

How to Promote Clusters

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1 Definition of clusters

Question: What do movies, hearing aids, ceramic tiles and surgical instruments have in common? Answer: A major part of global output is produced in very few locations. A large share of movies come from Los Angeles (Hollywood) and Bombay (Bollywood). A large share of high-tech hearing aids is manufactured around Copenhagen, Denmark. If you buy tiles, it is quite likely that they have been produced either in Sassuolo (Italy) or Castellón de la Plana (Spain). A disproportionate share of global output in surgical instruments comes from Tuttlingen (Germany) and Sialkot (Pakistan).

Underlying all this is the phenomenon of industrial clusters. Clusters are defined as a territorial agglomeration of closely related industries. Clusters mostly emerge due to historical coincidence. A typical sequence would go like this: Some person starts a garment operation. As the founder is competent and the market is growing, the business grows quickly. Some managers start to get bored with their status (and frustrated with their salary), and they decide to start their own business, doing what they can do best – garments. Other entrepreneurs perceive the opportunities created by a local concentration of garment manufacturers, and they start to supply (and later manufacture) fabric, thread, buttons, labels and other inputs. Sales representatives of sewing machines and other capital goods detect the local market and eagerly attend the growing demand. Then the experts in Information Technology start to develop specialised software packages for local manufacturers. The initial producers won't find skilled workers, but over time a local skills pool at the different skills levels will emerge. At some stage, specialised local training centers are created. The businesses may create a business association, and it may provide services like seminars or market research. Perhaps government or the business association create a laboratory to test inputs and certify products, and this operation evolves into a research and development center. Thus, over time a differentiated cluster of producers and supporting institutions specialised in one product – garments – has emerged. And it has emerged in an unplanned way, driven by the invisible hand of the market. This is known as “cumulative causation” – success breeds success. Once an area has acquired a reputation for exploiting local resources to meet the demands of a growing customer base, it becomes the perceived centre of production.

Manufacturers in a location like this enjoy obvious advantages. It is easy to find inputs and machinery. There is little problem in finding skilled labour. Even marketing and sales is easier than elsewhere, since customers will flock to this location. At the same time, manufacturers also suffer from disadvantages. Competition is not just the invisible hand of the market but manifests itself in the shape of the factory on the other side of the road. Local rivalry in a cluster is strong, and it often is one of the main drivers of cluster growth and competitiveness. Advantages and disadvantages of clustering to firms reinforce each other: Easy availability of inputs and production factors reduces transaction costs and barriers to entry, and rivalry stimulates an innovation-driven upgrading contest. The latter also affects the local suppliers, so that the quality of inputs increases, whereas prices are driven down by local rivalry.

The main disadvantage of clusters is that they can overheat. Intense competition, coupled with a level of customer demand that outstrips supply-side capability, can lead to a bidding-

up of material and labour costs which, over time, can render the cluster uncompetitive. Since the local area has a disproportionate reliance on one or two key industries, the socio-economic impact of the industry going into decline is far greater. An important lesson is that cluster promotion **must** be balanced with initiatives to promote diversity within the SME sector.

The importance of clusters for the understanding of industrial development was first pointed out by the British economist Alfred Marshall at the end of the 19th century. However, subsequently the issue was neglected. The dominating concept was not external economies, which are the key advantage of a cluster, but economies of scale. Thinking on industrial development was shaped by authors like Alfred Chandler, who emphasized the advantages of large, vertically integrated and diversified corporations that could achieve economies of scale and scope (Chandler 1990; see also Whittington, Mayer und Curto 1999).

Things started to change in the 1980s. External observers started to notice that industrial development in Italy did not quite fit with the Chandlerian perspective. Italian industrial policy had stimulated the creation of large enterprise. But in its shadow, mostly unsupported by government policy, a sector of small and medium-sized enterprises (SME) blossomed. The “Third Italy” (apart from the First, traditional corporates like Fiat, and the Second, government-owned large enterprises) was highlighted in a study published in 1984 by the American economic sociologists Michael Piore and Charles Sabel. Titled “The Second Industrial Divide”, they hypothesized that with increasing product diversification the superiority of the Chandlerian corporation was under question. In their view, the emerging alternative was “flexible specialization” based on dense interaction between dynamic SMEs in industrial districts. Italian authors who had been addressing this phenomenon for a while got international attention (e.g. Becattini 1990). The theme was picked up by authors who were specifically looking at developing countries, such as Hubert Schmitz (1989).

The discussion on clusters and industrial districts picked up serious momentum after the publication of Michael Porter’s “Competitive Advantage of Nations” in 1990. Porter emphasized the importance of clusters for industrial competitiveness. The impact of Porter’s work was not only due to his standing as a strategic management and competitiveness guru, but also to the fact that thanks to his association with The Monitor Company he was able to respond swiftly to requests for advice from national and regional governments and development agencies that soon rolled in. The 1990s turned into a decade of intense work on clusters – not only from an academic research angle but also from a practical economic development angle.

1.1 Business cooperation as a main feature of clustering

The emphasis in both the academic discussion and the policy approach was on inter-firm cooperation. The research on industrial districts in Italy had highlighted this aspect as a core element in explaining the international market presence and competitiveness of SMEs. Porter emphasized the relevance of localized rivalry in his 1990 book, but pointed out the importance of inter-firm cooperation in his later work on clusters (Porter 1998). Cooperation and networking also ranks first among the objectives of cluster initiatives across the world;

the figure below is taken from a recent survey of about 260 clusters, mostly in developed countries.

Cooperation between firms typically involves three features which can be analytically distinguished, namely relational contracting, information exchange / joint learning, and collective action. **Relational contracting** is the opposite of arms-length relationships. Whereas the latter typically involve spot transactions, often based on auctions or auction-like arrangements, relational contracting involves a long-term business relationship. Arms-length relationships require extensive legal dealings, whereas relational contracting is often based on trust. Relational contracting occurs both within hierarchical settings (for instance in supplier relationships) and in heterarchical environments (e.g. industrial districts).

Typical kinds of **information exchange** between firms include the following:

- Informal information exchange between firms in supplier/subcontracting arrangements, going beyond what is necessary for arms-length transactions. The customer may give assistance to his suppliers, e.g. how to work with certain new materials or how to deal with quality problems.

Figure 1: Objectives of cluster initiatives



Source: Örjan Sölvell et al., The Cluster Initiative Greenbook. www.ivorytower.se

- Formal and informal information exchange between firms in business associations. They often are a forum for technical discussions, market research, etc.

- Information exchange between firms' employees in professional associations, which may be formal (e.g. presentations in conferences) or informal (e.g. discussions during meetings and conferences).

Frequent types of **collective action** include the following:

- the provision of real services by business associations.
- joint trips to fairs, joint stands at fairs.
- joint purchasing, joint sales, export consortia.
- jointly maintained, organisationally separate supporting institutions in fields like training, technology information, or export information.
- political lobbying and active participation in forums which work on shaping locational advantages.

In the real world, relational contracting, information exchange, and collective action will often go hand-in-hand; in fact, all three types of activities will reinforce each other, i.e. meetings in well-functioning business associations open opportunities to informal information exchange, and information exchange may highlight barriers to growth that can only be overcome through collective action. Taken together, this leads to the emergence of inter-firm networks. It is obvious that spatial proximity helps in building and maintaining these networks; communication media like the Internet or videoconferencing can only partially substitute them.

Why would firms cooperate? In the view of institutional economics there are two major reasons, namely transaction costs and principal-agent problems in arms-length relationships (Richter and Furubotn 1996). Arms-length relationships require an elaborate contract which is costly to set up, negotiate, and enforce, thus causing high transaction costs. Principal-agent problems emerge to the extent that, for instance, a subcontractor or supplier is contractually obliged to employ certain process technologies but chooses a cheaper alternative, and the principal contractor is not easily able to tell the difference (for instance in surface treatment or chemical treatment of textiles). Relational contracting and dense, long-term networks may offer substantial benefits in terms of minimising transaction costs and reducing principal-agent problems. Such arrangements are based on mutual trust. Agreements are self-enforcing to the extent that firms run the risk of eroding trust, and thus possibly drop out of the network, if they behave opportunistically. This can allow SMEs to rapidly acquire the advantages of scale of larger enterprises without incurring the overhead costs. The lack of formality in the agreements can allow them to respond to market opportunities and changes more quickly than their larger corporate rivals.

In the perspective of innovation economics (Rosenberg 1982, Freeman 1994), co-operation between firms is a crucial feature since innovation is a cumulative process, involves learning-by-doing, -using, and -interacting, and often yields increasing returns. Particularly important is learning-by-interacting. There is both an empirical and a theoretical argument behind the emphasis innovation economics puts on learning-by-interacting. Behind the empirical

argument is the notion that the most frequent type of innovation, namely incremental innovation, is not an event but a process of continuous improvements. The process of incremental innovation takes up speed as a development trajectory of a given technology becomes established (Dosi 1982), that is as an increasing number of researchers and firms agree that a given technology is preferable compared to other technologies. After this (often implicit) agreement, two things happen. First, there is less uncertainty, i.e. the risk that investment in R&D will have to be completely written off because a given technology has to be dropped is minimised. Second, an increasing number of researchers concentrate on improving a given technology, and a mesolevel structure of research groups or institutes, training courses and textbooks, norms and standards, etc. is being created.

The theoretical argument addresses the issues of opportunity costs and increasing returns. The alternative to inter-firm co-operation in innovation would be an autarchy approach, i.e. each firm tries to go through its own research effort and learning processes. In a certain way, this occurs in the real world; it is usually referred to as the *not-invented-here-syndrome*. This approach involves high opportunity costs as firms could have avoided replication and repeating dead-end tracks by learning from the experience of other firms.

In the view of innovation economics, the issue of transaction costs involves the different forms learning-by-interacting can take. Formal technology transfer, e.g. by licensing, is one of them. However, as the use of technology implies a lot of tacit knowledge, no technology transfer contract can define all the details that are involved; it can try to define as many as possible, something that would be extremely costly in terms of drafting, supervising and enforcing the contract. The alternative is a combination of formal agreements and informal communication. Moreover, there are other forms of technological learning based on (often informal) communication between firms. These mechanisms have low transaction costs.

1.2 Cluster typologies

As research on clusters looked at more countries and locations, it became obvious that the Italian industrial districts – which are characterized by most if not all of the cooperative features just mentioned – are a rather special case. It is by no means obvious that close cooperation emerges between companies that operate in close proximity.

