Developing Cluster Policies in Seven European Regions

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Regional and Industrial Policy Research Paper

Number 42

December 2000

Published by:

European Policies Research Centre
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40 George St.
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ISBN: 1-871130-20-4

Abstract

The following paper is based on the Euro-Cluster project, which aimed to identify and understand the key factors behind the successful design, delivery and evaluation of cluster development policies. It was based on case studies in seven European regions: the Arve Valley (France); East Sweden; Limburg (the Netherlands); North-Rhine Westphalia (Germany); the País Vasco (Spain); Scotland (UK); and Tampere (Finland). The study has focused on the practical issues of cluster policy-making and endeavoured to highlight examples of good practice in different aspects of cluster policy. These aspects included:

- *auditing the regional economy*: to consider how cluster analysis has been used to better understand regional economic development and inform the process of cluster selection;

- *auditing the policy framework*: to analyse the appeal of the cluster approach to different regions and how it fitted with existing policy approaches;

- *designing a cluster-based policy*: to examine how the cluster policy was designed, how commitment was secured for the policy from the private sector and other parts of the public sector and the mechanisms for changing the policy over time;

- *implementing a cluster-based policy*: to review the different types of measures employed under the various cluster policies and the ways in which the policies have been implemented;

- *monitoring and evaluation*: to examine the importance of monitoring and evaluation in cluster policy, the special difficulties associated with it and options for addressing these problems; and

- *critical success factor*: to bring together the good practice identified in the other chapters and presenting the report's conclusions.

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1 Introduction

Over the past decade, there has been an upsurge of interest in the 'cluster' concept in economic development policy, as seen in the increasing support for the development of industrial clusters at both national and sub-national levels (Brown, 2000). Cluster policies have proliferated - both those clearly designated as such and related policy initiatives such as regional innovation strategies and measures to support local production systems – even though their implementing governments have often had little in common in their ideological attitude towards economic intervention (Enright, 2000). The use of the concept as a tool of analysis is not only widespread in Western Europe and North America, but increasingly popular in less-developed parts of the world as well. Indeed, as a policy approach, it has been promoted by international development organisations, notably the European Commission, the OECD and UNIDO, as well as led to the formation of associations of regions interested in pursuing cluster development (such as the Competitiveness Institute and the Italian and French Clubs of Industrial Districts).

With the profusion of policy initiatives, there is correspondingly greater interest in the factors supporting successful applications of cluster policy. In facing the diversity of policies for cluster development, policy-makers have increasingly looked to examples of good practice in order to assess the validity of the approach for their own areas. It is in this context that the European Policies Research Centre has undertaken the Euro-Cluster project over the past year. Funded by several European regional development organisations, the project aimed to identify and understand the key factors behind the successful design, delivery and evaluation of cluster development policies.

In particular, the study focused on the practical issues of cluster policy-making and endeavoured to highlight examples of, and the factors influencing, good practice in different aspects of cluster policy. These aspects have been envisaged as part of a cluster policy 'life cycle', extending from the initial idea to its evaluation:

- the *selection and targeting* of clusters in different regions and the methodologies used for identifying the choice of targeted clusters;
- the *strategic interpretation* of the cluster concept in practice, especially how the cluster concept has been interpreted within the wider processes of regional development;
- the *initiation, planning and development* of cluster policies, and how commitment has been secured from the relevant agents in the region;
- the *strategic and operational management* of the cluster concept;
- the arrangements put in place for the *monitoring and evaluating* cluster development programmes; and
- the *critical success factors* shaping good practice in these areas.

The following Regional and Industrial Research Paper presents a summary of the project's results. Its finding were based on comparative analysis and detailed fieldwork of case-study areas where a cluster policy has been initiated. Fieldwork consisted of face-to-face interviews with the main policy-making participants in each area and analysis of associated strategies, evaluations and documents. In selecting the case-study areas, the aim was to examine cluster policies differing in scale as well as focus. Seven areas were chosen, as summarised below (and shown on Figure 2).

- **The Arve Valley** (France)**.** Historically, cluster support in France has been limited. While there has been indirect support for clusters via a centralised national technology policy and localised 'self-help' activities, it is only in the last few years that DATAR (the French regional policy ministry) has directly assisted local groups of industries by subsidising cluster development programmes. One of the largest of these schemes has been in the industrial district of the Arve Valley within the Rhône-Alpes, in the metal cutting and precision tool sectoral complex. While relatively small in scope, it is an interesting example of a highly localised and sector-specific approach to cluster policy.

- **East Sweden** (Sweden). East Sweden is the first Swedish region to have undertaken a cluster-based regional development strategy. Focusing on encouraging networking among firms and between businesses and research providers, it is a good example of a region developing a policy based on a set of technological competences.

- **Limburg** (Netherlands). Cluster policy in Limburg has developed as part of its EU-funded Regional Technology Plan; indeed, it was one of the first Dutch regions to undertaken a RTP. Driven by the provincial authority, the RTP is based on promoting clusters within a group of mature and emerging industries through a series of pilot projects. Given that the Netherlands already has a strong national policy framework for cluster development, the region offers a good example of how national, EU and regional policies can be brought together to create a localised cluster policy.

- **North-Rhine Westphalia** (Germany). North-Rhine Westphalia (NRW) is a declining industrial region where new approaches to regional regeneration have been consistently explored in recent decades. Since the beginning of the 1990s, the *Land* has defined a series of clusters (or 'competence economies') for policy focus. The new approach to regional policy has been largely funded through the Structural Funds and is an example of a regionally integrated policy with an interest in both existing industrial strengths and new economic activities.

- The **País Vasco**, or the Basque Country (Spain). The País Vasco has been one of the most active regions in Western Europe in developing a cluster approach. Following a period of cluster identification and strategy development by the regional government, its Cluster Technology Plan explicitly focuses on the development of a series of emerging clusters in the local economy. The Basque approach highlights a number of interesting features, including its strategic focus, its highly decentralised approach to the implementation of the different cluster programmes and the lack of involvement of the national level.

- **Scotland** (UK). The Scottish experience of cluster development policy is one of the most well-known in Europe. Although not yet fully implemented, the cluster approach adopted by Scottish Enterprise has already been the model for other areas developing their own policy. As a highly visible example of a cluster policy, the Scottish approach combines a sense of departure from existing policy traditions with a comprehensive, strategic application of the concept to all stages of the policy-making process.

- **Tampere** (Finland). Based around a national scheme, the region operates several 'Centre of Expertise' programmes which are targeted at the region's main clusters. What is more telling of the strength of the cluster approach in the region though is the range of other regional and national policies which complement the Centres of Expertise. Here, the cluster approach has acted as a powerful 'prism', giving a cluster focus to several different but related measures and programmes.

Before presenting the results of the analysis, a series of observations should be made at the outset. The first follows on from this point about the diversity of policy approaches and regions among the case studies. There are differences in terms of the scale of policy, which ranges from very large dedicated budgets in Scotland and North-Rhine Westphalia to far more limited ones in the Arve Valley and Tampere. The regions also vary in terms of their size (from a population of 60,000 in the Arve Valley to over 17 million in North-Rhine Westphalia), prosperity and industrial focus of the policy (Table 1). Scale is not necessarily the most important determinant of policy in this context, but it must be taken into consideration in identifying good practice. The range of different regions, though, should enable a wider variety of different types of cluster policy to be examined.

This highlights the need for caution when making comparisons and extracting good practice. The policies of the case-study regions do not necessarily share the same objectives with respect to cluster development. In cases like the País Vasco and Scotland, policy encompasses different aspects of building clusters, while other policies are only concentrating on single aspects of cluster development, as in Limburg, where the focus is principally in developing project-based cooperation between firms. The variety raises questions about the extent to which it is possible to discuss 'cluster policy' as a separate entity. Nonetheless, the approaches which each region has developed to supporting cluster activity represent individual solutions to common challenges arising from their economic and policy environments.

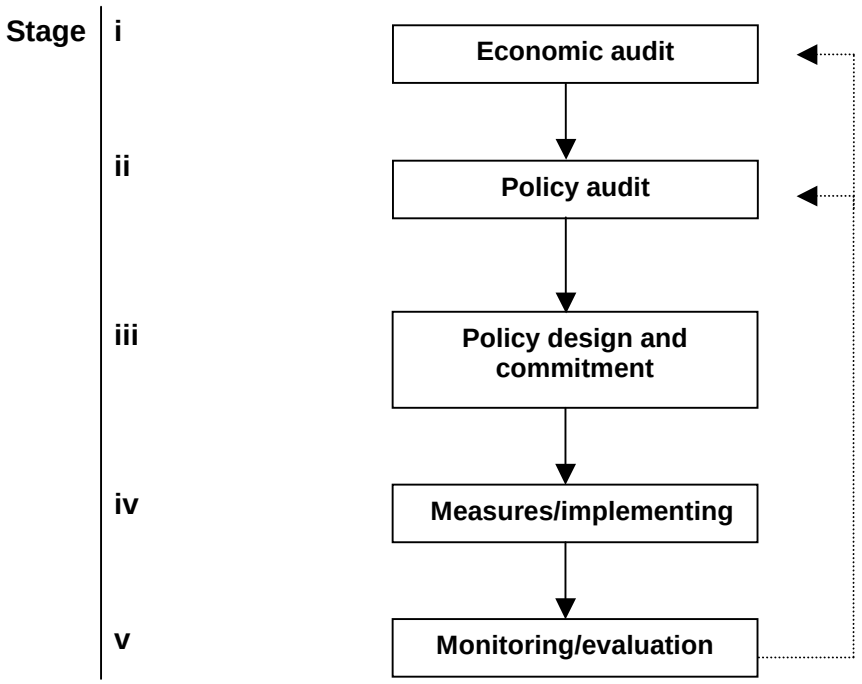
Table 1: Characteristics of the case-study areas

