

New Dimensions in Local Enterprise Co-operation and Development: From Clusters to Industrial Districts

Peter Knorringa / Jörg Meyer-Stamer

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Peter Knorringa (knorringa@iss.nl) is a fellow at the Institute of Social Studies, The Hague, Netherlands. Jörg Meyer-Stamer (meyer-stamer@uni-duisburg.de) was a fellow at German Development Institute from 1988 to 1998 and is now a fellow at the Institute for Development and Peace, University of Duisburg, Germany.

Introduction

There has been an increasing interest in industrial clusters and networks of firms since the early 1990s. This interest emerged from a number of different factors:

- In "The Competitive Advantage of Nations", Michael Porter (1990) identified clustering as an important feature in dynamic industrial development.
- There has been an increasing interest in the "industrial district" phenomenon, something that actually started in the first half of the 1980s when authors like Piore and Sabel (1984) argued that this model (i.e. geographically and sectorially concentrated networks of small and medium-sized enterprises) established an alternative to the established large-firm, Fordist model of industrial development. Researchers at IDS Sussex (Schmitz 1989, Schmitz and Nadvi 1994) and the International Institute for Labour Studies (Pyke 1992) introduced this line of argument into the work on SME development in developing countries.
- There has been increasing evidence from innovation economics that close interaction between firms is a major determinant of technological development and competitiveness (Lundvall 1992). Interaction may occur in dispersed networks, but often they are geographically concentrated (Storper and Harrison 1991).

Policy-makers, mostly in advanced industrialised countries and recently in some developing countries and multilateral donor agencies,¹ have begun to pay increasing attention to the cluster and industrial district phenomenon. Two elements were behind this:

- The insight that traditional industrial policy measures had often not yielded the expected results. Traditional industrial policy (via protection, subsidies, state ownership, etc.) was costly, no indisputable success, and ideologically suspect. Macroeconomic stabilisation alone did not deliver the expected dynamisation of economic development, either. This opened a window of opportunity for different and new approaches. Cluster-oriented policies fit into the general trend of decentralisation, and they may also be below the radar screen of radical neo-liberals. Formulating and implementing industry-related policies at the local and regional levels was an approach that looked particularly promising -- as groups of firms in different locations in a given country have different characteristics and suffer from different problems, it appears more sensible to formulate specific policies (i.e.

1 The World Bank is conducting cluster projects in Brazil, Turkey, Morocco, Egypt, and India (Business Environment Group, undated). UNIDO's Small and Medium Enterprises Programme is increasingly building on "cluster thinking" (e.g. Humphrey and Schmitz 1995). UNCTAD organized a first workshop on cluster-related issues in 1992 and is currently redirecting its work on Enterprise, Business Facilitation and Development in this direction (UNCTAD 1997). ILO's International Institute for Labour Studies was among the pioneers in popularizing the industrial district experience (e.g. Pyke et al 1990).

those measures that go beyond the macroeconomic and regulatory framework) at the local level.

- The idea of learning from successful experiences, combined with the observation that industrial clusters are ubiquitous. This gave rise to the hope that clusters (i.e. agglomerations of firms with little co-operation) might be turned into industrial districts, leading to dynamic industrial development.

However, not all clusters are alike. This paper addresses the question which types of clusters can usefully be distinguished, and to what extent one may expect various types of clusters to evolve towards an industrial district.

We will begin with a discussion of inter-firm co-operation -- what it means, why firms may co-operate, and why they may avoid co-operation. In order to understand the problems involved in industrial cluster policy, we will then introduce a typology of industrial clusters, and we discuss how industrial clusters react to radical changes in external conditions. Finally, it is also becoming evident that cluster- and network-oriented policies are neither easily formulated nor swiftly implemented. We suggest a number of policy measures which can be helpful for industrial cluster policy, that is efforts to actually upgrade mere clusters to industrial districts.

Inter-firm co-operation

What is co-operation between firms?

Co-operation 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 (Dore 1992). 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 in Japanese industry) 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. This may happen both among neighbouring firms and within global supplier networks.

- Formal and informal information exchange between firms in strategic alliances. There has been a strong increase in the number of national and international strategic alliances between firms, i.e. co-operation ventures aiming at the development of a given technology on the basis of a contract. Behind this is the necessity to pool R&D resources to reduce development lead-times and to realise synergies.
- Formal and informal information exchange between firms in business associations. They often are a forum for technical discussions.
- 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.
- jointly maintained, organisationally separate mesoinstitutions 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 reach barriers that can only be overcome through collective action. Taken together, this leads to the emergence of inter-firm networks.

It is obvious that there is great diversity of network types, which, in addition, exist side by side, without any one type being able to lay claim to clear-cut superiority. The following categories can help in systematising them:

- Formal vs. informal: Certain networks have a contractual or in some other way legally sanctioned basis (e.g. strategic alliances, export consortia, business associations), others are without any such basis owing to the mutual interests of the parties concerned (e.g. industrial districts).

