

## **Path-Dependency and the Role of Institutions in Cluster Policy Generation**

by Claire Nauwelaers<sup>22</sup>

### **Introduction**

This paper tries to shed some light on the rationale behind the infatuation for the cluster concept across Europe and proposes some reflections on the role and nature of cluster policies. It takes an evolutionary view to warn of the importance of phenomena of path dependency and of the role of institutions in cluster policy generation.

Section 1 of the paper sets the scene, summarising the current understanding of the nature of innovation and the role of territory in innovation processes, as main bases behind the cluster idea. Then section 2 continues by examining how this framework influences the shape of innovation policies. It points out necessary shifts in focus of these policies and reflects on the implications of this for the mode of intervention of public actors in the field. Section 3 looks at cluster policy, arguing that this changing framework gives rise quite naturally to the idea of clusters and cluster policies.

The diverse use of the concept of cluster, referred to in section 4, shows that there might be some distance between the theoretical roots of the concept and reality. That section also contains the main argument of the paper, asking the question of what is really new in cluster policy. Since the answer to this relates more to the policy intervention mode than to the policy instruments themselves, the importance of history and the shape of institutions for policy comes up for discussion. Finally, section 5 reports on the results of a number of recent examples of empirical research into the innovation policy situation in the EU, considering the latter as a breeding ground for the emerging cluster policies. The limits of the current innovation policies, when compared with the conceptual framework discussed before, are pointed out, as are various institutional and organisational constraints for the design of successful cluster policies. Throughout the paper, specific attention is paid to the regional dimension in policy building, although it is recognised that the local, national and EU levels also have their role to play in shaping appropriate cluster policies to support economic growth.

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<sup>22</sup> MERIT – University of Maastricht.

## **The Changing Framework for Innovation Policies at Regional Level**

In most policy circles, whether at the local or the European level, awareness of the role of innovation as a crucial factor for economic development has increased, together with an understanding of innovation as a phenomenon distinct from the application of R&D results. This evolution is also visible in the change of paradigm taking in place in academic studies, fuelled mainly by research results in evolutionary economics, where technology and innovation are understood as endogenous factors in economic development. The concept of innovation as an interactive process, although not a recent one – the seminal work of Kline and Rosenberg (1982) was instrumental in establishing such an understanding -, is still the relevant foundation for this evolution.

According to the interactive view of innovation, the main focus is no longer on increasing the inputs necessary for product or process development. Instead, emphasis is on improving the capacity of economic actors to develop linkages within and outside the firm, in order to access and use these inputs, and to develop their learning abilities and thus apply more strategic behaviour in innovation. In times of globalisation of the economy, it becomes more and more evident that very few organisations, including the largest MNCs, have the capacity to develop internally the bulk of knowledge necessary to stay competitive on the market. This is, of course, all the more true for SMEs. “Learning-by- interacting” and processes of social interaction are thus at the forefront as mechanisms to support innovative abilities in companies, while more formalised forms of learning, through access to codified sources of knowledge, progressively lose their precedence as the almost exclusive form of learning, as it was the case under linear contexts.

By the same token, the role of territories in favouring learning processes is also recognised, mainly on the basis of arguments concerning the “untraded dependencies” occurring among agglomerated firms when these develop exchanges and work together in a trust-based context. Thus, it is claimed that learning-by-interacting occurs both within and between firms and in and within territories. In this process other actors and organisations play a part in firms’ innovation strategies (technical centres, intermediaries, advisors, research organisations, local authorities, business organisations, etc). The concept of a “learning region”, has been developed to characterise those regions where a web of synergetic relations is growing on the supply side of the productive sector, and where the atmosphere is favourable to such a development.

Within an increasingly global world, the above evolution has generated a quite paradoxical interest in the role of regions and SMEs in economic development. The virtues of the “small is beautiful” argument are again

advocated, but the traditional argument, focused on the flexibility factor, is supplemented today by the networking condition. That is, being small and flexible is not sufficient if one remains isolated; innovative success depends on the capacity to build learning linkages with knowledge sources everywhere, within and outside an organisation, within and outside the immediate environment.

