Pergamon

www.elsevier.com/locate/worlddev

World Development Vol. 27, No. 9, pp. 1531–1551, 1999
© 1999 Published by Elsevier Science Ltd. All rights reserved
Printed in Great Britain
0305-750X/99/$ - see front matter

PII: S0305-750X(99)00074-1

African Enterprise Clusters and Industrialization: Theory and Reality

DOROTHY MCCORMICK *
University of Nairobi, Nairobi, Kenya

Summary. — Using six case studies from Africa, this paper examines the theoretical argument that geographic and sectoral clustering enables enterprises to overcome constraints to growth and development. Findings were both theoretical and practical. Theoretically, the study underscored the strength of the collective efficiency framework, but found that certain anomalies could only be explained by other contextual variables. Grouping the six case studies revealed important differences among them, and showed that each group plays its own part in the industrialization process. "Groundwork" clusters prepare the way; "industrializing" clusters begin the process of specialization, differentiation, and technological development; and "complex industrial" clusters produce competitively for wider markets. The paper concludes with practical implications for African governments, donors, and the business community. © 1999 Published by Elsevier Science Ltd. All rights reserved.

1. INTRODUCTION

African development is closely tied to small-scale industry. For more than two decades, observers have recognized that small, so-called 'informal' activities generate employment for the growing number of men and women who can no longer find work in agriculture, government service, or large-scale industry. Although many of the jobs provided by small firms are low-paying, they enable families to survive, educate their children, and in some cases, move out of poverty.

Small enterprise development has also been linked to the industrialization process itself, though here the negative side of the relationship has been stressed at least as often as the positive. Much of the available literature emphasizes obstacles and constraints to enterprise growth. Since the list of these is long—low levels of product and process technology, small product markets, lack of access to capital, lack of physical infrastructure—and the institutional framework for addressing them is weak, industrialization can seem like a distant, even unattainable, dream.

There is, however, a recent international literature which suggests that operating in clusters may help small enterprises to overcome these growth constraints. This literature offers three specific ways in which clustering enables firms to overcome obstacles to growth. First, clustering gives rise to collective efficiency which enhances firms' competitive advantage; second, clustering facilitates growth in small steps; and third, clustering makes it easier to respond to opportunities and crises. Much of this literature deals with advanced countries and, more recently, also with Latin America and Asia. There is very little material on Africa. This paper draws together some of that mate-

* This paper is based on research conducted under the Kenya portion of a larger project on Collective Efficiency and Small-scale Industry directed by Hubert Schmitz of the Institute of Development Studies at the University of Sussex, and funded by the Department for International Development, London. I am grateful to Hubert Schmitz for his leadership in the project, and to DfID for its financial support. I also acknowledge with gratitude the work of my colleagues, Mary Kinyanjui and Winnie Mitullah of the Institute for Development Studies, University of Nairobi, whose detailed analyses of the vehicle repair and fish processing clusters provided important insights into the strengths and limitations of enterprise clusters. The present version of the paper has benefited greatly from the constructive comments of Khalid Nadvi, Hubert Schmitz, and an anonymous reviewer.

rial and explores whether the benefits that clusters have provided elsewhere are also found in Africa.

The material gives some indication that clustering does indeed help the process of industrialization, but it also shows that the economic and social environment affects the impact of clustering. The six cases in this study suggest that the small size of product markets, the oversupply of labor, and the institutional weaknesses that characterize so many African economies are the main limiting factors. The cases also show that African clusters, far from being homogeneous, vary in both internal structure and level of industrialization. Some are laying the groundwork for industrialization by improving producers' access to markets and offering an environment in which joint action can begin. Others are industrializing, in the sense that they have begun the process of specialization and differentiation that leads to greater efficiency and ultimately to industrialization. Still others have diversified their size structure and interfirm linkages in such a way that they have been able to tap wider national and global markets.

The paper is presented in five section. Following this introduction, section 2 discusses the relevance of the collective efficiency model for incipient industrialization. Section 3 describes the six clusters. Section 4 offers a detailed analysis of the clusters, using the framework of collective efficiency. Section 5 assesses the usefulness of the theoretical model and concludes with practical implications for African governments, donors, and the business community.

2. ENTERPRISE CLUSTERS AND INCIPIENT INDUSTRIALIZATION

Industrialization is both the process of building up a country's capacity to convert raw materials into new products, and the system that enables production to take place. The process of industrialization implies increasing efficiency in the use of both labor and capital. Clustering is believed to help enterprises grow and contribute to industrialization more broadly.

(a) *Clusters and industrial change*

The term *cluster* is used in two somewhat different ways in the industrial development literature. Porter (1990) uses the term to designate a group of firms engaged in similar or related activities within a national economy. Although Porter (1990, p. 761) believes that the relationships within an industry cluster benefit from firms' being located near one another, he does not take geographic proximity as a defining characteristic of clusters. The second use of the term is explicitly geographic. According to Schmitz (1992), a cluster is *a geographic and sectoral agglomeration of enterprises*. This approach has its roots in Marshall's (1890) observations on the textile and metalworking regions of England, Germany, and France during the latter half of the 19th century, and it has recently been elaborated in studies of highly successful industrial districts in various parts of the world (See, for example, Piore and Sabel, 1984; Zeitlin, 1989; Storper and Walker, 1989; Becattini, 1989; Sengenberger and Pyke, 1992; Humphrey, 1995).[1] This study adopts the second definition because geographic proximity appears to be particularly important in developing countries where poor infrastructure, weak information systems, and cultures that place high value on face-to-face communication are the norms.

