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The Cluster Approach and the Dynamics of Regional Policy-Making

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Preface

The working paper was presented at the Regional Studies Association International Conference, *Regional Transitions*, in Gdansk, Poland, on 16 September 2001.

Abstract

The recent emergence of the 'cluster' concept represents one of the most common policy approaches to addressing the tensions between globalization and localization. Originally articulated in the work of Porter, Enright and others - though building on longer traditions such as the work of Marshall and the 'innovative milieu' research by the GREMI group - the factors influencing the propensity of industries to cluster in certain locations have been extensively examined over the past decade. The resulting clusters have been interpreted as self-reinforcing networks of not just firms, but a range of other organizations – including research institutes, universities, financial bodies and public sector agencies – all of which are characterized by high levels of both competition and collaboration. Interest in the 'cluster' concept has been especially apparent in economic development policy, as demonstrated by the increasing support for cluster development at both national and sub-national levels. As a result, cluster policies have proliferated over the past decade - both those clearly designated as such and related policy initiatives such as regional innovation strategies and measures to support local production systems – even though as a whole, the implementing governments have had little in common in their ideological attitude towards economic intervention.

While there has been a growing body of research on the importance – and in many cases, the existence - of clusters in economic development, there has been less attention given to the impact of the cluster concept in economic development policy-making. The range of policies claiming to support clusters suggest a widespread reorientation of regional development goals around models of cluster development. However, some have argued that the concept has merely involved a re-packaging of existing development approaches and measures under a fashionable new brand rather than a significant change in policy design and delivery. Given the diversity of policies that has appeared, it is timely to review whether these new economic ideas have been reflected in innovative approaches to public interventions in regional development systems.

The paper examines how the cluster concept has been interpreted in a number of European cluster-based policies, focusing on the internal processes by which policy has been developed in different institutional and strategic environments. Indeed, it is the paper's contention that attention on the economic realities and impacts of clusters have distracted from what may be the most important effects of the current enthusiasm for the cluster concept: its role in giving a focus for regional development policy, especially in regions and countries where such policy has been fragmented between a range of competing organisations and policy areas.

Research for the paper has been conducted under the Euro-Cluster project by the European Policies Research Centre at the University of Strathclyde. This was a comparative study of cluster policy in Europe which involved an overview of cluster

policies as a whole and in-depth case studies of cluster policy in seven regions. In presenting the project's findings, the role of the cluster concept in policy-making will be considered from three perspectives: the strategic framework for policy; the content of policy measures; and the delivery of policy.

First, in terms of the policy framework, the paper reviews how – or indeed, whether - a model of cluster development and policy intervention has been articulated in the policy-making process. It examines whether an interest in the cluster concept has changed policy-maker understanding of the impact of policy actions on regional development processes, how this new understanding fits with the existing priorities of regional development policy, and what have been the impacts of this on the responsibilities for regional development at different governance levels within a country (especially between national and regional levels of policy-making). Perhaps most significantly, it will question whether the adoption of cluster ideas has resulted in new definitions of regional competitiveness within different policy-making traditions.

Second, the paper uses original research to consider whether the cluster concept has generated new types of policy measures in support of regional development or whether it has been more important as a tool for re-classifying and grouping existing measures. It gives particular emphasis to how cluster policies have been critical in three sets of tasks: providing a more focused industrial targeting to regional development policies; integrating different types of measures which have often operated independently; and creating more effective systems for gathering policy information.

Lastly, attention is given to the extent to which developing a policy based on the cluster concept has led to new systems of policy delivery. In particular, many cluster policies have been based on greater involvement of the private sector in implementing cluster policy measures. The paper reflects on whether this has led to longer-term changes in how regional development policy should be delivered at local level.

Introduction

The emergence of the ‘cluster’ concept represents one of the most popular economic development approaches to addressing the tensions between globalization and localization which has emerged in recent years. Originally articulated in the work of Porter, Enright and others - though building on longer traditions through the work of Marshall and the ‘innovative milieu’ research by the GREMI group - the factors influencing the propensity of industries to cluster in certain locations have been extensively examined. The resulting concept of clusters has been interpreted as self-reinforcing networks of not just firms, but a range of other organizations – including research institutes, universities, financial bodies and public sector agencies – all of which are characterized by high levels of both competition and collaboration.

Interest in the ‘cluster’ concept has been apparent in the increasing support for cluster development internationally, as shown by the strong policy interest shown by the European Commission, the OECD and UNIDO as well as the associations of regions interested in pursuing cluster development (such as the Competitiveness Institute and the Italian and French Clubs of Industrial Districts). As a result, cluster policies have proliferated over the past decade - both those clearly designated as such and related policy initiatives such as regional innovation strategies and measures to support local production systems – even though as a whole, the implementing governments have often had little in common in their goals, policy measures, even their ideological attitude towards economic intervention.

While there has been a growing body of research on the importance – and in many cases, the existence - of clusters in spatial and regional development, there has been less attention given to the impact of the cluster concept in policy-making. The range of policies claiming to support clusters suggest a widespread reorientation of regional development goals around models of cluster development. However, it has been argued that the concept is merely a re-packaging of existing development approaches and measures under a fashionable new brand rather than a significant change in policy design and delivery. Given the diversity of policies that has appeared, it is timely to review whether these new economic ideas have been reflected in innovative approaches to public interventions in regional development systems.

The following paper examines how the cluster concept has been interpreted in a number of European cluster-based policies, focusing on the internal processes by which policy has been developed in different institutional and strategic environments. Indeed, it is the paper’s contention that attention on the economic realities and impacts of clusters have distracted from what may be the most important effects of the current enthusiasm for the cluster concept: its role in giving a focus for regional development policy, especially in regions and countries where such policy has been fragmented between a range of competing organisations and policy areas. Research for the paper has been conducted under the Euro-Cluster project led by the European Policies Research Centre at the

University of Strathclyde. This was a comparative study of cluster policy in Europe which involved in-depth case studies of cluster policy in seven regions.¹

The paper is structured in three principal sections, followed by a set of conclusions:

- i. a review of the key trends in policy towards regional economic development in recent decades and how the emerging cluster approach fits into these traditions;
- ii. a description of the case-study methodology used in the paper and the criteria for selecting the case-study regions; and
- iii. a comparison of cluster policy-making processes in the seven regions in two critical areas: the use of the cluster concept as a tool for understanding the processes of economic development at regional level; and the concept's impact on the ways in which regional policy are formulated and delivered.

The cluster approach and regional development

Interpretations of the cluster approach have been as diverse as they have popular. Its manifestations range from policies encouraging low-resourced, small-group business networks without a particular sectoral focus to complex, large-scale programmes of coordinated measures targeting a specific, geographically-limited industry. What these different policies have considered a 'cluster' has also varied significantly in terms of its sectoral breadth, density and permanence of its internal linkages, longevity, economic value to the surrounding economy and the extent to which its competitiveness is intrinsically linked to a particular territory (Enright, 2000). Nonetheless, where cluster policies have emerged in Western Europe, they have generally been rooted to the different spatial policy traditions of different countries. Cluster policies produced at national level have been mainly linked to the parts of government which are responsible for regional economic development (Raines, forthcoming).² At sub-national level, the policies have tended to be promoted by regional development agencies or tied to local development strategies. In either case, the cluster approach has principally been used as an instrument of spatial development.

To understand how the cluster concept has attached itself to spatial development policy traditions across Europe, it is necessary to review the evolution of regional policy in recent years. In this context, 'regional policy' as it has taken form in Western Europe can

¹ While the analysis and conclusions of the current paper are the author's own, they have been largely based on the fieldwork reports of the following University of Strathclyde researchers: Dr Peter Ache (Nord-Rhein Westfalen), François Josserand (Arve Valley), Mary Louise Rooney (Limburg) and Sandra Taylor (País Vasco).

² For example, cluster policies have been initiated or are under serious consideration by the following regional policy ministries: the Ministry of Interior (Finland), DATAR (France), the Ministry of Local Government and Regional Development (Norway) and the Department of Trade and Industry (the UK).

be widely defined. It can have a narrow definition, consisting simply of measures focused at individual businesses but with regionally-differentiated rates of award, or it can encompass a range of instruments designed to influence a specific regional environment as a whole (Bachtler, 2000). In some countries, notably Scandinavia, two definitions of regional policy are explicitly used: the 'narrow' (referring to a restricted set of largely business support schemes) and the 'broad' (which covers the totality of government expenditure in different parts of the country and its contributions to spatial development) (Raines, 1999). Regional policy can also be defined with regards to the levels at which policy is formed, as such policies can be devised through central ministries or by regionally-based organizations.

