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# Cluster Policy in Developing Countries

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# Cluster Policy in Developing Countries

## Abstract

After it has been discovered as a vehicle of economic policy in industrialized countries at the beginning of the 1990s, cluster policy has attracted the attention of development policy. Indeed, the case for using cluster policies to promote economic development is in principle not confined to the context of industrialized countries. As cluster policies necessarily have to be specifically tailored to each individual case, it should come as no surprise that their use in developing countries will always differ from their use in industrialized ones. Surely, individual cluster policies in developing countries, too, will differ from each other. Still, some general approaches that respond to typical framework conditions in developing countries can be discerned. This article elaborates some of them and suggests ways to promote clusters on the regional and local levels in developing countries.

**Keywords:** clusters, cluster policy, regional policy, development policy, development cooperation

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# I Introduction<sup>1</sup>

Beginning with Porter's (1990; 1998a; 1998b) work, cluster policy has gained high popularity among policy makers in industrialized countries. Somewhat later, it has come into use in development policy, too (e.g. Esser, Hillebrand et al. 1996; Ceglie, Clara and Dini 1999; Schmitz and Nadvi 1999; Altenburg and Meyer-Stamer 1999; Altenburg 2000; Scholz 2004: 197-203; Rauch 2009: 186-193).

As cluster policy focuses on upgrading industries' competitiveness,<sup>2</sup> it may seem as if it were a method of choice exclusively for industrialized countries. Yet, industries in developing countries can be competitive, too – at least in the regional or national markets they serve, and not rarely also in global markets. These industries will often be other ones than the most competitive ones in industrialized countries, or they can be found on other stages of the value chains, or they employ different competitive strategies. At the beginning of the industrialization process of an economy, competitive industries will often be those dealing with primary activities. But whatever developing countries' industries are doing, competitiveness is the key to their success (Meyer-Stamer 2006, S. 229-230), as it is for (other) industries in industrialized countries. In any case, economic development in any country, no matter on which stage of development, is all about empowering entrepreneurship.<sup>3</sup> As a consequence, cluster policy can be used as a means of development policy and is applicable in the context of developing countries, too.

Obviously, cluster policies employed in industrialized countries cannot be transplanted without modification into developing countries. But it should be born in mind that any cluster needs to be promoted with an individual strategy specifically tailored at its particular characteristics. There can never be an effective “one size fits all” approach (Enright 2000: 327). The need to develop idiosyncratic cluster policies in each single case (although its instruments can be drawn from a generalized toolbox) exists in industrialized and developing countries alike. No cluster policy should completely look like another one and therefore, there can not be a single “standard” cluster policy for industrialized countries and another single one for developing countries.

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1 This article draws in part on Benner (2012a; 2012b; 2012c).

2 According to Altenburg (2003), upgrading can be understood as the process of a knowledge-based augmentation of value added that leads to higher factor income.

3 I am grateful to Johannes Glückler for this notion.

Still, some “typical” conditions in developing countries can lead to some stylized adaptations that may often be necessary in applying a toolbox for cluster policy (Benner 2012a; 2012b; 2012c; 2012d) in developing countries. For example, localized potentials and structures may not exist or not be as visible as they often are in industrialized countries (Altenburg 2000: 334), which limits the possibilities of a pure top-down identification of clusters. Some clusters in developing countries will rely more on efficiency-enhancing mechanisms and less on those stimulating creativity (Benner 2009; 2012c). Yet, this does not need to be the case, and even in “low-tech” industries knowledge spillovers can still occur and be highly relevant to upgrading (Porter 1998b: 85-86; 2000: 19).

One salient aspect often distinguishing the institutional environment of industrialized and developing countries is that of redundancy or absence of organizations promoting the economy at the regional or local scale. In many regions and locations in industrialized countries, several different organizations with partly overlapping tasks that are to some extent relevant to clusters exist (e.g. business associations, chambers of commerce, regional management institutions, urban marketing associations). Here, the challenge often lies in coordinating their efforts to assure a coherent cluster policy. In many regions in developing countries, in contrast, it is likely that none of these organizations exists. If they do, they often lack resources or skills. In this case, the primary challenge is building an effective institutional environment for cluster promotion. For example, if there is no organization that can perform central network tasks in a cluster, a new organization has to be built from scratch. As far as agents of cluster policy exist, their institutional capabilities and resources might be more severely limited than those of their counterparts in industrialized countries. Thus, capacity building measures will often be necessary at the outset. The ability of government agents to perform basic public tasks might also be weak. On the other hand, multilateral or national donor organizations can fill this void (Altenburg und Meyer-Stamer 1999; Andersson, Schwaag Serger et al. 2004, S. 114-115; Ketels, Lindqvist and Sölvell 2006).

In any case, cluster policy needs to be based on a sound theory that links cluster theory and approaches of practical implementation. The normative theory of cluster policy and the cluster promotion toolbox proposed by Benner (2012a; 2012b; 2012c; 2012d) provide a foundation for

such a comprehensive theory. It is applicable to the contexts of industrialized and developing countries alike. In the following sections, it will be complemented with some specific approaches targeted at developing countries.

## 2 Instruments for cluster promotion

Clusters can be promoted by using instruments that can affect cluster mechanisms. These mechanisms can be at work within clusters and cause their dynamism, as argued by the various strands of cluster theory (Benner 2009).

Table 1 lists twelve salient cluster mechanisms and corresponding instruments. Each of these instruments can serve as a building block towards an individual cluster promotion strategy.

**Table 1: Instruments of cluster policy**

| Mechanism   | Instruments   |
|---|---|
| Recruitment of qualified new staff among alumni of higher education institutes                  | <ul style="list-style-type: none"> <li>▪ Job fairs</li> <li>▪ Direct matching between employers and qualified job-seekers</li> <li>▪ Direct dialogue between companies and R&amp;D/education institutions</li> <li>▪ Public relations initiatives for the cluster</li> <li>▪ Online job exchange</li> <li>▪ Use of social media tools</li> <li>▪ Lobbying for measures of education and science policy (e.g. for locating R&amp;D/education institutions within the cluster)</li> </ul>   |
| Labor mobility among companies or between higher education or research institutes and companies | <ul style="list-style-type: none"> <li>▪ Job fairs</li> <li>▪ Direct matching between employers and qualified job-seekers</li> <li>▪ Public relations initiatives for the cluster</li> <li>▪ Online job exchange</li> <li>▪ Use of social media tools</li> <li>▪ Lobbying for measures of education and science policy (e.g. for locating R&amp;D/education institutions within the cluster)</li> </ul>   |
| Student work in companies (e.g. as interns or student trainees or through writing theses)       | <ul style="list-style-type: none"> <li>▪ Job fairs</li> <li>▪ Direct matching between employers and qualified job-seekers</li> <li>▪ Direct dialogue between companies and R&amp;D/education institutions</li> <li>▪ Public relations initiatives for the cluster</li> <li>▪ Online job and internship exchange</li> <li>▪ Use of social media tools</li> <li>▪ Scholarships for theses and internships</li> <li>▪ Lobbying for measures of education and science policy (e.g. for locating R&amp;D/education institutions within the cluster)</li> </ul> |
| Spinoff formation   | <ul style="list-style-type: none"> <li>▪ Entrepreneurship or business plan competitions</li> <li>▪ Foundation of technology centers or science parks</li> <li>▪ Entrepreneurship seminars</li> </ul>  |