Industrialization, like the broader process of development of which it is a part, generally involves increasing complexity of production which, in turn, demands greater reliance on others for certain activities (Mead, 1994). In the early stages of industrialization, improvements in manufacturing productivity usually lead the development process (Chenery, Robinson and Syrquin, 1986; Snodgrass and Biggs, 1996). Some productivity improvements come from the structural shift from agriculture to manufacturing, but greater efficiency also requires technical and organizational change (Lall, 1990; van Dijk, 1992; Snodgrass and Biggs, 1996). Enterprise clustering makes it easier for the necessary changes to take place. When firms undertake related activities in close geographic proximity, both the immediate environment and the firms themselves are likely to change. The environment begins to adapt to the presence of the firms by attracting customers, traders, workers with related skills, suppliers of inputs and services, and still more enterprises anxious to benefit from the markets being created. Old institutions change and new ones spring up. Some developments happen spontaneously; others occur only when the firms in the cluster act together. For example, traders may simply appear because they heard

of the existence of the cluster, but a training institute may result from joint action of local producers.

As the environment changes, so do the firms. At its most basic level, clustering seems to encourage information sharing and opportunities for learning new techniques and designs. Sometimes firms then modify their own operations. One firm may specialize in some aspect of the production process while another turns from production to trade in inputs or final products. Still another firm may provide transport to different markets. Schmitz (1997) argues that this process enables firms to advance by taking small and calculable risks.

In short, clustering appears to have the potential to enable African countries to overcome or ease some of the obstacles to industrialization. By increasing market access, fostering communication and information sharing, facilitating technological upgrading, increasing efficiency, and contributing to the development of supportive institutions, clusters can build industrial capacity. In this way, clustering can provide gains not easily available to dispersed enterprises. These gains have been termed *collective efficiency*, defined as the competitive advantage derived from local external economies and joint action (Schmitz, 1995).

(b) *Collective efficiency: a framework for analysis*

The above definition stresses the two dimensions of collective efficiency: the planned and the unplanned, or in Nadvi's (1996) terms, the active and the passive. Passive collective efficiency is essentially reaping the benefits of external economies, while active collective efficiency involves collaboration between and among clustered firms.

(i) *External economies*

External economies exist when social benefits are higher than private benefits. They are the unintended or incidental by-products of economic action. Krugman (1991), following Marshall (1890), identifies three main types of external economies in enterprise clusters: labor market pooling, intermediate input effects, and technological spillovers. To these must be added the most basic of agglomeration economies: market access.

Market access is the first and, as we will see, most universal external economy for clustered firms. Clusters of similar enterprises attract buyers both from the immediate vicinity and more distant places, thereby improving access to the overall market for a firm's products or services. Thus, once a cluster is established, market access is one of the potential benefits of locating within its bounds.

Labor market pooling is the concentration of specialized skills that often develops within manufacturing clusters. The pooling, which occurs as a result both of skills upgrading within the cluster and of skilled labor being drawn from other places, benefits both workers and firms. Such pools of industry-specific skills are evident in many developing country clusters (Nadvi and Schmitz, 1994, p. 41). Nadvi (1997), p. 18), for example, reports that nearly all of the surgical instrument manufacturers in Sialkot, Pakistan, cited the presence of skilled labor as a major locational advantage. Its importance in other places will obviously vary with the skill content of the cluster's product or service.

Intermediate input effects are externalities associated with the emergence of specialized suppliers of inputs and services. Such suppliers either arise as a result of the internal process of specialization and differentiation, or are attracted from outside the cluster. In the first instance, firms already operating in the cluster see profit opportunities for other activities and turn from manufacturing to trade or services. In the second, the concentration of producing firms with similar supply needs lures suppliers from other places to begin offering raw materials or components, new or secondhand machinery, and spare parts (Nadvi and Schmitz, 1994, pp. 13–14).

Technological spillovers involve the diffusion of technological know-how and ideas. Clustering encourages such spillovers by permitting the rapid flow of technical information between producers operating near one another, and also by enhancing information flow between suppliers, producers, traders, and others connected to the cluster (Nadvi and Schmitz, 1994, p. 18). Given that one of the major characteristics of developing countries is their weak technological base, technological spillovers within a cluster are crucial to its upgrading and ultimately to industrial development.

The model clearly emphasizes the positive effects of external economies. This is in sharp contrast to mainstream economics, which treats such discrepancies between social and private

returns as market failures that lead to underinvestment.[2] The fact that external economies can be either beneficial or costly—enabling or disabling—suggests that they need very careful empirical investigation.