It is not the purpose of this paper to enter into a detailed review of changes in the theoretical framework underpinning the development of innovation policies at regional level, but rather to reflect on how this influences policies. Therefore, the above elements represent only a brief sketch of those changes, pinpointing the fundamental elements to be taken into account in policy reflections.

### **Conceptual Moves for Regional Innovation Policies**

On the policy side, it is clear that there is a need to take account of the conceptual changes referred to above. What should the effects of the evolution described above be in the innovation policy arena? In the following discussion we focus principally on the regional level, although acknowledging that policies at higher levels are subject to similar influences.

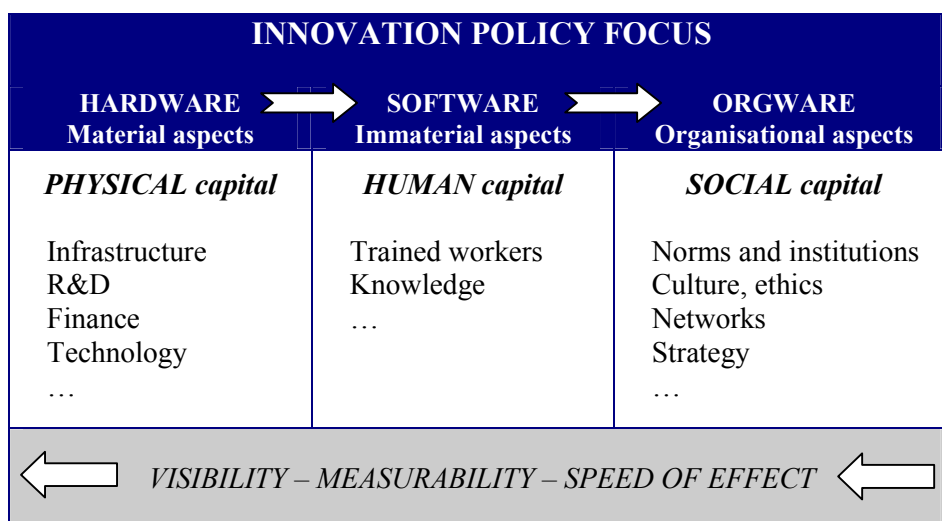
The “learning region” framework would imply a shift in focus in the policy rationale, from support for inputs in the innovation process to support for the process of innovation itself. While the understanding of innovation evolves from a mechanistic process, where more formal inputs lead rather automatically to more outputs (typically, more R&D would lead to more innovation), towards a more socially-embedded conception of innovation, where immaterial aspects also play a key role, policy targets need to evolve, too (see Figure 1 below).

Although it would still be necessary to provide companies with material inputs for carrying out innovation projects (and this covers important areas such as the availability of infrastructure, access to codified results from formal R&D projects, and financial capital), policies need to recognise that the “softer”, immaterial, aspects of innovation play a key role as factors enabling companies to access, combine, adapt, develop and engineer those material resources referred to above. Under this immaterial component of innovation, human resources and knowledge are key factors: they represent the longer term essential resources for conducting innovation processes and strategies. In their embodied form, they are usually much more firm- and place-specific, which means that they can be used to develop specific firms’ and regions’ advantages in the global competition.

Adopting the learning region concept to guide policies would also mean that policies should further focus on the “organisational” side of innovation. By this we mean that policies should not assume that provision of physical and

human capital are the only needs companies face when they want to enter into innovative practices and projects. The firm’s own strategic abilities, its internal culture, norms and attitudes with regard to innovation, are increasingly recognised as the factors responsible for successful innovation undertakings. At the level of the territory, the notion of “social capital” tries to capture the capacity of the set of territorially embedded actors to organise around common goals and to develop trust-based relationships, as mentioned above. It is argued here that policies can play a role in influencing even these non-classical, difficult to grasp, determinants of innovation.