|  |   |
|--|---|
|  | <ul style="list-style-type: none"> <li>▪ Consulting for (possible) entrepreneurs before and after the new business formation and information about support options</li> <li>▪ Matching of entrepreneurs and experts</li> <li>▪ Industry and technology-specific subsidies for new business formation</li> <li>▪ Lobbying for measures of education and science policy (e.g. for locating R&amp;D/education institutions within the cluster)</li> </ul>  |
| Availability of venture capital (including financing through angel investors)        | <ul style="list-style-type: none"> <li>▪ Allocation of venture capital by venture capital funds</li> <li>▪ Direct coaching for spinoffs by venture capital donors</li> <li>▪ Development of technology centers or science parks into incubators through the offer of venture capital</li> </ul>   |
| Cooperation between higher education or research institutes and companies            | <ul style="list-style-type: none"> <li>▪ Technology transfer departments of subsidiaries of universities</li> <li>▪ Technology transfer specialists at university institutes or chairs</li> <li>▪ Management of cooperation projects</li> <li>▪ Direct matching of potential partners</li> <li>▪ Congresses, seminars and other meetings as a means of initiating and maintaining contacts</li> <li>▪ University classes for industry workers</li> <li>▪ University training programs for industry workers</li> <li>▪ Use of universities' or R&amp;D institutions' infrastructure (e.g. laboratories or machines) by industry</li> <li>▪ Financial support for collaboration (also through cluster competitions)</li> <li>▪ Innovation vouchers</li> <li>▪ Formation of associations or working groups encompassing industry and universities or R&amp;D institutions</li> <li>▪ Use of contacts to other associations or networks for trans-regional matching in the external cluster dimension</li> <li>▪ Industry semesters of university teachers</li> <li>▪ Collaboration in designing a cluster strategy in order to participate in a cluster competition</li> <li>▪ Online cooperation database</li> <li>▪ Use of social media tools</li> <li>▪ Creation of a cooperative climate by building a common cluster identity (e.g. through public relations initiatives)</li> <li>▪ Lobbying for measures of education and science policy (e.g. for locating R&amp;D/education institutions within the cluster)</li> </ul> |
| Horizontal cooperation among companies (including cooperation in trade associations) | <ul style="list-style-type: none"> <li>▪ Management of cooperation projects</li> <li>▪ Direct matching of potential partners</li> <li>▪ Congresses, company visits, seminars and other meetings as a means of initiating and maintaining contacts</li> <li>▪ Use of leading companies' infrastructure (e.g. laboratories or machines) by other companies</li> <li>▪ Financial support for collaboration (also through cluster competitions)</li> <li>▪ Formation of industry associations or working groups</li> <li>▪ Use of contacts to other associations or networks for trans-regional matching in the external cluster dimension</li> <li>▪ Collaboration in designing a cluster strategy in order to participate in a cluster competition</li> <li>▪ Use of trade fair participation programs for trans-regional or international matching in the external cluster dimension</li> <li>▪ Use of delegation trips for trans-regional or international matching in the external cluster dimension</li> <li>▪ Online cooperation database</li> <li>▪ Use of social media tools</li> </ul>  |

|   |   |
|---|---|
|   | <ul style="list-style-type: none"> <li>▪ Creation of a cooperative climate by building a common cluster identity (e.g. through public relations initiatives)</li> <li>▪ Focused investment promotion towards external companies, including through focused allocation of subsidies</li> <li>▪ Use of public relations initiatives for trans-regional matching in the external cluster dimension</li> </ul>  |
| Vertical cooperation among companies      | <ul style="list-style-type: none"> <li>▪ Management of cooperation projects</li> <li>▪ Direct matching of potential partners</li> <li>▪ Congresses, company visits, seminars and other meetings as a means of initiating and maintaining contacts</li> <li>▪ Use of leading companies' infrastructure (e.g. laboratories or machines) by other companies</li> <li>▪ Financial support for collaboration (also through cluster competitions)</li> <li>▪ Formation of associations or working groups encompassing various industries</li> <li>▪ Use of contacts to other associations or networks for trans-regional matching in the external cluster dimension</li> <li>▪ Collaboration in designing a cluster strategy in order to participate in a cluster competition</li> <li>▪ Use of trade fair participation programs for trans-regional or international matching in the external cluster dimension</li> <li>▪ Use of delegation trips for trans-regional or international matching in the external cluster dimension</li> <li>▪ Online cooperation database</li> <li>▪ Use of social media tools</li> <li>▪ Creation of a cooperative climate by building a common cluster identity (e.g. through public relations initiatives)</li> <li>▪ Focused investment promotion towards external companies, including through focused allocation of subsidies</li> <li>▪ Use of public relations initiatives for trans-regional matching in the external cluster dimension</li> </ul> |
| Intensive local competition               | <ul style="list-style-type: none"> <li>▪ Sophisticated public procurement</li> <li>▪ Implementation of common parameters for competition through standard-setting and certification</li> <li>▪ Focused investment promotion towards external competitors, including through focused allocation of subsidies</li> </ul>  |
| Competition in the local social hierarchy | <ul style="list-style-type: none"> <li>▪ Information about cluster personalities (e.g. in newsletters and publications)</li> <li>▪ Allocation of awards</li> <li>▪ Use of social media tools</li> </ul>   |
| Cafeteria effects                         | <ul style="list-style-type: none"> <li>▪ Foundation of technology centers of science parks</li> <li>▪ Use of universities' or R&amp;D institutions' infrastructure (e.g. laboratories or machines) by industry</li> <li>▪ Use of social media tools</li> </ul>  |
| Social networks                           | <ul style="list-style-type: none"> <li>▪ Congresses, company visits, seminars and other meetings as a means of initiating and maintaining contacts</li> <li>▪ Use of well-connected personalities as a means of initiating and maintaining contacts</li> <li>▪ Industry semesters of university teachers</li> <li>▪ Collaboration in designing a cluster strategy in order to participate in a cluster competition</li> <li>▪ Use of social media tools</li> </ul>  |

Source: Benner (2013: 11-14); modified from Benner (2012c: 156-159; 2012d: 10-12).