(ii) *Joint action*

Local external economies may be necessary for the development of a strong cluster, but Schmitz (1997) argues that "consciously pursued joint action" must also be present for industrial clusters to flourish. This emphasis on the "joint action" aspects of collective efficiency underscores the importance interfirm linkages and networks.[3] Schmitz (1997) suggests an analysis using four categories of joint action in clusters, based on two dimensions. The first dimension has to do with the number of cooperators; the second, with the direction of cooperation.[4] Thus, joint action may be bilateral or multilateral. In bilateral cooperation, two firms work together as, for example, when they share an expensive piece of equipment. In multilateral action, groups of firms join together, often in an association or other organization, for some common purpose. Joint action may also be vertical or horizontal. Vertical cooperation happens when firms involved in different stages of the production-distribution chain work together. Horizontal joint action refers to collaboration between/among competitors. This categorization does not exhaust the possibilities for analyzing joint action. For example, studies of linkages have focused on the ownership or relative size of the linkage partners, on the nature of the relationship between them, and on the content of the cooperation (See Mead, 1994; Alila and McCormick, 1997; Barr, 1995, 1998; McCormick, 1998b).

Active cultivation of such firm linkages and entrepreneurial networks apparently affects firm growth and performance (Barr, 1998, 1995; Alila and McCormick, 1997). It has also been associated with technological change and the development of the technological capabilities of collaborating firms (Bell and Pavitt, 1995, p. 87). This suggests that cultivation of linkages within clusters, and from clusters to important external actors may contribute to the growth and development of the cluster. Whether the active aspects of collective efficiency are a necessary ingredient for cluster success remains to be seen.

Joint action also has its costs. The opportunity costs of associational activity are probably the most obvious example. In very small businesses, joint action usually requires the involvement of the entrepreneur, who must carefully weigh the use of scarce time for attendance at meetings or other activities that do not bring immediate rewards. Joint action may also have political costs, especially in situations where the authorities frown upon grassroots initiatives.

(iii) *The institutional context*

The discussion of collective efficiency suggests that clustering has the potential to facilitate industrialization. In the real world, however, this potential is not always realized. Many clusters get stuck at low levels of production and distribution. The internal operations of the cluster only partly explain why this should be so. For a more complete explanation, we need to look beyond the cluster itself to its institutional context. Business activity does not happen in a vacuum. Social, political, and economic institutions, by shaping human interaction, create distinct patterns of business operation and organization (North, 1990; Whitley, 1992; Evans, 1995; Pedersen and McCormick, 1999).

Beyond the market and government, which are the mainstays of economic analysis, it is not clear precisely which institutions need to be taken into account. The New Institutional Economics (NIE) highlights economic institutions such as contracts, firms, and property rights (Williamson, 1985; North, 1990; Langlois and Robertson, 1995; Hart, 1995). Others emphasize the role of political, social, and cultural institutions in shaping business behavior (Granovetter, 1985, 1992, 1995; Putnam, 1993; Fukayama, 1995). Observers of enterprise clusters have recognized the potential effect of various types of institutions on cluster dynamics. To date, however, the reflections on the role of institutions on cluster development have largely flowed from empirical work carried out in Latin America and Asia (see, for example, Bazan and Schmitz, 1997; Knorringa, 1996; Nadvi, 1998). One notable exception is Mitullah's (1998) study of the Kenyan fishing cluster, which forms one of the case studies for this paper. Given the lack of empirical data from Africa, this paper takes an exploratory stance that attempts to identify possible institutional explanations for cluster behavior which can then be the subject of future research.

3. SIX AFRICAN ENTERPRISE CLUSTERS

The literature on small-scale industry in Africa is full of examples of small enterprises that neither grow nor develop technologically. Does this also apply to cases where enterprises have clustered? Has clustering helped them to overcome the commonly found growth constraints? This section draws together some of the scarce material that exists on African enterprise clusters. After a brief explanation of the choice of clusters, we examine their economic environments, describe their characteristics and operations, and highlight their recent challenges. The next section will then ask whether clustering has helped the clustered enterprises to progress, and if not, why not.

(a) *Choice of clusters for study*

Six cases were selected for analysis (see Table 1). They come from three African countries, and represent four types of activities. The Kenyan fish, vehicle repair, and garment clusters are known to the author from recent research with close colleagues. Several factors dictated the choice of the other three clusters. The most basic was the availability of information.[5] The Kenyan metalworking cluster (Kamukunji) was included because it is well known from previous research and its location made it possible to supplement the secondary literature with a few key informant interviews. Studies on the Ghanaian (metalworking and vehicle repair) and South African (garment) clusters addressed nearly all of the relevant issues. Together this case material covers several of the main subsectors of small-scale manufacturing and services, including insights into the ways in which repair services can give rise to manufacturing activities. The three countries broadly represent eastern, southern, and western Africa, although because all were once British colonies, certain aspects of their institutional frameworks may be more similar than this geographic dispersion suggests. Although the coverage is not comprehensive, the six clusters offer clear illustrations of the issues surrounding the relationship of clusters to industrialization and help in assessing the "fit" between the reality and the theory of