A first important distinction refers to passive vs. active advantages of clustering:

“Collective efficiency is defined as having two aspects to it: external economies that clustered agents accrue by virtue of their location, and joint action benefits that arise from deliberate cooperation between local agents. I view external economies as the ‘passive’ dimension of collective efficiency. The term passive describes the nature of ties required between local agents in order to obtain externality gains. In contrast, joint action is the ‘active’ dimension of collective efficiency requiring deliberate and active cooperation.” (Nadvi 1999, 1608)

The second important distinction refers to the fact that many clusters do not primarily consist of networked SMEs that are successfully competing on the world market. Based on extensive

research in various industrialized and developing countries, Markusen (1996)¹ came up with a typology of clusters that is summarized in the following table.

Table 1: Markusen's cluster typology

	Italianate	Satellite	Hub-and-spoke
<i>Main features</i>	<ul style="list-style-type: none"> - mainly SME - strong specialization - strong local rivalry and networking ("co-opetition") - trust-based relationships 	<ul style="list-style-type: none"> - mainly SME, dependent on external firm(s) - often based on cheap labour 	<ul style="list-style-type: none"> - large local firms and local SMEs - clear hierarchy
<i>Main strength</i>	<ul style="list-style-type: none"> - flexible specialization - high product quality - innovative potential 	<ul style="list-style-type: none"> - cost advantage - skills / tacit knowledge 	<ul style="list-style-type: none"> - cost advantage - flexibility - weight of large firms
<i>Main weakness / vulnerability</i>	<ul style="list-style-type: none"> - path dependence, slow adaption to radical change in economic environment or technology 	<ul style="list-style-type: none"> - dependency on external actors for sales, inputs, and know-how - limited scope for local activities to create competitive advantage 	<ul style="list-style-type: none"> - whole cluster depends on the performance of few large firms
<i>Typical trajectory</i>	<ul style="list-style-type: none"> - stagnation / decline - changing internal division of labour, outsourcing of certain activities to other locations - emergence of hub-and-spoke structure 	<ul style="list-style-type: none"> - stagnation - upgrading, integration of backward / forward steps, offering complete package to external clients 	<ul style="list-style-type: none"> - stagnation / decline (if large firms stagnate / decline) - upgrading, changing internal division of labour (large firms outsource activities locally)
<i>Promising policy interventions</i>	<ul style="list-style-type: none"> - collective action to shape locational advantages, public-private partnership 	<ul style="list-style-type: none"> - typical instruments of SME upgrading (training at all levels, technology extension) 	<ul style="list-style-type: none"> - partnership between large firms / business associations and public SME support agencies to strengthen SMEs

Looking more specifically at clusters in Latin America, Altenburg and Meyer-Stamer (1999) suggest a different typology that reflects the different reality from internationally competitive to local survival clusters (**Table 2**).

A further typology has been suggested by Enright (2000). He addresses the different levels of emergence of a cluster:

1 The fourth type of industrial district identified by Markusen, the State Anchored District, is not dealt with here.

Table 2: Altenburg / Meyer-Stamer's typology of clusters in Latin America

	Survival clusters	Fordist clusters	Transnational clusters
<i>Main features</i>	<ul style="list-style-type: none"> - Mostly micro and small businesses - little specialization - little interaction between firms - competition based on price-cutting 	<ul style="list-style-type: none"> - similar to Markusen's hub-and-spoke clusters - strong presence of large, vertically integrated companies - little functional differentiation - little cooperation 	<ul style="list-style-type: none"> - transnational firms not only as lead-firms, but also as first and second-tier suppliers - high barriers to entry for national firms
<i>Main strength</i>	<ul style="list-style-type: none"> - income opportunity for persons with no employment opportunities in the formal sector 	<ul style="list-style-type: none"> - cost advantage due to passive advantages of clustering 	<ul style="list-style-type: none"> - part of global networks of highly competitive and productive corporations
<i>Main weakness / vulnerability</i>	<ul style="list-style-type: none"> - low skills level limits upgrading and specialization options 	<ul style="list-style-type: none"> - little or no active advantages of clustering, combine disadvantages of Chandlerian model and cluster model 	<ul style="list-style-type: none"> - depend on strategic location decisions by headquarters, factories may surprisingly close down – vulnerable to external shocks
<i>Typical trajectory</i>	<ul style="list-style-type: none"> - growth in times of macro-economic crisis - caught in vicious circle of price-cutting and predatory competition - persistent poverty 	<ul style="list-style-type: none"> - slowly moving towards more de-verticalization, specialization and collective action 	<ul style="list-style-type: none"> - depends on macro-economic factors (overall stability, exchange rate)
<i>Promising policy interventions</i>	<ul style="list-style-type: none"> - skills development - micro-finance 	<ul style="list-style-type: none"> - stimulate and support movement from passive to active advantages 	<ul style="list-style-type: none"> - investment promotion to attract complementary companies that sharpen the locational profile

- Latent clusters have a critical mass of firms in related industries sufficient to reap the benefits of clustering, but have not developed the level of interaction and information flows necessary to truly benefit from co-location. This can be due to a lack of knowledge of other local firms, a lack of interaction among firms and individuals, a lack of a common enough vision of their future, or a lack of the requisite level of trust for firms to find and exploit common interests. In any case, such groups of firms do not think of themselves as a cluster and, as a result, do not think of exploring the potential benefits of closer relationships with other local organizations.
- Potential clusters are those that have some of the elements necessary for the development of successful clusters, but where these elements must be deepened and broadened in order to benefit from the impact of agglomeration. Often there are important gaps in the inputs, services, or information flows that support cluster development. Like latent clusters, they lack the interaction and self-awareness of working clusters.
- Policy driven clusters are those chosen by governments for support, but which lack a critical mass of firms or favourable conditions for organic development. Many of the

electronics and biotechnology "clusters" found in government programs are examples of this type of cluster. Policy driven clusters tend to be chosen more on political grounds than through any detailed analytical process. They tend to rely on the notion that policy can create clusters from a relatively unfavourable base.

- ‘Wishful thinking’ clusters are policy driven clusters that lack, not only a critical mass, but any particular source of advantage than might promote organic development.”

Apart from these different stages of the emergence of a cluster, it is important to point out that – just like industries – cluster also go through a life-cycle of emergence, growth, maturity, and decline. Clustering is by no means an insurance against decline. Economic history has often seen the decline of once powerful clusters – from shipbuilding at the Clyde to textiles and clothing in the English midlands to coal and steel at the Ruhr. And there is strong evidence that close interaction and networking in a cluster can actually limit the capacity of the cluster to respond to radical change, as too dense networking creates a communication pattern that encourages a tunnel view and collective conservatism. Moreover, there is evidence that maturation makes collective action within clusters more difficult: consolidation of local companies creates major corporate units that are less reliant on collective action, takeover of local companies by external investors erodes social capital and trust, as does the outward migration of local companies that seek locations with cheaper factor conditions. Declining clusters seem to encourage predatory behaviour rather than local collective action (Belussi 1999, Grabher 1993, Staber 2001, Whitford 2001).

We started this section by pointing at a spatial category as one of the two main defining features of a cluster. As cluster promotion has evolved in the course of the 1990s, we have observed a change in the relevance of the spatial category. Whereas cluster promotion in developing countries mostly continues to look at clusters from a narrowly defined spatial angle, cluster initiatives in Europe increasingly abandoned this perspective and looked at systems of companies in closely related industries within a larger region, typically a province or state. In some instances, the use of the term “cluster” itself evolved. For instance, Scottish Enterprise moved from using “cluster” as a noun to using the term as a verb, thus indicating an effort to stimulate and support close interaction between companies.

1.3 Conclusions for practitioners

- The term “cluster” describes a broad variety of economic realities. The typical Italian industrial district that is often presented as the ideal type of a cluster is just one of many varieties.
- The fact that companies of the same subsector are located in close proximity does not necessarily mean that they are involved in intense formal and/or informal cooperation.
- There is, however, a strong rationale for “co-opetition”, i.e. the co-existence of local competition and local cooperation among firms that relates to categories like transaction costs and learning-by-interacting.

2 Understanding policy-makers' interest in clusters

Why is it that policy makers in regional development, SME promotion and related fields developed a keen interest in cluster promotion? Enright and Ffowcs-Williams (2000, 4) summarize the rationale of cluster promotion as follows:

“Membership of clusters and networks can enhance the productivity, rate of innovation and competitive performance of firms. Clusters and networks can allow small firms to combine advantages of small scale with various of the benefits of large scale. Public policy on clusters and networks can help SMEs realise the opportunities and meet the challenges associated with globalisation. Essentially, a policy on clusters provides a framework for dialogue and co-operation between firms, the public sector (particularly at local and regional levels of government) and non-governmental organisations. This dialogue can lead to efficiency-enhancing collaboration amongst firms, such as in joint marketing initiatives, the creation of mutual credit guarantee associations, joint design and sponsorship of training, a more efficient division of labour among enterprises, etc. Such a dialogue can also lead to an improved quality of policy and government action (such as in training, the provision of information, and infrastructure supply).”

Let us look at each of these elements:

- At an initial stage, the main interest of policy-makers is usually to introduce cluster promotion as an innovative approach to SME promotion. Governments in industrialized and developing countries alike are concerned with SME promotion as SMEs form a substantial part of the economy and are important job creators. At the same time, they suffer from scale-related disadvantages in terms of competent management, access to credit, access to technology, access to foreign markets, etc. Cluster promotion would try to promote networking among companies, the ultimate goal being to stimulate stronger specialization of each company in a cluster, and thus stronger competitiveness of each company. It creates the basis for individual and collective upgrading efforts, moving into more demanding and more profitable markets, including export markets. Dense networks of SMEs in clusters can create economies of scale and scope while avoiding the inflexibility and high overhead costs of large corporations.
- Related to this reasoning is the expectation that cluster promotion can stimulate inter-firm learning and collective action and thus unburden SME promotion agencies. SME promotion agencies that support individual businesses notoriously suffer from the problem of low significance; a very competent agency may interact with 5% of the total, an average agency with 1% of the total number of SMEs. Working with groups of firms increases the outreach and impact of an SME promotion agency. Stimulating inter-firm learning means that SME advisors can focus at those non-trivial issues that cannot be solved by experience-sharing among firms, and that they can reach a larger group of firms.
- Cluster promotion can contribute to the creation of a more business-friendly government. It creates the basis for dialogue between government and the private sector, so that government gets a better understanding of the obstacles it is creating for businesses. Moreover, cluster initiatives create an opportunity to overcome government

fragmentation. It is common to observe that a variety of government institutions and parastatals is involved in business promotion activities, typically with little or no coordination. Within a cluster initiative various institutions can share information about the promotion activities they pursue, can align them, and can develop a clearer profile for themselves. Research on cluster initiatives in Europe has shown that the stimulation of interaction between governmental promotion agencies is often the most important impact of cluster initiatives, as it lowers the private sector's transaction cost in dealing with government promotion activities (Raines 2000).