### **3 Points of departure for cluster promotion in developing countries**

A strategy for cluster promotion for a developing country can be built by combining a mix of instruments from the menu above which appear most suitable in the individual context. The adequacy of this individual mix of instruments depends on the state and structure of the respective country's economy and in particular on the groups of industries or value chains to be targeted.

In a first step, it should be asked which mechanisms could be or become salient at all. This depends, for instance, on the economic landscape, its agents, and the state of the technology employed. Next, instruments which affect the mechanisms that are judged most likely to have a considerable impact on the respective economy's existing or nascent clusters (including discernible cluster potentials) should be preferred. This is because they offer a possibly more beneficial cost-benefit ratio than those with a weaker prospective impact. In the same vein, it makes sense to prefer instruments that affect multiple mechanisms which can be or become effective in the countries' cluster landscape (Benner 2012c).

Most instruments can be used by national, regional, or local government agents through specific contributions (Benner 2012a; 2012b; 2012c). In a number of cases, it makes sense either to build a new institutionalized cluster initiative. It can serve as a network that unites all or most relevant cluster stakeholders. An alternative is to use and strengthen an existing one. Such a network might also be initiated and/or managed by existing organizations like business or trade associations or chambers of commerce. In clusters in which such an institutionalized cluster initiative is being constructed, it can serve as the central hub for cluster promotion and use many of the instruments listed in Table 1. National governments, assisted e.g. by donor organizations, can set incentives for the construction of such networks. Cluster competitions can be a vehicle for doing so if the institutional capabilities of a country render it possible. This approach merits further analysis that follows in the next section.

## 4 Cluster competitions: a choice for developing countries?<sup>4</sup>

In industrialized nations, a common approach employed by national agents to activate or strengthen clustering dynamics on the regional or local levels is the organization of cluster competitions. In principle, this approach can be applied in developing countries too. Although competitions are designed top-down, they exhibit a bottom-up orientation (Dohse 2007: 88) and create incentives through the funding they promise to successful regional or local cluster communities.

The BioRegio and InnoRegio contests conducted in Germany can serve as examples for cluster competitions (Dohse 2000; 2003; 2007). Such an approach exhibits some decisive advantages: As a cluster promotion strategy in each single region is being developed by regional or local stakeholders who are interested in taking part in the competition and in implementing the strategy in case their bid is successful, their ownership of the cluster promotion process is ensured. If it is coupled with empowerment through capacity building and funding, the two central requirements of bottom-up economic development are given. Cluster potentials that are not highly visible and thus are likely to be ignored in a top-down identification can reveal themselves (Kiese 2008, S. 26). The same applies to interested agents that are relevant but not known to policymakers on the national level (or to a donor organization).

A cluster competition can be organized by the national government, regional governments (for clusters on the local scale), or by a donor organization. However, the latter possibility does not lead to a transfer of skills to the national government, and does not ensure its ownership of the policy. Rather, a donor organization might advise the national (or regional) government in the design of the competition and the implementation of its first rounds.

While cluster competitions in industrialized countries are often seen as a means of technology policy and mostly focus on innovation, this does not necessarily have to be the case. A cluster competition can have a stronger focus on efficiency and “low tech” learning, which seems more appropriate in the context of a developing country.

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4 For a more detailed version of the following arguments, cf. Benner (2012e).

Still, the use of cluster competitions in developing countries encounters severe limitations. In contrast to an industrialized country context, an institutional environment sufficiently equipped to enable effective strategy design and implementation on the regional or local levels cannot be taken for granted in developing countries. Important agents might not exist at all or lack the necessary skills or resources. In the first case, building institutions and notably organizations will be the first step of almost every cluster policy. In both cases, extensive capacity building on the regional and/or local level is needed. Capacity building measures can draw on donor organizations' experience (Ceglie, Clara and Dini 1999; UNIDO 2001; n.d.). If this is desired by the organizing national or regional government, donor organizations might even play a more active role in assisting the government during first stages of implementation.

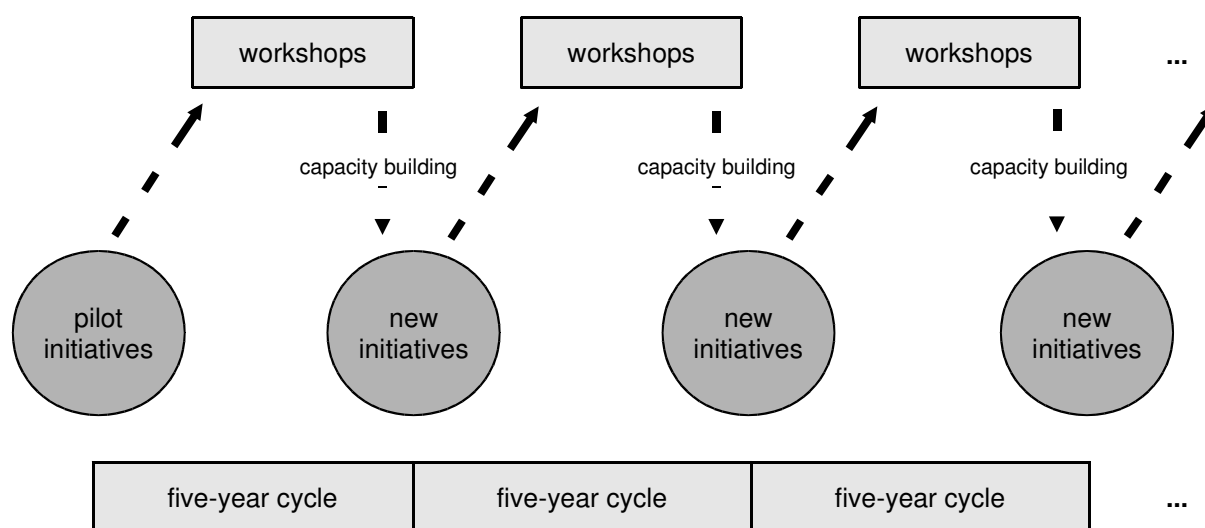
Furthermore, budget constraints on the national level severely limit the possibility to allocate funds to succeeding clusters. Reorienting regional policy funds towards cluster policy by using them for the promotion of the winners of a cluster competition can be a solution, provided of course that such funds exist. However, such a redesign of regional policy can be expected to prove politically difficult.

In sum, while cluster competitions can be an interesting device for cluster policy in some developing countries, they will certainly prove rather impractical in others. Alternative approaches that can equally combine top-down and bottom-up procedures and that can similarly ensure both ownership and empowerment of local or regional agents have to be added to the repertoire of cluster policy in developing countries.

