biotechnology: no NACE code. Ernst and Young definition.
[8] It is often said that commercial biotechnology is characterised by a division between specialised "upstream" companies (considered as the innovative hub of biotechnology) and "downstream" companies.

Biotechnology in Dublin, London, Paris and RhineRuhr

	Dublin	*London*	*Paris*	*RhineRuhr*
Definition	Non SIC based	Non SIC based	Non SIC based	Non SIC based Categories I and II
Firms	N.A	100	110	150
Employees (estimation)	N.A	N.A	4 000	4 000
Take-off	Not yet occurred	Late 1990s	Late 1990s	Late 1990s
Stage of development	Embryonic	Embryonic	Established	Established
Cluster development	Growing	Growing	Growing	Growing
Depth	Shallow	Shallow	Medium	Deep
Strengths	- No significance, yet	- UK lead in biotechnology in Europe - strong research - University, hospitals, regulatory - venture capital	- 45% of national potential - High scientific resources - - Pharmaceutical companies	- High density of global networking - Good position in R&D, one of the three national leading regions
Weaknesses	- The Pharmaceuticals and Healthcare Products sector employs only 4,200 persons in Dublin.	- high property values and space constraints - laboratory space - Competition from "Oxbridge"	- Societal acceptance - The region still behind the most dynamic regions of Europe	Synergies are not as expected (regional fragmentation) Societal acceptance
Spatial aspects	- No spatial significance, yet	- South East (counties of Surrey, Sussex and Kent) - Central and west London	- Cores in Paris, Evry (Genopole) and Val de Marne	Core in Cologne and neighbourhood (Aachen, Leverkusen, Duesseldorf).
Future prospects	- Current govt. strategies place a strong emphasis on development of biotech sector - Targeted strategies in place for development of biotech cluster	- Creation of biotech incubators in London - Develop local biotech networks	- In order to become a first-rate Bio-Region in Europe, the Ile-de-France region must whole-heartedly pursue efforts already made to make a major difference in the long term.	Depend more and more on demand-side factors like societal acceptance and political regulation. Sector building

Source: GEMACA II reports.

3.2.3 Creative industries

There are many definitions of the creative industries and it is difficult to identify the precise definitions that are used in many studies. The Gemaca team has broadly considered the creative industries to be those identified by the British Department of Culture, Media and Sport[9].

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[9] See www.culture.gov.uk/creative/mapping.html. The creative industries are disaggregated in the following ways: Advertising; Film and TV; Music Industry; Architectural, Engineering and other technical activities; Publishing; Software and Computer Services; Photography.

Creative Industries in Dublin, London, Paris and RhineRuhr

	Dublin	*London*	*Paris*	*RhineRuhr*
Definition	SIC based	SIC based	SIC based	SIC based
Firms	5 260	N.A	27 600 (establishments)	40 940
Employees	61 300	488 000 (1)	425 000	324 000
Take-off	1960s until now	1900's until now	1900's until now	Early 1980s until early 1990s
Stage of development	Established	Established	Established	Established
Cluster development	Growing	Growing, some subsectors are stable	Growing, in some subsectors declining	Growing, in some subsectors declining
Depth	Deep	Deep	Deep	Deep
Strengths	- Diversity and range of this sector - Strong physical concentration in centre of Dublin creates ease of interaction of skill resources	- Diversity of subclusters - Mutually re-inforcing between them - International standards and large scale	- Strong rise of media sector (TV, film, radio) ; relative specialisation with strong dynamic in technical clusters (software, engineering) ; large range of activities ; strong geographic concentration for media	- Polycentric agglomeration, - high potential in sub-regional specialisation
Weaknesses	- Ireland is not a European or global player in the Creative sector - -Creative sector is not a principal investment priority by government		- Film sector not technically prepared (digitalisation) and strong international competition from low cost countries ; - decline of the edition	- Lack of specialisation
Spatial aspects	- Strongly concentrated in the central wards of Dublin, particularly in the traditional office location of Dublin 2 and 4. Noticeable outliners exist in the southern suburbs of Dublin.	- The creative industries are heavily London based	- Paris - Hauts de Seine (La Défense and Val de Seine) - Massy-Palaiseau - New town of Saint Quentin en Yvelines - Plaine St-Denis	- Media (Cologne) - Advertising (Duesseldorf) - Software (Dortmund) - Fine arts (Cologne)
Future prospects	- Limited. Will probably continue to cater to small domestic market.		- Overall impact of digitalisation - Labour's adaptation	- Value change - Professionalisation

Source: GEMACA II reports.

3.3 The other sectors/clusters: an overview

3.3.1 Finance

An effective financial system is essential for the smooth running of the economy. Financial services, acting as vital intermediaries between lenders and borrowers, savers and investors, also offer optimal risk management.

According to European Labour Force Surveys, 5.2 million employees of the European Union were employed in the financial sector in 1999, i.e. approximately 3.4 % of total employment in Europe. The London Fur accounts approximately 8.3 % of European financial employment. The Ile-de-France region ranks second with 5.4 % of European staff in this sector, but ahead of the RhineRuhr (3.6 %), The Randstad-Holland (2.7 %) and Frankfurt (2.2 %). Other cities which have performed well are notably Brussels (1.5 %) and Dublin (0.8 %), proportionally employing more people in the finance industry than all other sectors on a European level.

The finance industry in European regions

Share of European employment

Region	Share
Brussels	1,5%
Ile-de-France	5,4%
Dublin	0,8%
Frankfurt	2,2%
RhinRuhr	3,6%
Randstad	2,7%
London	8,3%
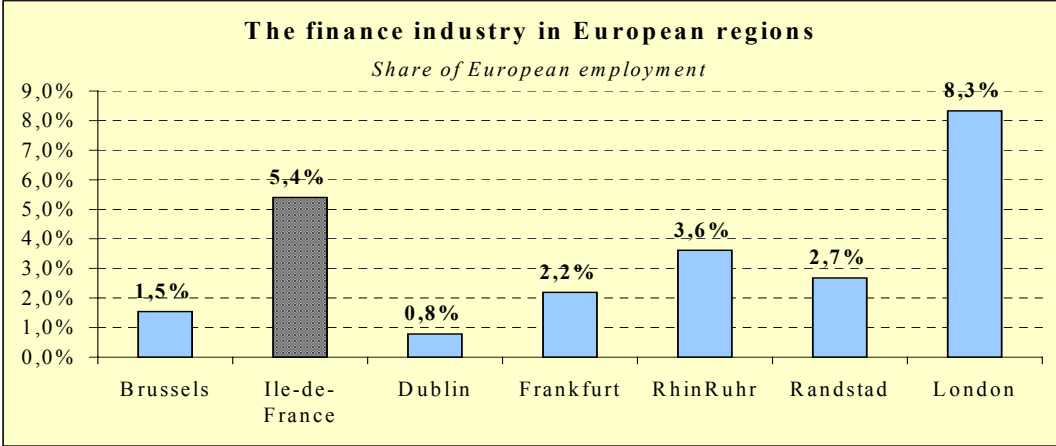
The regions studied are those included in the GEMACA II project, except Ile-de-France (administrative region) and Frankfurt (Regierungsbezirke in Darmstadt).
Data comes from European and national Labour Force Surveys. Employment is calculated according to place of residence in 1999 (London 1998).

Statistical processing IAURIF 2001

Finance in Dublin, London, Paris and RhineRuhr

	Dublin	*London*	*Paris*	*RhineRuhr (1)*
Definition	SIC based	SIC based	SIC based	SIC based
Firms	2 100	N.A	9 000 (establishments)	N.A
Employees (2)	41 000	438 000	284 000	190 000
Take-off	1990s	End of the 19th Big Bang (1986)	End of the 19th Law of 1984	N.A
Stage of development	Established	Established	Established	Established
Cluster development	Growing	Growing	Stagnating, in some subsectors declining	N.A
Depth	Deep	Deep	Deep	Deep
Strengths	- International Financial Services Centre (IFSC) - Special corporation tax regime - Funds administration	- One of the top three financial centres - 479 foreign banks - Pension funds	- Euronext - Numerous international headquarters - One of the world's leading asset management industries - An easy and cheap access to euro markets	N.A
Weaknesses	- Size of the cluster - Level of qualification of the manpower	- European competition (Frankfurt and Euronext)	- High wages costs; - an insufficient number of French financial intermediaries; - a lack of private investors; - a wide gap between taxation systems which is unfavourable to Paris.	N.A
Spatial aspects	- Finance services are concentrated at the Central Business District of Dublin : traditional office core an International Financial Services Centre in Dublin Docklands	- City (Square Mile) - Docklands - Outside London, most of the employment is in back office activities	- Finance services are concentrated near the Bourse (Paris 8ème), in La Défense and in eastern suburbs (back office activities)	N.A
Future prospects	- Need to move up value chain in selected niche areas - Improve the general urban environmental quality		- Impact of I.T ; future of headquarters ; development of skills ; evolution of the competitive position of Euronext Paris	N.A

(1)Information compiled by IAURIF.
(2)Source: Eurostat (Labour force surveys)

Source: GEMACA II reports.