	Population ('000s) 1996	*Unemployment rate (%) 1997*	*GDP per capita (pps), 1996 EU-15=100*	*Cluster policy focus*
Arve Valley[1]	60	10.5	100.4	Metal-cutting industry
East Sweden[2]	420	4.9 (1999)	92.4	Information & communications technology, software development, medical technology, food products, wood products
Limburg	1,135	5.4	97.8	No sectoral focus
North-Rhine Westphalia	17,920	9.0	109.7	A range including: new materials, transport/logistics, ICT, micro-system technology, medical technology
País Vasco	2,069	18.8	92.3	Machine tools, automotive, white goods, port facilities, shipbuilding, ICT, environment, knowledge management, energy, aeronautics, paper
Scotland	5,128	8.0	98.3	Semiconductors, biotechnology, food & drink, tourism, creative industries, opto-electronics, forest products
Tampere[3]	450	13.3 (2000)	91.7	Mechanical engineering & automation, ICT, healthcare technology, media services, knowledge-intensive business services

The paper analyses cluster policy in terms of the different stages typically associated with an idealised version of the cluster policy-making process (Figure 1). The process proceeds from an initial analysis of the capability of the regional economy and policy framework through the development of a policy to its implementation and finally to its evaluation. While these different stages are not always clearly outlined in the cluster policies, for the most part, they were present in each of the case studies.

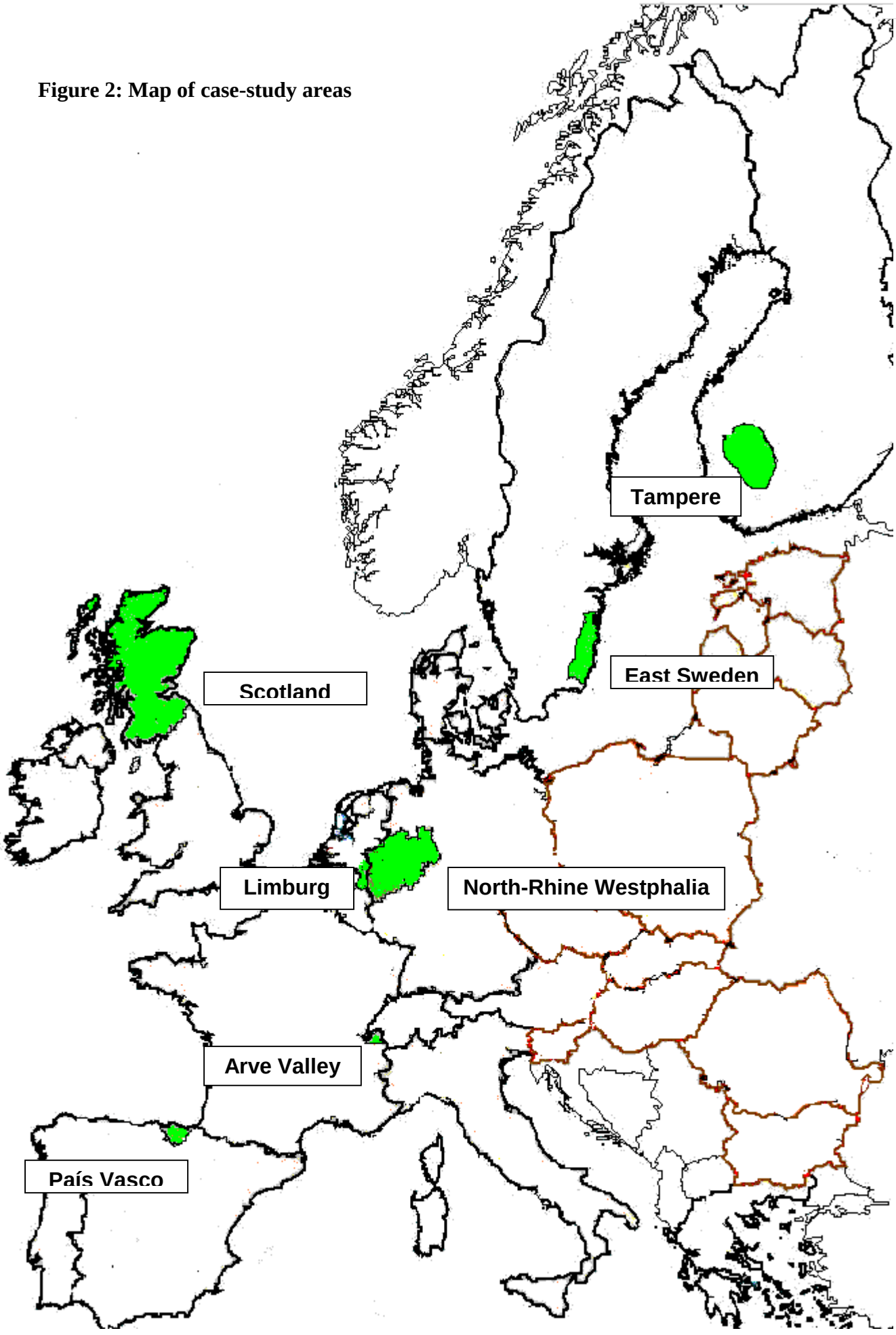
[1] Figures for GDP per capita are given for the Rhône-Alpes region, of which the Arve Valley is part.
[2] Figures for GDP per capita are given for the Östra Mellansvergie region, of which East Sweden is part.
[3] Figures for GDP per capita are given for the Etalä-Suomi region, of which Tampere is part.

Figure 1: Stylised cluster policy-making process



These different stages are reflected in the sections of the paper. Following this Introduction, there is a brief outline of the differing definitions of cluster and cluster policy and how these relate to the case studies. In Section 3, the different methods of identifying and selecting clusters are discussed. Section 4 focuses on the relationship of the cluster approach to existing policy frameworks and Section 5 on how cluster policy is developed in the case-study areas. The measures and delivery mechanisms making up cluster policy are the subject of Section 6. In Section 7, issues of the evaluation and monitoring of cluster policies are treated. Lastly, the critical success factors in cluster policy are set out in the concluding section of the paper.

Figure 2: Map of case-study areas



2 What is cluster policy

The terms 'cluster' and 'cluster policy' are subject to a wide variety of definitions, making analysis difficult. It is this very conceptual breadth that has been a source of both the appeal of the cluster approach to policy-makers and the problems associated with defining and developing cluster-based policies. The original formulation of clusters by Porter (1990) has influenced most subsequent practical definitions by policy-makers, but it remains difficult to clarify what policy-makers understand by 'cluster'. There has been no underlying, unifying theoretical consensus on what constitutes a cluster (Feser, 1998). Indeed, although the term 'cluster' has been used widely – applying to a variety of distinct industrial processes – it has often been interchangeable with other terms such as 'industrial districts', 'value chains' and 'business networks'.

In practice, the common line through most of the literature on cluster development is a series of generally-agreed cluster characteristics. First, the cluster's competitiveness is recognised as being more than the sum of its parts: competitive advantage arises from its network features, rather than the strength of the individual agents making up the network. Second, these networks involve businesses (both customers and suppliers, often from different sectors) and non-business organisations with key supporting roles (such as universities, research bodies and in many cases, public sector agencies) in relationships that combine aspects of competition, cooperation and interdependency. Lastly, agglomeration has traditionally been viewed as central to cluster development, in which geographical proximity has facilitated crucial externalities, particularly those relating to the generation and diffusion of tacit knowledge through the creation of an 'innovative' environment surrounding the industry.

As a result, from the perspective of this paper, while attention is given to the 'slipperiness' of the concept in the seven case studies, a simplified definition will be used to demarcate the boundaries of policy as far as possible. Hence, a 'cluster' will be taken to be a group of firms and other agents with four important features:

(i) the group undertakes the same or linked economic activities (eg. as part of a supply chain);

(ii) it is internationally-competitive in these activities;

(iii) geographical proximity is a source of strength; and

(iv) the competitive advantage of the cluster members resides outside of individual businesses but within the cluster as a whole.

This still leaves the problem of how to define cluster policy. The diversity of ways in which the cluster concept has been interpreted has resulted in a profusion of policy practices. It has been argued that 'cluster policy' as such does not exist – at least, not in the same way that there are an identifiable series of policy tools which have been classified as, for example, skills training or foreign investment policy (Lagendijk, 2000). Cluster strategies and measures apply to a shifting set of different instruments and approaches and usually comprise a never-the-same-twice portfolio of analytical

tools and policy instruments, often 'borrowed' from other policy areas. In this context, it is important to stress how cluster policies bring together key insights from other policy areas. As Boekholt and Thuriaux (1999, p.384) noted: "cluster policies are situated at the boundaries of industrial policy (including SME policy), regional development policy, and science and technology policy."

Consequently, from industrial policy, cluster policies may take the sectoral focus of policy and industry-specific measures: ie. its *technological* nature. From spatial development policy, cluster policies adopt the awareness that economic growth is dependent on the interaction of businesses, institutions (such as universities) and wider 'environmental' factors such as the labour market and infrastructure: ie. its *network* nature. Lastly, from SME policy, cluster policies acknowledge the importance of developing the capacity of individual (particularly smaller) businesses to overcome their growth challenges: ie. its *firm-specific* nature. In bringing together the role of technological development, relationships within a bounded economic space and individual business growth – as well as the different instruments associated with each policy area - cluster policies recognize that competitive advantage is based on these different policy areas working in combination.