Table 1. *Overview of enterprise clusters*

Cluster	Producing firms	Firm size	Products	Markets	Challenges and turning points
Kenya					
Eastlands garments	600	3.5	Clothing	Domestic: mainly rural and secondary towns	Market liberalization, especially second hand clothes
Kamukunji	2000	1–2	Metal products	Domestic: consumers, traders, and firms	Market liberalization and oversupply of labor
Ziwani	506	1.5	Vehicle repair	Nairobi individuals, especially matatu and truck owners	Market liberalization
Lake Victoria fish [a]	560	Fishing: 3–15 Trading: 1–50 Industrial processors: 35–300	Fresh and processed fish	Mainly export Limited domestic	Falling fish supplies and EU quality crisis
Ghana					
Suame	8,000	6	Vehicle repair and metal work	Domestic: consumers and firms Passive exports	Market liberalization and oversupply of labor
South Africa					
Western Cape	538	126	Clothing	Domestic: retail chains Some export	Opening of South African economy

[a] "Lake Victoria Fish" refers to that portion of the total cluster comprising the industrial fish processors and related activities in Uhanya Beach. Other fishing beaches are not included.

collective efficiency as set out above. These and other African clusters have been reviewed more extensively in McCormick (1998b, c). A few other clusters representing other subsectors and countries might have been included, but the purpose of the review seems better served by concentrating on a few clear examples than by attempting wider coverage.[6]

(b) *The economies of Kenya, Ghana, and South Africa*

Before examining the clusters themselves, we look briefly at the economies in which they are situated. Two of the countries—Kenya and Ghana—are very poor and in the early stages of industrialization. Early industrializers typically have limited resources. Most of their people have no industrial training and little education. Transport and communication systems are underdeveloped, public utilities are inadequate, financial systems are rigid and unresponsive, and many other institutions are inappropriate for growth. Firms lack not only physical and financial resources, but also information about inputs, problems, and markets. South Africa is more developed overall, but one of the legacies of apartheid is great economic inequality. Some parts of the country are as poor as the rest of Africa, and Black firms in particular face many of the same resource limitations as their counterparts elsewhere on the continent.

Table 2 highlights some of the key development differences among the three countries. Kenya and Ghana are both considered to be low-income countries. Although Kenya's 1994 GDP per capita was some 25% less than Ghana's, Kenya is more industrialized. Both total manufacturing value added (MVA) and MVA as a proportion of GDP are higher in Kenya than in Ghana. South Africa is in an entirely different category. Per capita GDP is six times Ghana's and nearly eight times Kenya's. The share of manufacturing in South Africa's GDP is more than double that of both Kenya and Ghana, and productivity, as measured by MVA per worker, is nearly triple the level of Kenya. As already indicated, however, such overall statistics mask wide differences within the South African economy.

Typically, the institutional environment for business activity in African countries is fragmented and weak, with the result that national business systems tend to consist of several distinct segments that interact in very limited ways (Pedersen and McCormick, 1999). The little literature available on institutions in the three countries suggests that this general pattern prevails in each one. Markets, legal systems, financial institutions, technology systems, and social structures are often weak and sometimes divided along racial or ethnic lines. Legal and financial systems provide good illustrations. The legal framework for commercial and industrial activity is weak in both Kenya and Ghana. Many laws have not been updated since the colonial period. Only the largest companies have access to the court system. Lack of assurance that commercial contracts can be enforced restricts many dealings to known persons who can be contacted face-to-face (Fafchamps, 1996; Kimuyu, 1997). The South African legal system appears to be much more developed, though it is not clear whether its benefits are equally available to all South Africans. Financial systems are also fragmented (Aryeetey *et al*., 1997). The formal financial systems cater mainly for large-scale business, forcing most small and microenterprises to finance business startups and operations out of personal savings.

(c) *Cluster facilities and product markets*

The six clusters include two manufacturing garments (Eastlands and Western Cape), two in vehicle repair (Suame and Ziwani), one in

Table 2. *Industrial development in selected African countries* [a]

Country	Per capita GDP (1990 $)		Total MVA (millions of 1990 $)		MVA as % of GDP		MVA per worker (thousands of 1990 $)	
	1980	1994	1980	1994	1980	1994	1980	1994
Kenya	337	328	540	976	12.9	10.9	5.2	3.6
Ghana	465	421	536	582	7.8	8.8	n.a.	n.a.
South Africa	3,022	2,554	22,709	22,657	22.6	22.8	12.8	18.0

[a] *Source*: UNIDO (1996).

metalwork (Kamukunji), and one in fish processing (Lake Victoria). Four clusters have between 500 and 600 firms each; Kamukunji and Suame are larger, with 2000 and 8000 firms respectively. The Lake Victoria and Western Cape clusters have a mix of small, medium, and large firms; the other four clusters consist almost entirely of producers with fewer than 10 workers.