- Hierarchic vs. non-hierarchic: Certain networks have a clear hierarchical structure (e.g. Japanese supplier networks, networks of hollow corporations²), while others have more egalitarian structures that do not necessarily develop a tendency toward hierarchical organisation over the course of time (certain Italian industrial districts fit into this category).
- Vertical vs. horizontal: One aspect that needs to be distinguished from the issue of hierarchies (which is a question of power structures) is the question of the techno-organisational division of labour within a network. In terms of division of labour, certain networks are organised vertically along the value-added chain (e.g. supplier/subcontractor networks), others are structured horizontally (networks of researchers, industrial districts in terms of information spill-over).
- Time-limited vs. long-term: Certain networks (e.g. technology alliances) are established with an eye to a concrete goal and thus for a limited period of time, others (e.g. districts, business associations) are long-term arrangements. The development of networks is a difficult and demanding undertaking, which -- as the experience with alliances shows -- involves a high risk of failure. But even once a network is operational, it remains costly, and maintaining it and keeping up its efficiency is a complicated affair.

We will in the following sections focus on clusters moving towards industrial districts, i.e. networks which are typically informal, non-hierarchic, both vertical and horizontal, and long-term. We will limit ourselves to discussing the local dimension of industrial districts, i.e. we will not discuss the way they are integrated into global commodity chains.³

Why firms may co-operate

In the view of institutional economics there are two major reasons why firms co-operate, 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). Some co-operation arrangements (e.g. strategic alliances) may also

2 These are firms that are active only in a limited segment of the value-added chain, typically in design and sales, and in the field of production restrict themselves to organizing a broadly structured network of suppliers; see Normann and Ramirez (1993) on IKEA and Clifford (1992) on the U.S. company Nike.

3 We are aware of the shortcoming this has as a dependent integration into global commodity chains (i.e. integration into a chain that is, for instance, governed by large distributors in industrialized countries) may limit the options for upgrading at the local level, for instance because the foreign customer discourages strong co-operation between local firms. However, we are not aware of more than anecdotal evidence to either support or falsify this notion.

involve principal-agent-problems. 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.

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 communication between firms, e.g. discussions in standardisation bodies or at congresses. These mechanisms have low transaction costs.

Agreement between various actors -- firms, researchers, and others -- on a given technological trajectory can create the preconditions for increasing returns. There are both increasing returns to scale due to a large number of firms and researchers improving the same technology, i.e. returns for the producers, and to adoption of a given technology, i.e. returns for the users.

Why firms may not co-operate

Despite all its advantages, it is by no means self-evident that firms co-operate. The advantages of co-operation may be obvious to innovation economists and SME-support policy-makers, but many business-people do not find them obvious at all, and for good reasons. Avoiding co-operation may be perfectly rational behaviour. In our fieldwork we have found four main reasons why entrepreneurs may choose go-it-alone as much as possible.

First, business-people often find the idea of co-operation repulsive because they consider other firms in the same branch to be rivals, and one would prefer not to communicate with them in order to avoid uncovering business secrets.

Second, macroeconomic conditions may discourage inter-firm co-operation. There may be high taxes on inter-firm transactions, thus stimulating vertical integration. If the macroeconomic framework is unstable and the "rules of the game" are constantly changing, transactions between firms may be seen as isolated rather than repeated prisoner's dilemmas, creating a situation where defaulting may appear as an attractive option (Axelrod 1984).⁴

Third, even though co-operation can reduce transaction costs, it also creates them. Coordinating a network often involves a substantial amount of time to prepare meetings, to participate in them, and to take care of the follow-up. Also, it is quite natural that conflicts will occur, and resolving them again will require a lot of time and effort. Therefore, there may be a discrepancy between the incentive for individual firms to co-operate and the intensity of co-operation that would be desirable from a macro perspective.

Fourth, there is the issue of the business culture and trust. In an environment where firms are highly vertically integrated, where they stick to themselves, where there have been occurrences of failed co-operation ventures and predatory behaviour, a business culture arises that is characterised by isolation and low trust. Both co-operation and non-co-operation in a certain way result in increasing returns. In the case of co-operation, successful joint ventures create more social capital, thus improving the conditions for more co-operation. In the case of non-co-operation, failed co-operative ventures strengthen the notion that co-operation is impossible, thus undermining the prospects of success of further efforts to stimulate co-operation. Both co-operation and non-co-operation are thus path-dependent, with a particularly strong lock-in effect in the case of non-co-operation as it is much easier to destroy trust than distrust.