Figure 1. Expected shift in focus in innovation policy



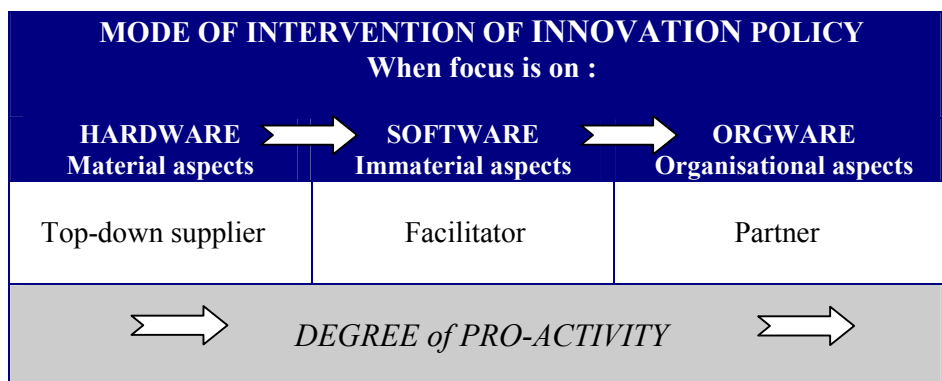
It is important to note here that the three focal points for innovation policies, as shown in Figure 1 (hardware, software and orgware), should be seen as mutually reinforcing, rather than as substitutes for one another. Firms need a combination of physical, human and social capital, of material, immaterial and organisational resources, to be able to conduct successful innovative projects.

The shift in focus for innovation policy, as described in Figure 1, reflects the difficulty faced by policy makers and, more generally, by a society that wishes to support such policies: as the accent moves from material, physical inputs towards immaterial and organisational aspects of innovation, the targets of the policies become less and less measurable, the effects of the support provided by policy actions acquire a longer-term nature, and the measurability of these effects decreases. Therefore, it becomes more and more difficult to

defend the relevance of actions undertaken, as well as to demonstrate effects using hard data (such as jobs directly created).

This shift in focus has implications on the role played by public authorities in innovation promotion (see Figure 2). In the case of basic, system support through the provision of “hardware”, public intervention is of a more top-down nature, with its main emphasis on freeing financial resources for use elsewhere. When policy concentrates on helping immaterial resources develop, and making knowledge available and accessible, the mode of policy intervention becomes instead a facilitator’s role, putting conditions in place for the rise and development of appropriate immaterial resources. Lastly, a policy targeted on the orgware of the innovation system means that policy makers are both the subject and object of intervention, since they are part of the system themselves. Therefore, to be able to conduct this role properly, policy makers should see their role and behave as partners of the regional actors.

Figure 2. Expected shift in mode of intervention in innovation policy



In evolving in this direction, the intervention policy is becoming more and more pro-active, in the sense that the public sector has to “take the risk” along with the economic actors concerned.

### Rationale Behind Cluster Policies

Within such a framework, policies focusing on the development of clusters emerge quite naturally. The essence of the cluster concept rests on the idea that an agglomeration of firms, developing a web of relationships and subtle mixes of co-operative and competitive practices, is an adequate form of economic organisation. It leads to the creation of competitive advantages for the territory on which this agglomeration is located.

The cluster concept has been developed into many variations around this core idea of agglomeration and interaction benefits, and in doing so, one can argue that it is in danger of becoming a catch-all buzzword. Nevertheless, the reasons for its success are quite clear: because of its accent on developing linkages and synergies, it responds quite nicely to the requirement of a more interactive vision of innovation processes. When the cluster concept is used in a territorial setting, it is also fit to capture the social capital factor for localised innovation processes where geographical proximity matters. It is therefore no wonder that policy makers, in accordance with the current understanding of innovation and of the role of territories, would welcome the concept and try to use it as a foundation for their innovation policies.

Because of its openness, the cluster concept has the potential to capture in a single (catch) word the three dimensions of innovation policy proposed in Figure 1 above with, however, a specific focus on the latter part, the organisational aspect. It therefore opens the possibility for policies to move towards better understanding the systemic character of innovation and to increase emphasis on favouring networking and the development of appropriate institutions for the innovation system. According to Figure 2 above, policy makers involved in cluster support are expected not only to support the clusters with material and immaterial inputs, as they do for isolated firms in a more traditional sense, but also to be involved in the cluster definition and promotion, since this is considered as a way to improve the economic performance of the region as a whole. In this way, public authorities become part of the undertaking themselves. Much flexibility is left for the definition of the actual content of the cluster, according to the output of the “social engineering” process within the cluster.