In all its forms, regional policy has remained focused on the problem of differential spatial development within a national economy. From before World War Two, European governments have operated specific policies to redress regional economic disparities (Armstrong and Taylor, 1993). Varying motives prompted the articulation of policies, but the two principal theoretical justifications for policy action were social equity – alleviating regional poverty as kind of area-based welfare - and economic – in which sustained economic growth at national level was viewed as dependent on balancing inter-regional development. Traditionally, regional policy has been based on the use of financial incentives to influence location decisions by companies, the 'narrow' definition employed above (Yuill, Bachtler and Wishlade, 1999). By attracting companies to invest in less-developed regions, governments were effectively providing subsidies to reduce local unemployment (thereby addressing 'social equity' concerns) and helping to create more even development trajectories between differing regions (as part of its 'economic' concerns). Over time though, a regional dimension was applied to other policy areas. Territorial differentiation of award rates and eligibility criteria were introduced into other national policies for business support (such as skills training or business advice). Additionally, specific policies to regenerate areas facing distinctive development problems were introduced for some regions, such as the northern area programmes in Norway (for regions experiencing severe peripherality) and southern Mezzogiorno region in Italy (for regions suffering from entrenched underdevelopment).

More recent trends in regional policy have deepened this shift towards greater regionalization while at the same time involving a broadening of the approaches to spatial development. Indeed, a wider variety of measures with a spatial focus has been implemented by governments. This has taken place not just in terms of policy instruments – for example, the proliferation of regionally-differentiated financial assistance programmes (UNCTAD, 1996) – but in the areas of business or regional development on which they are concentrating (such as support for RTD within enterprises or skills training). There has also been an increasing trend towards integrating different policy measures together into a single, programme-based regional development strategy (Bachtler, 1995). In the latter context, a key role has been played by the Structural Funds in developing more strategic methods of facilitating regional economic development. By encouraging a programme-based approach to combining different measures to address particular regional challenges, the advent of the Structural Funds has encouraged more experimentation in regional development policies. As a result, greater recognition is being given in policy to the idea that differences between regions require

differentiated policy approaches and that such differences derive from variations in economic development processes.

The emergence of more region-specific strategies – even where using standardized policy instruments, such as financial assistance for business investment or skills re-training - has been linked to a series of other policy developments. These set the context for the widespread adoption of the cluster approach in regional economic development over the last decade. The most important trends can be seen in changing policy attitudes towards: the regional business environment; regionally-based businesses; and the interaction between the spatial environment and businesses.

First, policy interventions in support of the regional economy have adopted new ways of understanding and influencing the *regional environment*. Increasingly, policies are envisaging regions as “unique set(s) of relational assets” (Lagendijk, 1999, p.111), in which policy should focus as much on the interaction between the existing assets as on the improvement of each asset in isolation. A more integrated approach is evinced in these policies than more traditional forms of intervention, which typically concentrated on the attraction, development or retention of a specific asset. What is more significant now is how policy can embed those assets in the local economy and augment the number and value added of the linkages between those assets and the wider regional economic environment.

An example of such embedding can be seen in the changing approach to FDI promotion. Inward investment attraction has been a traditional feature of regional policy. Originally, financial subsidies for capital investments were used to capture large projects because of the direct employment and income effects and the indirect impacts on levels of innovation and skills in the local economy. Increasingly though, policy has shifted towards improving the value of foreign investment in the local economy through linking foreign investors to local supply chains, usually through supplier development programmes or by deepening links with local research providers (Brown and Raines, 2000). Also, policy has sought to increase the value of the FDI assets themselves, often by promotion agencies working with local investor subsidiaries to raise their intra-corporate status and attract higher value-added follow-on investment to existing sites.

Second, regional policy has developed new targets within the *regional business community*. Greater attention has been given in policy initiatives over the past decade to indigenous SME development (OECD, 2000). The focus on SMEs and new business start-ups reflects both a recognition of the significant role of SMEs in employment creation as well as a desire to avoid regional economic dependency through support for large investment projects. It can be seen in the profusion of programmes to encourage entrepreneurship, facilitate new firm formation and assist small enterprise growth. It is also evident in the shift in FDI policy towards diffusing the benefits of large investors through supply chains often consisting of locally-based SMEs.

Lastly, the *relationships between businesses and their regional environment* are being considered in new ways by policy (Asheim, 1999). The sources of regional competitiveness have been increasingly cast in terms of the knowledge and innovation

capacity of local enterprises. A more sophisticated distinction has been made between *knowledge generation* – which has traditionally been supported through the RTD measures of national industrial policy - and *learning* – which entails examining the local systems supporting such learning, not just in individual businesses but in the wider economy (Temple, 1998). The policy focus on what makes enterprises more innovative has prompted questions about the external environmental conditions which support innovation. It also underlies an emerging conception of regional development as a self-regenerating set of processes that influences enterprise innovation, both individually and collectively as industries.

The focus on innovation has been a critical part of this process, in particular the insight that innovation is a localized phenomenon requiring policy to take greater account of the specific features of both the local economy and the individual business to be effective. Proximity has been central to changing approaches to understanding the relationship between innovation and local economic competitiveness (Storper, 1995 and Cooke and Morgan, 1998). The capacity for companies to develop and maintain competitive advantage in certain sectors has been linked to the extent to which uncodified knowledge and learning abilities have been embedded in specific economic environments. As a result, innovation is related to two other areas of increasing policy interest. The first is business networking, as economic and social links between related businesses have been regarded as central to the generation of innovative knowledge as well as its dissemination and productive industrial application. This can take place through formal ties – such as joint RTD among businesses, occurring in significant numbers where there is a large pool of potential partners – as well as more informal connections – such as the transfer of shared expertise through the circulation of personnel in a common labour pool. The second area is indigenous SME development, as innovation is no longer exclusively seen as the product of large firms with substantial resources but groups of smaller firms making often incremental changes that feed into larger-scale innovative shifts in the local industry.

This has been reflected in the profusion and regional focus of innovation support policies over the past decade. For example, greater attention has been given by policy-makers to accelerating the commercialization of university research, notably by encouraging industry-university networks to form. Similarly, initiatives have been proliferating which improve the skills and capacities of smaller companies to develop their innovative ideas. Above all, it can be seen in the *systemic* approach increasingly adopted by policy, in which innovation is characterized as function of a regional economic system rather than the product of a specific set of companies (Cooke and Morgan, 1998). This has been most visibly manifested in regional innovation strategies to support the emergence of economic environments more conducive to encouraging innovative enterprises (Downes *et al*, 2000). These policies have been characterized by a changing mode of public sector intervention, shifting from what Nauwelærs (2001) has described as support for *physical* capital (such as equipment) and *human* capital (skills training) to *social* capital, especially the relationships between the major innovation actors in the local economy. As she commented: “emphasis is on improving the capacity of economic actors to develop linkages within and outside the firm, in order to access and use (the) inputs

(necessary for innovation), and to develop their learning abilities and thus apply more strategic behaviour in innovation” (Nauwelærs, 2001, p.94).

Reinforcing this change to a more localized approach to regional development has been new bottom-up forms of delivering local economic development policy. This has centred around the changing role of the national level in both designing and administering regional policy. Occasionally characterized as a decline of national level governance, it perhaps should be regarded more as a shift in tasks, in which national ministries have a monitoring and overseeing responsibility, and frequently do not dictate the content or control the delivery of policy (Yuill, Bachtler and Wishlade, 1999). While most evident in the administrative devolution of regional incentive policy to sub-national tiers of governance, it is also clear from the rise of initiatives by locally-based organizations. In large part, this has been prompted by two processes encouraging more ‘bottom-up’ economic development policies. First, as already noted, the introduction of the Structural Funds has given an incentive to local partnerships of economic development organizations to design programmes specifically for their regions, often encompassing the innovation system ideas noted above (Bachtler and Taylor, 1996). Second, the emergence of Regional Development Agencies (RDAs) as semi-autonomous policy institutions with geographically-limited development remits has been accompanied by a series of regional economic development strategies (Halkier and Danson, 1997). RDAs bring together a range of development policy functions at regional level, enabling a regionally-differentiated approach to economic development to be pursued. Often closely involved in the design of Structural Funds programmes, the combination of decreasing national control, new resources and new regional institutions has led to a greater diversity within regional policy, in which region-specific strategies are formed to make use of local resources and harness local actors.