## **5 Another top-down/bottom-up combination: the cluster promotion chain**

Cluster policy in developing countries could draw on existing and successful pilot initiatives (understood here as efforts to set up a cluster initiative in a single region or location) as a reference for successive cluster initiatives with limited resources. A way to do so could be labeled the cluster promotion chain featuring revolving initiatives. It starts with the pilot initiatives and subsequently builds on successive cluster initiatives, as Fig. 1 demonstrates.

**Fig. 1: The cluster promotion chain**



Source: own work.

The cluster promotion chain consists of the following stages:

1. The pilot initiatives are the first link of the chain. They may have been organized by donor organizations or with their help by national and regional governments.
2. The next step is assembling regional and/or local stakeholders. The goal is to introduce the pilot initiatives to them. This can be done either in workshops on the national level or in several regionalized ones. The selection of participating stakeholders is critical. The workshops should be open to all local and/or regional stakeholders who are able and willing to participate in new cluster initiatives. Agents to be addressed include entrepreneurs, regional and local government officials, representatives of the financial sector (including e.g. those of microfinance institutions), business association representatives, trade union representatives, and teachers or principals in professional education (and, if applicable, in higher education).

Identifying, approaching and motivating stakeholders will often require coordination with regional and local government. Pilot initiatives' key personalities might help motivate stakeholders by communicating their experiences to them. National federations

of business associations and trade unions might help to approach representatives of their regional or local sections.

Involving entrepreneurs is especially critical at every stage of the cluster promotion process. If securing entrepreneurs' commitment does not succeed at the initial stage, approaching them as early as possible during the next stages should be a priority, as they are the primary target group of cluster promotion.

3. The workshops should be used to introduce the structures and results of the pilot initiatives, and the roles of various agents in their development. Ideally, stakeholders of the pilot initiatives would describe their roles. This would be especially valuable for corresponding agents from other regions. The goal is to give them an understanding of what it takes to build a cluster initiative in their own region.
4. Stakeholders from the same region who are interested in further pursuing the set-up of a cluster initiative should be given the opportunity to develop their own agenda during the workshop. As a basis for their agenda, they should be provided with an analysis of their region's economic structure, including its sectoral strengths and weaknesses. This data, which can use cluster tools described by The World Bank (2009), needs to be gathered in advance (e.g. by a donor organization in the first rounds of the cluster promotion chain, later by the national government). Depending on the group's size, they should be required to select between one and several representatives ("cluster leaders") who will coordinate the subsequent process of strategy formulation. Developing the agenda and selecting their representative(s) is critical to guarantee ownership. This process can be assisted by a donor organization and the national government. To build trust among the working group's members (which might be difficult, e.g. if employers and trade union representatives are present and labor relations are tight), each group can be assigned an external moderator during the workshop. In the first rounds of the cluster promotion chain, a donor organization might take over this role and later hand it over to the national government.

5. After the workshop, all selected regional or local cluster leaders are invited to national or (depending on the size of the country and the number of representatives) regionalized cluster policy seminars. In these seminars, representatives of the pilot initiatives should report their experiences and transfer their practical knowledge. Developing the capacities of the cluster leaders might draw on experiences in training “network brokers“ ( Ceglie, Clara and Dini 1999). Cluster leaders could also be taught the use of cluster tools as those described by The World Bank (2009), including techniques for further cluster analysis. The national government might use this forum to sample regional or local needs for assistance, provided cluster leaders are already aware of them at this stage. These capacity building measures will need to be, at least in the first rounds of the cluster promotion chain, assisted by donor organizations.
  
6. In the next step, cluster leaders will take the knowledge gathered in the seminars back to their regional or local working groups formed at the initial workshop. In these working groups, the agenda developed at the workshop and the lessons drawn from the seminar should be integrated into a more detailed strategy of cluster promotion encompassing a time frame of roughly five years (which does not mean that the initiative should end after five years but rather that the strategy needs to be renewed in case the initiative proves to be successful and sustainable). At the beginning of the process, the strenghts and weaknesses of the cluster and its enterprises should be examined with techniques learned in the seminar. This should help working groups develop the main thrusts of their cluster strategies. Such a strategy might include the formation of institutions (e.g. chambers of commerce or sectoral associations).

The working groups should remain open to agents interested in participating at any time. They might form the nucleus of a tentative institutionalized cluster initiative. However, if no formalized institution ensues, this does not have to be a disadvantage. The working group might permanently function as a semi-formal network. The process of strategy formulation, implementation, and evaluation should be assisted by donor organizations or by consultants. In later rounds of the cluster promotion chain, responsibility for assistance should be handed over to the national government (which

can commission external consultants in turn, in case it is needed). Standard evaluation tools could be provided by donor organizations.

7. During strategy formulation and implementation, the cluster leaders should regularly meet with the pilot initiatives' representatives. Ideally, there would be partnerships between pilot initiatives' leaders and new initiative's leaders. They could exchange their experience on a permanent basis. This would enable a transfer of know-how from the pilot initiatives to the new ones.
8. Study tours of cluster leaders and working groups visiting successful pilot initiatives might help motivate agents and lead to further know-how transfer (Ceglie, Clara and Dini 1999; UNIDO 2001; n.d.).
9. After a period of roughly five years, the process is started anew as new clustering potentials might have developed, or some initiatives may have failed but see a chance to restart. Additionally, as resources at the national level (and those of donor organizations) are limited, it might be inevitable to sequence cluster promotion. This means that the number of regions targeted in the first round of the cluster promotion chain would need to be limited to, for example, between five and ten. In case a region contains potentials for more than one cluster, promoting them requires sequencing. In each round, every participating region should have to concentrate on promoting only one cluster. To enable other clusters (and possibly also other regions) to participate, a new round of the cluster promotion chain should be started regularly. In this new round, successful new initiatives from the first round take the place of the pilot initiatives. This requires prior evaluation that can be assisted by donor organizations in the first rounds. Cluster leaders of initiatives that have come into being during a prior round might help approach and motivate stakeholders in regions not yet involved in cluster promotion. During subsequent rounds, they can team up with leaders of initiatives to be developed in a subsequent round. Thus they would take the place of the pilot initiatives' leaders in the first round. Donor organizations' roles should gradually be handed over to the national government during subsequent rounds. In several subsequent rounds, seeds for regional development can be planted throughout the country.

In the cluster promotion chain approach, it is possible that some resulting initiatives might not show salient characteristics of typical cluster promotion. Some might turn out to be cross-sectoral SME networking projects, or pursue other regional development objectives. Provided they show a clear focus on growth and competitiveness on the regional and/or local level, this should be tolerated as a form of bottom-up pluralism and competition between self-organized approaches of regional development.