The clusters' physical space and available facilities differ considerably. In terms of space, the small-enterprise clusters tend to be located in small, defined sites, while those including firms of various sizes are more spread out. Ziwani is the smallest, with its 506 enterprises crowded onto 1.2 acres. Kamukunji is similarly confined. The Eastlands garment manufacturers are located in two City Council markets. The Lake Victoria fish cluster, on the other hand, consists of two distinct parts: a group of industrial fish processors situated mainly in the large lakeside town of Kisumu, and the fishing village at Uhanya Beach, 60 km away.[7] The Western Cape clothing cluster extends from the city of Cape Town into the surrounding suburbs and townships.

Cluster facilities vary greatly. The vehicle repair and metalwork clusters—Suame, Ziwani, and Kamukunji—are large open-air workshops. Kamukunji and Ziwani are extremely crowded, while Suame is less so. These clusters have some shelters including, in the case of Kenya, government provided sheds, but much of the work must be done out of doors. Electricity, which is critical for higher level technologies, is available to only some firms. The markets housing Nairobi's garment cluster were built in 1974 for retailing fruits and vegetables. Their subdivision into stalls makes it difficult to organize work efficiently or to expand the size of a business. The premises are served by electricity and water, but lighting is poor and the electricity supply erratic. The Lake Victoria fish cluster's two parts have differing facilities. The industrial fish processors in Kisumu operate from factory premises, many of which have been recently upgraded. All have the water and electricity required for processing and storing fish. The Uhanya Beach enterprises function in much more primitive circumstances. The nearest electricity lines are over 20 kilometers away and the main water source is the lake. Recent improvements have provided a tank for chlorinating the water used for washing fish prior to shipping to the factories, but general sanitation remains a problem. Facilities in the Western Cape clothing cluster range from large, modern factories, to home-based "Cut-Make-and-Trim" (CMT) operations. South Africa's higher level of development means that even the small firms generally have electricity.

Three of the four small-enterprise clusters chiefly serve the local market. Their main customers are local people buying products or services for their own use, and traders who take the products of manufacturing clusters to smaller towns and rural areas (McCormick, 1998a; McCormick, Kinyanjui and Ongile, 1997). The Suame vehicle repair cluster draws customers not only from Kumasi, but also from the rest of Ghana and from neighboring countries. Foreign business, which grew sharply from the mid-1970s, appears to have been "passive" at first and only later consciously developed (Dawson, 1988).[8] In contrast, the Western Cape cluster and the Lake Victoria fish cluster pursue active strategies to reach national and international markets. In the case of the Western Cape, the primary market is national, reached through the retail chains that dominate South Africa's clothing distribution system (October, 1996). The cluster accounts for 45% of South Africa's clothing production and dominates the manufacture of higher quality, "fashion" clothing (Wilkens and Kane, 1997). 10% of production is exported. The Lake Victoria fish cluster targets the export market. In 1995 Kenya exported more than 12,000 tons of chilled and frozen Nile perch fillets, valued at US$29 million, most of it destined for Europe, Japan, Israel, and North America (Kenya, 1995).[9]

(d) *Opportunities and challenges*

The collective efficiency model posits that in order to respond to opportunities and crises, clustering firms cannot rely on incidental external economies alone, but need to resort to joint action (Schmitz, 1997). The actions themselves will be discussed in detail in the following section; this section briefly shows the challenges and opportunities faced by the six clusters in recent years (see Table 1).

Market liberalization has been a challenge for some clusters and a window of opportunity for others. Five of the six clusters have been directly affected by the liberalization of domestic markets and international trade (see Table 1). The Eastlands garment producers have had to cope with a flood of imported

secondhand clothes that compete strongly with the low-priced garments manufactured in the cluster. Kamukunji is beginning to feel the effects of market liberalization, as supermarkets and local traders expand the range of imported items that compete directly with the rough household goods, tin boxes, and hand tools made in the cluster. The Ziwani cluster has actually benefited from liberalization. Easy importation of secondhand vehicles has increased demand for repair services, and the spare parts needed for the repairs are now more available and cheaper than previously. The story in Suame is slightly different. Before liberalization the cluster had established a reputation as a place where scarce spares could always be found. Some of these were bought on the black market, others were manufactured in the cluster's engineering workshops. The general availability of parts after liberalization eroded some of the cluster's competitive advantage. The Western Cape cluster has had to confront a dual challenge. The opening of markets in South Africa, which came as a result of the country's post-apartheid reentry into the world community, brought about an immediate increase in imports of new and secondhand clothing that drove a number of weaker firms out of business, reduced overall employment, and cut into profits. At the same time, South Africa's new acceptability as a trading partner has provided new export opportunities which, as we will see, have been taken up by a number of cluster firms.