### **The Use of the Cluster Concept and the Nature of Cluster Policies**

The very openness of the cluster concept is at the same time its weakness. Today, the notion of clusters is increasingly referred to in policy programming to bridge formally the gap between policy and theory, i.e., to bring the interactive component of innovation on the policy scene. Such a move affects the rhetoric's of policies, but the degree to which the alleged clusters really tackle the social capital and orgware aspects of innovation varies a lot.

One can actually find, under the banner of clusters, configurations as diverse as:

- The objects of traditional sectoral policies, focusing on declining or, more often, on “future” sectors;
- Private strategic alliances between a restricted number of companies, of a temporal as well as longer-term nature, to achieve economies of

scale necessary to reach projects otherwise not accessible to individual companies. This can take the form of a joint R&D project, common development of a product or service, etc.;

- Arrangements of a less strategic importance between enterprises, possibly with the participation of intermediaries (chambers of commerce, etc.), aimed at joint utilisation of resources in various areas: common export promotion strategies, joint training actions, setting-up of common equipment or facilities, creation of joint buying strategies, etc.;
- Joint activities of research centres, eventually reaching the stage of merging part or all of resources, in order to reach an appropriate size for conducting large scale research projects;
- Training or coaching programmes, developed by large enterprises for SMEs, the latter being subcontractors or suppliers or even without business relations with the former;
- Purely geographic concentrations of enterprises involved in the same sector or vertical chain of production;
- Non-territorial linkages between enterprises, in the form of international strategic alliances, with an anchoring point in the region;
- Industrial districts in a given space, including enterprises developing strong business relations across the value chain, which generate positive externalities for the whole set of enterprises and for the territory as a whole;
- Very broad sectors, such as agri-food, which account for an important share of a (national) economy, and are competitive in foreign markets;
- Others.

From the above list it is obvious that the various types of “clusters” referred to differ largely in a number of key dimensions: the extent and depth of linkages developed between firms, the degree of formalisation of these linkages between members of the clusters, the permanence of those linkages, the importance and role played by geographical space, the respective importance of endogenous and exogenous resources for the cluster’s functioning, the degree of spontaneity in cluster formation and exploitation, the role of public intervention in the formation and running of the cluster and, most importantly, the capacity of the cluster to generate and support learning dynamics and innovative practices among and its members.

The latter point is especially important in an evolutionary approach, as a learning attitude and openness to innovation are seen as critical to avoid lock-in phenomena that might endanger clusters characterised by strong ties. It is hypothesised here that the more successful clusters are those which induce members to consider a more extended window of opportunity, i.e. those which help them to link-up better to the global world while offering them the power of localised relationships.

Coming back to Figure 1 above, the question becomes: what types of clusters tend to improve the orgware of innovation and which addressing its hardware or software only? Answering this question involves studying those cluster characteristics – possibly along the list of key dimensions enumerated in the above paragraph - that are more likely to act on this organisational aspect of innovation.

Faced with this fuzziness of the cluster concept in practice, the next question is: “what do we actually mean by cluster policy?”. Not unexpectedly, the answer to this question is far from straightforward. The existing overviews of cluster policies at stake in the EU (see OECD (1999)), and recent academic literature on this question (see Cowan and Wintjes (1999)), deliver the message that, in fact, cluster policies do not exist as a new policy area. Rather, cluster policy appears as an innovative combination of existing policy instruments from traditional policy fields, such as co-operation programmes between university and industry; setting up of specialised risk capital funds; building of infrastructure; support to training facilities and programmes; foreign direct investment attraction policies, etc. It is hard to find examples where, under the name of cluster policy, new instruments have been created.

However, while nothing is really new in the content of cluster policies, what is new is the mode of intervention of the public actor through cluster policy. According to Figure 2 above, the mode of intervention in cluster policy is characterised by a shift away from the “top-down” supplier of resources towards the facilitator of interactions in the clusters, implying a more participative role for public authorities in the definition and recognition of the cluster, and the involvement of “users” (i.e. the cluster members) in the determination of relevant policy tools. In short, cluster policy is characterised by a more interactive way of implementing policy.