## **6 Backing up cluster policy: the cluster promotion office**

Implementation of the working groups' strategies on the regional or local level can be permanently assisted by a cluster promotion office on the national level, which could be set up at the national ministry of economics or alternatively as a stand-alone institution, e.g. a foundation (UNIDO n.d.). Several tasks can be assigned to this office:

- It acts as a liaison between regional and local agents on the one hand and national policymakers and regulators on the other hand. It can function as a guide for regional and local agents if and when they need access to national policymakers or if national funds for promoting projects in the clusters are available.
- It is charged with harmonizing cluster promotion and general economic policy on the national level (including other policies of regional development, e.g. regional planning), and to advance the perspective of cluster promotion in national policymaking. In this regard, cluster policy can be linked with development policy at the macro-level (e.g. export promotion, trade policy, investment promotion, deregulation, or competition policy). The office needs to coordinate its goals and measures with other agents of economic policy on the national level (e.g. export promotion agencies and investment promotion agencies). For instance, an export promotion agency's sectoral focus can be oriented towards clusters, e.g. in creating contacts between their enterprises and those abroad.



- The office's staff should be in close contact with these institutions. If applicable, they can be members of their advisory or supervisory boards. The office itself might have supervisory and/or advisory boards of its own with national policymakers and staff from other relevant government agencies as members. The office's staff should also engage in informal networking with them.
- It can give impulses for strategy development and communicate best-practice lessons to working groups and cluster leaders. It might also invite cluster leaders to regular national or regionalized conferences and roundtables to let them exchange their views and experiences.
- It can advise cluster leaders and working groups on implementation issues. It could offer them assistance on cluster analysis and evaluation tools and their use.
- It can initiate contacts between representatives of cluster initiatives in different regions that could complement each other. It can also initiate contacts with clusters abroad (maybe with the support of donor organizations).
- It acts as a liaison to a donor organization with profound experience in cluster policy which might be consulted if unexpected difficulties arise during implementation of the regional or local strategies by the working groups and cluster leaders that cannot be solved by the national cluster promotion office itself.
- It can be assigned all the tasks that have been assigned to the national government in the cluster promotion chain process. It can gradually take over the role of donor organizations during the first rounds and grow into the role of catalyst and organizer of later rounds.
- The office's staff might also function as “cluster brokers“ (UNIDO 2001) in several regional or local initiatives in case they encounter internal differences that could be bridged by limited outside intervention, or if some degree of trust still needs to be built

in later stages of cluster promotion. To contain the office's resource requirements, this service should be offered only on an ad-hoc basis.

Notwithstanding its roles in the cluster promotion chain, the cluster promotion office might take a more direct role in initiating cluster initiatives on the regional or local level comparable to donor organizations' roles in initiating pilot initiatives. It can use some of the cluster tools suggested by The World Bank (2009). If this rather top-down approach is to be pursued (in addition to the bottom-up approach of the office's contributions in the cluster promotion chain), the office will probably need capacity development measures to be offered by donor organizations. Beginning with the pilot initiatives, donor organizations with profound experience in cluster policy might enable the cluster promotion office to directly initiate cluster initiatives and gradually withdraw its own involvement as the office gains experience in building cluster initiatives. This approach is, however, independent from the more indirect approach of the cluster promotion chain but it can be combined with it if more direct involvement in regional or local cluster initiatives is needed.

## **7 Enhancing the chain-office approach: complementary measures**

In an environment with a stronger institutional set-up, the approaches introduced above can be enhanced in various ways. For example, in addition to or instead of voluntary cluster leaders, a working group might choose to hire a professional cluster manager if they can raise sufficient funds. Alternatively, staff of an existing regional organization (e.g. a chamber of commerce) might act as professional cluster managers.

Apart from resources needed to initiate the cluster promotion chain and to keep it going, resources to directly fund the regional or local cluster initiatives are not a necessary condition for this concept. Networking is basically about people. By creating social capital (Coleman 1988; Putnam 1993; 1995) and fostering interactive learning between cluster agents on the regional and local level and by developing their capacities, dynamic effects of regional development might ensue as business needs on these levels can be more easily discovered and subsequently addressed.

However, addressing some of these business needs might turn out to require additional funds. The same holds true for specific projects being developed as part of the cluster promotion process on the regional and local levels. As cluster initiatives should ideally be permanently funded by the private sector, mobilizing funds among cluster agents should be the way of choice. Still, sometimes public funds are needed to complement private funding or if public seed funding for these projects is inevitable.

Even without any project funding, however, the cluster promotion chain works because it mobilizes social capital and creativity among cluster agents. Although it is likely that some cluster initiatives will fail without the incentive of external funding, the surviving ones are very likely to exhibit a high degree of ownership.

Even after tasks in cluster promotion have been transferred from donor organizations to the national cluster promotion office, the organization might still contribute targeted support measures as far as they are needed. For example, it might offer study tours to clusters abroad or “joint learning programs“ if the cluster promotion office perceives a need for this (Ceglie, Clara and Dini 1999; UNIDO 2001; n.d.).

## **8 Benefits of an integrated approach**

In combination with the cluster promotion office, the cluster promotion chain approach has several advantages:

- It is a bottom-up approach that does not presuppose a top-down selection of clusters to be promoted. Agents and structures on the regional and local levels are the basis on which this type of cluster policy is being built. Although these agents will need to be approached, their commitment and ownership are the driving forces for the process to go on. In contrast to many top-down policies, the cluster promotion chain is basically a demand-driven approach. It comes close to ensuring that cluster policy rests on existing clustering potentials – at least to some degree.
- According to its bottom-up character, the cluster promotion chain as proposed here is open to all sorts of strategies and measures developed by regional or local stakeholders.

Although some minimum standards of the strategies might be defined, the cluster promotion chain provides a framework that can be flexibly filled by regional or local initiatives according to the specific needs of the respective cluster and region.

- It draws on both ownership through self-organization of agents and their empowerment through capacity building and the tentative two-level support structure with the cluster promotion office as the first level and the donor organization or paid specialized consultants as the second.
- Setting up this support structure with two levels enables assistance for a large number of cluster initiatives in the long term.
- The revolving nature of the cluster promotion chain enables donor organizations to gradually hand over responsibilities to the national government and specifically to the cluster promotion office. However, if advice is needed in later rounds of the cluster promotion chain, the donor organization can take part in troubleshooting without getting directly involved in the cluster initiatives. Rather, it can advise the national cluster promotion office which is supposed to be the primary point of contact for cluster initiatives.
- Resource requirements are rather low. Project funding may be added to the concept, but is not a necessary requirement. The main components of the cluster promotion chain are informal networking (although it may be formalized in the long term) and capacity building.
- The absence of project funding may even turn out to be advantageous, as it enables a self-selection mechanism to work: Only initiatives that are driven by a genuine interest in regional development by agents who see its long-term benefits will be further pursued. It can be expected that rent seeking will not be their primary motivation.<sup>5</sup>
- The chance to be presented as an example of successful cluster promotion in a subsequent round might even act as an incentive to cluster agents.
- If the cluster promotion chain as proposed here does not lead to the set-up of cluster initiatives on the regional and local level, it still can be refined and combined with other approaches of cluster promotion and specifically with more direct interventions of the national government and donor organization at every stage. Thus, it provides a basic

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5 Altenburg (2003) describes the danger of rent seeking in innovation policy in developing countries.

framework that can be flexibly adapted to the individual context of developing countries.