Against this background, the observation that clusters, i.e. geographical concentrations of firms, do not necessarily mean dense co-operation between firms does not come as a surprise. The emergence of clusters is a ubiquitous phenomenon that is mainly due to the uneven distri-

4 For instance, this has been pointed out as one reason for low co-operation in the era of high inflation and frequent stabilization programs in Brazil. As each stabilization plan brought profound changes in the regulatory framework, negotiations between firms had to start from scratch after each stabilization plan. There was no stable set of rules which would have encouraged co-operation.

bution of production factors, positive externalities, and historical chance events (Arthur 1994, Krugman and Venables 1995). It is by no means a matter of course that co-operation emerges within clusters. Whether it actually occurs, and which forms it may take, depends on specific historical, local, institutional and sub-sector circumstances. In the next section we look at distinct patterns of co-operation in different types of industrial clusters in developing countries.

Industrial agglomerations in developing countries: Between survival clusters and industrial districts

It is almost impossible to define with precision the minimum threshold of agglomeration, depth of inter-firm linkages, and build-up of local know-how that constitute a critical mass at which a comparison with industrial districts in Europe may become a useful exercise. Still, most clusters in developing countries clearly do not cross such a threshold, no matter what their definition is. Probably the most common type of manufacturing clusters to be found in developing countries are embryonic or petty-commodity clusters (For Indonesia, see for example Weijland 1994; Klapwijk 1997. For Africa, see for example Pedersen 1997). Such clusters are based on horizontal specialisation and not (or at least not primarily) on inter-firm division of labour within the commodity chain. Still, relatively lower transaction costs may be achieved because of lower search costs for potential customers (consumers as well as traders) and the presence of a local specialised labour pool. Because such transaction costs are often extremely high, especially in the least developed areas of the developing world, they often give clustered enterprises a crucial competitive edge over isolated firms. In comparison to other clusters perhaps the main feature of such embryonic clusters is that they face very unstable conditions and are usually not the only and often not even the main activity of participating actors. Heinen and Weijland (1989) raised the question whether such clusters are a sign of poverty or progress. Microlevel studies reveal that rising incomes in some cases led to the collapse of such survival clusters, while in other cases it has led to a consolidation of the participants' commitments towards cluster activities. Evidently, clusters that have not yet completed such a consolidation process, will also not have reached the minimum threshold

Survival clusters are found both in rural and in metropolitan areas. The main difference is that most metropolitan clusters are built on survival-oriented self-employment, have less local roots and operate more in modern sub-sectors (Alma 1994; Benjamin 1991), while the rural clusters tend to be concentrated in traditional sectors, often with artisanal roots (Klapwijk 1997; for an in-depth longitudinal case study on the impact of technological change on cluster formation in rural Java, see Sandee 1996). That corresponds to some extent with the well known sub-sectors that the European small firm clusters also tend to specialise in: fashion-sensitive and labour-intensive sub-sectors with significant market niches which produce more efficiently quality-competitive artisanal products, such as footwear, other leather products, clothing, (wooden) furniture, jewellery, glassware, some metal products and toys and handi-

crafts. Most of the more promising clusters are also found in these sub-sectors, but are located in medium-sized towns, especially in Asia and Latin America.

Literature seems to indicate that Africa does not possess such more promising clusters (for a recent overview of African case studies, see McCormick 1997). However, this observation should not be taken at face value. First, researchers on clusters in Africa have tended to focus on the informal ("*jua kali*") segment of a particular sub-sector. Second, and related to the first point, the operationalisation of the cluster concept has been much stricter in terms of geography.⁵ Most cluster studies deal with, for example, an area on the outskirts of a bigger town where all vehicle repair shops / garages are concentrated (See, for example Kinyanjui 1997). To put it bluntly, as soon as one comes across a few printing workshops next to those garages, the cluster ends. In contrast, the Agra footwear cluster, notwithstanding concentrations in specific neighbourhoods, is spread out over a city of almost two million inhabitants, and encompasses modern large factories up to informal home-based units (Knorringa 1996). In the African context such variety within a sub-sector in one big city may well exist, but it would not be discussed as one cluster. For example, the garment sub-sector in Nairobi seems to encompass modern large factories (often export-oriented and often owned by white entrepreneurs), as well as a hidden medium-sized segment of workshops predominantly run by Asian entrepreneurs, and an informal survival segment run by indigenous black artisans.

Nevertheless, notwithstanding such differences in approach, it seems safe to say that most of the clusters that at least potentially could cross the threshold in terms of size of the agglomeration of firms and depth of inter-firm linkages, are found in traditional semi-artisanal sub-sectors in medium-sized towns in Asia and Latin America. Still, in terms of total employment and likely policy priorities for poverty alleviation, the large group of survival clusters may well be more important and more in need of support as compared to the more developed clusters. However, the industrial district model and policies do not offer a particularly useful angle to approach the problematic of these survival clusters. Therefore, in the remainder of this paper we focus on the smaller group of relatively more developed clusters in developing countries.