In the context of industrial district theory, this apparent 're-packaging' of existing theoretical elements prompted Harrison (1992) to consider whether this amounted to little more than 'old wine in new bottles', drawing on existing theoretical frameworks and policies but adding little that was genuinely new. Harrison eventually concluded that the new theory did contain significant, new insights – particularly, the role of communal identification and community-building institutions – but questions remain over whether the new theoretical frameworks have altered the substance or only the labels of policy. Research reviewing cluster policies tends to suggest that the approach does contain important developments on previous policies (Raines and Ache, 2000; Lagendijk, 2000). While cluster policy may not necessarily contain novel measures, its targeting of measures on particular sectors and the resulting strategic coordination of diverse measures does represent a new direction. Following on from this point, the focus of cluster policy is both on self-reinforcing business networks - rather than individual firms - as well as the factors influencing the competitiveness of those sectors (such as the availability of particular skills, technologies and finance). Cluster policy itself tends to operate through a network, in which the delivery of policy is not centralised in a single agency, but distributed among different public and private sector agents, all coordinated within common strategic objectives.

These observations hold true for the case studies here. When examined closely, the cluster development policies of the case studies reveal substantial variation. The variety of policies, the overall lack of any standardisation and the small number of common influences call into question whether 'cluster policy' can be used here to cover the different regions. There is some shared language between them, including the use of the term, 'cluster', but this is not always the case. In the Arve Valley, they are called *systèmes productifs localisés* and in North-Rhine Westphalia, they are referred to as 'competence economies'. Where the term is used, a suspicion remains that sometimes it is a loose synonym of 'networking'.

Two sets of differences between the policies can be highlighted. First, as noted in the Introduction, the scale of policy differs among the case studies. In financial terms, the resources targeted explicitly at cluster development varied from significant strategy budgets in North-Rhine Westphalia and in Scotland to small project awards in the Arve Valley.[4] More substantial resources imply a greater number of measures and the need for a higher number of actors to implement the policy. In consequence, the areas with larger resources can not only pursue different goals, or the same goals over a different timescale or area, but may face slightly different problems as a consequence of their size. This is not to argue that cluster policies with larger budgets are to be recommended. As will be seen below, good practice can be found in all the case studies examined here, but it is bound to differ between these areas.

A related point concerns the differences in the immediate objectives and instruments of policy. Hence, the policies in Limburg and Tampere are largely focused on supporting networking between cluster agents, whereas networking is just one of a range of measures and activities in the (better-resourced) policy in Scotland. Similarly, in the Arve Valley, cluster policy principally consists of a highly-focused project on a specific sector. In only a few cases is every aspect of cluster development supported. Further, it is not always clear whether policy-makers are aware that other aspects of cluster development are important or simply deciding that the other aspects do not need policy support. The cluster approach can take various forms:

- it can be manifest as separate policies with clearly-defined strategies and earmarked budgets, covering a range of industrial sectors and different aspects of cluster development (an issue discussed in more detail in Section 6 below) – this was the case in the País Vasco and Scotland;

- it can occur as policies with a focus on limited aspects of cluster development, such as networking between businesses or between businesses and research providers, as was the case in Tampere;

- it can be policies that are separate elements of other economic development strategies, as in East Sweden (support for cluster development is one 'strand' of the area's Regional Growth Agreement), Limburg (where it is a programme within the regional innovation strategy) and North-Rhine Westphalia (here, cluster support cuts horizontally through many of the priorities and measures of the region's Objective-2 strategy); and, lastly,

- it can be a common objective in a series of otherwise, largely uncoordinated measures targeting a particular industry (as in the Arve Valley, where local and national measures focus on developing the metal-cutting industry in the area).

Nonetheless, while not necessarily fully-articulated, the different policies all remain distinctive policy approaches in their respective regions, and are recognised as such

[4] In many cases though, cluster development is recognised as extending beyond the specific resources set aside for cluster policy. The cluster approach often provides a filter through which other measures were applied in the economy. As a result, few policy-makers can calculate the full sums dedicated to cluster development in their areas.

by the policy-makers. Indeed, while in many cases they are seen as just simple shifts in emphasis rather than full breaks with other policy approaches, the policies are acknowledged as representing new ways of dealing with economic development problems. In claiming this, policy-makers do not regard the cluster approach as a complete panacea. Even where it was very actively developed, the cluster approach is only one among several policy objectives. In none of the case studies is it designed to supplant existing economic development policies, only to supplement and – as will be shown – integrate these policies together to improve their effectiveness.

3 Using the cluster approach to analyse the economy

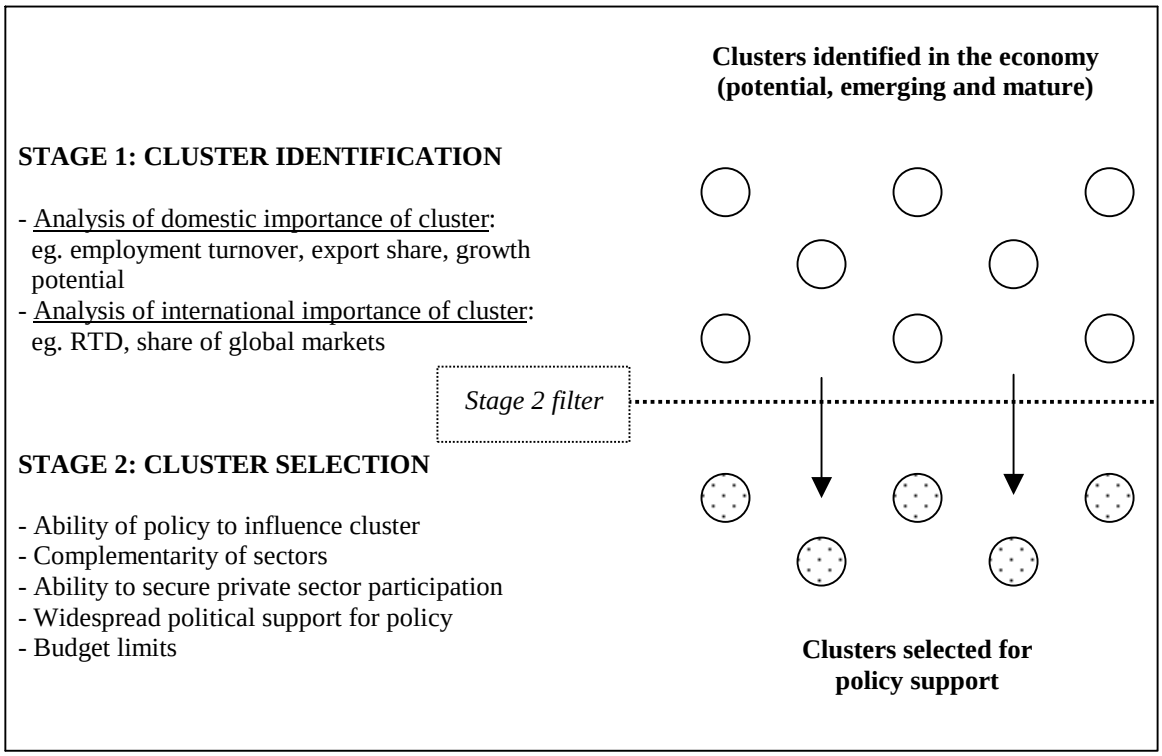
Cluster analysis is the first stage of developing a cluster policy. Indeed, the use of cluster analysis techniques has been very attractive to policy-makers, even when they were not employed to develop a cluster programme. Their appeal is that cluster analysis pitches itself between two forms of economic analysis. On the one hand, it does not focus on the systemic problems occurring at the macroeconomic level, where the links between changes taking place in the economy as a whole and individual business activity are not always clear. Where alterations are measured at this level of analysis (as, for example, changes in inflation or unemployment), their effects on the different actors in the economy can rarely be pinpointed with the accuracy needed for policy because the different ways in which these effects make themselves felt can be very complex. Similarly, cluster analysis also does not focus on individual firms. It does not treat businesses as stand-alone entities interacting with an undifferentiated economic environment, but places them in the context of their demand and input markets, often as part of industrial value chains which are not restricted to particular sectors. As well as mapping the links between different sets of businesses, it concentrates on their common sources of competitive advantage, recognising that they can be external to the firm and shared by a number of different agents in the economy (such as a pool of specialised skills, a body of acknowledged research excellence).

Another virtue of cluster analysis is that it is not limited by traditional ways of classifying industry activity. This can be critical in understanding economic development in an environment when some forms of economic activity are changing rapidly. For example, it can accommodate the difficulties in measuring the increasing overlap between certain service and manufacturing sectors as well as the trend in some sectors for businesses to provide goods and services that feed into a range of different industries. As a result, cluster policy does not tend to be a traditional sectoral policy because the tools of cluster analysis do not define clusters around traditional sectors. Such traditional sectors have featured in cluster policy, but this is often a reflection of the practicalities of policy delivery rather than evidence that clusters do not represent new ways of viewing the economy. The cluster policies supporting cross-sectoral activities such as software and creative industries indicate the change.

Cluster analysis in the case studies was a two-stage process. It involved the identification of clusters firstly – in which the local economy is examined in terms of its existing clusters as well as its potential for developing them – and then the selection of those clusters to be the focus of policy. Both stages are displayed in

Figure 3 and discussed in turn below.

Figure 3: Cluster analysis processes



3.1 Cluster identification

Cluster identification was the initial stage of selecting which clusters to target in policy. Identification entailed the analysis of the regional economy in terms of existing clusters and the potential for current groups of activities to turn into clusters with some policy support. In the case studies, it often required two types of analyses.