Against this background, the cluster concept has been highly attractive as an approach to regional development because it brings together so many of these thematic strands of policy. In Western Europe, its popularity can be seen in the range of cluster policies which have sprung up at national and regional level (see for example, OECD, 1999 and den Hertog, Bergman and Charles, 2001). As Nauwelærs (2001) has noted, the term ‘cluster policy’ covers a wide diversity of policies, ranging from a-sectoral networking initiatives to complex programmes of industrial development. Indeed, the term ‘cluster’ itself involves a degree of definitional confusion, as it has strong kinship to related concepts such as ‘regional innovation systems’ (eg. Cooke and Morgan, 1998), ‘innovation milieux’ (eg. Camagni, 1996) and ‘industrial districts’ (eg. Asheim, 1996) to complicate its discussion as a separate entity. Similarly, it has prompted a variety of distinct but often overlapping approaches to spatial development, ranging from those concentrating on: improving the ‘national competitive advantage’ to enhancing local SME competitiveness to improving industry-research collaboration at different spatial levels (Boekholt and Thuriaux, 1999).

Although most commentators note the deep historical roots of the cluster approach, it has been widely described as a significant paradigm shift in regional development policy (see for example, Feser, 1998, Legendijk, 1999 and Mariussen, 2001). Cluster theory was originally outlined and promulgated by the work of Michael Porter (especially Porter,

1990), though in the context of regional economic development, it has been applied most actively by Enright (1996 and 2000) *inter alia*. It is Porter-style clusters – with its basic conceptual structure of a system of inter-linked factors underlying cluster competitiveness – which has had the main influence on cluster policy development, though the value of his analysis and its ability to guide policy-makers has been actively debated (see, for example, Davies and Ellis, 2000). While space does not allow a full review of the literature regarding the cluster concept, it is important to underline the distinguishing features of the concept that have been regarded as marking a major break with existing policy traditions. Although a full review of cluster policies in Europe remains an outstanding research task, an initial survey of policies in support of cluster development reveals several of these features (Enright, 2000 and Raines, 2000). They clearly reflect the way the cluster concept has been linked to the existing mesh of regional policy developments reviewed above while extending the trends into new areas.

First, cluster policies generally concentrate their support in networks rather than individual firms. Measures tend to provide common resources for a group of inter-related firms – such as specialized infrastructure or specific skills training programmes - or to encourage linkages between and amongst firms and research providers (eg. CEC, 1999). The policy goal is to facilitate the development of a network rather than promote the growth of individual agents within that network. In this, cluster policy has been presented as a natural evolution of Lagendijk's concept of regional policy targeting the relationships between a region's 'relational assets' rather than the assets *per se*.

Second, following on from this point, cluster policy is generally concerned with only *selected* networks. This is not always the case – as will be seen in the case-study analysis later in this paper – but usually, the first stage of designing a cluster policy is the identification and choice of which clusters in the economies should be supported (Benneworth and Charles, 2001). The approach enables the concentration of policy resources in the parts of the region's industrial structure which are likely to show the greatest benefit, a form of 'picking winners', but one that is perhaps more sophisticated than the traditional industrial policy goal of supporting indigenous champions. Where a local development strategy has been steeped in the cluster concept, this has implications for the model of regional economic growth being advocated. Rather than addressing the systemic needs of the local economy as a whole, policy is preferentially favouring the development of a handful of sectors. By boosting the competitiveness of these sectors, a form of 'growth pole' approach is effectively being promoted. The aim – whether explicit or not – seems to be for these sectoral value chains to become the 'spines' around which wider economic development can take place.

Third, cluster policies emphasize the importance of enhancing innovation and learning within the cluster (Lagendijk, 1999). In this respect, the policies overlap extensively with more traditional innovation support policy areas (Nauwelærs, 2001). What is perhaps new in the policy is the targeting on particular sectors rather than the innovation system of a region as a whole, operating on the implicit principle that innovation is a function of specific networks which are a subset of the innovation system as a whole. Indeed, within such policies, clusters can be defined as networks which are bound and delimited by intensive and repeated knowledge transactions occurring far more often than in other

parts of the economy, thereby requiring fewer policy resources to generate step-level changes in industrial competitiveness.

Lastly, while cluster policy is a feature of governance from sub-national to international levels, it has been actively taken up by regional-level agencies (Raines, 2002a). The cluster concept appears to lend itself well to the strategic, integrated approach of regional development agencies (Danson and Whittam, 1998). Moreover, it has provided a useful concept around which regional economic strategies can be based, as seen clearly in the recent strategies of the newly-formed English Regional Development Agencies (Benneworth, 2000). The enthusiasm with which local policy bodies have taken up the cluster approach suggests that it has strengthened the move towards more locally-based development approaches in Western Europe.

Comparing European cluster policies: a methodology

From the above discussion, it would seem that the cluster approach not only exemplifies many recent trends in regional policy but fuses them into a new paradigm of local economic development. It could be argued that its popularity as a policy tool is because it combines these different policy strands in a simple conceptual framework. Nonetheless, questions remain over whether these various cluster policies merely reiterate these new regional development concepts or whether they provide genuinely new ways of undertaking policy analysis, design and delivery. The links between the cluster approach and existing policy trends are clear. What is more opaque is whether the cluster approach in itself represents a new trend in regional development policy-making. In discussing the interest of an earlier generation of policy-makers in 'industrial districts', Harrison (1992) wondered whether the concept was just a 'faddish' variation of existing policy ideas, introduced little into the understanding and pursuit of regional development, or indeed, whether it did extend existing approaches into new areas. The same doubts can be cast in the case of the cluster approach.

To assess whether the cluster approach has resulted in real changes in approaches to regional development, the European Policies Research Centre undertook the Euro-Cluster project to examine how cluster policies had been pursued in seven different European regions. The regions were selected in order to present a variety of regions and approaches, though all had in common a self-proclaimed set of measures for influencing cluster development. The seven regions were: the Arve Valley (France); Limburg (the Netherlands); Nord-Rhein Westfalen (NRW) (Germany); Östergötland (Sweden); País Vasco (Spain); Scotland (the UK); and Tampere (Finland). Short descriptions of the policy contexts of each are presented in the appendix.

Before comparing the cluster policies in these regions, it is important to stress the differences between them. There are differences in terms of the scale of policy, ranging from very large dedicated budgets in Scotland (approximately €360 million over six years) and NRW to far more limited one in the Arve Valley (approximately €5 million over two years) 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 NRW), 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.

Table 1: Case studies compared

	<i>Population ('000s) 1996</i>	<i>Unemployment rate (%) 1997</i>	<i>GDP per capita 1996 EU=100</i>	<i>Main cluster policy focus</i>
Arve Valley³	60	10.5	100.4	Metal-cutting industry
Limburg	1,135	5.4	97.8	No specific sectoral focus
NRW	17,920	9.0	109.7	17, including: new materials, transport & logistics, ICT, micro-system technology, medical technology
Östergötland⁴	420	4.9 (1999)	92.4	ICT, software development, medical technology, food, wood products
País Vasco	2,069	18.8	92.3	Machine tools, automotive, white goods, port facilities, shipbuilding, ICT, environment, energy, aeronautics, paper
Scotland	5,128	8.0	98.3	Semiconductors, biotechnology, food & drink, tourism, creative industries, optoelectronics, forest products
Tampere⁵	450	13.3 (2000)	91.7	Mechanical automation, ICT, healthcare technology, media services, knowledge-intensive business services

This highlights the need for caution when making comparisons. 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 a range of different aspects of building clusters – such as providing common infrastructure, encouraging cluster linkages and developing joint marketing - while other policies only concentrate on single aspects of cluster development, as in Limburg, where the focus is principally in developing project-based cooperation between firms. Indeed, although supporting cluster development, the Limburg policy is also distinctive for its lack of sectoral focus.

Nonetheless, the approaches which each region have developed to supporting cluster activity represent individual solutions to common challenges arising from their economic and policy environments. To examine these challenges, the current paper will study how cluster policies have been developed in each region and whether the cluster concept has introduced new approaches to regional development policy-making. In this context, policy-making can be considered as a multi-stage process – at any one stage, the

³ Figures for GDP per capita are given for the Rhône-Alpes region, of which the Arve Valley is part.

⁴ Figures for GDP per capita are given for the Östra Mellansverige region, of which Östergötland is part.