Cluster trajectories

Clusters that have passed the threshold may stagnate or evolve further along a number of distinguishable trajectories. The three trajectories identified in this paper are derived from Markusen (1996)⁶, who came up with the labels as part of a typology of industrial districts and

5 From a discussion with D. McCormick, W. Mitullah and M. Kinyanjui at the IDS, Sussex University, April 1997.

6 The fourth type of industrial district identified by Markusen, the State Anchored District, is not dealt with in this paper. However, it could be a useful metaphor in a discussion on the role of the state in trying to create industrial districts from scratch through setting up industrial estates.

their description for industrial economies, and from Humphrey (1995: 159), who described possible cluster trajectories in developing countries without providing labels. Remarkably enough, the trajectories sketched by Humphrey can be seen as running from a basic agglomeration to one of the types of industrial districts that Markusen distinguishes. But, to start with, the first option of course is a stagnating cluster which does not evolve along any of the possible trajectories. They: " ..will continue to be agglomerations of firms enjoying the external economies of agglomeration but without the inter-firm linkages which are at the heart of the industrial district model." (Humphrey 1995: 159). To be able to enter one of the trajectories requires a shift from "static gains" to "dynamic gains" (Rabellotti 1995), or from competitive advantages "just" derived from external economies to include processes of consciously pursued joint action by cluster participants (Schmitz 1995), or, in our words, from only information exchange to collective action.

In the first trajectory, a cluster develops the set of stylised facts that represent the Italianate industrial district. In Italy, it now appears as if at least some of its clusters are evolving into hub-and-spoke districts with a limited number of larger leading firms and many subcontractors. A second trajectory, more common in developing countries, concerns clusters that evolve from a basic agglomeration to a hub-and-spoke district without an intermediate stage in which they resemble the main features of the Italianate model. A third trajectory runs from a basic agglomeration to a satellite district, in which most small and medium-sized firms manufacture for leading firms located outside the cluster. There are indications that some satellite districts may subsequently evolve into hub-and-spoke districts. In the remainder of this section we present a selection of case studies from developing and developed countries on some of these trajectories. Given the scarcity of longitudinal case studies, this review necessarily relies on comparative static's. The following table summarizes the argument.

Table 1: Types of clusters

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

Italianate trajectory

The first trajectory, towards an Italianate type of industrial district, is also the most difficult to find in developing countries. In fact, we are only aware of two such cases, namely the surgical instruments cluster in Sialkot (Pakistan) and the ceramic tile cluster in Criciúma (Brazil).

The Sialkot cluster appears to have displayed a significant number of the Italianate features, at least in the beginning of the 1990s (Nadvi 1996). As Humphrey wrote in his overview, the Sialkot cluster consisted of: "... large numbers of small firms engaged in extensive inter-firm exchanges of service, horizontally and vertically, active producer associations, supportive local and regional governments, and the clusters' powerful position in the world market for basic surgical instruments." (Humphrey 1995: 159). However, a few years later this cluster seems to be on a trajectory towards a hub-and-spoke district. In a draft report on his most recent fieldwork, Nadvi (1997) reports about the consequences of the latest crisis for Sialkot's manufacturers. In May 1994 the Food and Drug Administration (FDA) of the United States, the most important export market for Sialkot, embargoed the import of Pakistani (i.e. Sialkot)-

made surgical instruments for failing to meet international quality standards. By 1996 Sialkot appears to have come out of this crisis even stronger than it was before. Sales are above the 1993 level, overall quality has improved. At the same time, while a substantial number of manufacturers are nowadays certified as conforming with international Good Manufacturing Practices (GMP) standards, only a few manufacturers are now ISO 9002 certified. In order to establish or maintain contacts abroad, such certification becomes more and more a necessary but not sufficient condition. Therefore, doing direct business with quality conscious importers becomes the exclusive domain of those entrepreneurs with the proper certifications. Moreover, also within the associations and institutions of the Sialkot cluster a relatively small group of entrepreneurs appears to become more dominant.

In the case of the Criciúma cluster, local actors from firms and business associations deliberately try to build Italianate structures (Meyer-Stamer 1998). The cluster consists of several medium- and two large-sized manufacturers of floor and wall tiles (all nationally owned) and a substantial number of suppliers (some nationally owned, some subsidiaries of leading firms from Italy and Spain). Unlike the case of Sassuolo, the world-wide leading tile cluster in Italy (Porter 1990), there are no local equipment manufacturers in Criciúma. In the past there was fierce rivalry and little co-operation between the firms. This changed after the industry entered into a deep crisis around 1990. Two presidents of local business associations succeeded in establishing co-operation; one of the important outcomes was the creation of a local technology centre. Two further aspects are important to understand why co-operation started. First, there was the observation that firms in Italy and Spain were mostly located in industrial districts and did actually co-operate; this helped in overcoming business-cultural obstacles. Second, firms can co-operate in fields like technology because they do not establish a competitive advantage; heavy investment in new equipment and a strong effort to establish quality management concepts like Kaizen and 5S are no more than a precondition for survival in an increasingly sophisticated industry. Competitive advantages are established through innovative design, logistics, and marketing concepts, and firms are keen not to reveal their tricks in these fields.