A detailed study on the key dimensions of clusters and cluster policies is beyond the scope of this paper, which should rather be seen as a preliminary reflection for such an undertaking. However, we would like to put forward the following thesis, as an important element to be taken into account when studying the relevance of cluster policies to support innovation in European regions: history and institutions have a key influence on the shape and direction taken by cluster policies in EU regions. History here relates essentially to the



process of innovation policy development, and institutions refer to the set of rules, norms, routines and culture prevailing in the environment where those policies are elaborated. Otherwise stated, the thesis is that one should not try to develop cluster policies following a uniform model, which should be valid everywhere and at any point in time. Rather, attention should be focused on the generic conditions under which the supported clusters could help firms and other regional actors to develop better learning practices and induce positive externalities, leading to competitive advantages for the region as a whole.

### **Current Situation of Regional Innovation Policies and Their Role as “Policy Incubators” for Cluster Policies: Institutional Barriers**

If history matters for the development of clusters policies in European regions, it is important to take stock of the current situation with regard to the development of innovation policies, which provide the framework for emergence of new cluster policies.

#### *Innovation Policies in EU Structural Funds*

Obvious candidates for this role of “policy incubation” are the policies elaborated under the European Regional Development Fund programmes. Indeed, their aim is explicitly formulated as the development of strategies able to reverse the vicious circle of lagging economic performance. ERDF programming exercises need to be conceived so as to address all possible areas where joint public action from the EU, national, regional and local levels can act as leverage for economic renewal. So research, development, and technology and innovation promotion, are usually among the areas forming part of these regional policies across Europe. The European Commission is, in fact, encouraging a greater focus on those areas in the Single Programming Documents.

Exhaustive analyses of these policies have recently been undertaken, covering both the least developed and the declining industrial areas of the EU, i.e. respectively the Objective 1 and 2 zones of the Union (as they were defined for the period under scrutiny 1993-1999). The results obtained look as follows (CIRCA (1999), ADE et al. (1999)). In Objective 1 areas, there is a slow, and still limited, evolution from policies targeting the material aspects of innovation and system attributes, towards policies taking into account the non-material inputs. However, this process is largely hindered by a lack of strategic capabilities from the policy side, with the result that the policy instruments adopted often reflect the relative bargaining powers of existing regional “champions”, rather than political vision based on the development needs of the territory. The main motor driving the policy building process is the ability of the selected projects or action lines, to absorb funds, hence a bias within the definition of orientations towards shorter-term actions and towards larger

projects concentrated in the hands of a few, well known organisations, often from the supply-side. The lack of policy design skills is also reflected in the absence of success indicators for the policies implemented, and consequently weak monitoring and evaluation practices. The mode of policy operation is too often that of a “cash cow”, reinforced in some regions by the large funding amounts at stake.

In Objective 2 areas, the situation may be slightly different regarding the focus of the intervention, since the accent is more and more on immaterial aspects, with some rather unsuccessful attempts to influence the organisational side of innovation. However, the policy planning process shows the same weaknesses as reported for Objective 1 regions: lack of policy intelligence, project-driven approach, funds absorption bias, low standards of monitoring and weak concerns for evaluation are the rule here as well. This weakness in policy design and implementation makes it difficult to distinguish between real efforts to shift the policy focus towards a more systemic view of innovation and pure window dressing efforts, trying to present the financing of material inputs with more “systemic” justifications, but without real change in the approach and content of the actions publicly supported.

If the policies analysed under these Objective 1 and 2 Single Programming Documents across the whole of Europe represent a valid cross-section of the average degree of maturity reached by policy making in the area of RDTI and regional development<sup>23</sup>, the diagnosis is quite worrying. Indeed, it shows, firstly, that the basis for developing cluster policies, i.e. an understanding of innovation as an interactive, territorially-embedded process, has not yet been translated into concrete policy evolution and, secondly, that the policy makers do not seem well equipped to run policies which require a deeper understanding of the processes at stake, nor handled the fine-tuned tools needed to manage the policy interventions. It is difficult to see how, under such conditions, policy makers could evolve as partners in a cluster mode of development in their regions.