3.3.2 Logistic, Environmental Industry and Services for elderly (RhineRuhr)[10]

The Environmental Protection Industry (EPI) for many years has been one of the most promising and cited example of an emerging new economic sector with great job potentials. Although the EPI meanwhile plays an important role in the economic structure of many regions it is difficult to describe it with statistical means. On the one hand the sector covers not only companies of the industrial sector but also to a large extent those of the service sector. On the other hand it is a typical cross-sectoral plant whose member firms are spread widely across traditional economic sectors. Because of the latter no sufficient data from official statistics are available to describe the EPI in a statistical sense.

To understand the development of the environmental technology in North-Rhine-Westphalia we have to keep in mind, that regional suppliers of the traditional production clusters (mining, steel) were able to master new tasks in the context of environmental protection. In this context the development of Northrhine-Westphalian environmental protection industry is of general interest in the discussion of regionally based diversification strategies. It can be explained not only by one dominating technical competence, but also by numerous different factors, which helped to join the new markets in a successful way, for instance:

- a long tradition in waste management especially in scrap collecting for recycling purposes;
- experiences in the construction of ventilation systems for the mining companies;
- traditions in co-operation with local authorities, especially in energy supply or water purification;
- experiences in the transportation of hazardous waste or;
- the availability of deposits and sites for incineration facilities.

Logistics. An effective flow of material and goods plays an increasingly important role in the global economy. Trends toward globalisation supply chain management and the development of information and telecommunication technologies are reshaping the world's trading patterns and consequently the physical trade flows. The existence of an efficient logistical infrastructure has become therefore an imperative factor for competitiveness and growth of industry and services.

To keep up with the new challenges a significant proportion of company expenditure and government resources are being spent in logistics. In a broader sense, logistics can be defined as conveyance of goods and passengers by various modes of transport. In every stage of economic activities, the goods and materials are transported from one place to another: from the supplier to the enterprise, within the enterprise and from the enterprise to the customer.

Thus, logistics can be regarded as a part of the general supply chain process concerning the question of how the delivery of goods, services and related

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[10] Source: report from *Institut Arbeit und Technik* for Gemaca II.

information from the point of origin to the point of consumption can be efficiently planned, implemented and controlled.

The logistic sector is considered as a growing sector promising new opportunities for growth as well as for new jobs. The general trends in the logistic sector can be summarised as the increase of individual demand for transport services, introduction of E-business and intensified application of information and communication technologies, concentration and consolidation among firms and increasing demand for additional services. These all will influence the strategies, structure and competition of firms.

The demand for transports depends on the general level of economic activity and manufacturing structures. New structuring of logistic chains through outsourcing and changing market structures (breakdown of the post monopoly etc.) spurred by progressive liberalisation in Europe, the opening of East European Countries and finally the reduction of barriers to mobility and flexibility led to an increasing demand for transport.

Services to elderly. Over the next few decades the population of Germany will experience ageing -like other OECD countries- particularly because fertility rates have fallen and people are living longer. Due to the fact that the post-war baby-boom generations will be reaching the normal retirement age, it is generally regarded as indisputable that large increases in the share of the over 65s in the populations of the OECD countries will inevitably occur.

In common, the ageing is considered in such studies as a challenge to be encountered with far reaching implications for the society. So far the discussions are concentrated on the social and economic impacts, especially on the health insurance and pension systems. This demographic change would also mean a chance for the economy and employment and might offer new opportunities for the renewal and competitiveness of firms and regions, related to the needs and requirements of the elderly.

Due to the growing share in the population, the economic and social needs of the older population have gained importance because of the quantitative increase in needs and its economic impacts. Since about the mid-nineties the interest in the older population as a customer target group has experienced an increase with the recognition that products and services for improving the quality of life in old age could mobilise additional purchasing power.

The Cluster concept plays today an important role in the modern regional and economic analysis related to this sector. In this way, the view is focused the individual products and services and potential total value creation with its forward and backward linkages along the production line. For the health and social services this means that the cluster concept concentrates not only on the hospitals, doctors, rehabilitation and care institutions as in the traditional analysis, but also in an extended view on the medicine, engineering, biotechnology and pharmaceutical industry, health tourism or services for quality of life. Recent studies use the cluster approach to analyse and describe the health and social services with particular focus on employment development and future perspectives.

The Cluster Services to elderly can be defined in this sense as delivery and provision of products and services designed to improve the quality of life in old age. The central issues in this framework refer mainly to the provision and delivery of effective and efficient health and social care for the old and frail; new technologies and design to help people retain their independence and autonomy; new prevention, treatment and rehabilitation strategies.

Logistic, Environmental Industry and Services for elderly in RhineRuhr

	Logistic	Environmental Industry	Services for Elderly
Definition	SIC based (1)	Non SIC based	SIC based
Firms	14 800	N.A	N.A
Employees	140 8000	82 500	160 000
Take-off	1980ies, further restructuring on the way	Late 1980s, early 1990s	Expected
Stage of development	Established	Established	Embryonic
Cluster development	Different trends	Stagnating	Growing
Depth	Deep	Deep	Medium
Strengths	- Geographical location, - demand density, - good modal split	- National leaders are part of the cluster, - leading national cluster, - complementary competencies	- High demand potential, - well established welfare infrastructure
Weaknesses	- Fragmentation	- Lack of integration and service culture	- Image (Ruhr), Lack of professionalisation
Spatial aspects	- Duesseldorf and Cologne as dominating locations - Dortmund : logistic architecture (consulting) - Duisbourg : Harbour centre - Different transport companies in the periphery (Northern Ruhr Area)	- Core companies along an axis Cologne, Duesseldorf, Essen, and northern Ruhr Area.	- No spatial significance, yet
Future prospects	- Capability to integrate new technologies (e-functions) - Professionalisation - Regulation (EU)	- Awareness concerning sustainability will decisive	- Capability to integrate new technologies

(1) Nace 60 + 61 +62 +63

Source: Institut Arbeit und Technik report for Gemaca II.

3.3.3 Tourism, R&D, Media

Tourism, Media and R&D

	Tourism (Dublin)	*Media (London)*	*Research and Development (Paris)*
Definition	SIC based	Non SIC based	SIC based
Firms	4 600	N.A	N.A
Employees	46 200	235 000	127 000 (1)
Take-off	1960s and 1990s	1900's until now	1790's and since 1960s
Stage of development	Established	Established	Established
Cluster development	Growing	Growing	Growing
Depth	Deep	Deep	Deep
Strengths	- Ireland is a leading tourist destination on a global scale - Dublin has become a top destination in Europe for short breaks	- First European location for the major Technology, Media and Telecommunications (TMT) corporate - Proliferation of independent production companies - High skilled and low cost location (film)	- One of the top five research centres - Successful in mathematics, physics and fundamental biology (science field). - Successful in electronics, fine chemistry & Pharmaceutics and instrumentation (technology field)
Weaknesses	- Lack of land linkages to rest of Europe means access is primarily by air and thus more expensive - Dublin becoming an expensive destination	- Small independent producers are unstable - Proliferation of freelance workers are precarious - Long term bad effects on training - Lack of R&D	- International image of the region - Demography - Decline of Heavy scientific equipment - - Links between low tech SMEs and public laboratories
Spatial aspects	- Concentration of tourist amenities and accommodation in Dublin city centre and larger towns in FUR	- Inside London media cluster is concentrated in its central part and in Soho district in particular.	- Half of the Ile-de-France's public research is located in the City of Paris and a quarter is located in Paris Sud. - The Hauts de Seine is the leading regional pole of private research. The Yvelines is the second pole.
Future prospects	- Good long-term growth prospects with an increasing emphasis on Dublin as a quality destination	- Established centres such as Soho are vulnerable and must compete and innovate - The prospect for	- Overall impact of globalisation - Innovation capacities - International competition

	- Short-term difficulties due to foot and mouth disease restrictions and terrorist attacks in USA	employment seems gloomy - Impact of digital television	24

(1)Full Time Equivalent.

4. Clusters policies in Dublin, London, Paris and RhineRuhr

There are few examples of industry cluster policy currently in place in Dublin, London, Paris and RhineRuhr. In UK, industry clusters have been used to help identify current economic activities in the regions[11] and such policy linkages as exist.