In a way these examples already put forward what may well be two of the more general reasons why the Italianate trajectory is hardly to be found in developing countries. First, small firms in developing countries find it even harder to afford the investments in technology to keep up with rising quality standards. The question of whether or how small firm clusters can (continue to) be technologically innovative is one of the greatest worries also for European observers (Asheim 1996). Maillat (1995) also puts (Italianate) industrial districts in the box of high "interaction logic", but is sceptical about their "learning dynamic". In short, there are reasons to worry about the sustainability of technological innovativeness of the Italianate industrial district. Therefore, it seems pretty unrealistic to expect small firm clusters in developing countries to be able to conquer a part of the market niche now held by their more mechanised and computerised Italian counterparts, who also possess much more experience with fashion-oriented high-road manufacturing.

Moreover, the second more general reason to explain the absence of an Italianate trajectory in developing countries has to do with the social structure. We are not aware of developing-country case studies that resemble the social boundary conditions typical of the Italianate trajectory. Clusters in developing countries are embedded in a setting fundamentally different from the Italian case studies (Amin 1994). For example, social cohesion and the integrating role of local institutions, the pet themes in the industrial district literature, seem to be less prominent in clusters in developing countries. Instead, internal segmentation seems to reproduce and even strengthen inequalities. Because of extreme differences in bargaining power between actors in the cluster, possible benefits from collective efficiency are skewed in favour of leading actors and market agents (Smyth 1992).

Perhaps there is one more reason not to be surprised about the scarcity of clusters in developing countries on an Italianate trajectory. The European and Italian debate also indicates that the Italianate features are now more and more seen as a phase in a broader restructuring process. Without suggesting that the Italianate model would be inherently unsustainable, it may well be less suitable to the situation of the 1990s in the world market for many of the relevant sub-sectors. Even in Italy, it now appears as if at least some of its clusters are evolving into hub-and-spoke districts with a limited number of larger leading firms and many subcontractors (on Italy see e.g. Dei Ottati 1996; Lazerson and Lorenzoni 1996; Albino et al 1996; for an analogy with one of the oldest industrial districts, Rochdale (Manchester), see Penn 1994).

Satellite trajectory

A second trajectory runs from a basic agglomeration to a satellite district, in which most small and medium-sized firms manufacture for leading firms located outside the cluster. Such leading firms need not necessarily be large manufacturers themselves, although they often were large manufacturers a few decades ago, for example in the footwear and clothing industry. In many of the relevant sub-sectors, the labour intensive manufacturing process has -- in steps -- been transferred to small and medium-sized manufacturers in developing countries. In many cases, the leading firms of such commodity chains in European countries have transformed themselves into trading houses, keeping a firm grip on designing and marketing.

Most observers consider the satellite trajectory to be least attractive, as it offers the least possibilities for an autonomous development process. Manufacturers who are attractive to leading international corporations for only one reason -- cheap labour -- are very vulnerable, as relative labour costs tend to keep changing between countries. Moreover, to be considered by a leading outside firm for only a particular job is fatal, since jobs are constantly changing. By contrast, in resilient and interdependent inter-firm relations, leading firms are more inclined to deal with a changing situation together with known partners. A leading firm must feel confident enough to rely on the specialised capabilities of its suppliers. Especially in fashion-sensitive industries, it is, nowadays, "... too costly and time consuming to perfect the design of new products and translate those designs into simply executed steps. Those formerly charged with the execution of plans -- technicians, blue collar workers, outside suppliers -- must now

elaborate indicative instructions, transforming the final design in the very act of executing it." (Lazerson 1993: 215). Evidently, this is a far cry from the Export Processing Zones' type of assembly line work where predominantly young women without previous industrial experience work long hours for low wages.

However, being part of a commodity chain led by someone outside the cluster is not necessarily all bad. Especially in the short run important benefits may accrue to local workers. To start with, the women workers usually involved may be able to learn some skills, earn their own income, and as a result possibly strengthen their bargaining position at home. At macrolevel, these increasing income opportunities for women may well contribute to a more equal income distribution. Secondly, it can, for a certain period, achieve a substantial production volume for both the domestic and export markets, and thus diversify the industrial structure. Moreover, although the conditions of this type of employment are not very promising, they are in many ways already an improvement over alternative job opportunities.

Moreover, entrepreneurs may also benefit from being part of such international commodity chains. Apart from earning large sums of money as intermediaries, they get access to all sorts of relevant information on the international market in their specific sub-sector and in the more optimistic view local manufacturers may learn and later try to venture out on their own. Moreover, they may capture more phases in the commodity chain over time. This may set off a process towards a hub-and-spoke trajectory, in which the leading actors in particular commodity chains are leading *local* entrepreneurs.