⁵ Figures for GDP per capita are given for the Etälä-Suomi region, of which Tampere is part.

adaptation of the cluster approach has the possibility of altering the processes of regional policy-making, its goals and its instruments. Four stages were considered in the project, partly echoing the wider policy ‘life-cycle’ model outlined by Hogwood (1987):

- *analytical*: an analysis is made of the needs of the economy and the scope of existing policy to address those needs;
- *developmental*: where the analytical stage uncovers a pressing area for policy to address, the relevant policy-making institutions undertake the necessary partner consultation, definition of key policy objectives, resource review and policy tool investigation and decision;
- *implementation*: the delivery mechanisms for the policy are established, along with review procedures, selection criteria (if appropriate), budgets and a timetable for implementation; and
- *evaluation*: the impact of policy and its efficiency in achieving those outputs are evaluated, the results then being fed back into new analytical and developmental stages of policy-making and refinement.

The present paper will only focus on two of these stages with respect to cluster policy: *policy analysis*; and *policy development* (though the latter will also include consideration of the delivery mechanisms put in place for cluster policy as well). These two stages cover the creation of policy, which is the main concern of this paper.

Within cluster policy, *policy analysis* entails identification of the need for policy intervention and the points at which intervention can take place. There are two aspects to the analysis stage. First, recognition of problems and opportunities which should be addressed by policy is required. In the context of the cluster approach, this typically involves the application of a model of cluster development to the local economy as a form of elaborate SWOT analysis. Cluster analysis enables policy-makers to determine how supporting clusters can influence economic development – its place in the policy approach to regional policy. It also considers which clusters should be selected for assistance - a process which demands political as well as economic judgments about policy priorities – and which parts of the cluster should be supported. The second aspect to this stage is an audit of existing policy: do current measures address the problems and opportunities uncovered in the economic analysis or do the latter require new policy initiatives?

The *policy development* phase in the cluster approach can involve novel policy-making processes. In developing the objectives, measures, targets and resources of a cluster policy, consultation with the private sector has been frequently cited by policy-makers as a critical aspect of policy development (Raines, 2000b). Given that the goal of cluster policy is to energize business networks and redress any market failures hindering their development, it is important that the main agents of cluster policy are fully engaged with the design and implementation of policy. This can bring new actors into the process of regional development policy-making and lead to a different division of responsibilities

between the private and public sectors. It can also result in the design of new policy measures and delivery mechanisms for pursuing cluster development if the existing policy framework is found inadequate.

The following two sections examine each stage in terms of whether the cluster concept has resulted in a paradigm shift in regional policy-making in the seven case-study regions. The first considers how the cluster approach has altered the analytical processes of policy, particularly the extent to which it has ushered in new understandings of how regional development takes place. The second looks at whether the concept has had lasting influence on how regional policy-making occurs in each of the regions.

The cluster approach as a new model of regional development

Given the semantic confusion surrounding the cluster concept, it is difficult to define a cluster model and apply it to regional development processes. It could be argued that the cluster concept only provides a description of activities within a regional economy, a sophisticated form of input-output analysis which can improve sectoral classifications in economic analysis but add little to an understanding to the sources of regional competitive advantage and how they can be influenced by policy. Even Porter's 'diamond' of competitive advantage offers little insight into the scope for government action, as the emergence of the four elements supporting a cluster's competitiveness is largely attributed to historical factors; indeed, Porter - at least in his original formulation of cluster theory - argued strongly against strong government intervention in cluster development (Porter, 1990).

Nevertheless, implicit within the cluster approach in the majority of its manifestations - and in nearly all the seven case-study regions - is a model of how regional economic development can be influenced. While questioning the extent to which the concept could be considered a self-contained model of regional development, Feser argued that the cluster approach was "a comprehensive description of how economic and geographic interdependencies are integral to regional growth and development approaches" (Feser, 1998, p.36). As a model, the cluster approach is meant to be complementary to other spatial development policies, but it does claim some priority in setting overall objectives by asserting the main development drivers of a regional economy. By focusing on the most competitive areas of the economy, the cluster approach suggests that regional growth is a function of key sectors, a paradigm that re-presents much of traditional 'growth pole' theory within the context of new theories linking technological development to economic growth. Regional growth as a whole becomes significantly dependent on the strength of individual clusters and the extent to which other parts of the economy can benefit from the latter's expansion. While such a model of the regional economy is not intended to be exclusive, it does suggest that policy assistance should be more systematically preferential than has been the case for regional development policy.

In consequence, one of the principal benefits of the cluster approach to policy-makers is whether the new set of analytical tools have generated new ways of analyzing and understanding the regional economy and the processes of economic growth. Cluster

analytical tools were used in six of the seven case studies - Limburg being the exception, as a specific sectoral emphasis was not adopted in its cluster policy - and in all cases, the analysis was regarded a valuable part of the cluster policy-making process. Techniques used to undertake the analyses varied considerably in their methodological rigour and complexity. In Scotland and the País Vasco, analyses of the regional economies in terms of their clusters were made by Monitor, the consultancy company closely associated with Michael Porter, and entailed large-scale statistical exercises based on complex input-output modelling. In contrast, less elaborate methods were used in Tampere (where clusters were defined along traditional sector value chain lines and identified using employment size and growth rates) and Östergötland (where the region's main clusters were identified largely on the basis of extensive interviewing with academics, consultants and policy-makers). Nonetheless, the *value* of the cluster analysis was common to all the regions which undertaken it and similar benefits were reiterated in each case.

First, cluster analysis generated benefits in terms of an overview mapping of clusters in the economy, particularly the cross-sectoral networks. Generally, the analyses did not bring to light any new competitive sectors of which the policy-makers were unaware. For the most part, analysis reinforced existing knowledge, though in at least one case, statistical anomalies in the analysis missed a cluster which the policy-makers knew existed in the economy (automotive components in the País Vasco). However, analysis could be important in tracing links between different industries which might not otherwise have been apparent. For example, mapping of the food and drink sector in Scotland sharpened policy-makers' understanding of the breadth of the value chain in different niches within the sector.

Analysis was also significant in drawing attention to the existing and potential sources of competitive strength in clusters. This was particularly the case in identifying emerging and/or unexploited research strengths in a local economy. In some regions, it underlined the scope for the commercialization of research within university departments, either through spin-off companies or joint research projects with local businesses. For example, in Östergötland, it highlighted how software development research in the University of Linköping had become a critical source of employment and new business creation in the local economy, while in Tampere and NRW, it showed how biotechnology and healthcare research could become such sources. Such competitive strengths were not restricted to research excellence, but could include a local pool of specialized labour skills. The best example of this was the Arve Valley, where the national-sponsored cluster analysis of France identified the metal-cutting craft skills tradition of the region as a key element in its economic competitiveness (TECSA, 1999).

Second, analysis facilitated the refinement of policy by assessing where the gaps in the region's clusters lay. As the cluster concept implies that cluster development is a systemic process, requiring the successful integration of a series of different factors, cluster analysis could be important in highlighting the factors which were weak within the system. These weaknesses were presented as a variety of 'gaps', either in the local supply chain or in the wider competitive advantages of the regional economy. Examples of both types of gap can be seen in the analysis of the Scottish semiconductor cluster. Supply chain gaps included the lack of an indigenous 'fab plant', making the

development of such a plant one of the priorities of the cluster programme. Similarly, Scottish strengths in semiconductor research were not supporting the region's competitive advantage because of the mismatch between university research interests and local industry's needs; the policy response has been to support greater dialogue and networking between research providers and businesses in the cluster.

A distinctive approach to how analysis can be used to audit cluster competitiveness was the case of Limburg. As part of the Regional Technology Plan, cluster policy neither existed as an independent policy area nor targeted selected clusters within the economy. For the most part, cluster measures focused on promoting networking among self-selecting groups of businesses. However, the concept had an impact on the way in which innovation policy has been conceived in the region, informing the regional understanding of the business innovation life-cycle (Province of Limburg, 1996). The RTP set out five stages to the life-cycle: 'sensitization' (raising the awareness of the importance of innovation); 'access to knowledge' (making innovative knowledge accessible to companies); 'improvement' (enhancing the enterprise's capacity to make use of innovative knowledge); 'innovation' (supporting innovation projects and technology transfer); and lastly, 'cooperation' (facilitating innovative business networks and clusters). Through the life-cycle approach, the Limburg RTP identified policy actions appropriate for each stage of innovation development, including encouragement of clustering behaviour in the final stage. The cluster concept did not so much transform the innovation model for economic development within the region, but provided a meso-level link between innovation within individual enterprises and wider technological growth in the local economy.