The first is internal to the cluster: a SWOT analysis, examining the sources of competitive advantage in a sector, its weaknesses and the areas in which policy can make a difference. In measuring the domestic importance of the sector, a series of measures were used, including the size of the sector/s by employment or turnover (and its pattern of growth over the near term), export share relative to the economy as a whole and new firm formation rates.

The second form of analysis is external: through benchmarking, determining the international importance of the cluster. This type of analysis has several benefits. It emphasises the role of non-business agents in the economy, particularly research providers such as universities (with respect to the international reputation of their RTD). As a result, it recognises that industrial competitiveness is not restricted by the behaviour of firms within a particular sector, but by a range of actors in the economy. It also fits the needs of policy-makers by providing policy priorities, making very specialised forms of intervention possible. Good analysis remains at the root of all cluster policy, as the latter is only as effective as the insights which analysis provides

on the workings of the economy's most competitive sectors.

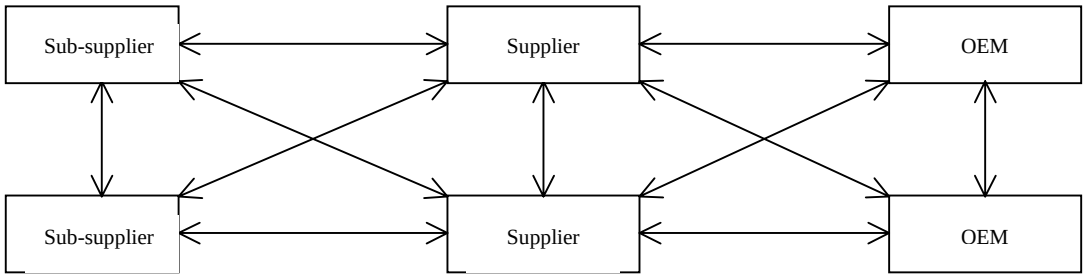
The most useful analysis has combined qualitative methods - particularly local expert knowledge on the strengths of the regional economy - with an examination of quantitative indicators. The indicators on which analysis is based should reflect not just the internal strength of the cluster relative to the rest of the economy, but its international standing as well, particularly through benchmarking with comparator regions. Perhaps most importantly, analysis needs also to assess whether policy activity can have a significant impact on improving the sector: it is not just a question of the competitiveness of a group of sectors, but how far that competitiveness can be influenced by policy.

In this context, qualitative analysis can be essential in identifying potential as well as actual clusters by taking into account the emerging areas of competence which have not yet been translated into measurable economic activity. Analysis is important when it also takes into account future market and technological trends which are likely to influence the international standing of the cluster.

Analysis is also critical in determining the *type* of cluster which can be supported by policy. The analyses conducted in the case studies showed that clusters could be categorised in a number of different ways, but from the perspective of policy, the most relevant referred to how the cluster derived its competitiveness. In this context, cluster competitiveness has tended to derive from either a network of sectoral linkages or the links between businesses and sources of research and technological expertise. Hence, clusters have been largely defined in policy as either *value chain-driven* or *competence-based*. This is an important distinction for policy, as the former focuses on the sector-based linkages between firms while the latter is more concerned with centralised areas of competence (particularly a research expertise) which can have spin-offs across a range of sectors.

The *value chain-driven* cluster represents the classic cluster as set out by Michael Porter, in which the cluster is delimited by a network of supply linkages. It tends to be more easily determined using traditional industrial classifications, extending into related sectors: for example, an automotive cluster would be built around the spine of a value chain connecting an automotive manufacturer to its suppliers, which in turn might be joined to producers of specialised industrial machinery, electronics and materials. An idealised version of this cluster type is represented in Figure 4, where the cluster mainly consists of networking between firms, often driven by the presence of a few large original equipment manufacturers (OEMs). A policy based on supporting clusters like this would largely be sector-based, focused on the links between businesses and devised within the parameters of the needs of individual sectors.

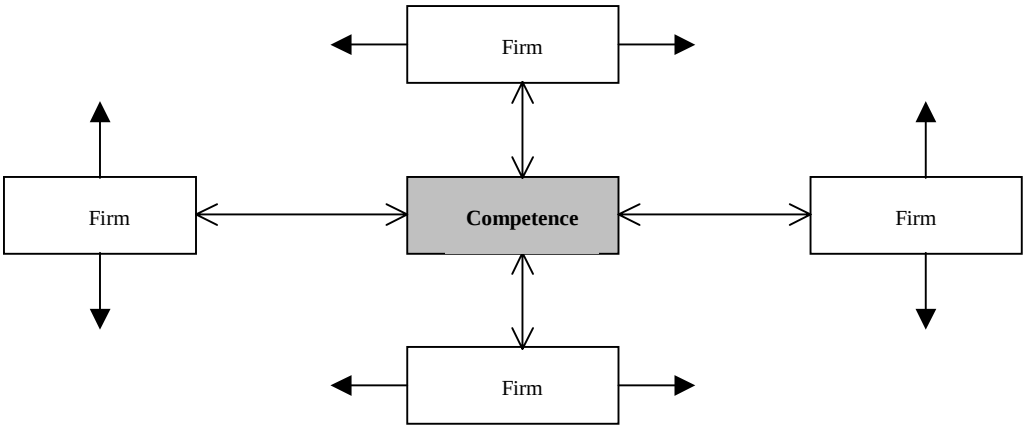
Figure 4: Value chain-driven clusters



In contrast, *competence-based* clusters depend on the technological expertise or competences within a region. Whether such competences are defined as a set of research resources or skills in this type of cluster, it is not supply linkages within a sector that are key, but the application of a common body of tacit knowledge across a range of often very different economic activities. Good examples can be found in the East Sweden and Arve Valley case studies. In East Sweden, the software cluster can only be loosely defined when examining the products of its constituent firms - which range from management development to telecommunications networking - but it is more clearly bounded when considering the main source of the cluster's competitiveness, the research excellence, graduate training and industrial ties of the University of Linköping's computer science department. Similarly, while businesses in the metal-cutting cluster in the Arve Valley perform similar economic activities, they are tied into different value chains as component suppliers to electronics manufacturers and automotive OEMs, which are typically located outside of the region. What holds the cluster together is a pool of common craft-based skills and expertise.

Both examples are described in Figure 5 below, where the core of the cluster is a source of competence (often a system of research providers) which can tie into a number of different sectors, which may in turn be part of value chain clusters. Clearly, the value of supporting a competence cluster is that it can 'seed' the wider economy, reinforcing existing industries and catalysing the growth of new economic activities where the technologies are more groundbreaking.

Figure 5: Competence-based clusters



3.2 Cluster selection

The second stage of cluster analysis is the selection of clusters to be targeted by policy. Not all clusters identified in a region are likely to be subject to policy action. Limits may be needed because of budget restrictions and the desire to test the approach on a few clusters initially. Consequently, policy-makers require 'filters' to decide upon which clusters to act.

The filters are not necessarily strictly economic. Targeted clusters do not necessarily include those which are demonstrably the largest within the economy. More important are considerations of whether the clusters can be affected positively by policy action. Indeed, there is a range of political and practical issues which will influence which clusters are selected (as shown in Figure 3 above).

In any policy, where public intervention is likely to be extensive, a limited number of clusters would be recommended, not least because of the initial problem of 'digesting' so many industrial foci by policy-makers. In choosing the target industries, they should not just reflect the economic strengths and potential of the economy, but explicitly take into account political and practical factors, recognising the need to secure widespread support for the policy in the region. In addition, the willingness of the private sector to participate in policy is a crucial element in which clusters are taken forward.

The portfolio of clusters should also be selected with a view to displaying diversity while preserving complementarity. A range of different cluster types has often been successfully supported, including value chain-driven and competence-driven as well as emerging and mature clusters within the same policy. This can be a useful means of combining different levels of 'risk' in the portfolio. At the same time, policy is most effective when the clusters have important areas of overlap, allowing new technological competences and potential clusters to develop by encouraging businesses to explore cooperation across traditional sectoral boundaries.

4 Applying the cluster approach to existing policy

In parallel with applying the cluster concept to the local economy, it is also important to 'audit' the ability of existing policy to support the cluster approach. For some of the case studies, cluster policy dovetailed relatively neatly with existing policies and organisations for policy delivery. A few involved a more extensive overhaul of policy, often as the implications of developing a cluster policy became more apparent. However, across all the case-study areas, policy-makers claimed that the cluster approach was important in setting a new framework for thinking about economic development and developing policies.

The cluster concept is not always the main impetus for this new approach - for example, in Limburg, it has been part of a wider innovation-based approach to economic development - but it has generally been considered a new policy paradigm. In most cases, it has been put forward as a highly self-conscious policy, even where the cluster concept is not expressed explicitly at a strategy level. Although it can be difficult to separate the cluster policy from existing policy traditions with continuity of measures and similarity of goals, at least policy-makers tend to *believe* they are establishing a new policy framework.

A key part of cluster policy-making is determining the suitability of existing policies for a cluster-based approach. The following sections treat two practical aspects of this: the motives of policy-makers in pursuing a cluster approach (ie. the value of the cluster approach); and the ways of securing commitment to the new policy from the other main actors in the region, in both the public and private sector (ie. demonstrating the value of the new approach to others).

4.1 Value of the cluster approach

A cluster approach can have significant benefits to policy-making itself. In this context, its value is threefold. It provides a new way of *targeting* policy more effectively, either on development within a particular industrial value chain or of a technological competence on which several economic activities are dependent. This does not necessarily lead to greater emphasis on a more sector-based policy in the case-study areas. There are no clear examples of public sector resources shifting within economic development policy to the target clusters (and away from other activities). However, it is argued that the policy framework is a better way of making use of existing resources or setting the criteria for bidding for new resources available through programmes like the Structural Funds (as is the case in the Objective-2 programme for North-Rhine Westphalia).