The footwear industry in and around Madras offers a successful example where local industrialists gradually take over more phases in the commodity chain (Sahasranaman 1993; Rao 1993). Most of the nowadays renowned firms have entered the footwear industry from a leather tanning background. These firms are long-standing suppliers of main European leading footwear firms. While the Indian firms previously supplied finished leathers (1970s), and before that semi-finished leathers (1960s), they now also prepare uppers (1980s) and increasingly full shoes (1990s) for these leading actors. In turn, the foreign firms assist in setting up modern factories where badly paid and unorganised women work with modern imported machines. One of these local leading firms was the only company from India that had its own stall in one of the upper-market exhibition halls at the main European shoe fair in Düsseldorf (March 1997).

Nevertheless, such examples are rare. Most of the clusters on a typical satellite trajectory are not even discussed in literature as clusters but as industrial production complexes, often termed Export Processing Zones.

Hub-and-Spoke trajectory

The last trajectory to be discussed is the hub-and-spoke trajectory, which may offer the most feasible road to take. At the same time, it seems to be the most common trajectory for clusters

in developing countries. According to Schmitz and Nadvi (1994: 12): "... most LDC clusters tend to be distinguished by internal hierarchies." The most typical example is no doubt the case of the Korean *Chaebol*, where small firms orbit large industrial complexes (Cho 1992). In the Brazilian Sinos valley (a shoe cluster) small firms tend to operate rather separate from a few Fordist giants (Schmitz 1995). In many of the South Asian clusters a combination of the above two trends is often found. A few leading families, who own the largest and more modern factories in the cluster (which are by international standards usually semi-mechanised medium-scale units), dominate the local industry through the local business associations and mould the cluster image as it is perceived by outsiders. Other smaller units either supply them as subcontractors or supply to other, usually less attractive, market channels (for example, garments in Tirrupur (Cawthorne 1995 and Swaminathan and Jeyaranjan 1994) and Ahmedabad (Das 1996a); flooring tiles in Gujarat (Das 1996b); textile printing in Jetpur (Dupont 1994); bicycles in Ludhiana (Kattuman 1994); and footwear in Agra (Knorringa 1996).

In most of these clusters one finds at least three tiers of firms:

"At the lowest tier of the hierarchy are households and small workshops which have limited resources, produce for local consumption and seek to survive. The medium tier is occupied by firms who are better endowed (in capital and skills), are able to generate an investable surplus and produce, either directly or on (sub)contract, for the domestic and often export markets. The third tier includes firms which maintain high levels of quality, are technically innovative, capable of entering export markets, and have growth aspirations." (Nadvi and Schmitz 1994: 12).

Moreover, the above classification applies not only to the South Asian case studies mentioned above, but also, for example, to the Tegalwangi rattan furniture cluster in Indonesia (Smyth 1992), the footwear clusters in Peru's Trujillo (Villaran 1993), and Mexico's Leon and Guadajajara (Rabellotti 1992), the textile and clothing cluster in Itajaí Valley, Brazil (Meyer-Stamer 1998).

Perhaps the main risk in a hub-and-spoke trajectory, in terms of innovativeness and capability of upgrading, is that often a few leading families try to monopolise benefits and often become a source of conservatism instead of innovation, even though they have the financial capacity to upgrade. Especially many of the South Asian case studies tend to indicate how such "fat cats" are often a drag on innovative behaviour (Cawthorne 1995; Das 1996; Knorringa 1996).

How clusters deal with radical change

Research on clusters in developing countries initially concentrated on identifying them, i.e. trying to find out whether dynamic agglomerations existed and whether they might offer growth opportunities similar to those found in Italy in the 1970s and 1980s. Typologies like the one elaborated before are useful to identify more clearly the growth opportunities and the possible trajectory open to a given cluster. Nevertheless, this is still a static perspective as it

assumes otherwise relatively stable framework conditions, i.e. the absence of radical change and disruptions. Only recently has the cluster debate moved from a static to a dynamic perspective, i.e. the question: how do clusters cope with radical change? This change may typically take two forms: radical technical change (probably more relevant for industrial districts in industrialised countries), and radical change in the economic framework conditions (highly relevant for clusters in developing countries). In the following section, we will focus on the latter aspect since it has been highly relevant for many developing countries in the recent past, mainly due to the general trend of economic liberalisation, especially the transition from inward-oriented to open economies, which generates a much increased competitive pressure.