- Cluster promotion is a more market-friendly way to run governmental SME promotion. SME promotion that targets individual firms always runs the risk of creating serious distortions, as it strengthens few businesses to the detriment of a large number of others. Cluster promotion has a bigger outreach, and it involves more generic (and thus less distorting) activities. Cluster promotion will rarely involve direct subsidies to individual firms. Instead, it will cover part of the transaction and opportunity cost of networking activities, and it will sponsor joint activities in areas such as training, R&D, marketing and exports that are based on a consensus between a substantial number of firms and benefit all of them.

An issue that has only recently started to attract attention is the effect of cluster promotion on equity. Cluster promotion so far had a tendency to benefit individuals and locations that were already relatively well-off. There is no quick-fix for this problem. For a detailed discussion of this issue see Rosenfeld (2002).

2.1 Conclusions for practitioners

Cluster promotion may appear to compete with other approaches to private sector development. The truth, however, is that cluster promotion is complementary to some other approaches.

- Promotion of microenterprise and SMEs, promotion of business start-ups: Cluster promotion is not different from these activities. It rather suggests a different perspective, namely a territorial perspective (business promotion for a local cluster). One of the most important effects of cluster initiatives is typically the improved visibility of existing support offers, a clearer definition of the complementarity between various support offers, and matching the supply of and demand for promotion activities .
- Value chain promotion: A cluster is not fundamentally different from a local value chain, and in many countries cluster initiatives address regional value chains. Thus, it would be artificial to try to define the distinctions between value chain promotion and cluster promotion. A cluster initiative tends to be more "local", a value chain initiative more "regional".
- Industrial policy: Cluster promotion is fundamentally different from traditional industrial policy. Traditional industrial policy used to be a central government activity that aimed at the creation of new industries. It was top-down, planning-driven and highly discretionary.

Cluster promotion has none of these characteristics. Cluster promotion always focuses at existing businesses. Trying to create a cluster from scratch, e.g. trying to develop an industrial park with the explicit objective of creating an industrial cluster there, is a futile exercise since it does not match with the realities of a dynamic market economy.

3 Identifying and Supporting clusters

3.1 When and why are cluster promotion activities appropriate?

Imagine that you are advising a national SME promotion agency. Your local counterpart mentions that in a given location there are 30 small furniture producers and suggests to pursue a cluster promotion approach to strengthen them. Is this a good idea?

The answer is not as straightforward as you would want it to be. The main issue at stake here takes us back to a question that has kept researchers and policy makers busy for more than 15 years, at least since Hernando de Soto came up with his controversial description of the informal sector as a seedbed of dynamic entrepreneurship. The question is: To what extent can you expect upgrading processes by micro and small enterprises, clustered or not, and how can you support these upgrading processes?

The biggest risk of the cluster discussion is to create unrealistic expectations in this respect. In an industrial cluster in Europe you would find companies like the world-market leader in the manufacturing of springs for car tank caps, a company located in Remscheid, Germany, that has three employees. Clusters in industrialized countries are the home to many such micro and small businesses, who despite their small size are highly competent and competitive. They derive an important part of their competitiveness from the cluster, since there are many other businesses, often also small, that are likewise specialized and highly competent in one specific activity.

So why not take the carpenters in some remote spot in Brazil and run a cluster initiative with them to transform them into a world-class furniture cluster? The answer is: Because it won't happen. To understand why, let us have a look at one of the standard instruments used in cluster analysis, Michael Porter's diamond. The diamond summarizes the key findings from Porter's research on the competitive advantage of nations. According to Porter, there are four critical factors that determine competitiveness:

1. Business strategies and structures and rivalry: Porter notes that despite all differences and national peculiarities one characteristic shared by competitive economies is that there is intense competition among domestic firms. Moreover, *"the more localized the rivalry, the more intense. And the more intense, the better."* (Porter 1990, 83) This is all the more true, as its effect is to cancel out static locational advantages and compel firms to develop dynamic advantages based on innovation and specialization.
2. Existence or lack of related and supporting industries: Spatial proximity of upstream or downstream industries facilitates the exchange of information and promotes a continuous exchange of ideas and innovations.

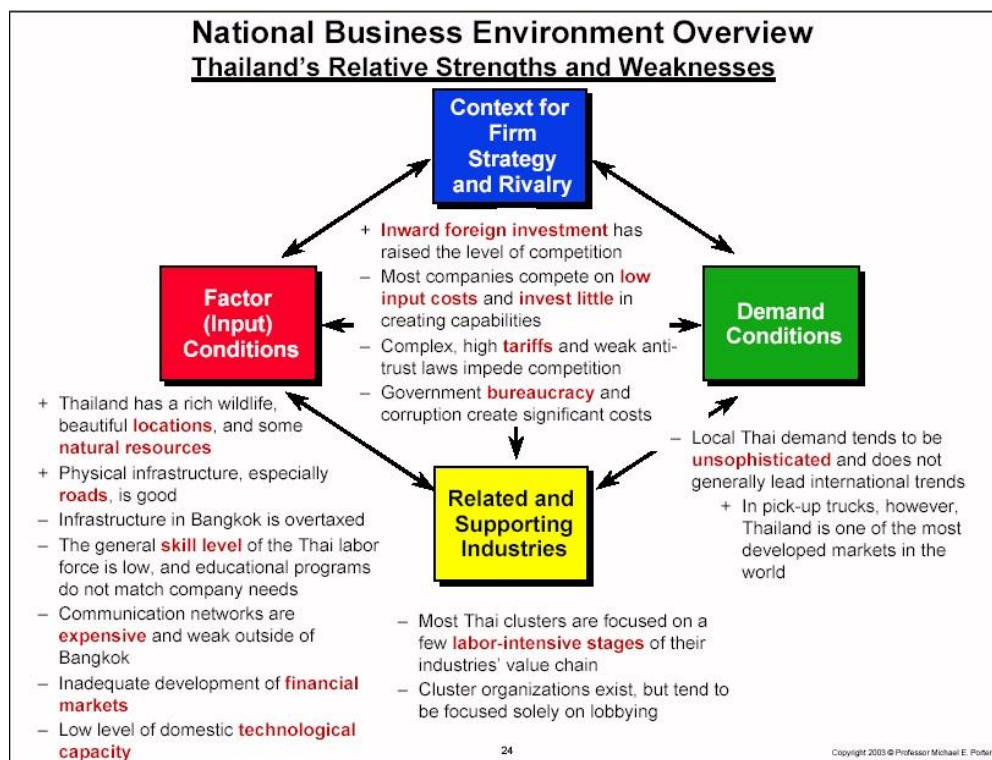
- Factor conditions: These include, e.g. the availability of qualified manpower or adequate infrastructure. *“Contrary to conventional wisdom, simply having a general work force that is high school or even college educated represents no competitive advantage in modern international competition. To support competitive advantage, a factor must be highly specialized to an industry’s particular needs – a scientific institute specialized in optics, a pool of venture capital to fund software companies. These factors are more scarce, more difficult for foreign competitors to imitate – and they require sustained investment to create.”* (Porter 1990, 78).

Disadvantages in general factor endowments need not necessarily prove disadvantageous, and they can even stimulate the development of competitiveness. If cheap raw materials or labour are available in abundance, firms will often yield to the temptation to rely solely on these advantages, and even to put them to inefficient uses. Conversely, certain disadvantages (high real estate prices, scarce labour and raw materials) can force firms to behave innovatively. This of course presupposes that positive impulses are generated by the other factors.

- Demand conditions: The more demanding the customers in an economy, the greater the pressure facing firms to constantly improve their competitiveness via innovative products, through high quality, and so on. Likewise, unusual or pioneering demand will force companies to develop specific capabilities.

The following figure gives an example of how Porter himself applies the diamond, in this case looking at the competitiveness of Thailand.

Figure 2: Objectives of cluster initiatives



Source: CAON Thailand 2003 FINAL 05-06-03 CK.pdf, available at www.isc.hbs.edu.

The overall impression – many more minuses than pluses – is the typical result of a diamond-based diagnostic of any developing country. And Thailand is a relatively dynamic developing country, with a strong growth performance and the top rank in the annual Global Entrepreneurship Monitor. So it takes little fantasy to imagine what the diamond would look like in a typical, not-so-dynamic Latin American country, and with respect to most Latin American clusters. So how would our Brazilian carpenters fare in a diamond diagnosis?

- Localized rivalry would be strong. However, it would be based mostly on price underbidding, much less on product differentiation and hardly at all on innovation. Since everybody would appear to steal everybody else’s ideas, trust would be non-existent and co-operation in the cluster accordingly very low.
- There would be only rudimentary supporting industries, such as sales persons for some key inputs. But key parts, such as hinges and locks, would come from elsewhere.
- Factor conditions would be unfavourable. Skills development would mostly be based on learning-by-doing and informal apprenticeship systems. There would be little formalized training, no research / development / technology extension, and financial services would be difficult to access.
- Demand conditions would be unfavourable. Carpenters would produce mostly for the local market, which would favour a low price (at a low quality). There would be little if any sophisticated demand, and accordingly little need for carpenters to upgrade.

In order to move from their current status, which would be more like a “survival cluster”, towards a more competitive constellation, the carpenters would need at least one or another critical competence, like the skills to deal with a very specific type of raw materials. If their skills are generic low-level skills, the idea to uplift them into the status of a world-class cluster is at best a very, very long-term ambition, but not a useful guiding idea for promotion activities here and now.

3.2 How to identify and choose clusters to work with

The discussion on how to identify clusters for promotion is often rather lopsided. It addresses the problems of national level policy makers who want to do something for local production systems. Apart from the fact that “doing for” is often a recipe for disaster, since it involves problems of paternalism and lack of local ownership (as opposed to “doing with”), this perspective covers only a part of the reality of cluster promotion. We can distinguish four types of cluster initiatives, which are summarized in the following table.

Table 3: Four types of cluster initiatives

	Driven by Public Sector	Driven by Private Sector
Top-down Cluster Promotion	National or provincial-level policy initiatives (e.g. Scotland, Austria, Jalisco / Mexico) (1)	National- or provincial level industrial body initiatives (e.g. Council on Competitiveness / USA, Federação das Indústrias do Estado de Minas Gerais / Brasil) (2)
Bottom-up Cluster Promotion	Local government initiatives (e.g. Dortmund / Germany) (3)	Local initiatives driven by Business Associations (e.g. Vale dos Sinos / Brazil) (4)

3.2.1 Top-down, government-driven initiatives

Probably the most frequent, though definitely not the most successful, approach to cluster promotion is driven by national or provincial governments in a top-down way. Policy makers adopt cluster promotion as an innovative approach to SME development and/or territorial development, often based on the advice of foreign donors or international consultancy firms. They are then facing a big question: Where do we start? A substantial amount of work has been done in recent years to guide policy makers in their search for locations where local cluster initiatives are to be launched. The following table summarizes the most common methodologies.