Lastly, analysis could clarify the basis on which a region's clusters could be assessed as fitting goals of policy. While this was not the case for all the case-study regions - several had relatively informal procedures for cluster selection - analysis could be used to set out criteria on which to determine which clusters should receive policy assistance and how the value of that assistance could be evaluated. The criteria could be both internal and international. For example, in Scotland, the competitiveness of the different clusters identified by analysis was compared using a combination of measures of their domestic performance (such as employment growth rates relative to the Scottish economy as a whole) and international benchmarking (such as the Scottish cluster's international standing). This had two potential benefits in the policy-making process: it ranked clusters in terms of their likely contribution to the overall economy; and it provided targets and benchmarks for the cluster by which the policy could be assessed in the future. In consequence, the cluster concept could act as an effective device for determining policy priorities and deciding how and when to change those priorities over time.

Overall though, the cluster approach did not produce distinctively different paradigms of economic development within regional policy-making. In very few of the case studies did it appear to have led to new insights into regional development *processes*. Its omissions have been most glaring with respect to two sets of critical linkages between policy and development. In none of the case studies was there a clear understanding of how the different cluster measures were meant to produce the critical mass which would

ensure the cluster could become self-sustaining entities no longer in need of substantial public intervention. Moreover, it was not obvious how - and if - support for clusters would assist the regional economy as a whole through multiplier effects. The catalytic impact of cluster policy continues to be based on conjecture rather than a better grasp on the relationship between policy and regional growth.

Nonetheless, the cluster concept has been a useful complement to existing models of economic development employed by policy-makers. It has been an effective filter of policy action by concentrating attention on those parts of the regional economy which are both most competitive in international terms and most likely to benefit from public sector interventions. It has provided a robust framework for determining which aspects of a cluster should be targeted by policy, enabling policy resources to be used more effectively. It also encouraged a shift in regional development policy towards a focus on common sources of competitive advantage in the regional economy, particularly with respect to research excellence and the commercialization of university-based research.

Moreover, in spite of its fuzzy conceptual utility, the cluster approach has been welcomed by many policy-makers as a means of systematizing the framework within which regional development is conceived. As will be described in more detail in the following section, the cluster concept formed an important backbone in the regional economic strategies of several of the case-study regions. In Scotland, it was given a high profile in the strategy documents for the region's main development body, Scottish Enterprise (1999). Cluster development was a key strand within the development strategies for Östergötland (through the Regional Growth Agreement developed in 2000) and Limburg (the Regional Technology Plan) (Province of Limburg, 1996). For the City of Tampere, it was the main development concept guiding the city's business assistance plans as outlined in its 2000 strategy. Finally, for the Objective 2 Structural Funds programme for NRW for the period 2000-06, 'competence clusters' were included as criteria for determining project selection and award rates. In many of these cases, the cluster approach did not so much lead to a new model of regional development, but through the rigour of undertaking an analysis of the economy's strengths and weaknesses, contributed to developing a more strategic approach to economic development in the first place.

The cluster approach as a new model of policy-making

In examining the impact of the cluster approach on the second phase of policy-making – the way in which policy is developed - the issue is whether applying the cluster concept to the development needs of a region necessitates new forms of policy-making. On first inspection, new policy-making mechanisms – or at least alterations to existing ones – would seem to be required to accommodate cluster policy. As has been shown above, the cluster approach introduces a greater *specificity* into policy-making because of its application to delimited parts of the economy and to particular elements within them. Consequently, cluster policy has information needs that the traditional policy-making may not be able to address (for example, expert knowledge about the research strengths and commercial competitiveness of a particular industry). In addition, as cluster policy tends to involve the use of a variety of different types of policy measure, the policy

development stage can demand a more *comprehensive and integrated approach* than hitherto.

To assess whether the cluster approach has resulted in new approaches to policy-making, the main features of policy development were studied in the case-study regions:

- the overarching *policy framework* for the region, governing the main policy priorities and framework for public sector intervention;
- the level and composition of *policy resources* allocated to regional development;
- the specific *measures* used in developing clusters; and
- the *delivery mechanisms* for the cluster policy.

The strategic framework of cluster policy

In examining the strategic framework for developing the cluster policy in the different regions, it is important to determine whether cluster policy exists as a separate area of policy-making. Did the policy emerge independently of other policy-making systems or was it an adjunct to the existing processes by which regional development policy was formulated? Perhaps more importantly, did the cluster approach shape the strategic priorities and objectives of spatial policies as a whole?

While ‘cluster policy’ itself can be difficult to define, within the case studies, it often constituted a significant, relatively autonomous area of policy-making. In most cases, it was intended to complement the existing strategic framework for economic development in the region rather than supplant it. However, the process of designing the policy had important ramifications for the systems and procedures for regional policy-making in the different regions. This was particularly apparent in four of the case studies, where cluster policy existed as a separate policy area - the Arve Valley, the País Vasco, Scotland and Tampere – though in the case of the Arve Valley, its impact on other policy areas has been decidedly muted, as the following sections demonstrate.

- *Arve Valley*. Cluster development in the region has been subject to an uncoordinated mixture of *ad hoc* national and regional initiatives. The only systematic approach to cluster development has been at the national impetus though. National measures were introduced by DATAR as part of a pilot approach to supporting projects for local clusters (or *systèmes productifs localisés*, as they are termed in France) in 1998, in which project awards were made to local partnerships. In the case of the Arve Valley, it funded the development of an industrial association, which existed alongside a series of regionally-based measures in support of the cluster, covering different aspects of training, commercial and technological intelligence and joint marketing within the cluster. While the regional measures were part of existing regional strategies – or ‘contracts’ – the nationally-funded project did represent a decisive shift in national regional policy and brought together new actors at regional level in the design and delivery of the project. However, its wider influence has been highly limited to date, and at neither regional nor national level has it changed the current system for policy-making.
- *País Vasco*. The cluster approach represented a distinct break with existing policy traditions in the País Vasco. The region’s Autonomous Government introduced cluster policy as a new policy area in addition to its existing innovation and RTD-related measures. The policy principally consisted of government support for the establishment of largely self-selecting cluster associations and the subsidy of several initiatives, as laid out in the *convenio* agreements made between the government and these associations over a period of several years. While cluster development nests within the wider strategic framework governing Basque economic development, its promotion represented a marked strategic shift by the Basque government in its industrial development priorities: cluster support has been one of the strategic priorities of the territory’s successive development frameworks through the 1990s and into the new century. However, as an area of policy-making, it has largely operated outside the existing policy-making structure, involving new agents through the extensive consultation with the private sector in the design and delivery of the policy (a point discussed in more detail later in this paper).

- Scotland.* As in the País Vasco, cluster policy in Scotland was a separate area of policy activity. Perhaps the most extensive of the policies investigated in this study, the policy consists of seven cluster programmes operated through Scottish Enterprise, the main economic development organization in Scotland. The impact of cluster policy-making within Scotland has been similarly extensive. It involved the introduction of private sector actors into the policy process in a more intensive fashion than hitherto. It has been a significant factor in integrating the different policy activities of Scottish Enterprise around cluster goals – for example, with respect to inward investment promotion and training – as well as in creating stronger links between the geographically-extended parts of the Scottish Enterprise network (through its network of Local Enterprise Companies). Lastly, cluster development has featured as part of the overall strategy of Scottish Enterprise, though as a supplemental not a core focus of the agency’s activities. What is less clear is whether the cluster approach will act as a paradigm shift in Scottish Enterprise development policy or a short-term experiment with a different policy approach. As with many other regions in the study, the policy has been pursued outside of the normal policy-making networks – principally through a series of specially-formed and short-term working groups - and its longer term integration into traditional policy activities has yet to take place.
- Tampere.* A similar approach to the Arve Valley was followed in Tampere, but as part of a more extensive cluster development programme. The Centre of Expertise was launched by the national Ministry of Interior in the early 1990s as a means of encouraging the development of key industrial competences in the different regions. Through the scheme, programmes would be submitted by each region for joint funding over a period of several years. In the case of Tampere, three programmes received funding in the first round (1994-99), and an additional one (as well as the renewal of the existing three) in the second (1999-2006). The design of the programmes was undertaken by the main local bodies and locally-based national agencies in the region in cooperation with each other. As a policy, it existed wholly outside the other policies pursued in the region, but it has catalyzed a degree of reorientation in the development strategies of both the City of Tampere and Tampere Region, both of whom have dedicated priorities to cluster development (though in neither case has the cluster concept shaped the documents as a whole).