4.1 Cluster policies for Dublin

In recent years, the Irish government has recognised the necessity for the country to remain competitive on a global level and sustain recent gains. In maintaining and enhancing Ireland's competitive position, policy-makers have identified the importance of fostering and enhancing economic development at national, regional and local levels by developing a critical mass of economic activity in various identified sectors for the purpose of achieving self-sustaining growth. In addition, the government departments responsible for enterprise believe that Ireland must adopt a robust culture of innovation in order for the country to retain its competitive position on a global scale. Current policy mechanisms aim to achieve the creation of a critical mass of economic development in specific locations through the targeted provision of support infrastructure including:

- Hard Infrastructure – Physical infrastructure supporting economic development (roads, rail, telecommunications, provision of serviced land for industry, etc.).
- Soft Infrastructure – Less tangible forms of infrastructure which are nevertheless vital for the creation of areas of self-sustaining economic development. Such infrastructure includes third level educational facilities and links between such institutions and private sector industry, training and upgrading existing skill levels in the labour force, developing linkages between multinational FDI firms and smaller local enterprises.

History of Irish Economic Policy
Since the Irish government embarked on a strategy of economic development through inward investment during the 1960s, policy in relation to developing economic clusters has been inconsistent and sporadic. In the 1960s, the central objective was to industrialise an economy which until the 1960s was largely stagnant and dependent of agriculture. Policy towards economic development tended to focus on marketing Ireland to industry based in other countries, most notably the USA, UK, Germany, France and Japan. The government offered an extensive package of incentives for industry to locate in Ireland, including low corporation tax rates, remission of local authority rates and in many instances, the provision of advance accommodation. Despite the success of theses early strategies, however, new industry locating in Ireland at the time was non-specific to any particular sector and government agencies did not discern between economic sectors – the priority was to create employment at almost any cost. The benefits of economic clustering, whereby linkages would develop between enterprises of related sectors, were largely unrecognised. Despite the creation of a large tax-free export-oriented industrial zone adjacent to Shannon Airport in the South-east of the country, industrial location policy was essentially one of widespread dispersal throughout the country (Ireland's population remained predominantly rural until 1971).

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[11] See DTI report.

During the 1980s, the failure of previous economic policy became apparent. Multi-national firms that set up in remote rural areas often tended to cease operations as a result of the uncompetitive position of their location. This was often characterised by low skill levels in the local labour force, poor telecommunications and transportation infrastructure. Compounding the emerging difficulties was the branch-plant nature of foreign firms, with their operation in Ireland characterised by low-skill assembly and low wages. Competition for emerging economies in Asia and other locations severely compromised the economic viability of many traditional manufacturing sectors, including textiles and the assembly of basic components. Policy analysts began to recognise that in order for Ireland to capture new investment, new strategies would need to be formulated which encompassed a broader range of sectors than assembly-based manufacturing activity. In addition, the importance of inter-firm linkages and spatial proximity to high quality infrastructure and higher-level educational facilities was recognised as a critical per-requisite for attracting new inward investment. At the beginning of the 1990s, policy toward enterprise was fundamentally altered in a number of respects, including:

- Re-focusing of emphasis in marketing Ireland to industry at a higher level on the value-added chain, in particular sectors characterised by rapid growth and high skill levels (e.g. ICT, Pharmaceuticals and Financial Services).
- Recognition of the importance in attracting new growth sectors to Ireland in order to maintain and enhance its competitive position.
- Development of state support for the Small to Medium Size Enterprise (SME) sector in Ireland, in order to this sector to gain from multiplier effects and "spin-off" benefits from FDI firms.
- Recognition of the vital importance of a reliable and efficient telecommunications and transportation infrastructure in attracting new investments and the importance of the proximity of new industry to third level educational institutions.
- Repositioning Ireland in the global marketplace a high skill, low taxation, low cost gateway for FDI to European Union markets with minimal regulatory and planning restrictions.

The success of the policies adopted is clearly evident in the rapid economic growth of Ireland's economy during the 1990s. Despite rapid economic growth, it is only in recent years that policy makers have begun to identify the importance of developing strategies which facilitate the creation of economic clusters. Current enterprise policy attempts to discern changes in global trends and respond to changes by accommodating the requirements of industrial firms and other enterprises (innovation, media, etc.). Policy in relation to developing physical clusters of similar and related economic activity, therefore, has been pro-cyclical and market-driven in character.

Digital Media Hub (Liberties/Coombe Area in Dublin 8)
The central government had designated a section of the inner city of Dublin to be the location of an area of innovative activity with respect to telecommunications and information technology. The development of a digital media hub in Ireland was recommended in the Technology Foresight Ireland report and is an objective of the national Development Plan 2000-2006.

To carry out the development, the government established Digital Media Development Ltd. (DMD) The core area to be developed by DMD comprises an area of 2.76 hectares including c.18 existing buildings.

Technology Foresight Ireland
Current policy through the National development Plan 2000-2006 was heavily influenced by the Technology Foresight Ireland report (1999). This report essentially devised possible scenarios in relation to the development of the IT and Biotechnology sectors in Ireland and recommended certain courses of action for implementation at policy level. Specific referencing is made to facilitating the development of a Biotechnology Cluster, which would be based on the development of strong links between the third level colleges and industry, agriculture and the financial services sectors. The report states that the creation of Biotechnology clusters has been successful in other countries such as the USA, UK Germany and Denmark. Most research on clustering in the biotechnology sector has led to the conclusion that the following conditions are necessary:

- a strong academic base with high quality R&D output, some of which is world-class;
- the right environment for translation of research output to innovation to company to product to market stages;
- an adequate labour and knowledge pool;
- an adequate base of ancillary firms that can support and service the biotechnology sector;
- an appropriate industry infrastructure;
- a positive government policy towards the sector;
- protection of intellectual property;
- availability of equity and finance.

The Technology Foresight Ireland Report recommends that the above factors be implemented for the successful development of a biotechnology cluster in Ireland. The report also notes that if a critical mass of activity is achieved, the cluster will become self-sustaining and the necessity for positive government intervention will recede through time. The report notes, however, that positive and targeted government intervention is vital in acting as a catalyst in the creation of a biotechnology cluster in Ireland.

National Development Plan 2000-2001
The National development Plan 2000-2006 has been influenced by a number of key policy recommendations prior to its formulation in 1999. In the case of economic clusters, a significant contributor to policy under the plan is the *aforementioned Technology Foresight Ireland* publication. Under the National Development Plan 2000-2006, the Irish Government plan to develop the concept described as Regional Innovation Systems, at a cost of IR£17.5 million (22 million Euros) in order to encourage regions in Ireland to bring together elements of the innovation system (industry, third-level institutions, agencies and financial institutions) with the objective of building strategies related to local; industrial or research strengths. Funding will be made available for both the preparation and implementation of regional innovation plans, and the proposals will incorporate regional technology parks, taking existing technology parks in Ireland as an model for future strategies. The National

Development Plan, however, makes no specific reference to Dublin in this regard and it is widely believed that the proposed Regional Innovation Systems will be created in peripheral regions of Ireland which currently have a weak or non-existent innovation culture.

National Spatial Strategy (2001)
The National Spatial Strategy (NSS), due to be published in December 2001, aims to dictate the pattern of economic development in Ireland for the period 2001 to 2016. The central ambit of the NSS is to distribute economic development on a more spatially even basis throughout Ireland, and attracting new investment into the lagging Border, Midlands and Western regions of Ireland in particular. A consultation draft entitled *Indications for the Way Ahead* was published in September 2001 and provides a template of the finalised version of the NSS. The National Spatial Strategy will probably recommend that economic development be concentrated into a series of existing urban settlements over a minimum size threshold, which are deemed to contain adequate "critical mass" of resources for self-sustained development. An additional number of number of towns located in marginal regions will be designated as "growth gateways" which will be targeted for accelerated investment in their infrastructure in order to transform them into new centres of critical mass.

The NSS recognises that the benefits of large urban centres are essentially in the number and range of facilities they offer the local population and enterprises – also termed critical mass. The NSS consultation draft also recognises that significant levels of inward investment will not take place in locations which do not meet the requirement of high value added sectors, such as ICT, Biotechnology and Financial Services.

Planning and Development Act 2000
In the context of economic clusters, the recently introduced *Planning and Development Act 2000* contains legislation for the provision of Strategic Development Zones (SDZs). These involve the designation of specific locations where major projects recognised as beneficial to the overall economy of the country will be excluded from the normal planning process. Projects located in SDZs will be fast-tracked to ensure rapid delivery and subject to initial approval, planning permission will be granted automatically for developments in the SDZ. The creation of Strategic Development Zone legislation has obvious ramifications for the potential development of economic clusters (Williams and Shiels, 2000).

Strategic Planning Guidelines for the Greater Dublin Area
The *Strategic Planning Guidelines for the Greater Dublin Area*, published in 1999 guides the land-use and transport development pattern of the Functional Urban Region of Dublin from 1999 until 2011. These guidelines intend to curtail the dispersal of the development of Dublin by intensifying development patterns in the inner designated Metropolitan Area, and to focus new development into designated centres or "nodes" located along transportation corridors in the outer Hinterland Area of Dublin. The Strategic Planning Guidelines are of the utmost relevance to the FUR of Dublin, as they outline the broad pattern of Development for the entire Functional Urban Region (Williams and Shiels, 2002).