Table 4

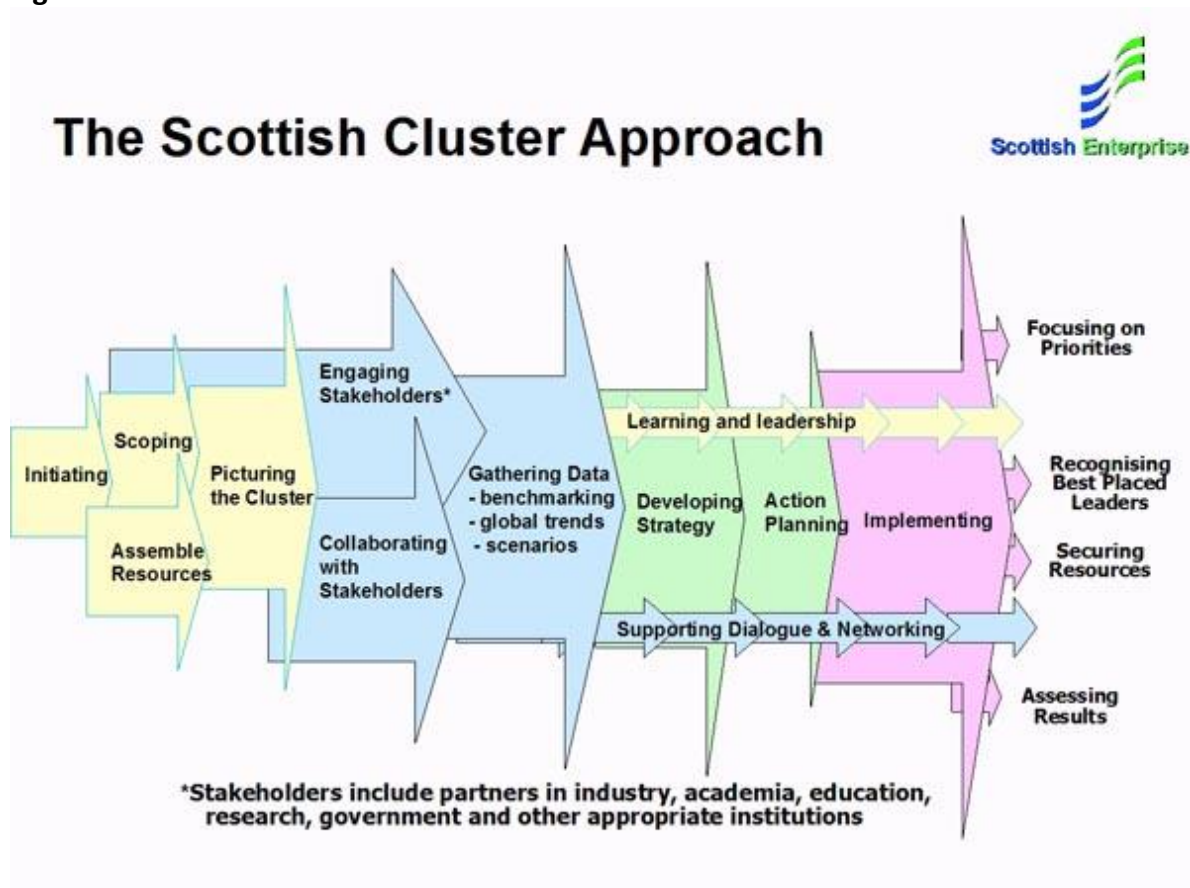
Alternative cluster analysis methods		
Method	Advantages	Pitfalls
Expert Opinion	Relatively cost and time effective Detailed contextual info	Not generalizable Systemic data collection very hard to do well
Specialisation indicators (LQs)	Easy, inexpensive; Can supplement other methods	Focus is on sectors, not clusters
Input-output: Trade	Often only major source of data on independence Comprehensive and detailed	May be dated Industry definitions imperfect Neglects supporting institutions
Input-output: Innovation	Key measure of interdependence	Data not available in U.S. (see OECD activities)
Graph theory/network analysis	Visualisation aids interpretation and analysis	Methods, software still limited
Surveys	Flexibility to collect ideal data; current	Costly Difficult to implement properly

Source: Edward M. Bergman and Edward J. Feser, *Industrial and Regional Clusters: Concepts and Comparative Applications*. In: *The Web Book of Regional Science*, 1999.
<http://www.rri.wvu.edu/WebBook/Bergman-Feser/contents.htm>

In a number of countries, elaborate data bases have been created to assist both policy makers and cluster researchers. One example is the Cluster Mapping Project at the Harvard Business School's Institute for Strategy and Competitiveness (<http://www.isc.hbs.edu/>). A first analytical summary of the insights gathered from their data collection effort has been provided by Porter (2003).

One of the more successful top-down, government-driven cluster development efforts has evolved in Scotland since the late 1990s. After a set of promising clusters had been identified by The Monitor Company, Scottish Enterprise started to approach the sectors one by one. The following figure shows the typical approach pursued by Scottish Enterprise.

Figure 3



Source: McKenzie et al. 2002

What is particularly remarkable about this approach, and probably a critical success factor, is the fact that cluster stakeholders are engaged at an early stage, before in-depth research and strategy formulation takes place. It is not rare to find that top-down cluster initiatives proceed the other way around. Out of the blue sky, actors in a given local cluster find themselves confronted with a surprise attack of elaborate research documents and strategy proposals, and government actors are in turn surprised by the lack of excitement and buy-in by cluster actors. The Scottish approach, where research and strategy formulation is driven by the cluster actors themselves, shows how to avoid this type of frustration.

Another unusual feature is that the Agency attempts to create demand-side effects to promote the need for upgrading, rather than the more familiar supply-side 'push' efforts that typify Government-led initiatives. This helps the industry focus on the overall benefits of clustering and offers a more substantive prize for the SMEs, leading to a faster build up of momentum. This is one aspect that has been successfully transferred from Scotland to recent

Figure 4: Cluster initiatives in a transition country

ClIs in a transition economy: the case of Slovenia

The case of Slovenia illustrates several factors that are particularly challenging in transitional economies:

- Trust in government initiatives is low, and there is little experience in industry collaboration to build on.
- Clusters are often weak, lacking domestic rivalry and foreign investments.
- General knowledge of clusters and cluster initiatives is poor and there is a lack of expertise needed to communicate the concepts. This makes it difficult to build common frameworks for ClIs.
- There are several obstacles to entrepreneurship, including bureaucracy and lack of venture capital.
- The government's long-term commitment in ClIs can be questioned if ClI programmes are not supported by other microeconomic policies, such as education policies or FDI policies.

Source: The Cluster Initiatives Greenbook, p. 13

cluster developments in Thailand, leading to a dramatic increase in cluster activity in the food and textiles industries there.

Figure 4, another quote from the Cluster Initiative Greenbook, summarizes experiences in a transition country (and Slovenia is, in fact, one of the more successful Eastern European countries), and the challenges encountered that are similar to those that stand in the way of top-down, government-driven cluster initiatives in Latin American countries.

3.2.2 Top-down, private sector-driven initiatives

Top-down, private sector-driven initiatives are relatively rare. In the U.S., the Council for Competitiveness has created the Center for Regional Innovation (<http://www.compete.org/nri/ncric.asp>) which pursues a cluster-oriented approach to stimulate industrial innovation. In Brazil, the Federation of Industries of the State of Minas Gerais (FIEMG) pursued for some years a cluster promotion initiative.

Top-down initiatives that are driven by the private sector do not suffer from all the problems of government programs. Unlike government, private sector bodies may have some credibility and established communication channels with companies and local clusters. With private sector-driven initiatives, they may be a slightly better chance to create local ownership.

At the same time, the Minas Gerais example illustrates one of the typical downsides of top-down initiatives. Inconsistency and erratic behavior, caused by frequent changes in decision making positions and petty politics, are by no means a privilege of government. FIEMG's

cluster initiative, CresceMinas, was one of the lead activities of the governing board that ruled FIEMG from 1998 to 2002. In 2002, a new board came in, with different priorities, and discontinued CresceMinas. The initiative's website disappeared, and if you enter "cresceminas" as a search term in Google, you find very little, mostly outdated information.

3.2.3 Bottom-up, government-driven initiatives

There seem to be few bottom-up cluster development initiatives in Latin America that are driven by local government. The survey by Pietrobelli and Rabelotti (2004) gives hardly any examples. One of the few documented cases refers to the emerging software cluster in Blumenau, Brazil, where local government played a supportive role (Bercovich and Swanke 2003). One reason for the lack of cases may be that governmental local development efforts in Latin America tended to have a focus at planning, which unfortunately was to the detriment of action (Helmsing 2001).

Elsewhere, there is some evidence that cluster promotion has a strong potential as one of the main areas of action in a local economic development program. For instance, the city of Dortmund in the Ruhr Valley, Germany, focussed its LED effort at a limited set of locally emerging clusters after the decline of old industries (coal, steel, beer) had thrown the local economy into depression and no more corporate headquarters were left after various rounds of mergers and acquisitions. Local actors are focussing their real estate development and brownfield conversion efforts, start-up and SME promotion activities, and skills development initiatives at the local growth clusters IT, microsystems and logistics. Local government has taken the lead, but it interacts closely with the Chamber of Industry and Commerce and other private sector players (see www.dortmund-project.com).