It is also useful in *integrating* policy. At the project level, the cluster approach encourages different types of measures to be assembled around a single industry priority. Measures and projects can also be integrated at the level of individual cluster programmes. For example, in Scotland, cluster policy has consisted of a series of programmes ('action plans') targeted at different clusters. The action plans consist of a variety of projects from across different policy areas relating to technology transfer, new firm formation and export development. Some of these measures have been newly developed for the action plan, but many are already in operation. The value of

the action plans has been in bringing together disparate measures which can reinforce each other through cluster targeting. Moreover, by examining the range of policy activities in a particular cluster, it is easier to highlight the gaps where policy may be needed. At its best, cluster policy can result in a more holistic approach to policy design and delivery.

Lastly, it is an effective source of *policy information*. More detailed and useful intelligence about a sector can be gathered using the cluster approach. Through the strong involvement of the private sector in the policy, up-to-date information about the state of a cluster sector and its assessment of its own needs can more effectively inform policy design. For example, in the País Vasco, policy-makers have noted that one of the principal benefits of the policy has been the establishment of arms-length intermediary organisations to carry out the individual cluster programmes, which have become important sources of information on developments in each sector.

As noted, the cluster policy can contain large segments of 'old' policies and measures, but given a new significance in this context. Clearly, if the language of using a cluster approach produces no discernible change in policy, then it can be put down as a marketing tool. In some areas, the use of the concept has not forestalled the development of projects with little explicit link to the cluster approach. However, even where the measures would have occurred anyway, in compelling them to be more targeted at parts of industry and integrated with other types of measures, the cluster approach has made an impact on policy direction. Above all, it has been a powerful tool for policy-makers to make greater strategic sense of the policy instruments available for influencing economic development.

4.2 Getting support for the cluster approach

For the cluster approach to take root in a region, it needs to win the support of the main policy actors in the region. This has taken place where the approach has been championed by a single agency or developed in an atmosphere of policy consensus. Where a single agency has pushed the policy, it has been most successful when that agency has been the main provider of financial resources for policy activity in the region. Indeed, the cluster approach can be at its most effective in helping to reorganise the policy functions of a regional development agency, showing the links between different policy areas and encouraging different parts of the agency to cooperate.

The cluster approach can also be taken forward where there is strong consensus of policy bodies. The existing network ties in the region should be used to gain agreement to the approach, building on consensus by stressing the benefits of the cluster approach to further increasing the level of policy cooperation taking place in a region. Its value as an agent of change in the relations of different policy bodies should be exploited.

It has also arisen out of a political desire to make a departure from existing policy approaches to economic development. Nevertheless, policy-makers have been keen to ensure the cluster approach is coterminous with existing policy approaches in the region. In terms of 'selling' the concept to other policy bodies, it is more likely to be successful when linked to previous policies, either as a natural outgrowth of their

approaches or a way of addressing the problems of earlier policies. Moreover, cluster policy should be trimmed to fit within existing policy strategies to ensure policy coherence in the region and enable the cluster policy to have access to funding. At the same time, other economic development strategies in the region should at least acknowledge cluster development as a goal.

5 Designing a cluster policy

Once a decision has been taken to pursue a cluster policy, there are two distinct phases to its development. The first involves articulating the overall aim of the policy itself: both the strategic framework (if there is one), individual programmes and measures, and the responsibilities for policy delivery. In most cases, this phase consists of differentiated tasks, including the overall coordination of policy formulation and the specific responsibilities of developing measures and policies for each cluster.

The second phase concerns the approach to developing the policy itself. An important feature of this has been 'selling' the policy. As cluster policies involve an unusually high level of private sector participation, it is essential that commitment be secured from participating companies, as well as other key actors such as private sector agencies, universities, unions and other social partners. The degree to which the cluster policy will survive largely depends on whether these actors accept their cluster identity and recognise the value of the policy activities being proposed.

5.1 Aim of the cluster policy

Some of the regions in the case studies are aiming to create strong clusters in the same areas of economic activity. Research in the field suggests that from an international competitive perspective, only a handful of clusters are likely to emerge in each region (Enright, 2000). Given the difficulties of achieving an admittedly, difficult-to-quantify critical mass for world-class clusters, it raises the question of whether some of the cluster programmes are realistic in their objectives. When clusters are as small as the company partnerships supported in some policies, it is arguable that the concept has been applied too loosely.

The cluster policies examined here are less concerned with influencing *clusters* so much as *clustering*. Few of the regions have clear notions of a defined cluster as an ultimate policy goal. There tends to be no explicit description of the set of economic behaviours which would be expected in a fully-developed cluster and thereby typify the outcomes of their policy. Hence, if policy-makers are concerned foremost with developing an entity known as a 'cluster', exit strategies will be difficult to make because clusters have not been properly defined. If goals are not clearly defined, the public sector cannot readily know when to withdraw from or lower its contribution to a policy. It increases the suspicion that cluster policy mainly aims to be a framework for organising a set of policies, making them more effective by providing better industry targeting and integration with other policies.

Where goals of policy are set, they are usually defined in terms of the economic benefits which arise from the process of clustering, regardless of whether this takes

place in a cluster. The distinction is crucial to understanding the value of cluster policy when put into practice and one which should be made more visible in policy. For the different cluster programmes, world-class clusters may or may not be achieved, but the policies have common assumptions that go beyond this: they see clustering itself as a valuable economic activity, and hence, goal of policy. The policies either support clustering as a goal in itself (through networking) or promote clustering to achieve other goals.

In these policies, 'clustering' is regarded (implicitly or explicitly) as closer cooperation between key economic agents in an economic activity. This cooperation takes place in ways which address market failures arising from competition but should not jeopardise the benefits of competition (as, for example, through cartel behaviour). Cooperation is also not meant to exist as one-off or short-term relationships, but occur in an environment where such relationships can easily and naturally form (and terminate) without excessive friction. Regardless of whether they are part of fully-fledged clusters or not, clustering can lead to RTD linkages, producing new products and services, new firm formation through the commercialisation of research and better business performance through exchange of experience and the development of common resources providing key business inputs. Where clusters are more fully formed, the benefits of clustering may be greater, but in policy terms, clustering itself at any stage of a cluster's development can be regarded positively. Indeed, when the cluster approach is promoted to businesses by the public sector, it is often explained in terms of clustering/networking.

5.2 Approach to designing the cluster policy

Policy has taken different forms in the case studies, but in some cases, a strategic approach was adopted. The evidence does not yet suggest that a cluster *strategy* is a more effective approach to cluster development than a less coordinated group of cluster measures. Strategies are useful, though, in structuring the process of identifying cluster needs and organising the available policy resources for addressing those needs. Whatever the shape of the cluster policy, it requires a single coordinator to drive its development. While this does not necessarily have to be the leading policy agency in the region, it should be the body with the responsibility for drafting and overseeing the main economic development strategies, whether the strategies are determined by criteria set at national, regional or even European levels.

Whatever the approach, extensive consultation is likely to needed in developing a cluster policy. Consultation not only draws on a wide range of expert knowledge, but begins the process of making policy the responsibility of the private as well as the public sector. In some regions, the programmes which have been developed for individual clusters have resulted from negotiations between the public and private sectors.

Consultation in cluster policy-making serves three purposes. First, by undertaking wider consultation, the strategy can be informed by a large body of expert opinion on the industry's trends, capabilities and needs; as cluster policy demands a highly-detailed knowledge of the industry/ies, access to this opinion is essential. Second, consultation is necessary if the private sector is to be galvanised into taking responsibility for cluster development, particularly financially. In helping to form the

policy, the private sector (and other cluster actors) will have a greater sense of its ownership and have more of a stake in working for its success. Lastly, consultation is the first step towards creating a cluster identity, whether bonding together previously disparate firms or transforming a sector-based sense of association to an awareness of a common set of competitive advantages. If the cluster is to emerge and thrive, its members must have an appreciation of their collective strengths: without this, they will be unable to identify the weaknesses in their cluster, let alone be prepared to act on them. Consequently, consultation is closely linked to the process of securing policy commitment. It is also a more important part of policy-making in this field than in many other economic development areas.

To be effective, consultation also needs to demonstrate early benefits for policy participation. This can be aided by focusing policy consultation on the value of 'clustering' and business networking and on the needs of any given sector rather than the more difficult-to-define concept of a cluster. Moreover, collective action is more likely to be forthcoming when collective needs can be proven: cluster analysis, benchmarking and market/technology trends reports can be useful here in showing the immediate results of policy (access to information) as well as the future potential gains of policy action.

Such consultation is the first stage of the longer process of securing commitment to cluster policy from the different agents within a cluster. It is also essential if the private sector is to develop a sense of ownership of the policy. How far this will be necessary depends on how ambitious the policy is aiming to be. For more involved strategies, it may require an investment over the medium term by the policy's champion agency to demonstrate the value of the approach across the region. However, if commitment from a significant number of cluster agents is not forthcoming in the short term, the policy should not be carried forward. Unlike some other economic development policy areas, private sector support for the policy as a whole and its main constituent measures is essential, as it requires a strong degree of self-governance and involvement from businesses.

6 Implementing cluster policy

The case studies produced a variety of measures and policy delivery mechanisms. The contents of policy and the ways in which it was implemented varied with the differences in economies and policy structures. The key lesson from the experience of the case studies is that there is no single model for cluster policy. Nonetheless, it is possible to comment on the procedures and actions for supporting cluster development from the design of measures, the ways in which they are to be combined and the mechanisms in place to deliver the policy.