## **9 Going beyond networking**

Notwithstanding the benefits achievable with networking approaches describes above, one should bear in mind that cluster promotion is more than networking. Networking (that is, various forms of cooperation between cluster constituents), which usually is the main task of an institutionalized cluster initiative, is often an important part of cluster promotion. But there are other ones, too.

Following Porter (1990; 1998a; 1998b), competition can be another highly relevant aspect of successful clusters. In the model developed by Benner (2009; 2012a; 2012b; 2012c; 2012d), this is reflected notably by the mechanisms of intensive local competition within the cluster and competition in the cluster's local social hierarchy, but also of spinoff formation. Labor market-related mechanisms are another important object of cluster promotion apart from networking.

Surely, an institutionalized cluster initiative can employ instruments that address mechanisms apart from networking. Concerning labor market-related mechanisms, such an enhanced role of these institutions is plausible. When it comes to stimulating competition, however, it is unlikely that institutionalized cluster initiatives play an active role. If they are to be financed by the cluster's constituent enterprises, they will probably hesitate to attract external competitors or to promote new business formation because this engenders new competition for established companies. Except in cases where such institutions can build on a strong and shared vision of the cluster's long-term success (even if this might entail short-term disadvantages for some of its current constituent enterprises), independent institutions may be better suited to employ instruments addressing competition-related mechanisms. National, regional, and local government and its affiliates (e.g. investment promotion agencies) come into play here. For example, a national or regional investment promotion agency might explicitly market existing clusters abroad and focus on attracting international competitors. Apart from their marketing function for the cluster, investment promotion agencies can also open the a cluster's doors towards external investors wishing to invest and to tap in its (informal) networks, social capital,

and knowledge. It can be difficult for external agents to become part of the social fabric of an established cluster, especially if they are (or are seen as) new competitors. It can be complicated for outsiders to build contacts to companies, business or trade associations, education or R&D institutions within the cluster. The investment promotion agency can play a highly helpful role in brokering these contacts. Thus it can contribute to the injection of new knowledge, capital, and competitive energy into the cluster.

In a number of cases, an indirect approach by which the national government strives to induce bottom-up cluster promotion, as is the case in efforts to support the creation and growth of institutionalized cluster initiatives on the regional or local level, is either not possible (e.g. because institutional capabilities of agents on the regional or local levels are not sufficient), has been tried unsuccessfully, is not to be attempted because of resource constraints, or is simply supposed to be complemented by other, more direct approaches of cluster promotion. In these cases, a national or regional cluster promotion strategy can build on interventions by government agents with instruments listed in Table 1. Donor organizations can assist national or regional governments in devising these strategies or, if applicable, consult regional or local business or trade associations or chambers of commerce in elaborating their own cluster promotion approaches.

Table 2 lists possible direct contributions of local, regional, and national government to instruments of cluster promotion, as well as ways for donor organizations to support them. An indirect approach that rests on initiating or assisting the setup of a bottom-down institutionalized cluster initiative is a possibility to complement and enhance these direct contributions. In fact, there are some instruments to which no direct contributions of the respective agents are conceivable (e.g. direct matching between employers and qualified job-seekers or direct dialogue between companies and R&D/education institutions). Concerning these instruments whose character is rather soft and personal, pursuing an indirect, bottom-up approach that enhances networking and builds a solid fabric of social capital is often the most promising approach, or even the only one available. Yet, if such a direct approach is not feasible, Table 2 still contains a host of other cluster promotion instruments that can be influenced. In addition, even these soft and personal instruments can emerge as a by-product of

instruments to which local, regional, or national government or donor organizations can directly contribute.

In Table 2, the role of donor organizations seems rather limited. Notably, their direct roles appear to be confined to brokering international contacts and deploying experts strategy formulation processes. Yet, in addition to the (few) possible direct contributions of donor organizations, they can play a much stronger role than is apparent from Table 2. This is because they can consult local, regional, and national government in their efforts to design their cluster promotion strategies and to implement them according to the toolbox proposed here. To each instrument and each possible contribution dealt with in Table 1 and 2, they can offer capacity building measures for government agents in their cluster promotion design and implementation efforts and insert their experience. Thus, donor organizations can play the role of a cross-section catalyst for the initiation of a comprehensive cluster promotion strategy. In principle, they can indirectly affect any contribution undertaken by government agents – especially by national government, but possibly also by regional and local governments, depending on the depth of the donor organization's involvement.

Direct financial support from donor organizations is possible for each instrument. Even so, it is not considered here as a specific contribution. The toolbox proposed here is meant to be applicable by donor organizations in a host of countries and regions simultaneously without encountering prohibitive budget constraints. In addition to the direct interventions of donor organizations listed in Table 2 and their indirect, catalytic contributions, targeted financial support to instruments remains an option for a donor organization able to allocate additional funds for this purpose. It is not a necessity through. Indirect contributions (e.g. capacity building) will often take precedence.

Eventually, direct and indirect contributions to instruments of cluster promotion can be combined if resource constraints do not pose severe limits to an integrated approach. In such a broad approach, coordination between cluster promotion agents is critical.

Ideally, even if it has been in the driver's seat in the initial stages of cluster promotion, the national government should gradually hand over its leading role to agents closer to the cluster(s)

promoted. In this way, even a top-down approach stands a chance to evolve into a bottom-up approach over time. A donor organization can limit its role to consulting in the process of strategy formulation, or it might take on additional roles in supporting its implementation (e.g. in in-depth capacity building for cluster promotion agents on the regional or local levels). Such a sequenced approach can enable widespread efforts of cluster promotion covering a greater number of regions with limited resources.

## **10 Cluster policy: what it can and cannot do**

Despite the potential of the approaches outlined, the possibilities of cluster policy should not be overestimated. It does not guarantee that growth and employment goals are achieved. Neither is it the method of choice for every region (Benner 2012c; 2012d).