3.2.4 Bottom-up, private sector-driven initiatives

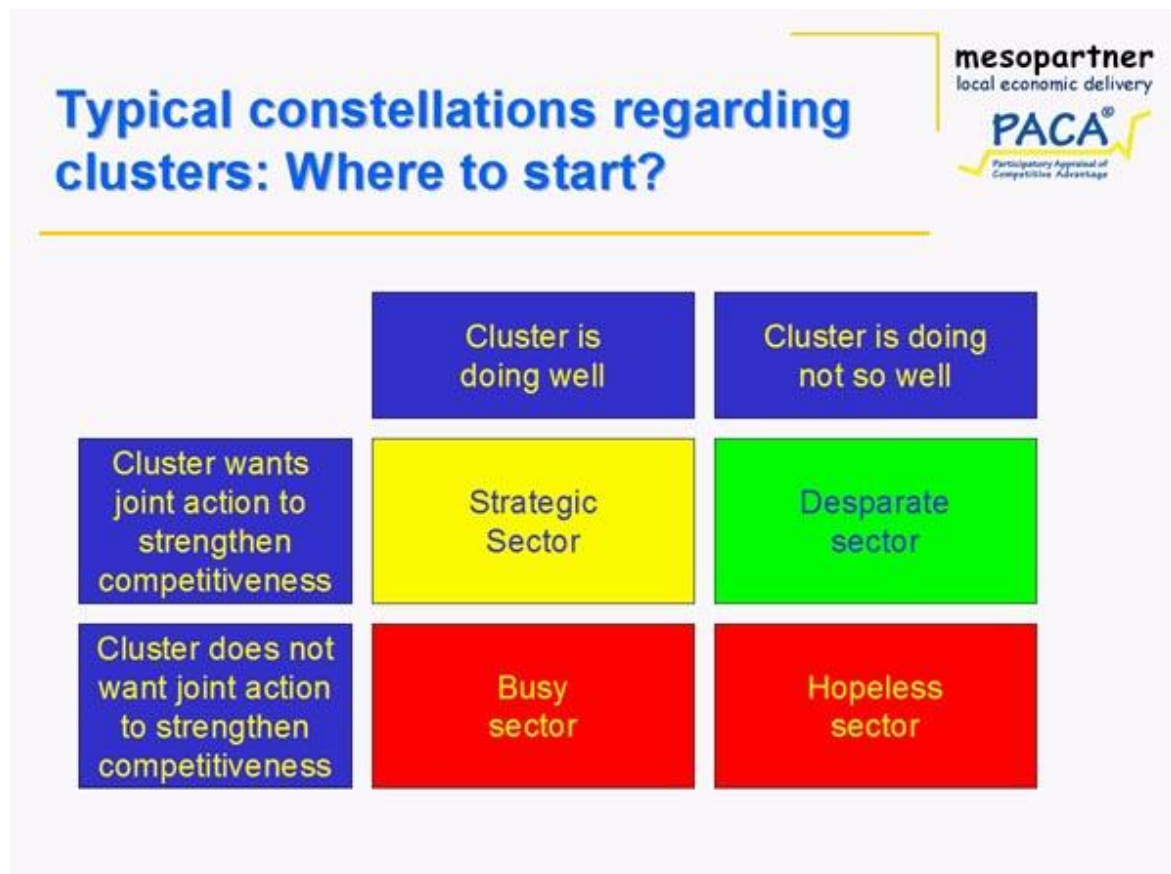
Business-driven cluster development initiatives have been documented in the literature. Probably the most widely known case is that of the footwear cluster in the Sinos Valley, Brazil. Hubert Schmitz' initial research indicated a strong role of private sector associations in cluster upgrading (Schmitz 1995). However, his subsequent research found a rift between local large companies and SMEs, which compromised the upgrading initiatives of the local business chamber (Schmitz 1998). This experience indicates that what may appear as the first-best approach to cluster promotion is by no means a panacea.

Apart from this huge cluster, there are probably quite a few very small cases, like the frog producers in Zamora, a small town in Ecuador. With 16 producers being no more than a mini-cluster, they have organized effective collective action, for instance regarding observation of their main competitors in Brazil and Taiwan. Their annual exports, mostly to the U.S., amount to more than one million US dollars. Initiatives like this one are often invisible to national policy makers, yet they offer more opportunities for significant cluster promotion than "wishful thinking" clusters.

3.3 Conclusions for practitioners

In order to identify locations where cluster initiatives are promising, it is crucial not to limit research and fact-finding to economic structure data. The success of any cluster initiative depends on the willingness of local actors to buy into the initiative, to interact with external agents and to collaborate with other local actors. A cluster identification / fact finding effort must thus focus at local actor structures. The following figure gives an indication of what to look for.

Figure 5



The green box indicates a promising location for a cluster initiative: a local cluster that is under pressure, i.e. where local actors are out of their comfort zone anyway, and where local actors find the idea of collective action to promote competitiveness and upgrading plausible. The yellow box represents the kind of case one would hope for: a cluster that is already doing well and where local actors have enough vision to understand the importance of collective action for an even better performance. This kind of place may give you a quick win, which may be important to convince decision makers and sceptical actors in un-cooperative clusters. However, you may not make as much difference as you would like to if you approach this kind of location.

The two red boxes in the lower row represent those places where a cluster initiative is unlikely to succeed. A cluster that is doing well without collective action will be absolutely non-

responsive to the suggestion of a cluster initiative. A cluster under pressure that suffers from a very non-cooperative local culture is also unlikely to give you a successful cluster initiative.

4 Typical obstacles to a cluster initiative²

Based on the case studies of successful clusters, we can identify three main areas of cooperation:

- Cooperation among firms (relational contracting, interactive learning, information exchange, and collective action);
- Cooperation between firms and supporting institutions (business associations and business support institutions in fields such as training, technology, exports, and finance); and
- Cooperation between the private and the public sectors.

It is useful to look at each main area of potential cooperation to identify typical obstacles to cooperation.

4.1 Cooperation and the Prisoners' Dilemma

For the firm, the choice between cooperating with competitors in a cluster-based competitiveness initiative or "going it alone" involves short-term costs, unknown benefits, and strategic uncertainties about the reaction of competitors. With respect to strategic uncertainties, the firm faces a special type of prisoners' dilemma, the most familiar example of what Oliver Williamson calls the coercive logic of game theory. Two prisoners are joint suspects in a major crime. They are interrogated separately. Both face, say, three years in jail if neither confesses to the major crime. The police offer a deal: if you confess and your partner does not, you'll get a light sentence and your partner gets 15 years. If you both confess, both will get 10 years. If neither knows what the other will do, the police win: the dominant strategy is to confess. Both confess and get to spend seven more years in jail than if they had kept silent.

But things change when the game is repeated because participants learn that opportunistic behaviour is detrimental. In fact, empirical research on the prisoners' dilemma has shown that the probability of cooperation is higher than 50 percent in repeated games. The likelihood of a cooperative outcome is further enhanced if direct communication is possible. Even without the opportunity to learn, however, the dominant strategy changes if both prisoners are affiliated with an organization, the local version of the Mafia and with rules (the code of silence), enforcement, and support for those who obey the rules, such as financial assistance to the prisoners' families. In this case, even though the prisoners may not trust each other, they are better off cooperating.

2 This section is a revised version of Jörg Meyer-Stamer, Obstacles to cooperation in clusters, and how to overcome them. *Developing Alternatives*, Vol. 9, 2003, No. 1.

Not so in a cluster. There, cooperation entails risks giving up valuable business secrets to competitors. Firms, especially in emerging markets, are fierce rivals. There is often a long history of rivalry that creates a strong bias toward non-cooperation. Typical events in the evolution of a given cluster will reinforce this bias. For instance, spin-off firms will cater to the same customers and their founders may take trade secrets from their former employer with them.

Moving from non-cooperation to cooperation in clusters is difficult, especially if non-participants benefit from the cooperative efforts of others – a variant of the “free-rider” problem. Isolated attempts of individual actors to cooperate will evoke opportunistic behaviour by other actors, thus frustrating the cooperation pioneers and reinforcing a non-cooperative bent. If many firms produce similar products, everyday business behaviour will tend to be opportunistic because firms are desperate for sales. Firms are competing for the same customers, so they will tend to underbid one another, which is of course a stimulus for innovation and increased efficiency to lower costs. It is not by chance that in his early publications Porter emphasized the importance of rivalry for cluster dynamics.

Ironically, this disposition may become even stronger in periods of crisis, when cooperation might offer a way out (for instance, through a collective effort to upgrade) but when opportunistic behaviour is even more likely as firms scramble for survival. From both a theoretical and an empirical perspective, one thus has to expect the emergence and reinforcement of non-cooperative games in clusters, and any kind of initiative to strengthen clusters has to be based on the assumption that it will be very difficult to move to a cooperative game.

4.2 Risks of formal cooperation among firms

In the view of the industrial researcher, stronger linkages in clusters offer real opportunities. The perspective of local business people may well be the opposite. They may or may not appreciate the advantages of strong clusters, such as the easy availability of inputs and skilled workers and easy access to customers. They are certainly aware of the disadvantages, such as the loss of skilled employees and the swift diffusion of information about new technologies, customers, and markets. Regarding formal networking and cooperation, be it within an association or some other type of collaborative venture, any decision has to be based on an assessment of the benefits on one hand and the costs and risks on the other. Often, the benefits will be long term and hypothetical, whereas costs and risks are obvious and immediate. For a firm, the most obvious risk is the loss of trade secrets, such as technology or knowledge regarding markets and customers. These risks are an important motive for firms not to enter cooperative ventures with direct competitors.

Another risk regards anti-competitive behaviour, when cooperation becomes collusion. Many firms basically like the idea of cooperation, in particular if it involves the creation of market power or the elimination of market processes, such as joint purchasing, sales cooperatives, or cartels. Such practices are common in many industries. In countries with strong anti-trust policies, many firms have a clear idea of the costs of such cooperation – namely, the fines they have to pay. In fact, in these cases, firms may find it strange that government agencies

promote clustering and cooperation and may prefer to distance themselves from such initiatives as long as the anti-trust implications remain unresolved.

The direct costs of cooperation include first and foremost transaction and opportunity costs. Meetings have to be held, there has to be some follow-up, and discussion papers and minutes have to be prepared. All this puts a strain on the scarce time of decision makers in firms. If firms agree on concrete activities, this will generate further costs (for example, the investment and operational costs of joint development projects). This may lead to the kinds of problems that are well known from research and development and training, where the inability to appropriate returns on the respective investments creates a discrepancy between the individual and the collective benefit, leading to underinvestment. In the field of research and development, governments subsidize firms' activities. Similarly, it may be necessary for government to subsidize cooperative ventures and cover at least part of the transaction and opportunity costs.

4.3 Problems of cooperation between firms and supporting institutions

There are two kinds of problems regarding cooperation between firms and supporting institutions. First, there is often a complicated relationship between **firms and business associations**, especially between small and medium-sized firms and chambers of industry and commerce. Smaller firms often perceive, correctly or not, that chambers are dominated by large firms, and they feel that the support they receive from their chambers is inadequate. At the same time, the chambers often have to deal with expectations they cannot meet, given their limited resources. Firms also may be sceptical of business associations. They may suspect that certain associations exist largely because of political motives, or they may perceive that their associations are weak or that there are too many of them. A further problem may be mandatory membership, which often minimizes the performance pressure on business associations or creates the image that a given association is a para-governmental organization. Of course, the conditions under which business associations exist varies from country to country, and must be examined carefully in each case. For example, business associations are more widely accepted and better regarded in many European countries, while the same may not be true in most developing countries.

Second, there are the usual problems of cooperation between **firms and supporting institutions**. For many supporting institutions, the satisfaction of local customers from the private sector is not the only, and often not the most important, performance indicator. This problem is particularly pertinent in the case of training and technology institutions; a priori, it is not necessarily likely that they cooperate with firms. In education and training institutions, especially in higher education, academic merits play an important role. But research and development institutions also have a difficult time balancing the demands of private sector customers and academic criteria, something that is further complicated by profoundly different standards. Researchers want to publish their results quickly and widely and aspire to a profound understanding of problems, whereas firms want quick solutions to problems and want to keep research results secret. Moreover, cooperation is more likely with large firms, which often have elaborate training centers and research and development laboratories, than with small and medium-sized firms.