The Lake Victoria fish cluster has faced different challenges. The first was a steady drop in the supply of fish and the second, a sudden quality crisis. Fish supplies have fallen steadily since the early 1990s as a result of overfishing, including the harvesting of "baby" perch, and the spread of the water hyacinth weed (Mitullah, 1998). Industrial processors and larger fishing and trading firms have been able to get access to fish farther out in the lake or in neighboring countries, but ordinary fishermen, most of whom use non-motorized boats, have been seriously affected by the shortage of fish. The second challenge appeared suddenly. In early 1997, two people died in Spain of salmonella poisoning after eating Nile perch imported from Uganda. Spain immediately banned imports of Nile perch originating anywhere in East Africa. Other European countries and then the European Union (EU) quickly followed suit. The effect on Kenya's fish industry was immediate and devastating. Factories that had been supplying the European market cut production drastically pending a visit by EU inspectors. Prices at the beaches fell by 50% almost overnight. The inspection revealed serious problems in fish handling, both at the beaches and in the factories. Lifting of the EU ban was made conditional on appropriate corrective action, yet, as we will see, the cluster lacks effective institutional and organizational mechanisms for the collaboration needed to take such action.

This brief overview highlights some of the similarities and differences among the six clusters' economic environments, internal organization, and products and markets. It also provides information on the specific challenges and opportunities faced by the clusters in the recent past. With this background, we can now take up the discussion of whether clustering has helped small enterprises in these countries to progress.

4. AFRICAN CLUSTERS AND INDUSTRIALIZATION: THE REALITY

The evidence suggests that clusters can and do further industrialization, but they do so in different ways. Categorizing the clusters into groups helps to make clear their contribution to the industrialization process. Three categories have been identified: clusters laying the groundwork for industrialization, those in the early stages of industrialization, and those that are fully part of the industrial sector in their respective countries (McCormick, 1998a). The following section looks closely at each group of clusters through the lens of collective efficiency, examining both external economies and joint action.

(a) *Laying the groundwork for industrialization*

Some clusters lay the groundwork for industrialization by building a productive environment that, in some respects at least, prepares the way for the emergence of collective efficiency. The Eastlands garment producers and the Kamukunji metalwork cluster are such "groundwork" clusters. The major positive external economy for both clusters is improved market access. Other potential external economies are either weak or actually disabling. Joint action is stronger in Kamukunji than in the garment cluster, but even here, collaboration is

Table 3. *Comparison of "groundwork" enterprise clusters*

Cluster	Eastlands garments	Kamukunji metalworking
External economies	Improved market access Some labor market pooling Weak intermediate input links No technological spillovers	Improved market access Disabling labor market pooling Weak intermediate input links Little technological spillovers
Joint action	Weak bilateral linkages No multilateral linkages	Few bilateral linkages Small wheelbarrow producers' group Association focused mainly on supply-side constraints

limited. Table 3 compares external economies and joint action in the two clusters.

Market access is the most important external economy in these clusters. The concentrations of clothing producers in the two Eastlands markets, and of metalworkers in Kamukunji are well known, and no doubt serve as magnets for customers. Particularly important, though not fully described in existing studies, are both clusters' ability to attract traders who carry their products to the smaller towns and rural areas. Government control of commodity trade and its involvement in the wholesaling of certain manufactured goods have probably stunted the growth of Kenya's rural trading networks, making them less wide and complex than the Indonesian networks described in Weijland's article in this Special Issue. Kenya also lacks the retail chains that play such an important role in distribution in Zimbabwe (Pedersen, 1993). Although the two main supermarket chains have hardware and clothing sections, these chains have outlets only in the largest towns. Thus, the role of the small trader is critical in the distribution of Kenyan manufactures. Location in the cluster gives firms access to such traders and, through them, to customers in small towns and rural villages throughout the country.

Economies associated with labor market pooling appear to be minimal among the Eastlands garment producers, and actually disabling in Kamukunji. Garment producers complain that workers' skill levels are uneven, so although labor is plentiful, it does not seem to contribute much to the upgrading of the cluster (McCormick, Kinyanjui and Ongile, 1997). Kamukunji suffers from the combination of low barriers to entry and an oversupply of trainees. Newly trained workers are likely to establish their own businesses, filling the cluster with many tiny firms and heightening the already fierce competition.

The two clusters have limited trade in intermediate inputs. The garment cluster has some fabric sellers and a few shops selling buttons, thread, and other materials, but their high prices force producers to go to wholesale and retail shops in the center of Nairobi. Each of the facilities also has machine repairers, scissor sharpeners, food sellers, and transporters. Kamukunji has many scrap metal dealers providing inputs for the charcoal stoves, cooking utensils, and some of the other products made in the cluster. The Association attempted to make new materials more easily available, but the effort broke down, forcing artisans to purchase from traders or retail shops in town.

Neither the garment cluster nor Kamukunji appears to have positive technological spillovers. Garment producers use standard technology, with little innovation either in the flow of work or the machines used. In Kamukunji, production is even more basic. The majority use hand tools or simple hand-operated machines. Production processes are slow and products poor in quality.

The clusters vary considerably in the type and level of joint action. Linkages among the garment producers are weak. Horizontal cooperation is confined mainly to borrowing and lending of basic tools, such as scissors and measuring tapes, and the contracting of services requiring specialized machines (McCormick, 1997). Neither facility has a site association, and there is no sectoral association of garment producers anywhere in Nairobi. Although vertical linkages on both the supply and demand sides exist, these ties seem not to have resulted in joint action. Some businesses have established enough of a relationship with

suppliers to qualify for credit (McCormick, Kinyanjui and Ongile, 1997), but there is no indication of active collaboration. Location in the cluster facilitates access to the traders who frequent the buildings to buy finished goods, and as already discussed, this greatly expands their market access. The relationships between producers and traders seem to stop at the level of exchange, however, without involving them in the type of information exchange that could lead to improvements in product design and quality.