In particular, it is no substitute for a comprehensive economic policy that also includes a solid macroeconomic framework:

„Only when these preconditions, such as the existence of real markets, coherent macroeconomic policies, a certain level of proficiency among government agencies, etc. are in place will an industry based or cluster based strategy be helpful or appropriate. Otherwise, “cluster programs” result in hopelessly piecemeal solutions to systemic problems, or, even worse, become tools to subsidize politically connected companies or industries“ (Enright 2003, S. 122).

Even so, cluster policy can be applied in a macroeconomic environment that is far from perfect. It might still achieve some progress in regional economic development, provided that basic framework conditions on the macro level are guaranteed (e.g. a solid legal framework including clearly defined property rights). In such a context, its chances to unfold its full potential can certainly be expected to be reduced. Still, some chances remain that make it an approach worth pursuing if and when the use of scarce resources for it is commensurate with its prospects.



Above all, cluster policy should not be taken as a convenient excuse not to pursue “hard” macroeconomic reforms. In a comprehensive systemic strategy of economic development (Esser, Hillebrand et al. 1996), sound policies on the macro, micro, and meso level, with the latter including cluster policy (Benner 2012c; 2012d), should go together.

**Table 2: Contributions of development-cooperation agents to instruments of cluster policy**

| Instruments   | Local government   | Regional government (if applicable)  | National government  | Donor organization |
|---|--|--|--|--------------------|
| Job fairs   | <ul style="list-style-type: none"> <li>▪ (Co-) Organization</li> <li>▪ Financial support</li> </ul>  | <ul style="list-style-type: none"> <li>▪ (Co-) Organization</li> <li>▪ Financial support</li> </ul>  | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>          |                    |
| Direct matching between employers and qualified job-seekers   |  |  |  |                    |
| Direct dialogue between companies and R&D/education institutions  |  |  |  |                    |
| Public relations initiatives for the cluster  | <ul style="list-style-type: none"> <li>▪ (Co-) Organization</li> <li>▪ Financial support</li> </ul>  | <ul style="list-style-type: none"> <li>▪ (Co-) Organization</li> <li>▪ Financial support</li> </ul>  | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>          |                    |
| Online job (and internship) exchange  | <ul style="list-style-type: none"> <li>▪ Setup of the exchange</li> <li>▪ Financial support</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Setup of the exchange</li> <li>▪ Financial support</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>          |                    |
| Scholarships for theses and internships   | <ul style="list-style-type: none"> <li>▪ Allocation of scholarships</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Allocation of scholarships</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Allocation of scholarships</li> </ul> |                    |
| Use of social media tools   | <ul style="list-style-type: none"> <li>▪ (Co-) Organization</li> <li>▪ Financial support</li> </ul>  | <ul style="list-style-type: none"> <li>▪ (Co-) Organization</li> <li>▪ Financial support</li> </ul>  | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>          |                    |
| Lobbying for measures of education and science policy (e.g. for locating R&D/education institutions within the cluster) | <ul style="list-style-type: none"> <li>▪ Leadership or participation in lobbying campaigns</li> </ul>  | <ul style="list-style-type: none"> <li>▪ Leadership or participation in lobbying campaigns</li> </ul>  |  |                    |
| Entrepreneurship or business plan competitions  | <ul style="list-style-type: none"> <li>▪ (Co-) Organization</li> <li>▪ Financial support</li> </ul>  | <ul style="list-style-type: none"> <li>▪ (Co-) Organization</li> <li>▪ Financial support</li> </ul>  | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>          |                    |
| Foundation of technology centers or science parks   | <ul style="list-style-type: none"> <li>▪ Foundation of own facilities</li> <li>▪ Equity interest in facilities</li> <li>▪ Financial support</li> </ul> | <ul style="list-style-type: none"> <li>▪ Foundation of own facilities</li> <li>▪ Equity interest in facilities</li> <li>▪ Financial support</li> </ul> | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>          |                    |
| Entrepreneurship seminars   | <ul style="list-style-type: none"> <li>▪ (Co-) Organization</li> <li>▪ Financial support</li> </ul>  | <ul style="list-style-type: none"> <li>▪ (Co-) Organization</li> <li>▪ Financial support</li> </ul>  | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>          |                    |
| Consulting for (possible) entrepreneurs before and after the new business formation and                                 | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>  | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>  | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>          |                    |

|   |   |   |   |  |
|---|---|---|---|--|
| information about support options   |   |   |   |  |
| Matching of entrepreneurs and experts   |   |   |   |  |
| Industry and technology-specific subsidies for new business formation                                   | <ul style="list-style-type: none"> <li>▪ Allocation of subsidies</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Allocation of subsidies</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Allocation of subsidies</li> <li>▪ Creation of tax incentives</li> </ul>   |  |
| Allocation of venture capital by venture capital funds  | <ul style="list-style-type: none"> <li>▪ Setup of public venture capital funds</li> <li>▪ Financial support of private venture capital funds</li> </ul> | <ul style="list-style-type: none"> <li>▪ Setup of public venture capital funds</li> <li>▪ Financial support of private venture capital funds</li> </ul> | <ul style="list-style-type: none"> <li>▪ Setup of public venture capital funds</li> <li>▪ Financial support of private venture capital funds</li> <li>▪ Creation of a legal and fiscal framework for venture capital</li> </ul> |  |
| Direct coaching for spinoffs by venture capital donors  | <ul style="list-style-type: none"> <li>▪ Setup of public venture capital funds</li> <li>▪ Financial support of private venture capital funds</li> </ul> | <ul style="list-style-type: none"> <li>▪ Setup of public venture capital funds</li> <li>▪ Financial support of private venture capital funds</li> </ul> | <ul style="list-style-type: none"> <li>▪ Setup of public venture capital funds</li> <li>▪ Financial support of private venture capital funds</li> <li>▪ Creation of a legal and fiscal framework for venture capital</li> </ul> |  |
| Development of technology centers or science parks into incubators through the offer of venture capital | <ul style="list-style-type: none"> <li>▪ Foundation of own facilities</li> <li>▪ Equity interest in facilities</li> <li>▪ Financial support</li> </ul>  | <ul style="list-style-type: none"> <li>▪ Foundation of own facilities</li> <li>▪ Equity interest in facilities</li> <li>▪ Financial support</li> </ul>  | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>   |  |
| Technology transfer departments of subsidiaries of universities   | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Creation of a legal framework for technology transfer</li> </ul>   |  |
| Technology transfer specialists at university institutes or chairs                                      | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Creation of a legal framework for technology transfer</li> </ul>   |  |
| Management of cooperation projects  | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Financial support</li> <li>▪ Elimination of possible anti-trust law obstacles</li> </ul>   |  |
| Direct matching of potential partners   |   |   |   |  |
| Congresses, company visits, seminars and other meetings as a means of initiating and                    | <ul style="list-style-type: none"> <li>▪ (Co-) Organization</li> <li>▪ Financial support</li> </ul>   | <ul style="list-style-type: none"> <li>▪ (Co-) Organization</li> <li>▪ Financial support</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>   |  |