4.4 Problems of cooperation between the private and public sectors

Local governance structures – how firms and other elements of potential clusters interact – may set limits for cluster initiatives. First, a crisis can put the advantages of cluster cooperation in sharper perspective. However, this outcome is by no means obvious. It is just as likely the opposite may happen. Local actors may perceive a profound crisis as a structural crisis; they may define the dominating branch in the cluster as a sunset industry that does not deserve promotion; or they may direct their promotion activities at diversifying the local economic base, preferably achieving broad diversification to avoid the vulnerability of depending on just one branch. In other words, local actors may perceive a de-clustering strategy as the best option.

Second, another phenomenon has been observed in old clusters. Communication and cooperation between local actors may become so intense that their ability to perceive changes outside the cluster suffers, which leads to collective conservatism. Moreover, old clusters tend to be organized and politically connected. Accordingly, they have the motivation and the means to focus on keeping old industries alive, rather than promoting and shaping structural change.

Third, in most countries chambers of industry and commerce may have difficulty in playing a constructive role in cluster initiatives. While most Chambers cater to firms from many sectors and branches, a cluster initiative will involve only a limited set of branches, and those firms not directly linked to the dominant branches in the cluster will feel frustrated if the chamber puts a lot of effort into the cluster initiative. Especially in those locations where one cluster dominates the local economy, firms from other branches will complain loudly because of their perception that the chamber is focusing too much energy on the cluster-related branches.

Fourth, there is no reason to believe that politically motivated differences can be overcome more easily at the local level than at other levels. It is likely that political differences are intertwined with other factors, such as personally motivated aversions, traditional enmity between families or elites, and economic rivalries, and that a complex set of obstacles emerges that make organizing a coherent initiative complicated.

Finally, in countries with a long history of the heavy hand of government – which includes all of the transition economies and most developing countries – a private initiative to strengthen clusters and systemic competitiveness may be deeply mistrustful of any attempts by government officials to contribute.

4.5 Global governance and local initiatives

Global governance patterns create two types of problems for local initiatives. First, cluster initiatives depend on networking between persons rather than between organizations. Such initiatives therefore face serious obstacles whenever important firms are not locally owned and directors change frequently. Moreover, in large companies with a global reach, the director of a local branch plant frequently has limited freedom to make decisions. In this

respect, dramatic changes in framework conditions for clustering initiatives can occur if a key local firm is taken over by an external investor.

Second, external oversight of local firms also can have a major impact on cluster initiatives in another way. Clusters, especially in developing countries, often are part of global value chains that are ruled by a large firm elsewhere (for example, large distribution chains in industrialized countries). The large firm may of course have an interest in the long-term perspective and performance of the cluster, but usually its short-term considerations will prevail. This frequently means that external buyers are playing cluster firms against one another to get the best price or that they discourage cluster firms to engage in upgrading efforts that might change the power structure in the value chain (Schmitz 2004). This leads us back to the observation that fierce rivalry between local firms is often a major obstacle for local cooperation. Moreover, it means that even well-meaning government initiatives may bear no fruit.

4.6 Conclusions for practitioners

The following table summarizes the main observations of this section.

Table 5

<i>Obstacles to co-operation between firms</i>	<i>Obstacles to co-operation between firms and supporting institutions</i>	<i>Obstacles to co-operation between private and public sector</i>
Prisoner's dilemma in an un-cooperative environment	Difficult relationship between SMEs and associations, particularly in some country settings	Local governance issues (political rivalry, collective conservatism, role of chambers)
Costs and risks of co-operation	Common problems of co-operation between firms and supporting institutions	Global governance issues (externally owned firms, foreign buyers)

There is no quick and easy way to address these problems. Instead, it is crucial that any cluster practitioner constantly reminds him- or herself of them and expects them at every corner. Nothing is more unrealistic than the expectation that a cluster initiative will be smooth sailing.

5 Implementing cluster initiatives

You should not trust any manual for cluster initiatives that presents you with recipes for the activities you are supposed to implement as part of your cluster initiative. Each cluster and each cluster initiative is different. There are no blueprints and no recipes, except for recipes for disaster. One such recipe for disaster is this: Invite an internationally renowned consultant or researcher to your – as yet very uncooperative – cluster to give a presentation on the successes of highly cooperative clusters elsewhere. First, you will find it challenging to actually mobilize a local audience. Second, the local audience will easily identify all sorts of reasons why those experiences from elsewhere have exactly zero relevance for their location. Your speaker departs in a frustrated mood, and you have made zero progress with your initiative.

When you start with a cluster initiative, your main concern should be people and relationships, not practical cluster activities. Never start a cluster initiative with a clearly defined list of activities you want to launch within the first x months. You may have such a list in the back of your head. But the main focus of your work in the initial phase will be around building credibility, relationships, and trust. You need to engage local stakeholders, since you cannot succeed without their buy-in and ownership of the initiative; this includes identifying and involving strong local champions. In order to achieve that, you will have to understand the concerns, problems and aspirations of local actors, so that you quickly move to small practical activities that create quick wins. This is the most promising approach to creating credibility, relationships, and trust. Participatory local economic development methodologies such as PACA (<http://www.mesopartner.com/> see knowledge resources/methodologies) have been explicitly designed to implement such an approach in an organized and efficient way.

When starting a cluster initiative, you are on the safe side if you expect that the level of cooperation in the cluster is low. You would assume that the obstacles mentioned above are in place. How is it then possible to increase the propensity to cooperate in the three areas outlined above?

Regarding inter-firm cooperation, initiatives are most likely to succeed if they meet four criteria:

- They address the immediate problems of firms;
- They do not touch what firms perceive as their core activities;
- They offer little or no latitude for predatory behaviour; and
- They present the potential of savings through economies of scale.

These criteria can be explained by outlining typical activities that do not meet them and usually fail. First, there is technological cooperation, such as the joint development of a new production process. In such a case, participating firms fear that other firms learn pieces of information they perceive as essential to their competitiveness. Accordingly, they put pressure on their technicians not to unveil any possibly critical information, thus crippling the cooperation project. Firms also may choose their less competent technicians to take part in the project, thus decreasing the probability of success. Second, when one mentions the option of cooperation, business people in a non-cooperative cluster typically come up with ideas that are anti-competitive, such as forming a purchasing cooperative. However, if firms do not trust one another, a supplier that is the target of the cooperative will easily break it by offering preferential purchasing conditions to one or several of the participating firms.

What then are activities that meet the four criteria? Looking beyond short-term activities for quick wins, such as informal get-togethers or local business directories, three types of activities typically do:

- *Training.* The economies of scale are obvious, as are the benefits. Training can be limited to areas that do not touch upon core activities, and there is little opportunity for predatory behaviour.
- *Environment-related activities.* As environmental legislation starts to get enforced, firms initially usually sticking to end-of-pipe solutions, perceiving environmental protection literally as a peripheral activity. Moreover, a government environmental agency generally serves as an external enemy and creates an incentive for firms to stick together, for instance by creating technically focused working groups. In textiles clusters in Brazil this has given rise to intense learning and some technical innovation (Meyer-Stamer 1997).
- *Basic testing activities.* In the textiles industry, for example, this refers to testing cotton fibre and chemical inputs.

The results of Michael Enright's cluster survey cited above supports the notion that these are areas where specialized organizations are perceived to add value. Success in initiatives focusing on these areas may pave the way for more ambitious cooperation activities. As firms see that cooperation creates advantages, they may develop a certain degree of trust that permits other, more ambitious and riskier cooperation activities, such as an exchange of technological information. However, there is by no means a clear trajectory in this respect. The experience of the tile cluster in Criciúma, Brazil, is sobering (Meyer-Stamer, Maggi and Seibel 2001). A precipitous decline in market share created a sense of crisis and triggered a massive effort to regain competitiveness. After this response achieved most of its declared goals by the mid-1990s, cooperation virtually collapsed. Whereas in 1996 several of the local actors saw their cluster on track to emulate the experience of the Italian industrial districts, in 2000 we could sense frustration because maintaining cooperation takes real effort, and in fact more effort than most cluster actors were willing to invest.

5.1 The Role of Specialized Organizations

Among specialized organizations, business associations can play a role in facilitating cooperation among firms. However, business associations in developing countries and transition economies tend to be relatively weak, with few employees and a low level of competence, especially when it comes to providing member firms with real services. Organizational development in such associations is a lengthy but unavoidable activity.

In the past, institutions such as training and technology institutes tended to operate in a kind of vacuum and were highly self-referential. In the import-substitution era, technology institutes found little demand from the private sector, which was under scant pressure to innovate in a not very competitive market. Training institutes existed in an environment marked by massive skills shortages so that whatever training they provided was gladly accepted by the private sector. Even though most vocational training was administrated by the private sector itself, the possibility of firms articulating their specific demands vis-à-vis the training institutes was often limited. In a new, more competitive environment, these institutions face tough challenges.

To gain a better understanding of how to make supporting institutions more responsive to private sector demand, it is useful to use a concept implicit in much of the restructuring that took place in firms in the 1990s. There were four key goals of organizational development: efficiency, quality (in the sense of minimizing the cost of quality management), flexibility (the ability to satisfy a wide scope of differentiated demand), and responsiveness (the ability to respond quickly to demand). In the old days, optimizing these factors involved trade-offs. Increasing flexibility often went to the detriment of efficiency, responsiveness went to the detriment of quality, and so on. In the management field, the analysis of Japanese organizational methods provided crucial insights in terms of overcoming these trade-offs. There is no reason this idea should not be applicable to supporting institutions in fields such as education, training, and technology. True, it often will involve a major upheaval in organizations that so far have had a single-minded rationale (for example, academic excellence). But reaching a balance between different rationales is exactly the point of organizational development.

Cooperation between the private and the public sectors puts high demands on both sides. On the side of the private sector, it is, first and foremost, essential to have effective organizations. Large firms can interact with government, especially local government, on an individual basis. Small and medium-sized firms will find this difficult. They will have to unite their voices to be heard.

5.2 Options for Government

On the public sector side, the first rule is that the government, especially local government, has to take an active interest in the fate of the private sector. This interest should not be taken for granted. Many private businesses – in particular, small and medium-scale firms – have been growing for decades without support from local government. Moreover, because central and state governments used to set promotion policies, local government has developed a disposition to wait for action rather than acting on its own.