Implementation can be considered from several inter-related perspectives. First, there are the measures themselves. For the most part, cluster policy has not summoned new types of measures into existence: instead, measures tend to be adapted from other areas of economic development policy. In some cases, measures that pre-date the cluster policy are either given a new context by the policy or are referred to in a new way. In general, though, the measures are distinguished in cluster policy by their

precise focus on the needs of a particular cluster.

Second, there are the systems in place to deliver the policy. In some cases, these are simply adaptations of the existing policy framework (occasionally not even that) but overall, they have had to be re-organised to fit the specific needs of implementing cluster policy. Depending on the region, up to three tiers of policy management have been required: an overarching coordination of the policy as a whole (a particular feature of strategies where several cluster programmes may be running in parallel), the management of the individual cluster programmes and the operation of the specific projects and measures.

6.1 Cluster policy measures

The different measures which together comprise cluster policies can be classified into different categories:

i. *community building:* measures which encourage cluster agents to think and act as a cluster and which promote their identity;

ii. *linkages and projects:* measures which directly promote networking between cluster agents based around specific projects or objectives; and

iii. *common resources:* measures which supply public goods lacking in the cluster, particularly specialised information, infrastructure and skills which would not have been produced by the cluster participants alone.

The measures address cluster formation at different points: the first group sets the limits of the cluster; the second deepens the interactions between its members through concrete forms of partnership; and the third creates common resources around which the cluster can form. Many projects and measures have more than one purpose, and in reality could fall under more than one of these headings, but the classification does provide a useful way to structure a discussion of cluster policy measure types.

6.1.1 Community building

Cluster 'community-building' measures have two purposes:

- *identity-building*: through supporting the initial association of the cluster, encouraging more frequent and prolonged links between cluster members and increasing members' understanding of the cluster and their sense of 'belonging' to it; and

- *identity-projecting*: by defining an image of the cluster which can be used in collective marketing exercises or to attract foreign investors and other key actors into the cluster.

Many of the initial activities in developing a cluster policy involve measures that can be classified here, particularly international benchmarking, market and technology trends studies, and SWOT analyses of clusters. Its significance varied by cluster: well-established, mature clusters tended to focus instead on measures to keep

members in touch with each other and with general developments, but less well-defined, emerging clusters, usually in new technology-based industries, required more pro-active efforts to get businesses to regard themselves as part of a single cluster. This was also an important objective of

Across the clusters, four sets of community-building activities were evident: forum-based, communication, 'concentration' and 'branding'.

i. *Forum-based*. An important part of many cluster policies was the use of regular meetings to bring together the different actors in the cluster. An extension of the kind of activities used in policy consultation, the principles are the same: firms can identify common problems and opportunities, consider joint solutions and begin to develop a wider sense of common association as a cluster. This was particularly true in the Centre of Expertise programmes in Tampere, where groups and sub-groups of firms and research providers from the cluster met to discuss specific issues, often identified by the cluster coordinator: for example, standardising design software specifications among mechanical engineering firms, or discussing common supply opportunities for the main companies in the ICT cluster. In the case of Tampere, the meetings worked because they formed around clear and very specific issues of common interest and were hosted and facilitated by the cluster coordinator.

ii. *Communication*. Websites and newsletters are frequent outputs of a cluster policy: apart from their ostensible goal of communication, they also help to engender a sense of common cluster identity. More sophisticated versions are used to provide information to the cluster, such as market and technology trend studies, databases of product and supplier services and recruitment support. They can also be used to project the image of the cluster abroad, publicising the business activities of its individual and collective members (eg. products and services). Special cluster websites developed by Scottish Enterprise serve many of these functions as well as distributing strategy and action plan documents and providing a facility for cluster discussion and feedback.

iii. *Concentration*. The visibility of the cluster is higher where there is a geographical concentration of the participating firms, an important factor in being able to attract foreign investors and assist in the international marketing of the cluster. The establishment of new science parks for bio-medical/healthcare technology firms in East Sweden and Tampere were intended not only to support new start-ups, but also to provide a focal point for the existing, scattered firms in the region through the incentive of subsidised property and services and access to research providers (university hospitals in both cases).

iv. *Branding*. A 'brand' for the cluster has commonly been developed in the case studies. Normally part of an export development exercise, 'branding' can be used to link together the disparate parts of a cluster through common characteristics: for example, the cultural and historical connotations of 'Scottishness' explicitly employed in the food/drink and tourism clusters in Scotland.

6.1.2 Support for linkages and projects

Measures which support networking and cooperation between the agents in a cluster are among the most common cluster policies. Networking measures can involve either business-to-business ties or links between businesses and research providers. Business-to-business linkages are a strong feature of value chain-driven clusters. They are important in supplier development, pooling the resources of a number of suppliers in a business activity to achieve economies of scale (eg. marketing) or improving the business performance of suppliers by encouraging transfer of experience, skills and technology.

Cluster policies in some areas also give significant priority to developing links between research providers and businesses. These activities are particularly important in competence-driven clusters, where the commercialisation of research is one of the main dynamics in the cluster. The success of such measures depends on several issues. Partly, they need to be operated in conjunction with other measures, such as entrepreneurial training programmes for researchers and the provision of financial incentives to support RTD cooperation projects.

They can also be helped by the presence of special units acting as intermediaries between universities and industry. For example, a highly-developed set of such units exists in East Sweden and Tampere to support the commercialisation of research. In Sweden, centres of research excellence are nationally designated and given the responsibility of joining particular research specialisms with companies. In Tampere, the Technology University of Tampere has, independently of the cluster policy, set up a number of such intermediaries, effectively, 'one-stop shops' for industry to connect with university researchers in different fields. As with agencies specialising in business-to-business linkages, the success of these organisations depend on an expert knowledge of the companies, the ability to make contact with different agents in the sector and credibility as a respected broker of services. Some clusters may provide more cooperative environments than others, (eg. ICT firms are more used to both types of cooperation than forestry product firms), and the right kind of organisation must be found for each cluster, with expectations set appropriately.

6.1.3 Common resources

A key feature of most definitions of a cluster is the presence of common competitive advantages that are external to individual firms but internal to the cluster as a whole. When Alfred Marshall wrote about industrial districts at the end of the 19th century, he pointed to common labour markets of specialised skills as one such advantage for firms operating in the same economic sphere and geographical area, but advantages can include special research excellence (in a firm or a university) and other forms of tacit knowledge that are specific to the region. Many cluster policies aim to increase that tacit knowledge through a series of measures focusing on developing these common competitive advantages. For the most part, they are pitched at developing common resources which will improve the competitiveness of a group of firms within the cluster, but which individual firms may not have the resources or the business incentive to develop themselves, either singly or jointly. Such externalities are the focus of this section.

Common resources can include a variety of inputs and activities, such as access to key business information, specialised forms of infrastructure, technology transfer, tailored skills training and venture capital provision (especially for technology development). The first three appear most commonly in the case studies. The three types - information, infrastructure and skills - are discussed in the following sub-sections.

(i) Information

Some information can be important for business development within a cluster, such as future market trends, details of specific market environments, export opportunities, future technology trends and sources of particular technologies, services and supply components. The cost of acquiring that information can mean that there is little access to it within the cluster: providing that information free or on a subsidised basis is a public good aimed at encouraging businesses to identify common problems and solutions within the cluster.

Producing such information in the form of one-off reports can be part of the policy consultation process discussed in the previous chapter. While it simply helps to encourage initial policy participation in this case, it can be a valued activity which is regularly provided to the cluster. It can also be institutionalised in a dedicated agency whose responsibilities are to communicate with the members of the cluster and disseminate key information through reports and training seminars. These agencies have been supported in several regions, either as an 'early warning' mechanism for changes that might affect the cluster's competitiveness or a source of specialised technical information.

(ii) Infrastructure

Support for infrastructure development can be both general and highly specialised. General infrastructure development has been a central part of the clusters in East Sweden and Tampere through the regions' science parks. In both regions, a science park has been the main focus around which the region's principal clusters have collected - Mjärdevi and the ICT and software clusters in East Sweden, Hermia and the ICT cluster in Tampere. While the science parks pre-date the cluster policies, they are integral to the policies (even in organisational terms, as the Tampere Technology Centre is both the coordinator of two Centres of Expertise and the managing agency for Hermia). Policy targets businesses located in the science parks and supports incubator units for new firms locating there. New science parks for the bio-medical sector have been set up for the policy to repeat the successes in ICT with a new industry - Berzelius in East Sweden, Finn-Medi in Tampere.

Specialised infrastructure is supported in cluster policy through assistance to set up research facilities in niche parts of the cluster. They can take the form of testing or prototyping units for businesses and research providers or integrated centres of excellence, providing both access to key research and space for business development (effectively, combining the university and science park functions noted above).

(iii) Skills

Different types of training can be subsidised by cluster policy. Among the possibilities is general business training, especially for researchers interested in setting up businesses around their research, but lacking entrepreneurial skills. More specialised skills can be provided in technical areas to support a cluster. The bodies offering these skills, research and training services also do not have to be self-sufficient providers. They can be networked organisations, specifically linked for the benefit of the cluster. For example, in Scotland, the Virtual Food and Drink College anticipates offering degree programmes for the food/drink industry through departments belonging to colleges and universities across the area. As with much of cluster policy, it is not always important to create the common resources, but to network them together in a way that make them more accessible to businesses.