### *Regional Innovation Policies*

Another research project, the SMEPOL project (see STEP (2000)), focusing on the analysis of the effectiveness of innovation policy tools developed at regional level, delivers results which are consistent with the above findings (see Figure 3 below). The policy scene is still dominated by linear tools, addressing inputs in the innovation process rather than the functioning of the system, and providing

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<sup>23</sup> This view is somewhat pessimistic, as the areas concerned are less-favoured regions by definition. However, the Commission negotiations for these programmes include national authorities, which would suggest that experiences from more advanced regions could be passed on to those less-favoured areas through the national government.

support to firms in isolation rather than to networks of actors. The policy instruments that address behaviour changes towards innovation, dealing with informational, organisational or strategic needs, are still rare and immature. That is, policy instruments are concentrated in the first quadrant of the table (A), and much less frequent are policies targeting the functioning and learning processes of systems (quadrant D). However, for firms to be able to access D-type tools, it seems first necessary to develop and successfully apply B- and C-type tools that help policy approaches evolve away from the linear understanding of innovation. Cluster policies would represent typical policy tools of the D-type.

**Figure 3. Classification of policy instruments studied in SMEPOL along two policy paradigm dimensions**

<b>Form and focus of innovation support</b>		
<b>Target of support</b>	<i>input resources</i> <i>(reactive tools allocating inputs for innovation)</i>	<i>behavioural additionality</i> <i>(proactive tools focusing on learning to innovate)</i>
<b>firm-oriented</b>	<b>A</b>	<b>B</b>
<b>(regional) system-oriented</b>	<b>C</b>	<b>D</b>

Source: Nauwelaers and Wintjes (1999)

Note: The size of the letter in each quadrant (A,B,C,D) indicates the emphasis placed by the various policy frameworks on each form of policy intervention.

The SMEPOL project also revealed that the division of labour still existing between economic policy, on the one hand, and research and technology policy, on the other hand, leads to a lack of co-ordination of policy instruments and a lack of overall policy coherence. The more promising tools, which are far from representing the majority of existing instruments, are the ones that gather under one “umbrella” several instruments usually delivered in isolation. They are more prone to respond to a broader vision of innovation than those that tackle single steps in the innovation process at a time, revealing a linear policy approach. But to be successful they require from policy designers and implementers, not only a high degree of understanding of the innovative firm’s behaviour, but also self-reflexive capacity and openness to evaluation.

### *Strategic Exercises at Regional Level*

Perhaps the most promising experiences worth looking at in this brief insight in the recent history of policy building in the area of innovation policies, are the RIS and RITTS programmes, aiming precisely at defining more adequate frameworks for innovation policy in European regions. The RIS and RITTS exercises are initiatives taken by regional authorities, or at least endorsed by them, to review and implement or improve their innovation policies on the basis of a diagnosis of regional strengths and weaknesses with regard to innovation in the business sector. The European Commission provides funding to the regions for the implementation of a consensus-based process of policy development, as well as a platform for the exchange of good practices among regions involved in such an exercise. Thus, the approach tackles strategic weakness in policy making, as mentioned above, and provides opportunities for debate on fundamental questions such as the nature of innovation and the role of innovation policy in regional contexts. Over 100 European regions have been or still are involved in these endeavours.

Although formal evaluation findings from these exercises are not available yet, what is already quite clear from the available information is that, to be successful, those exercises need to set up an interactive learning process between policy makers, beneficiaries of the policy, and organisations in charge of implementing the policy (suppliers or intermediaries). The difficulty of these exercises is that they try to combine in one move, four highly demanding activities (Charles, Nauwelaers and Mouton (1999)):

- A knowledge-building exercise, whereby regional stakeholders acquire a better understanding of the factors affecting innovation in the region, of the barriers and stimuli to this process, and of the major opportunities faced by the region to exploit its potential. Very often,