|  |   |   |   |  |
|--|---|---|---|--|
| maintaining contacts   |   |   |   |  |
| University classes for industry workers  | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Financial support</li> <li>▪ Creation of tax incentives</li> </ul>   |  |
| University training programs for industry workers  | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Financial support</li> <li>▪ Creation of tax incentives</li> </ul>   |  |
| Use of universities' or R&D institutions' infrastructure (e.g. laboratories or machines) by industry   |   |   | <ul style="list-style-type: none"> <li>▪ Creation of a legal framework to open universities' and R&amp;D institutions' infrastructures</li> </ul>   |  |
| Use of leading companies' infrastructure (e.g. laboratories or machines) by other companies            |   |   | <ul style="list-style-type: none"> <li>▪ Elimination of possible anti-trust law obstacles</li> </ul>  |  |
| Financial support for collaboration (also through cluster competitions)                                | <ul style="list-style-type: none"> <li>▪ Organization of a cluster competition on the local level</li> <li>▪ Allocation of subsidies for collaboration</li> </ul> | <ul style="list-style-type: none"> <li>▪ Organization of a cluster competition on the regional level</li> <li>▪ Financial support of a cluster competition on the local level</li> <li>▪ Allocation of subsidies for collaboration</li> </ul> | <ul style="list-style-type: none"> <li>▪ Organization of a cluster competition on the national level</li> <li>▪ Financial support of a cluster competition on the regional and local levels</li> <li>▪ Allocation of subsidies for collaboration</li> <li>▪ Creation of tax incentives for collaboration</li> </ul> |  |
| Innovation vouchers  | <ul style="list-style-type: none"> <li>▪ Allocation of innovation vouchers</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Allocation of innovation vouchers</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Allocation of innovation vouchers</li> <li>▪ Creation of tax incentives for the use of innovation vouchers</li> </ul>  |  |
| Formation of associations or working groups encompassing industry and universities or R&D institutions | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Financial support</li> <li>▪ Elimination of possible anti-trust law obstacles</li> </ul>   |  |
| Formation of industry associations or working groups   | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Financial support</li> <li>▪ Elimination of possible anti-trust law obstacles</li> </ul>   |  |
| Formation of associations or working groups encompassing various industries                            | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>   | <ul style="list-style-type: none"> <li>▪ Financial support</li> <li>▪ Elimination of possible anti-trust law obstacles</li> </ul>   |  |

|  |   |   |   |  |
|--|---|---|---|--|
| Use of contacts to other associations or networks for trans-regional matching in the external cluster dimension                    |   |   |   | ▪ Brokerage of contacts institutions of clusters in different nations                        |
| Industry semesters of university teachers  | ▪ Financial support   | ▪ Financial support   | ▪ Financial support<br>▪ Creation of a legal framework to enable industry semesters by teachers employed by public universities   |  |
| Collaboration in designing a cluster strategy in order to participate in a cluster competition                                     | ▪ Leadership in the strategy formulation process<br>▪ Financial support of the strategy formulation process | ▪ Leadership in the strategy formulation process<br>▪ Financial support of the strategy formulation process |   | ▪ Deployment or brokarage of trainers, moderators, consultants, or cluster promotion experts |
| Online cooperation database  | ▪ Set-up of a database<br>▪ Financial support   | ▪ Set-up of a database<br>▪ Financial support   | ▪ Financial support   |  |
| Creation of a cooperative climate by building a common cluster identity (e.g. through public relations initiatives)                | ▪ (Co-) Organization<br>▪ Financial support   | ▪ (Co-) Organization<br>▪ Financial support   | ▪ Financial support   |  |
| Use of trade fair participation programs for trans-regional or international matching in the external cluster dimension            | ▪ (Co-) Organization of trade fair participation programs<br>▪ Financial support                            | ▪ (Co-) Organization of trade fair participation programs<br>▪ Financial support                            | ▪ (Co-) Organization of trade fair participation programs<br>▪ Financial support  | ▪ Brokerage of contacts institutions of clusters in different nations                        |
| Use of delegation trips for trans-regional or international matching in the external cluster dimension                             | ▪ (Co-) Organization of trips<br>▪ Financial support  | ▪ (Co-) Organization of trips<br>▪ Financial support  | ▪ (Co-) Organization of trips<br>▪ Financial support  | ▪ Brokerage of contacts institutions of clusters in different nations                        |
| Focused investment promotion towards external companies (including competitors), including through focused allocation of subsidies | ▪ Focus existing investment promotion efforts   | ▪ Efforts to focus the work of the investment promotion agency  | ▪ Efforts to focus the work of the investment promotion agency<br>▪ Attraction of investments by companies in which the government's sovereign wealth fund holds stakes |  |
| Use of public relations initiatives for trans-regional matching in   | ▪ (Co-) Organization<br>▪ Financial support   | ▪ (Co-) Organization<br>▪ Financial support   | ▪ Financial support   |  |

|  |   |   |  |  |
|--|---|---|--|--|
| the external cluster dimension   |   |   |  |  |
| Sophisticated public procurement   | <ul style="list-style-type: none"> <li>▪ Standards for own procurement</li> </ul>                       | <ul style="list-style-type: none"> <li>▪ Standards for own procurement</li> </ul>                       | <ul style="list-style-type: none"> <li>▪ Standards for own procurement</li> <li>▪ Standards for local and regional government procurement</li> </ul>                       |  |
| Implementation of common parameters for competition through standard-setting and certification |   |   | <ul style="list-style-type: none"> <li>▪ Financial support for standard-setting and certification organizations</li> <li>▪ Transformation of standards into law</li> </ul> |  |
| Information about cluster personalities (e.g. in newsletters and publications)                 | <ul style="list-style-type: none"> <li>▪ Own publications</li> <li>▪ Financial support</li> </ul>       | <ul style="list-style-type: none"> <li>▪ Own publications</li> <li>▪ Financial support</li> </ul>       | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>  |  |
| Allocation of awards   | <ul style="list-style-type: none"> <li>▪ Calls for applications</li> <li>▪ Financial support</li> </ul> | <ul style="list-style-type: none"> <li>▪ Calls for applications</li> <li>▪ Financial support</li> </ul> | <ul style="list-style-type: none"> <li>▪ Financial support</li> </ul>  |  |
| Use of well-connected personalities as a means of initiating and maintaining contacts          |   |   |  |  |

Source: own work based on Benner (2012a; 2012c: 172-173; 2012d).

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