The Guidelines indicate that economic activities, and therefore employment, tend to locate at places that offer a specific economic advantage. Development strategies can thus create the conditions for the facilitation of economic activities through the concentration of future development into locations well served by economic infrastructure. A key recommendation of the Guidelines is *"to investigate and introduce measures (e.g. dedicated land, advance factories, service provision, tax incentives, etc.) to secure employment activities in* **the identified development centres** *in the Hinterland area of Dublin."* (SPG, 1999). The Guidelines intend to concentrate employment activities into the designated development centres in order to provide a local employment base for the population of the centres and to reduce the necessity to commute to Dublin for work. In addition, the Guidelines recommend that new data on employment, patterns in the Greater Dublin Area (approximating with the FUR) should be generated for the purposes of monitoring the implementation of the Strategic planning Guidelines and future planning in general. The Guidelines also recommend that measures to encourage Tele-working practices from the home in order to reduce commuting be implemented.

4.2 Cluster policies in UK and in London[12]

A number of policy issues arising from the nature and distribution of UK business clusters have been identified by DTI. Here DTI summarises briefly those that appear significant.

The UK as a clustered economy
The distribution of clusters, their detailed complexion and their comparative size suggest that in some ways the UK is not a particularly strongly clustered economy. Many of the clusters and concentrations identified in the report are relatively shallow and the dispersion of some industries - aerospace, automotive and chemicals for example - around the country is apparent. Notwithstanding this, there are some extremely successful clusters in the UK (e.g. financial services in London, ICT/electronics in Eastern region and many others). The fact that some clusters do not respect administrative boundaries (e.g. motor sport) is significant for cross regional co-operation (and competition).

Cluster depth and performance
The research in the DTI study suggests that the depth of a cluster contribute to its performance. It follows that building of cluster depth is important. It follows also that the preservation of existing linkages within clusters should be taken seriously.
We have identified many linkages within clusters, through, for example, trade associations, public sector initiatives, and the involvement of higher and further education. In some regions and for some clusters these are extensive. In others, there is evidence of potential linkages not being exploited, or of previously strong links 'unravelling'. The impact of higher and further education is crucial. Why are there relationships between cluster strength and research excellence in some places, and not others?
We identified a few clusters in which local education institutions were engaged in skill development related to local cluster strengths. Biotechnology in the South-East is one example, automotive-related skills at Loughborough University is another. The

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[12] See DTI, 2001 (bibliography).

strength of HEI links to clusters in some regions, and their apparent weakness in others, is an important topic for further research.

The research also suggests that superior job creation performance in clusters cannot be taken for granted. In particular, in regions whose strengths lie in capital-intensive clusters, steps to boost the development of clusters will not necessarily bring about a significant increase in numbers employed.

The impact of public policy

We noted examples of the impact that public policy, for example public procurement or regulation, can have on the success of clusters. Policymakers should not overlook the potential for public policy decisions to help shape cluster development.

Cluster strengths and competition

It is clear that there are examples of very successful clusters in the UK. A regional policy dilemma arises if there is a desire in other regions to develop similar clusters. This dilemma is especially profound in the case of most of the creative industries. All regions have some creative industry presence but, with one or two important exceptions, London dominates. While there is undoubtedly scope for considerable growth in the creative industries, attempts to develop strengths in other regions runs the risk of undermining the position of a globally competitive cluster. Conversely, the scale of the task involved for a region in developing a cluster when a strong, established cluster already exists elsewhere should not be underestimated.

The distribution of clusters

Clusters across the UK are not the same. Although very few are 'unique' (i.e., found in only one place) their nature varies significantly. There are three fundamental issues.

The first is that the UK's deepest and apparently strongest clusters are found in the southeast of the country. These include financial services, software, biotechnology and motor sport. The presence of so many of the stronger clusters in the southeast is not simply to do with the size of these economies.

Secondly, south eastern clusters tend to be more service based while the northern clusters tend to be built around rather more traditional manufacturing. This is not by itself associated with the comparative strengths of regional economies. As the research shows, there are several examples of 'traditional' clusters performing well. In so far as regions may be concerned about this, the concern may be to do with 'balance' in local economies.

Thirdly, because clusters are about concentration, it follows that one region's relative strengths can be another's relative weaknesses (although all can benefit from more efficiently produced inputs and dynamic markets for their products). In general this is a source of strength, for example Scotland is strong in oil activities, and the West Midlands in automotive and each has related and supporting industries geographically close.

We have noted the regional policy dilemma that arises from the strengths of some clusters. This can be manifest in other ways. For example, we have reported a concentration of software and R&D in the south and east of the country – it is clearly an attractive location for these activities, many of them internationally mobile – and contributes greatly to the UK's competitive profile. From the perspective of other regions, there might be a wish to have more knowledge-intensive activities co-located with manufacturing activity, for example, the software and research-intensive

aerospace clusters in the South West, North West and East Midlands. The challenge is to help improve the performance of these clusters without weakening the software and R&D clusters in the southeast.

The impact of regional specialisation
The cluster analysis of regional economies shows that some regions' clusters are spread thinly and lack depth. This is not a function of the size of the economy. The methodology controls for that. We would expect a small regional economy with strong clusters to have fewer of them than a larger economy. This is not the case in the UK. The regions have broadly similar numbers of clusters.

Further issues for regional policy
An issue for regional policy is whether regions should focus on 'new industries' such as biotechnology, digital media, ICT, environmental industries, or software, or on their existing clusters 'strengths' such as automotive, metal processing/ products, industrial machinery, clothing/textiles, or food. The considerations here are those of the balance of the local economy; the need to build cluster depth; and the recognition that considerable strength may exist elsewhere.

A subsidiary question is whether regions should place emphasis on regional clusters (or industries) which are large employers essentially serving the domestic market. These clusters or industries have the potential to deliver job growth. Or should regions place emphasis on established regional clusters serving export markets? These are often the older, traditional industries. Examples include tractor manufacture, quarrying and power generation equipment. These are not major job creators and they are often thought of as mundane (in spite of the factors detailed in the discussion on 'old economy' industries).

A final question is suggested by comparative specialisation within the regions. Should smaller regions focus on fewer clusters or seek to expand the industrial base? Doing so carries increased risk of exposure to fewer clusters; it carries the potential benefit that might accrue from increased depth. The answer here might suggest a more explicit acceptance of stronger regional industrial differentiation and specialisation.

4.3 Cluster policies for Paris

One of the distinctive features of the Ile-de-France region is the "spontaneous" development of clusters or sectors with high-growth potential. A number of factors explain the dynamism of this region including the size of its economy and population, the presence of a large number of public and private research laboratories, the high-tech orientation of the economy. Other advantages include the highly skilled workers located in the region and the workforce's skills particularly relating to innovation and new technology[13].

Business sectors with high-growth potential are thus able to benefit from support in the fields of high technology, research and development and in specific business sectors (cinema, biotechnology, information technology, etc.). Financial support granted by public authorities (state, Ile-de-de-France region, departments, etc.) for

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[13] The Internet has expanded rapidly in the Ile-de-France region, to a much greater extent than other French regions, thanks to the capacity of the Parisian population to adopt to innovations, which have come about as a result of advances in information technology.

these programmes is substantial. However, if the total amount of funds raised is compared with the population of the Paris region (11 million inhabitants), the volume of funds granted to companies amounts to only a few hundred euros per inhabitant, which is proportionally much lower than that of Dublin and most other French regions.

The lack of direct support from public authorities in the Ile-de-France region is balanced out by substantial investments in other areas, making life easier for Parisians and companies in the region. These investments are concentrated in three major areas:

- The expansion and maintenance of heavy infrastructure such as roads and motorways, public transport (metro, bus, tramway, the RER (Paris city and suburban express rail network), the international airports of Roissy and Orly. Other areas include high-speed telecommunications (opening up to competition, direct investment of local authorities if there is a lack of investment in research in the private sector). A part of these investments is decided upon on a contractual basis between the State and the Ile-de-France region through the "contrat de Plan Etat-Région"[14] (State-Region agreement). Therefore, for the period 2000-2006, 4.7 billion Euros investment is planned in transport infrastructure by the State and the Region, which includes 2.5 billion for public transport. By way of comparison, economic development is budgeted at 234 million Euros over the same period.
- The creation and expansion of amenities or other services which contribute to economic development such as incubators, regional centres for technology transfers (CRITT), management institutions, etc. Recently, bodies set up to assist business creations and innovation in the region has been expanded in order to meet the needs of the Paris population.
- Economic development achieved through the creation of ARD Ile-de-France (regional agencies for development in the region) and RDT-Ile-de-France (distribution networks for technology) and the expansion of existing structures such as local "business angels" and the association ParisEuroplace for finance. This has also been carried out to satisfy the needs of companies in the Paris region who often indicate that they feel isolated in a region which is so richly provided for in terms of financial, technological and scientific resources.