There is significant variation between these four different policies. They range from small-scale projects – as in the Arve Valley – to substantial programmes of largely new actions – as in Scotland. Several key points can be noted here about their influence on wider policy-making processes, in terms of the role of the cluster concept as an appendix, an experiment and an integrator within the regions’ wider strategies.

First, cluster policies have largely been add-ons to the existing strategic approaches to economic development in the four case-study regions. Cluster development did form important parts of development strategies in the cases of the País Vasco, Scotland and Tampere, but they did not reorient the region’s existing strategic goals. There was no suggestion, for example, that a focus on clusters heralded a wider shift of public sector

intervention in favour of the competitive sectors of the economy at the expense of other business activities.

Second, in the cases of the Arve Valley, Scotland and Tampere, cluster policies are still regarded as experimental and for the time being, short-term. This is especially clear when considering the attention given to public sector exit strategies in most of the cluster policies. For all the case studies, cluster policy is explicitly meant to receive time-limited funding only. In some cases, the cluster programmes have been rolled over into new funding periods – as in the País Vasco and Tampere – but nevertheless, the intention by policy-makers is not fundamentally alter the existing systems for policy-making.

Lastly, in spite of its apparently peripheral status to policy-making, cluster policy did involve a strategic integration of existing policy measures which – for the most part – had not been attempted before. In most cases, the cluster policy provided a policy framework from which other policy resources could be drawn. For example, in Tampere, the Centre of Expertise programme supported networking between different companies, research providers and public sector bodies in joint research projects. While the programme enabled the projects to be established through an intensive form of matchmaking, the projects themselves were funded from other policy sources, such as the innovation financing provided by the public agency, Tekes. Even if the approach is only at present experimental in most of the case-study regions, the principle of integrating different policy resources in economic development was an attractive one which had been greatly promoted by the experience of cluster policy

In the three other regions in the study, cluster policy was not a separate area of policy-making, but was incorporated into the development of other economic development strategies. While generally they did not greatly differ in content from the policies mentioned above, their context meant that no separate policy-making networks or procedures were created as a result. The cluster approach was a useful tool in strategic development, but not a defining principle.

- *Limburg*. As discussed above, cluster development was seen as part of the Regional Technology Plan. While it influenced the innovation model on which the RTP was based, it did not entail new policy-making processes within the region.
- *NRW*. Cluster support in NRW consisted of a series of on-going, one-off projects, but given strategic direction by the recognition of cluster development as a priority in the 2000-06 Objective-2 strategy. The Structural Funds programme has provided the main funding for cluster-based projects. Its presence in the programme arose from the intention of creating something ‘durable’ in the NRW economy beyond 2006 because of the likelihood of losing funding with EU enlargement and Structural Fund renegotiations. Nevertheless, while it shows an important shift in NRW regional policy priorities, the cluster concept was accommodated by the existing Structural Funds strategy-making structures in the region. In this, the policy is a natural extension of the ‘process management’ approach to development, with its focus on the regions taking responsibility for developing regional strategies. This model has helped to establish a more decentralised regional policy approach, based on local

partnership between different public and private actors and emphasizing the exploitation of the region's endogenous potential.

- *Östergötland*. As noted above, the cluster approach was part of the Regional Growth Agreement developed for the region. Such Agreements have been required of all the Swedish counties by the national government as a framework for national expenditure in the regions. In drawing up economic priorities for the region's strategy, the cluster concept was an important catalyst for the strategy-making process in Östergötland, but it did not greatly alter the timetable, procedures and participants in strategy development.

Cluster policy resources

The cluster approach could not only change the way that policy-making took place in the regions concerned, but also the distribution of policy resources. It could result in additional resources for regional development, similar to the resources provided by EU funding for regional development. It could also lead to a reallocation of existing regional development funds and a new balance between different policy priorities. The question is whether the adoption of the cluster approach had longer-term implications for the way that regional development is resourced in the different regions.

It is a difficult question to address conclusively. Defining expenditure on cluster expenditure was not always simple within the policy programmes. In some cases, cluster development expenditure was relatively straightforward to identify as it was associated with funding a series of small projects (such as the pilot project in the Arve Valley) and cluster-building organizations (such as the agencies designated with promoting networks and joint research projects in Limburg and Tampere). In total, the sums involved were low relative to other regional policy budgets, either at national level (such as the expenditure on financial incentives) or regional level (such as the resources available to regionally-operated business support programmes). However, in the better-resourced policies, it could be more difficult to establish the outlines of total funding, as the cluster component of expenditure was not always obvious. For example, the Scottish cluster programmes were given individual precise budgets and costed project actions, but the sums do not indicate any wider shifts in Scottish Enterprise expenditure. Many of the actions funded in the cluster programmes were included as part of other, existing budgets, complicating identification of any resource shifts. Also, in some cases, it was hard to determine resource levels where project funding had not yet been awarded. as in the case of the Structural Funds in NRW, where cluster projects are meant to be preferred but are not specifically budgeted.

Policy-makers did not regard cluster policy as a major change to existing policy resourcing. It either took the form of limited funding for small projects which could be identified as supplemental to existing spending or criteria which acted as filters on larger budgets. The example of the Structural Funds in NRW has already been given, but cluster development was also meant to have a notable, though unquantifiable impact on project funding in economic strategies in Tampere (such as the regional strategy overseen by the Council of Tampere Region) and the Regional Growth Agreement in Östergötland.

As the cluster concept was seen in almost all of the case-study regions as a means of concentrating existing policy expenditure and thereby enhancing its effectiveness, it clearly was intended to alter funding priorities at some level. However, these alterations tended to take the form of linking together existing, often disparate policy actions and resources rather than re-directing funding between priorities and budgets. The cluster concept was a framework for integrating rather than re-distributing or expanding regional development funding.

The use of the cluster approach as a way of leveraging funds from other sources demonstrates this principle. For example, the Centre of Expertise programme was co-funded by both the City of Tampere and the regional council and the networking projects it helped to support drew public subsidy from a range of other national and regional business assistance and innovation funding measures. Similarly, in the País Vasco, while cluster policy was directly limited to financial support of the cluster associations, cluster development indirectly benefited from the other public sector assistance schemes for which the associations could apply for different activities.

What the cluster approach has been less successful in achieving is a leveraging of resources from the private sector. Again, this is not easy to determine, as clearly, private sector funds are being secured for cluster development where joint networking projects are involved. However, apart from investment in such services and the purchase of company-specific services, there is little evidence of cluster programmes being funded in a substantial manner from the private sector. They remain largely public sector-directed and funded interventions into the regional economy.

Cluster policy measures

As discussed above, debate has been lively on whether cluster policy generates a new array of instruments or simply re-packages existing measures. The question of the degree to which cluster development demands new policy actions has two aspects: first, have the cluster policies in the case-study regions resulted in new *forms* of policy; and second, even if the type of action is not novel, is the action itself still additional to the existing portfolio of interventions used for economic development in that region. Moreover, in the latter context, to what has one of the main benefits of the cluster approach been its integrative framework for different policy measures?

The case studies demonstrated mixed results on these issues. For the most part, the cluster policies did not produce actions which were unprecedented in the region, nor did it imply a broad shift in the types of measures favoured by policy-makers in regional economic intervention. Similar to the measures which might be used in Structural Funds programmes, the projects supported through cluster policy were largely typical of the region in question. Policy-makers were not called upon to devise policy forms which had not been used in some form in the region – or at least at national level – before.

In the majority of cases though, the actions were at least *additional* to the region's set of policy actions. Only in a few cases could cluster policy be said to have principally consisted of a re-labelling of existing activities, most notably in the case of Limburg. In

spite of the impact that the cluster concept had on the framework for regional development in the province, in practical terms, cluster development consisted of the continuation of an existing networking programme in the region operated by the organization, Syntens. In general, cluster policy called forth new, mainly short-term interventions to address the issues revealed in the policy analysis stage.

This further highlights the key feature of how the cluster concept was applied to regional development in the case studies: the cluster approach was less about the novelty of specific measures than the unique integration of a range of different measures in support of a specific sector. The tailoring of a package of measures for particular cluster programmes has been the main policy-making process in the different regions, enabling the concentration of existing resources through the catalyst of additional funding. In most of the cluster programmes, the measures were designed to address different features of cluster development. These features can be summarized as: the overall reach of the cluster (through community-building measures); the internal relationships of the cluster (primarily by measures supporting linkages and joint projects); and its common sources of competitiveness (measures enhancing the common resources of the cluster).