The second rule is akin to the Hippocratic oath – do no harm. Government at all levels tends to erect obstacles for private business and for the collective pursuit of competitiveness. Some of these obstacles are essential and may be necessary to stimulate competitiveness, such as environmental regulation and consumer protection, but many are inefficient or unenlightened. Before becoming actively involved in cluster initiatives, government therefore ought to get its own house in order. Reviewing regulations, removing those obstacles that are not essential, and reorganizing what remains are the most important tasks for government. In practical terms, this means different things at different levels, such as moving from command and control to economic instruments for environmental policy at the national level, streamlining regulations at all levels, and creating one-stop or first-stop agencies at the local level.

Only after addressing the obstacles it has created for the private sector will government have the credibility to get involved in meaningful private sector promotion activities, such as cluster initiatives. Government agencies at the local or the regional level can play two important roles. First, they can act as moderators, mediators, and facilitators and play a crucial role in

overcoming mistrust among firms. Second, they may cover part of the transaction costs any cooperative venture incurs. In this respect, the justification is much the same as in terms of government support for activities where the returns on investment are difficult to appropriate, especially in environments with a less than adequate protection of property rights.

5.3 Conclusions for practitioners

- The key challenge in cluster initiatives is process management. Do not overwhelm local actors with proposals for cooperative activities that are inconceivable for them, since they do not trust anybody, least of all their local competitors. Define your role in a cluster initiative as a communicator, facilitator and moderator.
- Try to involve specialized organizations (like business associations, training providers, technology extension agencies) in your cluster initiative from the start. For these organizations, the initiative creates an opportunity to develop a better understanding of demand and to adjust their offers accordingly.
- If you are working with government, try to develop an understanding of the credibility and prestige government has with the private sector. If government wants to drive a cluster initiative, but the private sector perceives government as the single most important obstacle to growth, the initiative is doomed to fail. Building a constructive relationship between government and private sector is one of the most difficult challenges in cluster development.

6 Financing cluster initiatives

When it comes to financing cluster initiatives, it is important to distinguish between real and artificial problems.

The most important artificial problem is created in the context of cluster initiatives that address wishful thinking clusters or survival clusters. Such initiatives are typically the outcome of top-down government programs, possibly in combination with donor interventions. The traditional approach of trying to solve a problem by throwing money at it, which has been harshly and rightly criticized by the proponents of the new Business Development Services (BDS) approach, is still quite alive. This approach, however, did not work for traditional small business promotion strategies, and it does not work for cluster initiatives, either. Allocating serious amounts of money for cluster initiatives in an environment dominated by survival clusters is pointless. It is creating perverse incentives and a dependency mindset. It discourages rather than stimulates bottom-up problem solving and self-reliance. Ultimately, it reinforces a vicious circle of underdevelopment.

Regarding real problems, there are two that stand out: First, how can you ensure that cluster initiatives do not become (overly) dependent on external subsidies? Second, where do the funds for practical activities that emerge from a cluster initiative come from?

Any cluster initiative involves two types of funding:

- The cost of facilitation. This includes the fee of the facilitator, the rental for venues and possibly catering, and transport cost. It may include cost of research, to the extent that research (in the sense of fact-finding) is actually needed to start the cluster initiative.
- The cost of implementing practical activities. At an early stage, this may involve things like trips to national or foreign fairs or inviting speakers to seminars. Subsequently, more cost-intensive activities may emerge, such as joint stands at major fairs, the set-up of joint show-rooms, the creation of export consortia, joint purchasing of costly specialized equipment, or the creation of training or research and development centres.

The cost of facilitation is relatively limited, yet in the initial phase it will be the main cost, and the question of who pays, say, the 200 dollars for catering at a workshop may be a big issue. Over time, if the cluster initiative takes off, the cost of facilitation will become relatively small compared to the cost of practical activities. If and when the cluster initiatives develop a momentum, the funding structure will change:

- Initially, most of the – relatively limited – funding will come from a dedicated cluster development fund.
- As cluster actors start to pursue practical activities, two other sources of funding will dominate. First, businesses will cover, partially or fully, the cost of activities like trips to fairs. Experience shows that business people do not hesitate to pay for activities that make immediate business sense. Second, local actors will approach other external sources of funding, for instance national or provincial R&D funds, national skills funds, or national export promotion funds. You would also expect that a cluster initiative involves the development of a more constructive relationship between firms and local branches of commercial banks, so that the barriers of access to formal credit are lowered.

In other words, from the perspective of an external funding agency a well-crafted cluster development program may be a low-cost activity with a high leverage effect. In a best case, the cluster members will sustain the initiative over time, for instance by creating a cluster association or club and/or by employing a “cluster manager”. This process can be encouraged by a consistent management of expectations that clearly communicates the external financier’s exit strategy from day one. Ideally, the external funding should therefore be declining in amount over time as the cluster leaders take on more and more of the responsibility, either from internal funds or external credit and investment funds.

However, there often is a problem with appropriability in cluster initiatives, similar to the well-known problem of underinvestment in R&D. Firms may underinvest in cluster initiatives and networking. It may therefore be justifiable to continuously allocate a small annual subsidy to cover part of the opportunity cost of a cluster initiative, based on the argument that from a macro-perspective a stronger effort in business cooperation may be desirable than appears justifiable from a micro-perspective.

To what extent is it advisable to include funds for practical activities into a cluster development program? In fact, the more limited the budget is, the better.

- You are creating a management of expectations nightmare if you come in with a cluster program that promises huge amounts of funds.
- Effectively, you are creating perverse incentives, since companies will grudgingly go for window-dressing in order to fulfil the “cluster criteria” which you will have to formulate. The technical effort involved in formulating and implementing these criteria will distract your attention from what you really want to achieve, namely stimulate sustainable networking between businesses in a location.
- You are creating massive distortions if you disburse funds for certain activities, such as training, technological upgrading or export promotion, only to certain clusters, especially if you pre-select those clusters.

Again, a good example of this comes from Thailand, where the central Government budget for cluster development is notional; 17 million Baht (approximately \$85,000). By managing the stakeholder expectations from the outset, the small, core team at the Department of Industrial Promotion has encouraged private sector investment from the outset. Two key initiatives, to construct a common training facility for the textiles industry and to form an import/export company for the food industry’s transactions with China, have received no public funding at all.

As long as other sources of funding are available for export promotion, skills development, technology development and other activities, a cluster program should involve only very small funds (“seed money”) for such activities. If, however, other sources of funding are not easily available, there may be no alternative but to include these funds into the cluster program. In this case, you may consider to proceed as follows. **Do not pre-select Clusters.** You must not waste your time with the elaboration of legally waterproof cluster definitions. Instead, launch a cluster program as a contest:³

- Define clusters / territories / regions rather loosely.
- Define quality criteria in advance.
- Define the minimum acceptable size of applicant groups. Also define the preferable composition (e.g. not just companies but also local support institutions).

Whichever groups of companies submit the most convincing proposals obtain initial funding. Subsequent funding for major activities should be based on the merits of the application. After the start-up phase, no further funding should be based on a 100% grant. Instead, consider

- the disbursement of matching grants,

3 For instance, contest-based regional development programs have been successfully employed in Germany since the mid-1990s. Examples include the BioRegio program to support biotechnology clusters and the InnoRegio program to support innovative clusters in the former East Germany.

- the disbursement of low- or zero-interest loans where the repayment feeds into a cluster-based, locally administrated revolving fund.

6.1 Conclusions for practitioners

One of the most important lessons in economic development is this: You don't solve a problem by throwing money at it. This also applies to cluster programs. You don't make clusters work better by offering them large amounts of money. It is rather the other way around: If your cluster program is successful, you will find it much easier to generate demand for your financial products. You should expect that a cluster initiative initially generates only a small flow of funds, except if you decide to waste massive amounts of money for research and fact-finding. The flow of funds from your pipeline will grow exponentially over time, as the generation of trust leads to the identification of increasingly sophisticated and costly activities.

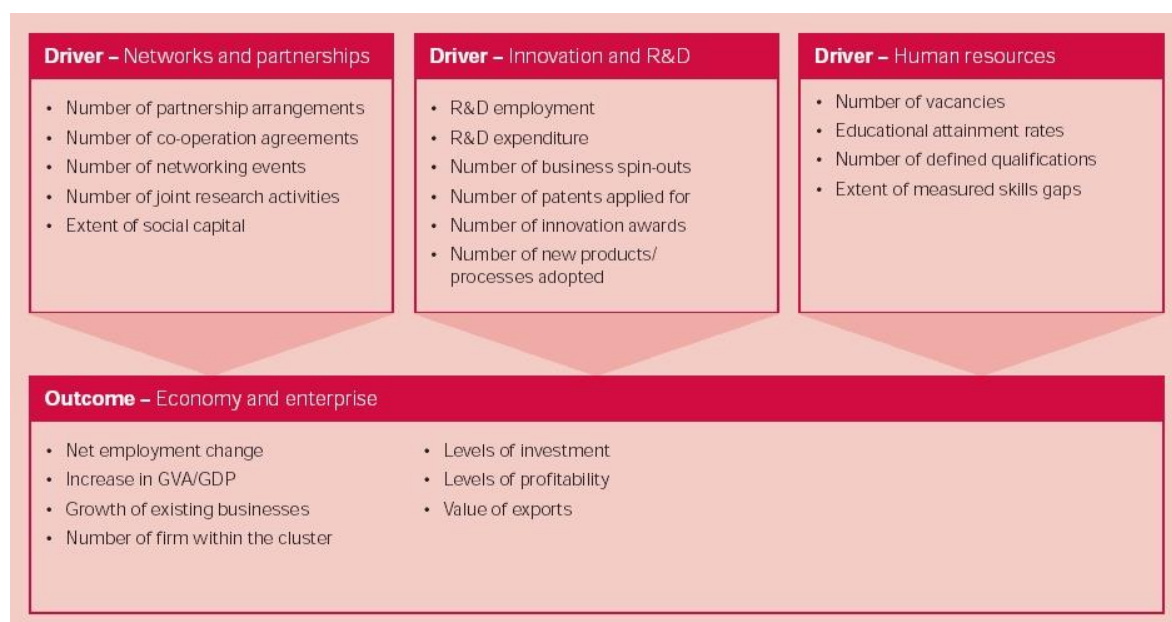
7 Monitoring

7.1 How to monitor cluster progress

There is no standard best practice when it comes to monitoring, evaluation and impact assessment of cluster initiatives. In fact, it sometimes would appear that cluster practitioners are not too keen on monitoring and evaluation since this would highlight the fact that their cluster initiative makes only slow progress. This is usually due to the fact that a cluster initiative often involves protracted periods of building trust and overcoming resistance to cooperation among local actors, and trust-building activities are inherently difficult to monitor and to evaluate, especially when it comes to quantifiable indicators.