Kamukunji's *Jua Kali* association owes its existence to government policy originating in the late 1980s (McCormick, 1998a). All of the artisans in a particular location are members. Associations typically serve as links with government for the implementation of programs aimed at small-scale entrepreneurs and as advocates for policy change. The Kamukunji site association doubles as a sectoral association because all of the producers are involved in some type of metalwork.

A few firms in Kamukunji also have taken joint action in production. They have formed a producers' group that manufactures wheelbarrows using a common design. About 12 different workshops make the wheelbarrows, using a design obtained and modified in 1984. They purchase the iron sheet, pipe, and flats, and weld the final product together. There is no job specialization among the wheelbarrow makers. Each producer makes the product from beginning to end. The workshops attempt to standardize parts for their own wheelbarrows, but there is no standardization across producers. The producers have begun to discuss joint marketing beyond Kamukunji, and are approaching some of the large chain stores with hardware departments.

(b) *Industrializing clusters*

Industrializing clusters have much clearer signs of emerging collective efficiency. The two clusters in this group—Suame and Ziwani—in some ways resemble the two already described, but the greater specialization and differentiation of firms lead to stronger bilateral production linkages and, ultimately, to higher efficiency. Higher level technologies in at least some of the firms set the stage for positive technological spillovers. Although associations are present in these clusters, their activities sometimes get derailed by internal power struggles or external forces. The Ziwani association, which is more active than its counterpart in Suame, has extended its concerns beyond basic supply-side matters to markets and technology. Table 4 compares the clusters' external economies and joint action.

Although the benefits of "market access" are almost universally positive, these clusters differ in the availability and impact of labor market pooling and intermediate input effects. Both, however, had some positive technological spillovers, and it is these that set them apart from the first group.

Labor market pooling affects the two clusters differently. Both clusters attract large numbers of apprentices and unskilled laborers, and both are unable to absorb all of the job seekers into existing firms. The two clusters, however, experience this situation differently. Suame is, like Kamukunji, a case of disabling labor market pooling. The situation in Ziwani would be similar, except that the cluster has little space for new entrants, forcing most to start their businesses elsewhere.

Linkages between Suame's metalwork and vehicle repair firms have enabled both to

Table 4. *Comparison of "industrializing" enterprise clusters*

Cluster	Suame	Ziwani
External economies	Improved market access	Improved market access
	Disabling labor market pooling	No significant labor market pooling effects
	Positive intermediate input effects	Weak intermediate input effects
	Technological spillovers from engineering workshops to vehicle repairers	Weak technological spillovers
Joint action	Extensive subcontracting	Extensive subcontracting
	Garages Association mainly an intermediary between firms and government	Association dealing with both supply and market constraints
	Some (important) vertical links with engineering workshops	No vertical bilateral links

benefit from the availability of intermediate inputs and positive technological spillovers. A small group of firms—the engineering group—was assisted by the Technology Consultancy Center to upgrade their technology and improve their products. These engineering workshops have, in turn, contributed substantially to the technological capability of small vehicle repairers (Riedel and Schmitz, 1989, p. 147; Dawson, 1992, pp. 37–38). The ability of these small machine shops to make both equipment used in the repair process and vehicle spare parts has enabled the repairers using those goods to occupy niches that would otherwise be beyond their reach. Although the engineering workshops are important, they are few, and most enterprises continue to use the same hand tools as before. What is important is that the technology is present somewhere within the cluster so that it can be tapped when needed (Dawson, 1992, p. 38).

The Ziwani cluster appears to be at an earlier stage of development with regard to intermediate inputs and technological spillovers. The cluster includes 30 manufacturing firms producing vehicle parts, machines, and household goods (Kinyanjui, 1998). The vehicle parts manufactured include silencers, rubber bushes, chassis, and car seat cushions. The two spares shops run by the Association stock these local manufactures as well as imported and/or domestic spares. Despite the presence of shops in the cluster, the easy availability of spare parts, especially since liberalization, has encouraged most firms to buy spares elsewhere. Ziwani has considerable potential for technological spillovers. Vehicle repairers readily share ideas and information about repair procedures, but what they share is limited by their lack of current technical knowledge. The choice of Ziwani by the United Nations Industrial Development Organization (UNIDO) for its skill development project offers the promise of technological upgrading.

Vehicle repairers in both clusters have extensive subcontracting linkages. In Ziwani, subcontracting partners form strong bonds that are rarely broken, and they recognize that being in the cluster facilitates cooperation (Kinyanjui, 1998). In Suame there are also close ties between metalwork and vehicle repair firms that have allowed repairers to tap the expertise of the engineering workshops to rework existing parts or make new ones modeled on the old.