6.2 Policy implementation

Overall, policy implementation will be shaped by the existing system for delivering policy. Cluster policy should fit into the existing structures as far as possible while allowing the opportunity for greater integration of disparate policy areas. Nevertheless, common to many successful cluster policies is the existence of an overseer of policy, particularly where policy is laid down in large strategies. Where several cluster programmes exist, it is important to have a single agency responsible for tracking the development of the different programmes, overseeing the organisations delivering them and suggesting changes to the programmes where appropriate. Intermediary organisations can serve this function, but they require the support of the main development agencies in the region.

The appeal of such a 'controller' is twofold. It is an effective way of developing a cluster-based strategy, as the main development agency is more likely to be responsible for the different measures in a cluster policy in any case. It can also be a means of integrating previously disparate functions within the agency. Scottish Enterprise is a good example of how the cluster approach can provide organisational benefits in this area. In pursuing the cluster approach, the agency has found that it has enabled integration of different units - such as sector-based support, training and export development – around particular clusters. Moreover, it has helped to integrate the geographically-diverse the network of Local Enterprise Companies (effectively, the local representatives of Scottish Enterprise).

Such a manager has had several key functions, typically associated with ensuring a cluster strategy is being implemented as a whole. These are:

- *choosing the clusters*: the main controller is usually responsible for selecting which clusters are to be the focus of policy;

- *choosing the cluster coordinators*: organisations need to be set up to operate the individual cluster programmes, and it is the role of the controller to select this coordinator (or in some cases, to encourage such a body to be set up), set the terms of their conduct, provide budgets and oversee their activities; and

- *authorising measures*: while the controller may not necessarily dictate the measures composing the cluster programme (although in some cases, it will be involved in suggesting them), it normally has a veto role as a budget provider for many of the programme's projects, often through examination of multi-year action plans for the cluster.

Cluster policy can make strong use of devolved responsibilities for policy-making. At the level of individual programmes or projects, policy is best delivered by special coordinators either drawn from the private sector or with existing close ties to businesses in the cluster. These bodies have also been effective in developing as well as operating programmes. In several cases, new organisations have had to be set up, employing a mixture of public and private representatives. Wholly public-based agencies could be found in Tampere, where special companies have been set up with public funding to coordinate policy and deliver services to specific clusters, such as Media Tampere (for the multimedia cluster) and Professio (for the knowledge-intensive business services cluster). In contrast, the Basque government has deliberately kept cluster development within the private sector, inviting clusters to put forward their own solutions to the issue of co-ordination. In between can be found the Scottish case, where the cluster programmes have been overseen by special plan delivery groups, composed of experts drawn from the Scottish Enterprise network, university departments and the private sector.

7 Evaluating a cluster policy

Just as cluster can be vaguely defined in policy terms, so too is what constitutes 'success'. As already noted, the goals of cluster policy are generally not clearly expressed, making it difficult for policy-makers to answer the question, 'are we a cluster yet?'. The problem is not just how success is to be defined in cluster policy, but indeed, *whether* it can be defined. Once defined, it also poses the problem of how to measure success and to evaluate the policies that produce it.

Two forms of benefits have been associated with the success of policy in the case studies. Traditionally, policy goals have been cast in terms of economic benefits, whether macroeconomic (such as increases in employment and income levels) or business-specific (productivity, export levels etc.). However, as has been seen, cluster policy often represents a new framework for analysing, delivering and presenting existing policies, so there are potential organisational benefits in the policy sphere as well. Hence, evaluation has different roles in measuring these benefits. Traditionally, policy assessment has aimed to measure the *efficiency* of policy – ie. how well policy has been designed and operated and whether it has delivered its outputs appropriately – as well as the economic *effectiveness* of policy actions – ie. measuring whether they have had a significant impact on their target groups and in the wider economy. However, for cluster policy, the novelty of the approach has raised questions about whether the existing approaches to evaluating economic development can be applied or whether cluster policy has need of new concepts of assessment. It is not just the instruments of cluster policy which have been subject to greater scrutiny, but the approach as a whole.

7.1 Monitoring and evaluation in the case studies

Overall, little monitoring and evaluation has been undertaken by the case-study regions. In large part, this can be attributed to several inter-relating factors. First, as stressed elsewhere in the report, the policies are quite 'new' and have often not been in operation long enough to have evaluations conducted (though in most cases, evaluations are being planned). Second, the policies themselves are so loosely defined in some cases that it has not been felt appropriate to evaluate them independently. Lastly, given the interest in cluster policy as an expenditure-reducing exercise and the general absence of political pressure to conduct evaluations (which is present, for example in regional policy – from the national level – and the Structural Funds – from the European level), there has been reduced incentive to introduce appropriate procedures. As a result, where evaluations have been conducted, they are often at project level, with little effort to view the results in the context of cluster development in the region as a whole.

Evaluations appear to be planned in nearly all the case studies. The only exception is the País Vasco, where the place of evaluation is problematical because of the degree of self-management of the programmes by the private sector. Effectively, the Basque system assumes self-evaluation, where the continuing participation of companies in the different cluster programmes is taken as evidence of their value. Indeed, there is greater concern for whether the agreed actions have taken place and whether they were well-designed (ie. outputs) rather than for the links between outputs and impacts. Nevertheless, the Basque government still monitors the public share of expenditure by the cluster coordinators on an annual basis and regularly reviews spending through the *convenio* agreements for the different programmes.

Lying behind the weakness in evaluation and monitoring in the case studies is the fact that policy assessment has not been seen as a particularly important part of the policy process. In general, the case studies do not reveal great interest in trying to find the actual economic impacts of what was often a novel policy approach. The cluster approach was not assessed systematically against other policy approaches and for the most part, there was little pressure to justify policy before a wider audience. Indeed, the importance of evaluation has only really been pronounced in Scotland. In large part, this reflects the strong tradition of policy evaluation in the UK as a whole, especially in economic development areas. Relatively robust political pressures exist in Scotland for evaluation: Scottish Enterprise is operating in an environment of robust political accountability for public expenditure, which has been increased by devolution and the establishment of the Scottish parliament. The pressure to show the results of the policy has also been raised by its unusually self-conscious and publicised nature (relative to the other case studies).

7.2 Problems with assessing cluster policy

Cluster policy is not unique in this regard. Other forms of economic development policy have shared similar evaluation shortcomings. To a significant extent, this is due to the significant methodological problems in evaluating policy, such as separating 'net' from 'gross' effects and determining what would have happened in the absence of policy intervention. It also reflects the limited value that evaluations have for many policy-makers. The concern has usually been more with the *efficiency*

with which policy has been implemented rather than its overall economic *effectiveness*.

In part, this reflects the methodological hurdles faced in the evaluation of all policy actions. In economic development policies, the most outstanding of these relate to whether policy has actually encouraged new behaviour ('additionality'), the calculation of 'net' from 'gross' effects ('displacement and substitution'), the use of multipliers and the difficulties in determining what would have happened if the policy had not been applied ('counterfactual').

- *Additionality*. In order to understand the effectiveness of a policy measure, evaluations need to determine whether the encouraged activities would have taken place in the absence of the measure. For example, if businesses receive public subsidies to pursue particular activities, has the measure altered the scale and timing of the activity, or indeed, the decision to undertake it in the first place? In other words, how *additional* is the activity affected by policy?

- *Displacement and substitution*. Evaluations should separate 'net' from 'gross' effects in measuring impacts. Taking additionality into account is an important element of this, as is the measure of other sets of effects. These include (i) 'displacement', where the effect of policy is gained at the expense of another business or area, as for example, when financial incentives influence investors to shift locations from unassisted to assisted areas, and (ii) 'substitution', where the policy effect is gained at the expense of a person or organisation which was not eligible for assistance.

- *Multipliers*. In addition to the direct impacts of policy, there can be a series of 'ripple' effects. For example, if policy supports the growth of business, does that growth in turn have indirect effects on other businesses through its increased purchases and higher wage bills? Determining the level of these effects requires the use of multipliers, which vary with the policy measure being implemented.

- *Counterfactual*. In evaluation, one of the key questions is what would have occurred in the absence of the policy. Policy is effective where it can be demonstrated that the 'real' and the 'counterfactual' scenarios show significant (and positive) divergence. However, the counterfactual can be very complex to determine, particularly at a macroeconomic level where it must take account of a highly diverse range of variables.

However, the problems of evaluation are more acute in cluster policy. It has not always been clear what should be evaluated in a cluster and what are the links between increased activity in a cluster and overall economic development. The value of the cluster approach in bridging different economic policy areas has made it more complex and less easy-to-define in terms of evaluation.

First, there is organising evaluation of a cluster policy. If evaluation is part of a single strategy, it is easier to lay down common indicators and systems for monitoring and evaluation, as is being attempted in Scotland. It is more difficult to standardise when different measures are more loosely coordinated together. Second, there are fundamental problems in measuring cluster behaviour which will require more

innovative evaluation methodologies. Cluster policy tends to aim at a 'step change' in business behaviour, a change which cannot simply be measured on the basis of the outputs associated with other economic development evaluations.

7.3 Options for assessing cluster policy

While good practice in monitoring and evaluation may be lacking in the experience of cluster policy-making, useful lessons can be drawn from other policy areas, particularly the Structural Funds. As a policy area, European regional policy is similar to cluster policy in that it brings together several different economic development measures, many of which often existed in some form before the programme, and measure how they contribute to a common set of strategic goals. Both policy areas can have a diversity of projects and delivery mechanisms, but in the case the Structural Funds, standardised approaches to monitoring and evaluation have been actively encouraged at national level as well as between Member States. This can be seen in both the importance placed on evaluation in the Structural Funds (through European Commission guidelines) and a degree of shared experience in dealing with recurring methodological problems. Lastly, the Structural Funds shares with cluster policy a requirement to measure aspects of economic development which are traditionally difficult to quantify - in the case of the Structural Funds, these include horizontal issues such as gender mainstreaming and environmental sustainability.