In any case, it is crucial to emphasize that monitoring and evaluating a cluster initiative must not look at hard economic indicators only. If your cluster initiative runs for, say, three years, and if you limit your evaluation focus to indicators like job creation, start-up generation, or export growth, the results may be sobering – even though you may have laid the groundwork

Figure 6: DTI's "Illustrative Monitoring Framework"



for very substantial growth in the longer term. For this reason, cluster monitoring and evaluation frameworks operate with a broader focus.

7.1.1 *The DTI approach*

The British Department of Trade and Industry published, in January 2004, “A Practical Guide to Cluster Development” that includes a section on the monitoring of cluster initiatives. The following figure summarizes their approach.

Research of successful cluster initiatives identified the three main drivers mentioned in the top row. Two of them are easily quantifiable – innovation and R&D, and human resources. The third driver, networks and partnerships, involves much more fuzzy indicators. The core idea is that good performance with respect to all three drivers will lead to the measurable outcomes that are summarized in the bottom row.

7.2 Cluster evaluation and measurement in Scotland⁴

When trying to measure and quantify the impact of cluster initiatives, Scottish Enterprise has used a large number of methodologies and economic indicators; from standard measures such as jobs created/safeguarded, increase in exports to (where applicable) newer measures such as number of businesses adopting e-commerce and number of new networks created. The measures will vary depending on the nature of intervention/activity within the cluster, e.g. inward investment for semi-conductors, commercialization for biotechnology and value-chain integration for food & drink.

There is a consensus, however, that this does not explain the full picture. A blend of macro-economic performance measures are needed for the cluster as a whole, and microeconomic measures, to establish the success of individual interventions or projects within the cluster, is needed.

In an attempt to address both areas, a version of the ‘Balanced Scorecard’ approach (Kaplan and Norton, 1994) has been introduced. This simplifies and reduces the number of measures and targets whilst producing the desired blend of internal and external market indicators. It also provides enough flexibility to accommodate cluster-specific measures at micro-level whilst maintaining enough consistency to compare clusters at meso or macro-level.

4 This subsection is taken from Wulf Noll, Grant McKenzie and Jörg Meyer-Stamer, Cluster Development in NRW and Scotland, in: Partners in Development. A Report on Structural Policy in Scotland and Northrhine-Westphalia (Germany), published by Scottish Enterprise, Scottish Executive and the Ministry of Economy, Energy and Transport of the State of Northrhine-Westphalia. January 2002.

Figure 7: Balanced Scorecard for Cluster Evaluation – Critical Success Factors

<p>Economic / Financial</p> <p>Levels of overall Investment</p> <p>Company Performance</p> <p>Market performance – Global, UK # performance of the market as such</p> <p>Employment Levels / no. Companies</p>	<p>Knowledge</p> <p>R&D and Innovation</p> <p>International Awareness/recognition</p> <p>Integration of academia & business</p>
<p>Skills</p> <p>Appropriate skill levels & structure</p> <p>Improved value-add per employee</p> <p>Continuous learning & development</p>	<p>Cluster Process</p> <p>Local Connections & Networks</p> <p>Appropriate Infrastructure</p> <p>International Connectivity</p> <p>Industry Leadership</p>

Source: MacCallum, N (2001), Knowledge Management, Scottish Enterprise Network

As can be seen below, this includes some ‘softer’ measures as well as more traditional ones. Each Critical Success Factor (CSF) shown has 1-3 associated Key Performance Indicators (KPI) that can be easily measured to show whether the CSFs are present.

Evaluation has, in recent years, begun to be embraced within Scottish Enterprise and Local Enterprise Companies as valuable aid to organizational learning. In general, evaluation is still carried out by external consultancies (to ensure objectivity) but it is relatively infrequent and lacks consistency in some areas. The establishment of a Knowledge Management directorate and KM practitioners within the Network has put the use of evaluation into context, though – it is a key knowledge asset to be used and leveraged. Practices are being standardized to improve consistency and the feedback loop is becoming much tighter; learning points and best practice are actively being sought by the rest of the organization, keen to avoid any issues or pitfalls of the past.

The transfer of Scottish know-how to Thailand resulted in the development of an adapted balanced scorecard for the involved clusters. The following example is taken from the food industry.

Figure 8: Draft Balanced Scorecard of the Thai Food Cluster Initiative: Critical Success Factors

<p>Financial Perspective</p> <p>Ease of access to loans</p> <p>Financial market sophistication</p> <p>Cost control</p>	<p>Internal Business Perspective</p> <p>Availability of skills and labour</p> <p>Supply chain integration</p> <p>Visionary leadership</p>
<p>Customer Perspective</p> <p>Quality of goods and services</p> <p>Accessibility</p>	<p>Innovation & Growth Perspective</p> <p>Increased innovation levels within companies</p> <p>Detailed market knowledge</p> <p>Communication and knowledge sharing</p>

The Key Performance Indicators linked to these Critical Success Factors are the following:

Financial Perspective

CSF - Ease of access to loans

- Number of companies producing business and marketing plans for investment
- Reduction in number of Non-Performing Loans (NPL)
- Increase in average timescale for loan repayment

CSF - Financial market sophistication

- Number of sector-specific financial products available
- Increase in the number of financial organisations making products available

CSF - Cost control

- Number of buying consortia established
- Number of companies adopting lean manufacturing processes
- Number of companies adopting new technology

Customer Perspective

CSF - Quality of goods and services

- Percentage increase in level of customer satisfaction
- Percentage decrease in returns/complaints

CSF - Accessibility

- Number of companies marketing or trading online
- Number of international retail outlets stocking Thai goods
- Number of companies adopting multi-channel strategies

Internal Business Process Perspective

CSF - Supply chain integration

- Number of companies adopting Just-In-Time (JIT) delivery methodology
- Percentage reduction in waste of raw materials

CSF - Availability of skills and labour

- Percentage reduction in staff turnover rate
- Number of participants in core skills programmes

CSF - Visionary leadership

- Number of companies using IT
- Number of members recruited into the cluster
- Rate of business growth

Innovation & Growth Perspective

CSF - Increased innovation levels in businesses

- Number of new products/services launched or processes implemented
- Number of companies certified to GMP/HACCP

CSF - Detailed market knowledge

- Number of companies conducting competitor analyses and marketing plans
- Increase in number of channels to markets

CSF - Communication and knowledge sharing

- Existence of an internal (cluster) communications plan
- Number of companies using the internet/IT for research, communications and reporting

7.3 Reflection, learning and analysis in cluster initiatives

An external agency that launches a cluster program will usually be tempted to run monitoring and evaluation within its standard operational framework, and that often means that M+E is introduced as an external inspection, where an external evaluator parachutes into the local clusters from time to time to assess their progress. This kind of approach is not at all

Table 6: Differences between conventional and participatory evaluation

	Conventional	Participatory
<i>Who</i>	External experts	Community members, project staff, facilitator
<i>What</i>	Predetermined indicators of success, principally cost and production outputs	People identify their own indicators of success, which may include production outputs
<i>How</i>	Focus on 'scientific objectivity'; distancing of evaluators from other participants; uniform, complex procedures; delayed, limited access to results	Self-evaluation; simple methods adapted to local culture; open, immediate sharing of results through local involvement in evaluation processes
<i>When</i>	Usually upon completion of project/programme; sometimes also mid-term	More frequent, small-scale evaluations
<i>Why</i>	Accountability, usually summative, to determine if funding continues	To empower local people to initiate, control and take corrective action

Source: Estrella and Gaventa (1998, 16)

participatory, it can disempower local actors and erode local ownership of an initiative, and it can reinforce the perception among local actors that this cluster thing is just another fashion of higher-level bodies. Traditional top-down evaluation may thus become an important factor that contributes to the lack of performance and impact. It's like measuring the magnetic behaviour of volatile particles with a highly magnetic apparatus.

In order to stimulate local ownership and bottom-up energy, M+E of cluster initiatives must involve (and preferably rely predominantly on) participatory evaluation procedures along the lines described by Estrella and Gaventa, as outlined in Table 6.

A participatory approach to M+E of a cluster initiative can pave the way towards "reflexive locational policy" (Meyer-Stamer 2003), i.e. a practice where local stakeholders not only monitor their own achievements, but also benchmark them against achievements of other cluster initiatives elsewhere. Further activities may complement such local knowledge generation and reflection activities. A typical complementary tool would be the conduction of a Regional Foresight Exercise (FOREN 2001), a methodology that has become a core element of territorial development approaches in Europe in recent years.

7.4 Conclusions for practitioners

- Monitoring and evaluation of cluster initiatives and cluster programs should be based on concepts that widen the perspective beyond the economic outcome and address process indicators. The Balanced Scorecard is one example of this approach.
- It is not wise to run the M+E of cluster initiatives predominantly as an externally driven inspection exercise. Using participatory M+E techniques strengthens the local ownership of a cluster initiative.

8 Learning from cluster initiatives: Translating pioneering experiences into policy guidelines

For a higher-level agency that runs a cluster program, it is of key importance to set up a proper knowledge management system. This should involve three lines of activities.

1. Install a meta-monitoring of cluster initiatives early on

Whether a cluster program is launched with a contest or a top-down selection process, it is important to lay the groundwork for a cluster initiative observatory at this stage. As proposals from clusters come in or consultants submit their fact-finding reports, the information contained in those documents must be documented properly. It is useful to set up a data base at this stage, and to outsource this activity to a research institute, a university or another pertinent organization. As cluster initiatives actually start, it is important to encourage local actors to define their performance indicators as early as possible, and to take the collection of sets of performance indicators from various cluster initiatives as the starting point for the setup of a benchmarking system.

2. Codify successful methodological approaches to cluster development

The key challenge in cluster initiatives is to overcome uncooperative local business cultures. Addressing this challenge is by no means trivial, but rather involves sophisticated communication and change management methodologies. Experienced change management practitioners are not always good at making their tacit knowledge explicit (and may hesitate to do so if they fear that they undermine their competitive advantage as a consultant). For an agency that runs a cluster program, it is essential to strike a fair balance between cluster facilitators' interest in protecting their proprietary know-how and the necessity to make successful change management methodologies explicit so that they can be applied elsewhere.

3. Develop a roll-out strategy for successful cluster development methodologies

Experience from various countries indicates that specialized consultancy firms emerge that develop specialized and sophisticated know-how for cluster development. It is in the best interest of an agency that is tasked with a cluster program to stimulate the emergence of a competitive market of competent consultancy firms specialized in cluster development. The agency should consider to maintain a permanent "cluster initiative facilitation fund" that provides seed money for local or regional actors who want to launch a cluster initiative and would like to contract a specialized consultancy firm to assist in starting the initiative. Such a fund would offer matching grants to cover the facilitation cost in the start-up phase of a cluster initiative (e.g. during the first year).

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