Since the crisis at the end of the 1980s and the beginning of the 1990s, such measures to assist companies have increased to make up for weaknesses in certain business sectors facing increasing international competition.

Unlike sectorial programs or general public assistance, policies to promote clusters are somewhat underdeveloped in the Ile-de-France region. In fact, with the exception of R&D, there is no policy at a regional economic level in Paris, which is directed towards creating one or several clusters at a regional level. Policies promoting clusters are quite rare in the Ile-de-France region and their influence on a geographical level is limited.

Funds are raised to promote clusters from two major sources:

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[14] The "contrat de plan Etat-Région" is explained in detail in the governance report.

- The government (through Datar – urban planning and regional policy agency) has provided national support to clusters and networks of companies. This is intended to finance the different kinds of co-operation created among companies with a view to increasing these companies' competitive strength, improving their international market positioning and providing them with access to innovation, education, training and information. In partnership with the Ministry of Labour, Employment and Vocational Training, special financial support has been granted to companies that form clusters and who wish to adapt their expertise to fit new techniques and technologies. Financial support for such clusters in the Ile-de-France region is lower than other French regions because the dynamics of sectorial development extend across the whole of the region[15] ;
- The region which has implemented a policy to promote local development for several years now. The local authorities have thus supported an increasing number of local clusters.

These governmental and regional policies have encouraged economic development in infra-regional economic areas such as the Génopole d'Evry (genetics), the "Silicon Sentier", Paris (Internet), Montreuil (multimedia), Optics Valley (optics) and also in economic sectors of the region that are undergoing restructuring (biomedicine in Bobigny and mechatronics in Ivry-Vitry). These policies have encouraged more effective local co-ordination of sectorial aid and the development of regional bodies to help booster the economy. The best example of this type of policy is the Génopole d'Evry . Public and private initiatives were developed in order to promote a research and educational centre for life sciences and a business creation unit with assistance for researchers creating start-ups and the creation of a bio-park. To achieve this objective, the public authorities (State, Region, the Department of the Essonne and the Syndicat d'Agglomération Nouvelle, Evry) and private contributors (AFM – French Myopathies Association, the Chamber of Commerce and Industry of the Essonne and companies) have raised funds. These funds finances research, technology transfers, business creation, training and higher education and telecommunications in order to position the Génopole d'Evry as a centre of excellence, or even a world leader in genomics.

4.4 Cluster policies for RhineRuhr

According to the regional study carried out by Nordhause-Janz & Öz & Rehfeld the following issues are of significance in the case of the RhineRuhr.

- In the RhineRuhr-Region there are many initiatives that are important for sector development and cluster building but policies explicitly aiming at cluster building are new and not yet established. Therefore, cluster policy is in an experimental stage.
- Potential aspects of cluster policy that can be seen as very important toward cluster development are location management, acquisition policy, training programs, the improvement of public implementation strategy, urban planning, and initiatives activating co-operation as well as informal contacts.

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[15] In metropolitan areas and regions of provincial France, strongly specialised areas were often largely structured and concentrated locally, at an infra-regional level of employment (Glass in Lorraine, Textile in Roubaix, the spectacle trade in the Haut Jura).

- But, the competence in cluster management is very different from region to region. Small experience in project management, deficits in co-ordination (horizontal as well as vertical), problems in priority setting is key problems in the public sector cluster policy.
- According to Porter (1991, 1999) clusters work by combining co-operative and competitive elements. Public policy without any doubts can initiate co-operation but it is difficult to organise competition in a co-operative way.
- There is still no evidence about the right time for policy towards cluster building. As far as cluster policy can be regarded as successful in the RhineRuhr-Region it concerns clusters that are already expanding. Therefore good practice in cluster policy often concerns instruments to keep a cluster working, to speed it up. The case is much more difficult when a cluster is a potential rather than reality because than you need to initiate a self-enforcing dynamic.
- Successful clusters are basing on informal communication, on face-to-face contacts, on trust. Process like this work in a private setting. Politics in contrast needs to engage the public, it has to be presented in media, it needs discussion in parliament and it needs public legitimisation.
- Due to these issues policy is focusing on cluster management impossible to and indirect support of emerging clusters intentional cluster making is far from being an elaborated and established target of policy as yet.

5. Recommendations

5.1 Common Recommendations

Cluster-oriented policies represent a major shift from traditional economic development programs, which focused on individual firm oriented policies. In comparison a policy meant to help the development of a cluster can only be achieved on a local/regional basis. The FUR level therefore is very important because it is here that new, emerging and mature clusters can be identified. It's also at this level that the linkages between regional governance and regional economic strategies can be co-ordinated.

Clusters then represent a major challenge for local and regional actors, since the stimulation of clustering can be an effective means of encouraging an efficient allocation of limited resources available for urban and regional economic development.

5.1.1 Introduction

If the literature concerning clusters is very recent, the debate about the role of the state and its implications about cluster oriented policies is still unclear (Diez and Esteban, 2000). Research emphasises the importance of governance and policies, but a precise implication of the state has yet to be defined. For example Porter (Porter, 1998) points out a "fourth role" of a government which would consist in "facilitating cluster development and upgrading" and provides a map of action for a government when dealing with cluster policies. But on the other hand, he goes on to state "active government participation in a private-led effort, rather than an initiative controlled by government, will have a better chance of success" (Porter, 1998). Krugman (1996) stated that "there is an intellectually respectable case to be made for places to intervene to boost competitiveness – but most actual cases fail this test, and are disguised efforts to promote special interests – at the cost of others", underlining the fact that one has to be careful when conducting such policies.

Empirically a variety of approaches have proven their efficiency: the Irish Government helped develop the region around Dublin through implementing different policies in order to facilitate the development of clusters. On the other hand major clusters such as the Media Cluster in London are proving that they can develop by themselves without a specific cluster-oriented policy. However, in a general case, the impact of cluster-oriented policy seems to be relatively low. In a recent study (Enright, 2001) results indicated that while cluster policies are generally considered as positive, their impact varies from "very unimportant" to "moderate"[16].

In fact, most authors consider the role of the government as a collaborating, supportive and catalysing one rather than a leading one. The problem is now to fix

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[16] This study was based on 160 clusters based world-wide, and the impact of the policies was judged on their improvement of the general business environment, the information and data provided, the infrastructure provided, the education, training, and research, the support for business networking and inter-firm collaboration, the business services provided, the attraction policies conducted, the subsidies and tax-breaks, and the community building, the grades being 5 for Very Important, 4 for Important, 3 for Moderate, 2 for Unimportant, 1 for Very Unimportant, 0 for No Policy and –1 for Negative Impact. For more information see (Enright, 2001).

how far a government can go, or how much power it can delegate. It is clear that interventionist governments will seek to drive leading policies towards clusters whereas non-interventionists will only address market failures, arguing that market dynamics will decide on the latter development of the cluster (Humphrey and Schmitz, 2000). Other research indicates that intervention should be specific to each cluster, since every cluster has its own industrial and social environment and a differing stage of development (Enright, 2001).

Moreover, in practice, the cluster approach has proven to be a useful framework for developing and applying new forms of governance, moving away from direct intervention towards forms of indirect inducement. This approach focuses upon facilitating networks and creating the institutional setting that provides incentives for market-induced cluster formation and for the revitalisation of existing clusters. Cluster policy is about creating the right framework conditions of innovation, it is about identifying barriers to innovation, and it is about building relationships and networks. As such, it requires an appropriate mix of analysis and action. Cluster studies can in practice be used as a working method for systemic innovation policy-making.

Clusters are useful frameworks for co-ordinating policies and reducing complexity. The cluster approach provides an integrative knowledge and innovation management tool or framework for spurring innovation in clusters and customising all policies affecting innovation in clusters. Clusters provide policy makers with a way of dealing with increased complexities and better targeting policy by addressing particular systemic failures that hamper innovation. Thus, the role of governments may be seen as one of providing selective response to the needs of innovative clusters. In other words, leveraging innovation in clusters is in itself a challenge, calling for appropriate policy mixes to be designed in pragmatic ways.

5.1.2 Guideline for Cluster oriented policies: the Cluster Policy Cycle, as reviewed by GEMACA

Based on the literature as well as the works conducted within the GEMACA II project, the GEMACA team was able to draw a framework of action, or guideline, meant to provide a guideline on how to conduct cluster policies, and what should be avoided. This framework is mainly based on the different works and studies conducted for GEMACA, on the Cluster Policy Cycle of Charles and Hogwood (2001) and on others reports issued for national or industrial entities as well as articles and papers published by cluster students[17].