From the perspective of cluster development, the Structural Funds provides good practice in a number of areas. The most important of these relate to the *organisation* of evaluation, its *methods* and its *focus*.

Given the diversity of measures and programmes within cluster policy, the *organisation* of evaluation can benefit from a framework which allows for different types of evaluation to be conducted. It should be integrated within a common structure, where indicators and data categories are standardised as far as possible between the different measures being evaluated and the results can be fed into a unified assessment of individual clusters and the regional economy as a whole.

The *methods* of evaluating cluster policy will also be varied. They will range from the use of international benchmarking with comparator clusters in other regions to intensive case-study analyses of changing business behaviour. Evaluation should take a long-term view as cluster change is not a short-term process. Further, new methods of evaluation will need to be devised to measure the type of activity associated with cluster development, particularly networking between businesses and other agents within the cluster.

Lastly, the *focus* of cluster policy should be less on quantifying its impacts than establishing clear positive links between clustering behaviour and economic development. Ultimately, the resources required for a full evaluation of all policy activity associated with cluster development may be prohibitive. What is more important is the need to establish that such positive links exist and that policy measures can promote them, as it is an area in which research continues to be lacking.

In applying these lessons to the evaluation of cluster policy, it is possible to present

options for developing an assessment of cluster policy. This would have two aspects: how to measure cluster activity itself; and how to work out if that activity is linked to wider economic development (Figure 6).

Figure 6: Options for evaluating cluster policy

Measuring cluster activity		
International competitiveness	*Networking within the cluster*	*Common sources of comparative advantage*
• Benchmarking with comparator regions in terms of relative growth in the cluster	• Number and significance of cluster participants • Frequency of contacts among cluster participants • Quality of networking among cluster participants	• Changes to the scale and nature of the comparative advantage • Changes to the domestic significance of the comparative advantage • Changes to the international significance of the comparative advantage
Linking cluster activity and economic development		
Links between community-building activities and economic development: eg. role of 'branding' in improving export sales	Links between support for linkages and projects and economic development: eg. number of new joint products developed	Links between common resources and economic development: eg. how investment in common skills improves business performance

Cluster activity can be measured by examining the main features of a cluster. These include: its international competitiveness; its networking aspects; and the strength of its common sources of competitive advantage.

- *International competitiveness* can be determined through international benchmarking with comparator regions. Benchmarking would have to be conducted over time to measure how the target sectors are performing on a range of relevant indicators. Care would have to be taken in choosing the right comparator region as well as sector.

- Changes to *networking* within a cluster can be measured in several ways. First, it is important to work out *who* the network partners are, an issue of defining the potential members of the cluster. Evaluations could follow the networking patterns of this sample over a period of time through the use of business surveys and qualitative interview research, producing maps of what parts of the cluster have been in contact with other parts. Second, *what* is being measured in networking is also important. There is the frequency of contacts between cluster members, ranging from general group meetings to more intensive forms of cooperation between a handful of firms. Lastly, there is also the *quality* of contacts which need to be measured, and particularly what impacts result from the contacts.

- *Sources of competitive advantage* would have to be measured by a combination of different evaluation techniques. An example of how this can be done is regions

where the advantage lies in the skills profile of a cluster sector. Different types of evaluation can cover different aspects of the value of these skills. Assessments of the ability of skills providers to deliver skills to businesses can measure the supply of skills into the cluster. The level of skills in the economy can be measured with the use of the specialised job categories employed in labour market studies. The relevance of those skills to cluster agents can be determined using skills need analyses.

With regards to linking cluster activity to economic development, more theoretical work is required. Different forms of cluster activity will have different contributions to overall economic development, whether they are community-building activities, support for linkages and projects, or development of common resources. To establish the links between networking and real economic impacts, it would be necessary to evaluate whether more and higher-value contacts lead to significant changes in business performance: for example, through new technology or ideas of organising production, or the enhanced status of a supplier to its main customers.

The problems of such evaluations are that they can be highly resource-intensive, to both the public sector and the firms taking part. Perhaps it is only important then to *establish* the links between the cluster activity which policy is targeting rather than *quantify* it. In this case, evaluation's utility would be indicative, confirming the value of the approach without measuring the precise impacts.

8 What are the factors behind successful policies?

There are no clear preconditions for cluster policy. However, there are a number of supporting factors which make good practice easier to implement. In many respects, these factors are not unusual to cluster policy, but can be found in many successful economic development policies.

Policy supporting clustering is as important as that focused on developing clusters. From this perspective, it is less critical that the economy has a large portfolio of outstanding sectors of world-class excellence - clustering can be of value in a diversity of sectors. From the range of sizes and relative economic strengths of the case-study areas, there appear to no simple economic criteria for the emergence of clusters.

Nonetheless, policy has been most successful where the clusters have several features. They should be characterised by the potential for growth, or contain sub-sectors which are able to develop - sectors in crisis are less likely to pursue cluster activity. Where firms are more concerned about survival and restructuring, it can be very difficult to secure commitment to policies of networking and cooperation.

From a policy perspective, cluster development can also be easier to achieve where there are strong local actors in the cluster who can act as policy targets or partners. In East Sweden and Tampere, the role of Nokia and Ericsson has been fundamental to the success of the regions' ICT clusters, and large key firms have had a major role in the Scottish semiconductors clusters. Large firms are not essential in all clusters - emerging clusters built around new technologies show how they are not always needed - but even here, there are often other large actors with a key role in

underpinning the cluster. Hence, for example, in the biotechnology clusters of the case studies, while there are often few large businesses in the sectors, university departments or research-based hospitals have played a major role in providing a platform for the cluster's growth (and usually an initial focus for policy activity). However, it is not universally the case – in the País Vasco, some cluster groupings deliberately excluded large firms to avoid the danger of SME members being 'swamped' by their voices.

Networking within the economy is also another important contributing factor. Where there are traditions of cooperation between businesses - whether through personal ties (eg. personnel rotating through a small number of firms) or business networks (eg. long-term supply arrangements), the cluster concept is more readily understood by the private sector. Sectors which feature intense competition - as for example, in the metal-cutting industry in the Arve Valley - have problems in creating sufficient trust within the private sector to support clustering. Similarly, sectors which are so disparate that they lack a history of cooperation present significant challenges to cluster policy, as could be argued for sectors such as knowledge-intensive business services and tourism.

The presence of internationally-recognised research strengths in the region is important as well, especially where they have a strong applied and commercial dimension. Building on such strengths can form the main substance of cluster policy, both as a source of technical skills, research services, new products and (where commercialisation is successful) new firms to the rest of the cluster. While this is perhaps more true for competence-driven clusters, the importance of a research base is true for all cluster types. Where the research expertise is concentrated in universities rather than key large firms, policy will have greater scope for multiplying and deepening the linkages between the research provider and other agents in the cluster. Where the universities have their own traditions of industry networking, policy will again be in the favourable position of enhancing an existing activity rather than creating a new one.

Such research strengths and networking capacity can be better activated where the supporting infrastructure is already in place. The science parks in East Sweden and Tampere have been major factors in their regions, especially in fostering cooperation between research providers and businesses. They have underlined the importance of the cluster having a recognisable core to its development. While this does not preclude the development of clusters without geographical anchors - for example, software-based 'clusters', not proximate but closely linked through telecommunications networks such as the internet - it provides policy (and its private sector partners) with visible hubs on which measures can target. In many cases, one of the goals of policy has been to create such hubs in an emerging cluster through science park developments.

Finally, the policy structure itself is an important determinant of the success of the cluster approach. Cluster policy has formed in regions with a variety of policy structures - those with a strong leading agency and those where policy responsibility is widely distributed. It has been promoted in regions with largely independent authority and those closely linked into the national structure of government (indeed, the cluster policy can often be national in origin). What regions developing

successful policy have had in common was the capacity for achieving policy consensus. A solid tradition in networking and cooperation among the main policy agencies has been a key feature in its successful implementation.

Bibliography

Boekholt, P and Thuriaux, B (1999) 'Public policies to facilitate clusters: background, rationale and policy practices in international perspective' in OECD (ed.) *Boosting Innovation: The Cluster Approach*, OECD Proceedings, Organisation for Economic Co-operation and Development, Paris.

Brown, R (2000) *Cluster Dynamics in Theory and Practice with Application to Scotland*, Regional and Industrial Policy Research Paper 38, European Policies Research Centre, University of Strathclyde, Glasgow.

Enright, M (2000) 'The globalization of competition and the localization of competitive advantage: policies towards regional clustering' in Hood, N and Young S (ed.) *Globalization of Multinational Enterprise Activity and Economic Development*, Macmillan, London.

Feser, E (1998) 'Old and new theories of industry clusters' in Steiner, M (ed.) *Clusters and Regional Specialisation*, Pion, London.

Harrison, B (1992) 'Industrial districts: old wine in new bottles?', *Regional Studies*, 26, 469-83.

Lagendijk, A (2000) 'Learning in non-core regions: towards "intelligent clusters" addressing business and regional needs' in Rutten, R, Bakkers, S, Morgan, K and Boekema, F (ed.) *Learning Regions: Theory, Policy and Practice*, Edward Elgar, London.

Porter, M (1990) *The Competitive Advantage of Nations*, Free Press, New York.

Raines, P and Ache, P (2000) *A Review of Cluster Development Theory and Policy*, mimeo, report to the Euro-Cluster project consortium, European Policies Research Centre, University of Strathclyde, Glasgow.