- bits and pieces of this knowledge already exist in the region, but no single actor has a clear and complete view of the situation;
- A political exercise, aimed at putting innovation higher on the agenda in policy making. This process means that a large number of actors have to be assembled around a discussion table to deal with a subject which seldom is similarly understood everywhere on the regional scene. The exercise thus means, firstly, that the concept need to be clarified and distinguished from other policy objectives and, secondly, that it needs to be translated into actual policy programmes and mainstreamed in the official policy lines for the region. The process is further complicated in cases where a regional authority is either non-existent or weak;
  - An action-oriented process, focused on the reorganisation of the supply-side for innovation, with clarification of the respective role of the often numerous organisations involved to support innovation not always explicit. The exercise needs to be translated into visible changes in the mode of operation, or in the structure of this supply-side of innovation;
  - The setting-up of concrete innovation projects led by, or with the active participation of, firms incorporating the lessons from the strategic exercise.

Working on the four targets at the same time has proven to be very difficult and, depending on the stage reached by the region in policy building, at the start of the exercise, the thrust will normally be on a subset of the four objectives. Typically, regions which could be described as weaker – in terms of innovation policy maturity – will more or less confine themselves to a knowledge-building exercise. This can serve as a first step before the development of political exercises and more concrete actions. Regions which are more advanced regions in policy terms may be able to develop targeted actions right from the start, both on the supply and demand sides. Important barriers to such multi-faceted exercises are found on the institutional side: orgware often limits the efficiency of the policy learning process. A number of these are described below.

In accordance with the SMEPOL findings, one clear barrier is the fact that innovation policy, often not yet formulated as an explicit policy area, implies crossing the border between traditionally separate policy fields: economic or industrial policy, on the one hand, and science and technology policy, on the other hand. Both are concerned with the promotion of innovation. Unless the institutional context allows such horizontal thinking and the formulation of policy options crossing the boundaries of those areas, it is very difficult to move towards innovation policy formulation. In many European

regions, the divide between economic policy and science policy circles is strong, and hinders this process. In several cases, the need has been felt to raise the issue of innovation up to the Prime Minister's level, to overcome this divide.

Another barrier is present when we consider the differences in the degree of autonomy enjoyed by the regions to determine their own policy setting. Observation of the RITTS and RIS exercises, suggests that one of the most complicated institutional framework has the power of developing policies shared between the Region and the Central State (as it is the case e.g. in France). Under such circumstances, the policy design process is further complicated by the need to reach consensus among representatives of the two levels of authorities, each of them approaching the problematic of innovation promotion in a given regional territory with different points of view and expectations.

The process of moving from the position of fund deliverer towards one of partner is made difficult for policy makers and policy implementers by the atmosphere of mistrust between public and private actors that often prevails in regions. Especially when the public authority has for decades followed a top-down approach, and where the working standards within administration have been poor, this gap between the private and public sector mentalities may be too large to enable partnerships to be created easily on the basis of consensual decisions. Weakness in policy learning, reflected in particular by a lack of openness to evaluation practices as mentioned above, is another constraint to be overcome in the regional institutions if one wants to build up innovative innovation policies. These will require even more careful follow-up because they will involve a greater trial-and-error component than is the case with traditional instruments.

## **Conclusion**

Because of its appeal as an interactive and territorially embedded vision of innovation, the cluster approach is increasingly being adopted by policy makers in charge of designing innovation policies, notably at the regional level. Our understanding of this approach, when translated into policy terms, is that it means above all a new, more strategic and more interactive way of conducting policy, rather than the design of new types of intervention tools. Thus, if such approaches are followed in institutional contexts where economic development and the promotion of R&D and technology are seen as separate policy areas, where the mode of policy intervention does not leave much room for efficiency evaluations, and where policy intelligence is limited, there is a danger that so-called cluster policies will merely reshuffle existing approaches and instruments. The outward appearance may change without bringing the alleged benefits from cluster policies in terms of better addressing the orgware of

innovation and sustaining the development of social capital in the region. A better understanding, on the one hand, of the core elements of the cluster concept and, on the other hand, of the essentials of cluster policy, is crucial if one wants to confer more substance to those very promising new approaches, which are well in line with the more advanced ideas in academic circles.

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