In total, the team was able to identify five stages that seem particularly relevant of interest and that should be deepened for each cluster policy: the initial decision, the identification of the clusters, the framework of action, the definition and implementation of tools, and finally the evaluation of the whole process.

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[17] The readings that have been used for this guideline are Bekar and Lipsey (2001), Diez and Esteban (2000), Enright (2001), Ffwocs-Williams (2000), Globerman (2001), Humphrey and Schmitz (2000), Maskell (2001a), Meyer-Stamer (2001), OECD (2000), Porter (1998), Roelandt et alii (2000), Rosenberg (2001), Saxenian (1994).

Figure 1: A stylised representation of the cluster policy cycle
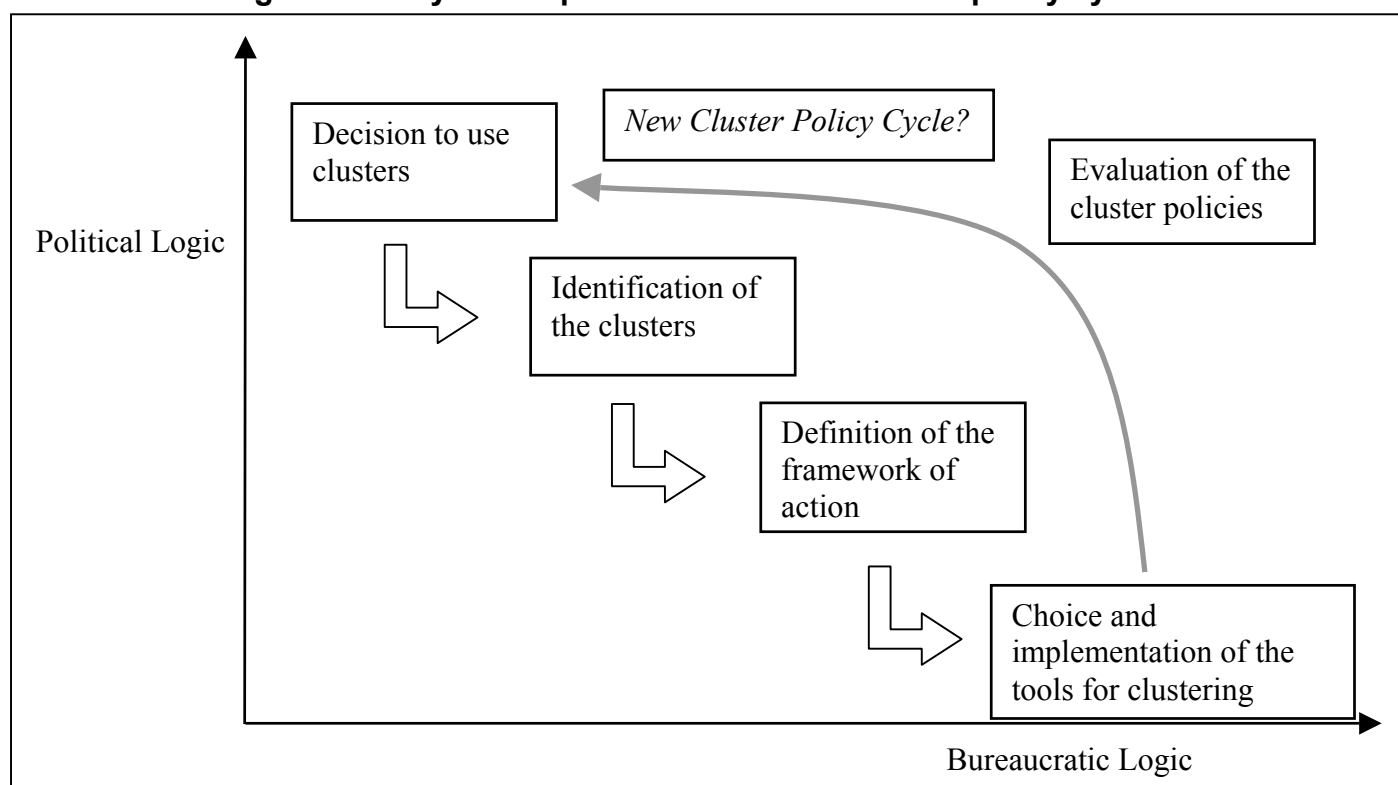
5.1.3 The decision to implement clusters

The first stage of the guideline consists in a preliminary but necessary approach to each cluster oriented policy, i.e. the decision to implement clusters. Most often, such a decision is made by some governmental body, for example the local or regional government. But it must be noted that this decision can be influenced by local enterprises, who can be willing to be considered as a cluster and treated like one, and thus have an easier access to some infrastructure, capital or institutions, or incentives, depending on the local policy concerning clusters.

Deciding to conduct a cluster policy is not always easy, because conducting cluster policies cost time and money and demand a strong and permanent presence as the cluster develops. Moreover, as mentioned previously, it is a very different approach from the traditional ones, and represents a challenge for every level of the government. Consequently cluster policies imply a strong reorientation of the existing policies and the building of new tools. Such a decision can only be motivated by strong lobbying and/or hope for future profits for the community.

5.1.4 The identification of the clusters

The identification of the clusters is the second step of the cycle. It is an absolutely necessary stage and has to be conducted before implementing cluster policies. There is not a single way to identify a cluster and many approaches have proven to be successful. One can for example look at the concentration of employment in a particular industrial sector, but one can also find a cluster when looking at the geographical origin of exports of a particular set of products or services. Then one

can give a closer look and check if local productive system can be considered as a cluster or not, and if there is a chance to develop one. This identification has to be very systematic, so as not to forget a cluster.

Once identified, it becomes essential to characterise a cluster. One can look at its geographical spread, its core activity (or core activities), its breadth and depth, its stage of development, if the cluster is a well-developed one or an embryonic one, its functioning and the different links between the local participants, its external links, its social and economic environment, this in order to determine the strengths and weaknesses, the opportunities and threats. For each cluster a particular study is necessary, and the success of the policies will often depend on the quality of the identification.

Here a participatory approach seems to be particularly adapted. Legal as well as statistical data can point out a geographical concentration of enterprises acting in neighbouring sectors, and what ties them legally (e.g. joint ventures, supplying contracts), but they are not able to draw all the informal and non-traded relations between the different cluster participants. However these links can be identified with the help of these participants, and participants can characterise them as well, for example if they are strong or weak, if they have an influence on their production process, if they are useful and if they foster innovation, collaboration or competition. Only the protagonists of these exchanges can perform this task, and consequently can play a very important role by identifying which links are most important, and which have to be developed, what can be changed to foster them.

5.1.5 The framework of action

The next stage of the cycle consists in defining the framework of action. This framework determines what role the government has to play and what are its limits of action, its sphere of influence.

First, concerning the role of the government: as said previously, the role of the different governing bodies is a supportive and catalysing one rather than a leading one; furthermore they have to leave as soon as possible the leadership to the private sector, and should note act as a leader.

Concerning the cluster approach: the government has to consider every cluster. It should not leave some clusters asides or choose a national champion, a "super-cluster" which would receive all the attentions. Every cluster has to be taken into account since every cluster has an enormous growth potential. The government should neither favour a sector in particular; there are no first-rank sectors (and associated clusters). Every sector can develop a cluster and make some profit out of it. Furthermore such an attributing policy could lead to some measures that are favourable for one cluster but harmful for all the other ones. These efforts would be costly and vain. In contrary the state should concentrate its efforts on the embryonic clusters and clusters at some early stage of development; they need help the most.

Concerning the government's strategy, its objectives have to be coherent and verifiable: only a realistic strategy will be successful. Policies that tend to look for some enormous growth weeks or months after their application have a great chance

to become absolute failures. Clusters policies in contrary are long-term ones. One can look for early but small successes, but the action of the government has to be spread over time.

A participatory approach can be very efficient here as well. Participants can say what they need the most, and what can be improved. An important point is then a shared vision of the cluster. The role of the local parties and actors is now to be defined, and the local needs and particularities are to be identified, in order to determine the most appropriate tools and how to implement them.

5.1.6 Implementing clusters: the building of new tools

One of the main challenges for future cluster policies is the building of new tools, so as to foster the concentration and collaboration of enterprises and different forms of exchanges between them. For example the Irish government has implemented a special tax regime for the financial and IT sectors and is particularly supportive of SMEs; it also has decided to develop a Digital Media Hub in Dublin, meant to attract ICT and high growth potential enterprises. The Ile-de-France Region has followed a similar way with the creation of two regional development agencies (the ARD and RDT).