- Activities in *community building* include the use of associations and workshops to bring potential cluster actors together, cluster-wide communication through websites and newsletters, concentration of most cluster companies in a geographically-visible location (such as a science park) and identifying a common marketing 'brand'. Another important aspect of community-building activities is the provision of common services to assist clusters and their members to act more as a joint entity, such as joint export marketing trips.
- *Linkage* measures, which support networking and specific cooperation projects between cluster agents, are among the most common measures identified in the case-study policies. Networking measures involve both business-to-business ties and links between businesses and research providers (especially university research departments).
- In terms of *common resources*, a key feature of most clusters is the presence of common competitive advantages that are external to individual firms but internal to the cluster as a whole. Common labour markets of specialised skills are one common competitive advantage for firms active in the same economic activity in the same geographical area. Other advantages include special research excellence and other forms of tacit knowledge that are specific to the region. Common resources can involve a variety of inputs and activities, eg. access to key business information, specialised forms of infrastructure, such as science parks and special research facilities in niche parts of the cluster), different types of targeted training, etc.

Several of the case-study cluster policies showed a clear emphasis for one type of measure – such as networking in the case of Limburg and Tampere. For most regions though, a variety of different types of measure was used to support cluster development, brought together through a common policy framework. By way of example, the biotechnology programme in Scotland showed how the different forms of intervention

could address different aspects of the cluster's growth. In terms of community building, the programme recognized a need for common marketing and 'branding', involving activities such as the establishment of an industry website and regular workshops on common business issues. Internal linkages within the cluster would be actively promoted through the creation of a new public-private organisation, the Scottish BioAlliance. Lastly, policy would bolster the common resources on which the cluster drew, notably through infrastructure development (such as incubators and development of applied research centres) and access to finance (such as a specialized biotechnology-specific venture capital funding unit within Scottish Enterprise).

The capacity to integrate traditionally segregated areas of policy was one of the main values of the cluster approach to policy-makers. For example, in Tampere, it was acknowledged by policy officials within the region that the Centre of Expertise programme had been an effective means of providing a focus for the different resources and measures of the Council of Tampere Region, the City of Tampere's business development unit and the local office of the Ministry of Trade and Industry. Similarly, in Scotland, cluster programmes were generally regarded as an important way of drawing together measures undertaken by disparate units within Scottish Enterprise. While these integration frameworks are only applied to single sectors – and there is no hint of them becoming more widespread models for the different policy bodies in the case-study regions – in most of the regions, the cluster approach has strengthened a tendency to partnership and coordination between complementary policy initiatives operated by different bodies or different units within the same agency.

Mechanisms for delivering cluster policy

The last aspect of policy-making to examine is the systems and bodies put in place to deliver cluster policy. As has been shown in earlier sections, changes in the delivery of policy have been central to the emergence of a more regionally-based, locally-differentiated approach to economic development. Has cluster policy led to similar impacts by demanding the creation of new organizations and forms of policy delivery? Has cluster policy instead only resulted in a revamping of existing institutions, or indeed, have been adequately accommodated by the existing mechanisms for policy delivery?

Just as the cluster approach can be best considered an integrating tool for the different conceptual strands in current regional development, the implementation of cluster policy has tended to reinforce the existing trend towards more localized delivery. Typically, they involved agencies (or parts of an agency) which not only had existing expert knowledge of the cluster but also a degree of credibility and status within the cluster (essential if the private sector was to be encouraged into participating in projects). They varied in their origins: sometimes, sectoral associations which have been converted into cluster coordinators (as in the case of several cluster associations in the País Vasco), other times, existing public bodies already carrying out relevant activities (such as the East Sweden Food Technology Centre, within the University of Linköping and the food cluster in Östergötland).

In a number of cases, new organizations 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 coordination. 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.

For the most part though, cluster policy implementation took place via *ad hoc* administrative arrangements that did not transform the existing structures for policy delivery. Implementation involved a sub-contracting of policy responsibilities from the public sector to specially-designated bodies, in which funding and target-setting would be provided by the main development agencies in the region, but the delivery bodies would have significant freedom in how policy was to be implemented. In many cases, the bodies only provided a coordinating role, whereas actual delivery of cluster policy lay with the organizations with traditional responsibility for its constituent policy elements.

However, one critical feature of cluster policy was a greater sharing of responsibility for implementation between private and public sectors (Raines, 2002b). Private sector involvement in the delivery (and in many cases, the design) of policy was pronounced. While the decision about which parts of the economy should receive policy targeting lay firmly with government, joint public-private groups representing the clusters had significant influence in shaping the programmes of policy support. The level of involvement is directly linked to the requirements of government in developing a cluster policy. The private sector can have an important role in providing policy intelligence. Given the significance of cluster policy in being able to target precise gaps in the value chain or business environment preventing the full development of clusters, substantial consultation with private sector agents in the cluster is essential.

Conclusions

The proliferation of cluster policies in recent years demonstrates that there is much in the cluster concept that lends itself well to regional economic development. From Porter's original ideas and drawing on traditions that took in industrial district, innovation and endogenous growth theories, what has come to be understood as the cluster approach, while not quite a cohesive paradigm, has quickly developed into a framework for undertaking policy. In this regard, however conceptually conflicted the underlying theory, the cluster concept is of importance in regional development studies because of its extraordinary popularity. Perhaps no other theoretical construct has had analogous influence on regional development policy in over two decades.

The value of the cluster concept to policy-makers can be considered in two areas: as an analytical model of economic development; and as a system for developing policy

interventions in the regional economy. First, as a model of economic development, the cluster approach links an understanding of geographical agglomeration and economic interdependences with a tool for identifying the points in the economy where policy actions can influence growth trajectories. In its most articulated form, while the model does not explain how the nested development processes link together growth in enterprises with changes in value chains, sectors and the regional economy as a whole, it can provide a sophisticated toolkit for mapping the sources, weaknesses and potential development paths of carefully-defined competitive advantages. As a model for policy intervention, it works on the premise that the limited resources available for regional economic development demand their concentration in the regional economy's 'winners'. Although silent on how such a growth pole approach will have a 'trickle-sideways' effect on the rest of the regional economy, the model clearly understands three key features of regional development: that innovation is the source of regional competitiveness in an ever-more globalised economic environment; that innovation is a systemic process dependent on the inter-relationships of different regional assets; and finally, that a region's 'innovativeness' cannot be considered as a whole but as a series of smaller, sector-based innovation systems, or clusters.

Second, the cluster approach has generated a model of policy-making as an institutional, analytical and political process. While again it has never purported to be revolutionary in any of its many forms, the cluster policy-making model contains greatly enhanced if not necessarily new features which distinguish it from traditional policy development structures. In the new system, the private sector has a greatly expanded role in policy. The cluster approach is more targeted than many other regional development initiatives, and hence, there is a need for more up-to-date and detailed policy intelligence about different sectors which is best provided through the private sector. The approach also depends on a delivery of policy close to the cluster to be effective, frequently requiring the administrative and resource involvement of the private sector. Moreover, the new model demands far greater integration of different types of measures, often the responsibility of competing policy bodies, and so requires a more strategic consensus and practical partnership within the public sector than hitherto.

The seven case-study regions discussed in this paper show indications of these models taking root, but do not suggest that the excitement surrounding the cluster concept is likely to be translated into any paradigmatic shifts in policy. Although several of the policies remain experimental, often pilot projects, none of the regions have been anything more than tentative in their adaptation of the cluster concept. Even where the concept has been adopted because of the promise of 'new thinking' about development solutions, the resulting approach has only been appended to the existing policy structures. For the most part, enthusiasm has been more pronounced where the concept has been more clearly a natural variant of existing policy trends rather than an evolutionary successor. Its chief utility has been as a means of achieving greater theoretical coherence and practical efficiency in the operation of current policies.

The points can be demonstrated by an examination of how the two kinds of cluster model functions have fared in the case studies. As a model of development, the cluster concept has only had a limited influence on the way that regional development is understood by

policy-makers in the case studies. However, it is important to remember that regional policies do not tend to be based on coherent models of how the regional economy works. Most policy frameworks are drawn from a patchwork of often competing ideas, resulting in a series of programmes that can be running in parallel. In this context, the cluster approach has had two important effects in the case-study regions: the crystallization and systematisation of policy.