From a theoretical perspective, arguments in favour of and against a superior capacity of clusters to cope with radical change can be made. Firms in clusters should be better able to deal with increasing competitive pressure because they benefit from various positive externalities and thus have to deal with less challenges than isolated firms. Another important favourable factor is the capacity to organise collective action to deal with increasing pressure, e.g. by reorganising or founding mesolevel institutions to support firms in fields like training, technology, and information. On the other hand, we have already argued that both co-operation and non-co-operation are path-dependent. It is not necessarily the case that changing external conditions force a non-co-operative cluster into co-operation. Moreover, even if there is co-operation, actors in a cluster will not necessarily act swiftly to deal with changing external conditions. A change in reality is one thing, the way it is perceived by local actors is another. Clusters do not only involve technical and economic externalities but also socially constructed cognitive patterns (or what Denzau and North [1994] call "mental models"). It is an open question how fast the socially constructed perception of reality adapts to radical changes in the "objective" reality.

From an empirical perspective, it seems that the evidence, which so far is very limited, points to a good capacity of clusters to cope with radical change. In the case of Sialkot local actors reacted swiftly to the enormous threat posed by trade barriers erected by the U.S. Food and Drug Administration (Nadvi 1997). In the case of the Agra footwear cluster many firms succeeded in upgrading and changing the modus operandi after the main market had vanished (Knorringa 1997). The case of the Criciúma tile cluster has been mentioned, and something similar may occur in the textile and clothing cluster in Itajaí valley; even though the element of path dependence was strong in the initial phase after the change in external conditions, about two years later firms and their associations started to pursue more than just incremental changes (Meyer-Stamer 1998). In these cases, radical changes in the macroeconomic framework conditions led to a deep crisis of the sector which opened opportunities for radical changes in behaviour, namely from non-co-operation to co-operation. Things seem to be somewhat more complicated in the case of the Sinos valley footwear cluster. Collective action to improve locational advantages started but then ground to a halt when the large firms (which dominate the local business association) preferred relocation to low-wage regions in North-eastern Brazil to efforts of local upgrading (Schmitz 1997). Overall, it appears that clusters in developing clusters are resilient and they do upgrade but that, as a response, the internal

structure of clusters also changes. Some actors lose out, power may become more concentrated, and the hub-and-spoke trajectory appears to become more pronounced.

Policy implications

Current wisdom suggests that one cannot create industrial districts -- they emerge out of a long development process with increasing division of labour between firms, increasing trust, and growing externalities (e.g. Schmitz and Musyck 1994). Current wisdom also suggests that things happen rather the other way around: once an industrial district is emerging, firms will organise themselves politically and will exert pressure on local policy-makers to support and strengthen the industrial district, especially by means of building mesoinstitutions in fields like training and technology.

In our view, things are a bit more diverse. To be sure, it is unlikely that attempts to create an industrial district from scratch work. For instance, the history of technical assistance is full of efforts to create industrial estates, and sometimes even sectorially concentrated industrial estates, but there is no evidence that this has ever led to an industrial district. However, building from scratch is only one of several constellations to be encountered in real world industry promotion policy. In terms of industrial district-related policy we see at least three other stylised constellations of stimulating industrial districts: clusters with little co-operation that move towards industrial district-like structures; industrial clusters under adjustment pressure; and newly emerging clusters based on external investment.

The case of the textiles and clothing industry in Brazil's Itajaí valley is a case of a cluster with little co-operation that moves towards industrial district-like structures. It is unlikely that an Italianate structure will emerge, especially given the fact that large firms continue to play a dominant role, and do not show a propensity to complete hollowing-out (i.e. outsourcing all their productive activities). The more likely scenario is the emergence of a hub-and-spoke structure with several large lead firms. The change in the development path of the clusters was initiated by two types of activities. First, large firms started to outsource part of their production process, thus moving from complete vertical integration to a hierarchically governed network structure. Second, medium-sized and large firms began to co-operate, for instance by institutionalising information exchange and by strengthening the role of business associations. At the same time, local training institutions strengthened interaction with firms, adding new and specialised courses to their menu. Likely future steps are more courses in fields like fashion design and business administration, technology extension, the establishment of a regional quality brand label, and maybe the creation of a market research institution.

Both Sialkot and Sinos valley are cases of clusters under adjustment pressure. A tradition of co-operation and functioning business associations facilitate collective action to respond to external pressure. In particular the swift response of Sialkot firms to the FDA shock is an impressive example of the advantages that an active cluster may offer. Recent events in Sinos

valley have been less encouraging. They underline a problem documented in many of the developing-country case studies: local and regional associations and institutions may be monopolised by a few leading families or clans, which often blocks rather than enhances innovativeness, which is characteristic of European cases. This is not to say that successful European clusters have not experienced any internal power struggles. History shows that the very successful clusters of today often also experienced bitter internal struggles before becoming prosperous, notwithstanding the collective amnesia once success came their way (Sabel 1992: 225-229). The point is that the social structure has allowed the distinct actors in the cluster to fight it out among themselves and find a solution that may primarily lead to better economic performance of the cluster, and not a solution in which a small elite is able to keep full control. However, such countervailing power appears to be much less present in most clusters in developing countries. It may be an important task for higher-level policy-makers to stimulate and strengthen such countervailing power. Not siding automatically with the local leaders may provide an important signal to other collective actors, and may lead to a more balanced conflict resolving.