Generally speaking, measures meant to help the development of clusters can be articulated around six axes:

- **The general business environment**. One of the major tasks of governance is to remove both the barriers it has imposed and the market defaults. The following task is to contribute to the improvement of the quality of the business climate through incentives, a favourable tax policy and a constant review of the regulation. Finally governance has to maintain a stable economic environment. This set of measures is not particular of clusters, but without a quality business environment the development and creation of SMEs, which are critical to a cluster, are heavily hampered.
- **Collaboration, innovation, competition** and other links between the participants. Concerning collaboration, the role of governance consists in fostering the creation of networks and other associations between the cluster participants (e.g. suppliers networks), of local councils (for the lobbying), and in permitting the development of local trust between actors. In order to enhance innovation, the role of the different governing bodies is to provide education and formation (universities), to set up the necessary links between the public R&D facilities and the private companies, etc. More generally speaking it is to promote knowledge creation and diffusion among the local actors by fostering informal exchanges. Finally, about competition, the government should also insist on this point since it is a very good driver for innovation. It can help by lowering the entry barriers and facilitating the creation of SMEs (incubators), especially of spin-offs.
- **Services and infrastructure.** The next step for the government is to provide some infrastructure, hard as well as soft, to enterprises. Hard infrastructures consist in roads, airports, and telecommunications, whereas soft infrastructures include services like accountancy, market studies, data banks, and access to them. One could say that one of the tasks of the government is to become an information provider.

- **International marketing of the cluster**. The fourth set of measures that have to be implemented rely on the external links of the cluster. The government first has to market the cluster so as to attract foreign capital and investment and second to ensure the access to foreign markets in order to enhance the competitiveness of the products and services of the cluster through their confrontation with other products.
- **The general (social) environment of the cluster**, its community. This point is important as well, since a quality environment can help foster trust among the participants. The questions that have to be addressed are the congestion, the housing prices, the access to land, pollution, security, and other common services likes schools, hospitals.
- **The institutionalisation of the cluster,** last but not least. The development of cluster has to be followed by the creation of local institutions meant to help local enterprises. The different services cited in point three can sometimes only be addressed by local institutions. These institutions can be public, semi-public and private. They offer the same services as the government but at a latter stage of the cluster. Then the government has to support these governments, instead of duplicating the services provided.

5.1.7 Evaluation of the process

As indicated by Diez and Esteban (Diez and Esteban, 2000, the evaluation of a cluster oriented policy is one of the major difficulties met and one should be cautious about the results of a cluster-oriented policy. Clusters enhance innovation through a complex and diffuse process based on inter-firm linkages and knowledge spillovers. Hence, how can one measure the effect on a policy supposed to favour innovation? One may look at the papers published or the number of patents, but it is hard to draw a linear cause-effect model between policies and innovation. A second issue is the close linkage between the actors of the cluster. It is almost impossible to separate them in some kind of "layers" so as to observe where a policy could have the most effect. A third issue is that cluster and cluster policies are part of the social and industrial framework of a cluster, "embedded within their socio-economic and institutional environment". Each policy is specific to a cluster and its environment and cannot be therefore evaluated by common indicators.

A way promoted to overcome some of these problems is to develop participatory evaluation. Diez and Esteban (2000) describe this as a process that "takes shape through the collaboration of all the stakeholders and their active participation in the analytical evaluation process". Its advantages are based in its pluralistic approach, its creativeness, and since all participants contribute, it builds trust, serves as a knowledge creator and as part of the regional policy, it can be considered as interactive learning. Questions remain however as to its impartiality and objectivity of such evaluation.

5.1.8 Limits of cluster oriented policies

Cluster policies, like other polices, contain risks of failures and losses. These risks can be assessed of course, but due to the nature and the complexity of the mechanisms intervening in a cluster, they are high compared to traditional policies

oriented towards specific sectors and industries. On the other hand, of course, large local revenues can be expected. Therefore one has to be very cautious.

Limits of cluster policies can be divided into two categories: the local ones, and the general ones. The local limits are limits related to the specificity of the context: some locations just cannot support or develop a cluster. Some cities do not have the appropriate labour force market, or the local tax policy can be too harmful for certain industries that otherwise could have clustered there. Some other locations do not have the necessary infrastructure, and sometimes the local mentality is not entrepreneurship or innovation oriented, thus hindering the chance for a cluster to grow.

Concerning general limits, a specific danger lies within policies which try to impose a particular form of clustering – a specific 'approved' location for example – which may be damaging if that location is not selected in the light of an understanding of the particular conditions favouring clustering in that/those activities. Policies, which apparently address other issues – frequently infrastructure or land, use regulation – may impede clusters from developing or reaching their potential. One should also take care not to favour only high-tech clusters: an argument for increasing the level of innovation of low-tech clusters is the importance of their 'weight' in the national or regional cluster blend. Even within individual clusters, a focus on high technology and R&D is no guarantee that innovation will be supported most effectively.

Another limit is the specificity of a cluster policy: cluster policies have to take into account the context, social as well as economical. Cluster specific measures have to be adapted to the local particularities. One cannot assume that one can develop a high-tech cluster just because such a cluster has successfully developed in another location. One should not try to imitate previous attempts. One can be inspired by such an experience, but imitation is no guaranty of success. On the other hand, one should try to develop and own policy based on the specificity of the context. Flexibility is a key to a successful cluster policy.

One should also be cautious with policies, which try to create clusters in cases in which no particular benefits arise, as these may be damaging to the wider economic interest because they consume resources but by definition produce no return. Another major concern is that cluster policies could encourage over-specialisation in the economy (Rosenfeld, Stuart, 1995, 1997). If the industries in the cluster fail, then the economy in the entire region is damaged. Many leaders chose to encourage the diversification of the economy, and fear that the use of a cluster policy will run counter to this effort

And finally, another argument to take into consideration is that cluster-oriented policies are quite recent, and if sometimes a short-term impact has been observed, long-term consequences have yet to be analysed. Cluster policies are still at an experimental stage, and thus are not very reliable in certain circumstances.

5.1.9 Conclusion

The fundamental requirement for successful policy is a better understanding of the source of the advantages clusters may generate and priority issues such as:

- The initial identification of sectors,
- The support and development,
- The role of state agencies,
- The future development.

But policies also have their limits and creating, sustaining or developing clusters can be damaging to the cluster in itself, or even to the whole local economy. Cluster policies require major investments that could have been sometimes more useful when spent otherwise.

5.2 Cluster policies recommendations for Dublin

Government policy towards economic clusters in Dublin has only emerged in recent years, as industrial and economic development strategies have become more elaborate and targeted (Williams and Shiels, 2002). A cluster type policy has been essential, in particular with regard to the attraction of FDI in key emerging sectors such as ICT and Financial Services. For the creation of a successful economic cluster, the following conditions are considered necessary in the Irish policy context:

- A strong academic base with high quality R&D output, some of which is world-class
- The right environment for translation of research output to innovation to company to product to market stages.
- An adequate labour and knowledge pool.
- An adequate base of ancillary firms that can support and service the appropriate sectors in each cluster.
- An appropriate industry infrastructure.
- A positive government policy towards the sector.
- Protection of intellectual property.
- Availability of equity and finance.

The Irish Industrial Development Authority (IDA) has recently recognised the importance of economic clusters and will switch emphasis from individual projects to developing new strategies including:

- Strategic Business Areas, which are clusters in which groups of technology companies, both international and Irish, academic and corporate interests and other agencies will congregate to create conditions conductive to innovation and entrepreneurship (IDA, 2001). Central to this strategy will be the linkages which develop between third-level institutions and industry and the IDA plan to focus development on a small number of key areas of business and technology which are based on high levels of knowledge and expertise.
- In tandem with the forthcoming *National Spatial Strategy*, the IDA plan to attract specific economic sectors to specific regions in order to create a critical mass of self-sustaining economic growth, with an example of past IDA policy in this regard being the pharmaceuticals industry in the Cork region. The IDA have selected three Regional Economic Centres at Athlone, Sligo and Waterford which, it is hoped, will develop as magnets for inward investment in their own right. Central to creation of the Regional Economic Centres will be the relocation of important

operating units of IDA personnel in order to stimulate their development as magnets of economic growth.

The GEMACA II Project can be classified as one of the first attempts to examine and analyse economic clusters in Dublin, as relatively existing little work has been carried out to date. The study has found a number of significant clusters in Dublin, including the ICT sector, Financial Services, Creative/Media and Tourism. The Pharmaceutical and Innovation sectors remain under-developed in the Functional Urban Region of Dublin and there is no evidence for clusters of these activities. Current government policies aim to continue support for all of the sectors examined in this report under the current *National Development Plan 2000-2006*. Government strategy aims to develop the Innovation and Biotechnology sectors in Dublin, through the creation of induced clusters and therefore continue the movement of Dublin up the value-chain in terms of international importance and competitiveness. From the relative scarcity of specific data relating to clusters in Dublin, the DIT study team would recommend the collection of data at DED/Ward level in order to track economic sectors n the FUR basis and a more thorough investigation into the trends and dynamics affecting cluster development.