First, it has been instrumental in *crystallizing* latent regional policy ideas and goals in several cases. With respect to existing policies in support of innovation and SMEs, for example, the cluster approach has focused attention on concepts embedded in existing policy frameworks. For example, the importance of developing research expertise in Östergötland, long acknowledged, has now taken a more central position in the Regional Growth Agreement as a result of the ‘flirtation’ with the cluster concept. Similarly, in NRW, it has been critical in reinforcing the region’s move towards a more bottom-up approach to economic development which emphasizes the exploitation of endogenous potential.

Second, the cluster approach has had a critical *systematizing* function. For several case studies, this was the first time where policy had been placed within a conceptual framework, albeit one that was carefully bounded in policy terms. It provided clear rationales for the better targeting of policy, created incentives to strive for an improved understanding of how policy could influence different points of the regional economy and overall, offered the prospect of a holistic approach to economic development. This did not mean that the cluster concept was used as a defining principle for economic development in the case-study regions, but its comprehensiveness was a catalyst for exploring programmatic approaches to economic development in Östergötland and significantly influenced the strategies adopted in Limburg, the País Vasco, Scotland and Tampere. In many respects, the cluster approach has been far more important for the rigour of its processes than its conceptual content.

As a model of policy-making, again, the cluster approach has not transformed but cast existing ways of developing policies in relief. It has assisted in the emergence of regional economic priorities by catalyzing a more strategic approach to economic development. It has contributed to the setting of common goals through partnership between the main development participants in strengthened policy networks which may facilitate other policy developments. Yet cluster policies themselves have not led to any significant change/reallocation of the resources and measures associated with regional development. Rather, it has prompted the drawing of new boundaries around different sets of policy, adding to the understanding of how they can be used in tandem more effectively in the economy. It has been part of the *rationalization* of policy-making, not its substitution with new systems.

Feser (1998) has made the useful distinction between cluster-*specific* policies – where public sector interventions are systematically tailored and resourced for the development of particular clusters - and cluster-*informed* policies – where a range of other policy areas are influenced by the cluster concept, whether in terms of their targeting (specialized support for clusters) or form of support (enhancing networking between enterprises).

What is becoming clear is that the two types of policy tend to exist side by side. In the case-study regions, special cluster policies have been devised, but the experience of creating those policies has had a wider impact on related policy areas, whether localized RTD policy (as in the case of Limburg's Regional Technology Plan), business assistance (as, for example, with the City of Tampere's economic strategy) or foreign investment (as in the case of Scottish Enterprise). It is cluster-informed policies which are arguably the more important area of public sector activity to be affected by the cluster approach. As a result, it is less a question of the degree to which policy can create world-beating clusters than how the cluster concept has strengthened the idea that regional development policy should concentrate on enhancing and differentiating local competitive advantage, whether defined in cluster terms or not. The approach has been important as a conceptual Trojan Horse, but not in terms of proselytizing a Porter-derived view of economic development. Rather, it has conveyed to policy-makers three other interlocking principles: that spatial policy can be the integrated product of all policies with a spatial impact at a local level; that economic development is mainly a matter of mapping and influencing local economic inter-dependencies; and that policy effectiveness operates from identifying and concentrating on a succession of aspects of the regional economy rather than a blanket attempt to influence all aspects at once.

Nevertheless, cluster policy as currently practiced in the case-study regions – in turn, typical of Western Europe more generally – can only be limited because of restrictions on how far any regionalized policy can influence such local interdependencies. The factors and linkages integral to cluster development are not limited to regional economic spaces, but are just as likely to be national, if not international, in origin. Consequently, there are a range of policies firmly lodged in the remit of national governments which can be critical for cluster – and by extension, spatial - development. These can be as diverse as the legal frameworks for technological patenting, the incentives for researchers to commercialize their findings within the national education system and the role of the national public sector as a customer in emerging industries. It points to the bigger issue in regional economic development: the increasing need to integrate all public policies with a spatial focus if regional development potentials are to be maximized. However, cluster policy is as likely to experience the same conflicts of national and regional interest as spatial development has historically (for a discussion in the case of cluster policy, see Raines 2002a). The cluster approach has not only illuminated the conceptual drivers of current spatial development policy in an increasingly globalized world, it has also highlighted its tensions.

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Appendix: description of the case-study regions

Arve Valley

Cluster support in France has traditionally been a mixture of centralized national technology policy and localized ‘self-help’ activities. Over the last few years, DATAR – the French regional policy ministry – has been directly supporting local groups of industries by subsidizing cluster development programmes (Raines, 2002a). 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. Since 1997, a partnership of local business associations and district councils have been implementing a cluster strategy to support the sectors through encouraging inter-firm networking. While smaller in scope than many of the regional strategies discussed here, it is an interesting example of a highly-localized and sector-specific approach to cluster policy.

Limburg

Cluster policy in Limburg developed around its EU-funded Regional Technology Plan (RTP); indeed, it was one of the first Dutch regions to undertake a RTP. Driven by the main provincial authority, the RTP is based on promotion of clusters within a selected group of mature and emerging industries - such as transport and logistics, tourism, horticulture and agro-business – through a series of pilot projects. Its priorities focus on improving the ‘knowledge infrastructure’ and the intensity of ‘knowledge use’ by businesses, especially SMEs, and appear to integrate a number of existing policy measures in the region. Cluster development appears as a strand within the wider Plan. Given that the Netherlands already has a strong national policy framework for cluster development (Roelandt *et al*, 1999), the region offers a good example of how national, EU and regional policies can be brought together to create a localized cluster policy.

Nord-Rhein Westfalen

North-Rhine Westfalen (NRW) is a declining industrial region – based around the *Ruhrgebiet* - where new approaches to regional regeneration have been consistently explored in recent decades. Since the beginning of the 1990s, regional policy in the *Land* of NRW has followed two distinctive strands. First, the policy model changed to an approach characterized as ‘procedural management’ with a focus on new regions, regional conferences and regional development strategies. Altogether, these developments constituted a more decentralized regional policy approach, based on local partnership between different public and private actors and an emphasis on developing endogenous potentials. Second, the *Land* tried to define a series of clusters, from old (automotive) to new ones (environmental technologies, bio-technology), on which policies and programmes concentrated, with SMEs as a major target group. The latest approach towards regional policy tries to bring together both elements, the political and partnership approach with an industry policy approach, going together as ‘competence

clusters'. NRW constitutes an example of a regionally-integrated cluster policy with an interest in both existing industrial strengths and new economic activities.

Östergötland

Östergötland is one of the first Swedish regions to undertake a cluster-based regional development strategy. As part of its Regional Growth Agreement development strategy in 1999, support for the main clusters of this region in eastern Sweden was identified as a key priority. Several cluster areas being targeted: information/communications technology; software development; medical technology; food; and wood products. The main policy actions consisted of the identification and promotion of networking opportunities, especially between the private and university research sectors.

País Vasco

The País Vasco – or Basque Country - 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 focused on the development of a series of emerging clusters in the local economy – such as automotives, machine tools and telecommunications. Since 1997, the strategy was implemented through a number of specific initiatives and programmes designed in collaboration with businesses and universities. The Basque approach highlights a number of interesting features, including its strategic focus, the relationship between regional and national level activities (as the Spanish government also has very active RTD policies) and its involvement of different organizations within the local economy. It contains about a dozen cluster areas of policy action.

Scotland

The Scottish experience of cluster development policy is one of the most well-known in Europe (Danson and Whittam, 1998). Since the early 1990s, the main development agency in the region, Scottish Enterprise, has been using the cluster approach to produce a series of specific programmes for developing clusters and to refine its more generic policy activities (eg. inward investment attraction and export promotion). Seven cluster areas are currently being targeted by programmes: semiconductors; food/drink; biotechnology; opto-electronics; wood products; tourism; and creative industries. The scale of the programme is considerably larger than for most of the other regions.

Tampere

The national government in Finland initiated a centrally-funded scheme to develop local competitive advantage at regional level by encouraging networking within clusters. As a successful applicant to the scheme, Tampere region has operated several 'Centre of Expertise' programmes which have targeted the region's main clusters since 1995 (Valtonen, 1999). As with Östergötland, the policy has largely consisted of measures to encourage greater cooperation within the clusters and more effective use of the region's

research institutions by the private sector. At present, Tampere has five cluster areas: mechanical engineering and automation; information and communications technology; medical technology; multimedia; and knowledge-intensive businesses.