One common feature of the first two types of experiences (i.e. clusters moving towards co-operation and adjusting clusters) could be the role of the state: as far as the cases we have been observing are concerned, there is none. More precisely, government does not play an active role in supporting structural change. In the case of Brazil, central government played the key role in creating the macroeconomic conditions that enforced structural change. However, neither central nor state nor local government did much to help firms in their struggle for survival. Much the same is true in the case of Sialkot in the aftermath of the FDA shock. In all cases, adjustment efforts were only made by firms and business associations. These observations underline the increasing emphasis that recently has been placed on the potential of business associations in promoting private sector development (Moore 1996).

However, this does not mean that government has no role to play regarding clusters. Experience from industrialised countries indicates that all levels of government can contribute to improve the performance of clusters. Local government can directly help in providing infrastructure, real estate, training, business incubators, and so forth. State or province governments can do the same plus provide financing and technology extension. Moreover, it can stimulate local activities, e.g. by awarding grants to local economic development on a competitive basis. Central government can give financial support to all these activities, and it plays a crucial role in creating the adequate economic and legal framework conditions that stimulate co-operation and action at the local level.

It is, however, crucial to beware of overly optimistic expectations regarding local cluster policies. The main argument of this article has been that clustering is basically a good thing (even if there are no Italianate industrial districts), that it offers opportunities for industrial upgrading, and that it should therefore receive political support. However, anybody who has been discussing industrialisation strategies with policy-makers, and especially local policy-makers in clusters, will often have encountered the exact opposite view. They tend to perceive clustering as a nuisance, as a feature that makes the region overly vulnerable to crisis in the

industry that happens to be clustered locally, and thus as something that should be overcome. Diversification rather than strengthening the cluster is the dominating discourse in many developing country clusters. Much the same used to hold true for regional policy (as implemented by central government) that tried to scatter industries across the territory rather than stimulating the emergence of clusters. Although it is widely accepted in the academic discussion that this kind of regional policy did not work (Hansen, Higgins and Savoie 1990), this insight has not yet reached all the policy-makers. Therefore, it is unrealistic to expect local and regional policy-makers to embark enthusiastically on a cluster-strengthening policy. It will rather require a lot of pressure of cluster firms and business associations to persuade policy-makers to take care of them instead of pursuing unrealistic projects.⁷

We mentioned before that there is another ideal type of clusters, namely newly emerging clusters based on external investment. External investment does not necessarily mean foreign investment, as the example of Sinos valley footwear manufacturers setting up factories in Ceará illustrates. However, in most of cases foreign investors will lead the process. The most evident case is the passenger car industry which displays a strong trend towards new investment in the developing world. Due to the lean manufacturing and just-in-time logistics doctrine new investment means that not just one factory but an entire hub-and-spoke cluster is located in a given region. Car manufacturers usually pull in other foreign firms, i.e. multinational car parts manufacturers, who are the "globally preferred supplier" for a given subsystem of a car (Humphrey 1998). Local firms at best populate the second tier of suppliers; but even in a country with a long tradition of car manufacturing like Mexico only few domestic firms are prepared to cope with the demands established by car and car parts manufacturers (Altenburg et al. 1998). Cluster-related policies in this context mean something different, namely anticipating the demands of new firms in terms of qualified labour and infrastructure. A carefully designed policy to upgrade local firms to work as second- or third-tier suppliers may promise some spill-overs, especially in the medium-term when employees of foreign firms set up their own shop.

Finally, it is important to have realistic expectations regarding the development potential of the type of cluster that is most frequent in developing countries, namely survival clusters. Some of the enthusiasm in the discussion on clusters in developing countries seems to be driven by the hope that cluster support may be a promising way of upgrading informal sector micro and small firms. It is unlikely that this hope will materialise. Even a proposal to upgrade such firms so that they can form a satellite cluster is unrealistic. Survival clusters are populated by firms that often are not even remotely in a position to cope with the cost, quality, and responsiveness demands of the formal sector. This does not mean that there should not be cluster-oriented policies to support micro firms and survival activities. On the contrary, sur-

7 For example, in the case of Itajaí valley, local policy makers in the early 1990s put all their efforts into trying to attract a car assembly plant. Until today there is no local government policy directed towards the textiles and clothing industry. In Criciúma, local policy makers tried to revitalize the moribund local coal industry. Again, there is no local government policy directed towards the ceramic tile industry.

vival clusters should be a main target of policy intervention. But it is important to keep in mind that policies for survival clusters are within the realm of poverty alleviation and are usually neither about manufacturing best practice, nor about technological innovation or export promotion.

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