5.3 Cluster policies recommendations for London

The most important thing for the 'cluster approach' and cluster policy is to understand and be able to identify the conditions which give rise to an activity or a particular set of activities enjoying economic advantages from 'clustering'. Policies, which try to create clusters in cases in which no particular benefits arise, are damaging to the wider economic interest because they consume resources but by definition, produce no return. Policies which try to impose a particular form of clustering – a specific 'approved' location for example – may be damaging if that location is not selected in the light of an understanding of the particular conditions favouring clustering in that/those activities. Equally policies, which apparently address other issues – frequently infrastructure or land, use regulation – may impede clusters from developing or reaching their potential.

London is a very large and diversified city with the highest levels of human capital of any of the cities included in the GEMACA II study. Its economy has an especially large range and depth of experience in traded services. In conditions such as these the best policy for clusters and cluster development may be to stop doing things which are 'stupid'. Reducing the uncertainties injected into private investment decisions by particular aspects of public administration probably represents by far the best value for money improvement for cluster development in London. The form of the British Land Use Planning system and the barriers and delays it imposes on development has rightly been cited as a major problem. Since the barriers, delays and uncertainties tend to increase with the size of the development: and at the same time the larger the development the more private investment decisions are contingent upon it, the process of land use control in Britain systematically impedes private investment. This is especially true in London because, being the largest city in the UK, development projects tends to be larger and more politically sensitive. It also systematically impacts on clusters because their development as geographic units is especially sensitive to land uses policies. Obvious examples of these types of problem are the decisions with respect to the 5th Terminal at Heathrow, the high-

speed rail link to the Channel Tunnel or the medical and biotech cluster near Cambridge which has been largely dependent on green field development.

The state of chronic underinvestment and indecision in London's public transport infrastructure is a good example of the second and related problem of public administration. As this study revealed two of the key factors in the location of new media companies (and 'dot.com' companies in general) are access to high capacity Internet connections and access to public transport nodes. The availability and quality of both are largely dependent on public policy and the quality of public administration. Access to public transport is critical to new media companies because they depend on being able to assemble specialised and highly skilled labour forces and there is high turnover in their labour forces. In the media companies in particular the whole production process is geared to short-term contracts and assembling teams with particular skills for each project. Many key workers will be hired by the day. Thus in a large city, with a radial transport system, access to high quality public transport is critical to assemble the appropriate, highly specialised labour force for each project.

It is for these reasons that **the fundamental** requirement for successful cluster policy in any context is a better understanding of the source of the advantages clusters and clustering generate. It is also underlies the recommendation that frequently – and certainly in a large and diversified city such as London - the best policy is an enabling one. Moreover most frequently the best enabling policy is to improve the quality of public administration and decision making in those areas which are the preserve of the public sector.

Furthermore we are still relatively lacking in quantitative knowledge on clusters and the world economy evolves so fast that picking the clusters of the future is nearly a hopeless task. Therefore, the best cluster policy may be no targeted policy at and to build and maintain the conditions in which clusters can develop as a result of the decentralised decisions of many private actors. The supportive role of the public sector is then to provide public goods, such as educational or research efficiently; to reduce uncertainty in the decision making environment of private investors; and to provide public urban services such as transport or security efficiently.

5.4 Cluster policies recommendations for Paris

As previously mentioned, policies to promote clusters are somewhat under-developed in the Ile-de-France region. Such conditions can prove to be detrimental in the sense that the local area is one of the factors which contributes to the economic development of the region. It can encourage greater innovation under the right conditions such as the existence of research centres, dynamic teams in the region, business incubators and a strong willingness at a local level to take concerted action.

Therefore, it is recommended that activities with high-growth potential, already established in the Ile-de-France region, be supported as part of the policy to promote clusters with a view to combining and developing policies which have already been taken at a sectorial level, in particular by creating territorial coherence. Nevertheless, international examples and literature indicate that more action needs to be taken than just the promotion of clusters in order to facilitate the creation of ex-nihilo economic

activities. They can only add to or expand existing economic buoyancy. Clusters are not created according to decisions taken but depend on the already existing dynamism of companies and institutions with links among them.

Apart from this general consideration and based on previous experiences of measures taken in the Ile-de-France region to promote local clusters (optics valley, genopole d'Evry, multimedia centre in Montreuil, image centre in Seine-St-Denis, etc.), the following recommendations have been put forward:

- Bring together the expertise and know-how of companies with similar economic or technological interests to make them more competitive ;
- Build on previous experiences in the Ile-de-France region ;
- Put these experiences to good use by comparing them with other initiatives taken in France or abroad ;
- Create a "tool box" of good and bad practices for promoting clusters ;
- Use this tool box to increase the chances of success of local clusters in progress in the Ile-de-France region ;
- Develop initiatives taken by local clusters at a departmental and regional level, in particular as part of action taken by the ARD Ile-de-France.

Apart from this direct and individual support for each local cluster in the Ile-de-France region, thought should be given to clusters on a regional level as soon as possible. Indeed, a distinctive feature of the economic region of Paris is the juxtaposition of clusters and economic sectors of activity. In most cases, these clusters / sectors operate on a regional level and not on a local level. Moreover, given the various initiatives taken to promote local clusters in the Ile-de-France region, it seems necessary to discuss the following:

- The identification of all sectors/ clusters which are currently expanding rapidly in the Ile-de-France region ;
- The geographic location of players (companies and institutions linked together) who actively participate in the economic dynamics of the cluster.

On this basis and drawing on previous experiences, the regional strategy will have a greater influence on the concentration of new amenities in existing and emerging geographic centres. This strategy will also help to reinforce complementarities rather than competition among local clusters.

5.5 Cluster policies recommendations for RhineRuhr

According to Knapp and Schmitt, five main areas require attention in order to improve cluster management in RhineRuhr

- There is need of a shared understanding about cluster related policies. In North Rhine-Westphalia the conceptual and strategic situation is quite confusing. Most actors avoid discussing cluster policy, because of ideological terms. From a liberal point of view the cluster approach is suspected to be an interventionist one. Therefore cluster related policy is labelled as regional innovation policy, innovation systems, regional joint projects, regional networking or strengthening regional competencies. While there is an expectation of success nobody really

knows whether this approach is a promising one, what are the preconditions for successful cluster management in structural as well as in strategic terms, and what are the results that can be expected realistically. Thus, an important aspect is to co-ordinate and to make clear these blurred structures and expressions for such policies as well as to better the communication on potential benefits through cluster oriented policies.

- Professional cluster related policy needs a lot of competencies that are not usual to be found in economic development agencies. Up to the 1990s local development agencies have concentrated on acquisition and organising incentives. But as the competition on investments has become very strong at a global level, the focus of the activities of economic development agencies has shifted to strengthen the local base of innovation and the economic strength. In line with (Bratl & Trippl 2001), the new tasks of cluster related policy or cluster management needs many new competencies especially in areas such as:
  - Strategic development
  - Location marketing
  - Human resource management
  - Innovation and technology management
  - Internal and external networking
  - Knowledge management
  - Conflict management
  - Controlling linkages and exchanges.

- Cluster related policies make only sense if the companies involved are participating. Sometimes the initiatives for cluster management come from the companies. But in most cases, it is initiated by local development agencies, by trade unions or by European or national programs. In the latter case, cluster management often has to face the situation that most companies are not really interested in cluster politics, because the regional dimension is not the focus of their interest. Therefore cluster management basically depends on motivating and activating participants. This means first of all, to demonstrate that companies benefit from cluster management in the short run as well. The differences between the strategic orientation of the companies on the one hand and the local development agencies on the other has been the most critical aspect in most cluster projects and there is simultaneously a strong need in common learning strategies to overcome this bottleneck.

- Cluster related policy needs integration with an overall strategy of local or regional economic development. To focus merely on cluster management, the danger arises of ignoring other tasks and potentials particularly local development policies. Moreover, it has to be noted that not all regions have the preconditions for successful cluster management, due to a very dispersed and weak industrial base. In general at the local level there are a lot of vital pre-conditions for successful cluster activities such as the support by the public sector, cultural, social shopping and leisure facilities which all contribute to a good quality of life. These factors are important in establishing the location advantage of established or emerging clusters, even though they are not at the centre of cluster management research. Furthermore, a lot of new industries is clustered by specific regions, and is dependent on the continuing proximity of their customers.

This is the case for the older services sector and some ITC or creative industries and despite clustering they are supposed to become important for all regions. This means, locations have to strengthen these sectors, even if they cannot hope to build clusters based on them.

- Professional cluster management needs new ways of evaluation. As Diez (2001) points out, cluster management is not based on linear causal relationships between resources, activities, results, effects and regional impacts. There are often no well-defined objectives and there are many difficulties in quantifying effects because of very complex interactions of systematic nature. Hence, an ex-post evaluation is not really valid and we need a change to a flexible and dynamic evaluation design.

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