Ziwani has a stronger foundation for multilateral joint action than Suame. Three recent actions seem especially important for the cluster's future development. In the first instance the Association has recognized a gap in Kenya's institutional framework. The Association stands ready to mediate disputes between member enterprises. This step toward developing cluster-level institutions to facilitate interfirm contractual relations is especially important, given the general weakness in Kenya of institutions governing various types of contracts (Kimuyu, 1997). If successful, this can protect both cluster firms and their clients against opportunistic behavior. The other two actions taken by the Association address the weakness in marketing so often found in small enterprises, both clustered and otherwise. The Association is attempting to improve the cluster's image by strengthening general discipline within and around the site and by taking measures to control theft and the sale of stolen vehicle parts. Association officials claim that this will make the cluster more attractive to potential customers. Finally, the Association has identified a new market opportunity in the imported secondhand cars now flooding the Kenyan roads. Recognizing that the investment in diagnostic equipment and large replacement parts (doors, plastic bumpers, etc.) is beyond the means of individual repairers, the Association applied for a bank loan. Its application was turned down, but it is pursuing alternative funding sources. This level of associational activity contrasts sharply with Suame where, according to Dawson (1988), the Garages association, which serves both the metalworkers and repairers, functions as little more than a government errand boy.

(c) *Complex industrial clusters*

The two complex industrial clusters are much more different from one another than those in the other two groupings. They nevertheless have three important characteristics in common: both include firms of different sizes; in both, the many small firms use simple technology and tend to depend on large firms for their markets; and perhaps most important, both have been able to expand their market reach from local to national or global. Still, the differences between them cannot be minimized. The Western Cape clothing cluster exhibits strong external economies, and joint action is institutionalized in associations, subcontracting, and collaborative arrangements. In the Lake Victoria fish cluster, in contrast, the

potential for collective efficiency is greatly underutilized (see Table 5).

The Western Cape garment firms stand to improve their market access by being within easy reach of the national retail chains that dominate South Africa's domestic clothing market. Since nearly all of these are headquartered in the Western Cape, location within the cluster brings clear advantages (October, 1996). Market access for Lake Victoria firms varies depending on whether one is a fisherman, a trader, or an industrial processor. Fishermen and traders gain access to their main market—industrial processors—by operating from a beach served by the processors' trucks. Uhanya is a particularly good beach for both fishermen and traders, but it is certainly not the only one. The industrial processors appear to maintain independent contacts with specific foreign buyers. None of them mentioned access to product markets as a benefit of clustering. Rather, most seemed to have chosen their location to be near fish supplies.

Labor market pooling also differs in its impact on the two clusters, partly because of differences in overall employment levels and partly because of technology and skill requirements. The 47,000 employees of Western Cape garment firms and 23,000 workers in related industries constitute a significant pool of labor available to the garment industry. Although it is not clear from the description of the cluster what skills these workers have and whether skill levels have been increasing, the nature of the industry suggests that labor market pooling effects should be at least moderately positive. On the other hand, benefits of labor market pooling in the Lake Victoria fish cluster are few. Both fishing and fish processing can, according to the respondents, be learned in less than two months by even the slowest learner, and factory workers seem to require minimal skills.

Neither intermediate input effects nor technological spillovers provided significant benefits to either cluster. The Western Cape cluster contains textile firms, fabric printers, suppliers of trim, and vendors of new and secondhand machinery, all of which cater for the needs of clothing producers. Surprisingly, however, clothing producers obtain less than one-quarter (22.4%) of their intermediate inputs from these firms (October, 1996). What should be a key intermediate input for the Lake Victoria fish cluster—ice—is not commercially available. The lack of local electricity supply makes refrigeration of the catch at the beach impossible. Making ice in a nearby town that does have electricity appears to be an entrepreneurial opportunity that is still waiting to be taken up. Without such an initiative, fishermen will continue to find it difficult to negotiate prices and to construct a more equal relationship with the industrial processors.

Some of the Western Cape clothing factories are technologically advanced and ready to welcome others to see their factories. Although many firms have taken up this opportunity, few of them have enough capital to invest in state-of-the-art technology. Furthermore, the high

Table 5. *Comparison of "complex" industrial clusters*

Cluster	Western Cape clothing	Lake Victoria fish [a]
External economies	Market access	Market access for fishermen and traders; little benefit for industrial processors
	Positive labor market pooling	Little or no benefit from labor market pooling
	Significant intermediate input effects	Positive intermediate input effects for industrial processors
	Potential for significant technological spillovers	No technological spillover effects
Joint action	Vertical and horizontal bilateral cooperation	*Ad hoc* vertical bilateral action
	Vertical multilateral cooperation (common trading agents)	No vertical multilateral cooperation
	Horizontal multilateral cooperation (two associations)	*Ad hoc* horizontal cooperation by industrial processors; ineffective fishermen's cooperative; welfare associations

[a] "Lake Victoria fish" refers to that portion of the total cluster comprising the industrial fish processors and related activities in Uhanya Beach. Other fishing beaches are not included.

closure rate for small firms means that much learning that does occur is never applied. Lake Victoria's industrial fish processors operate in a generally closed environment that does not lend itself to technological spillovers. At the beach, on the other hand, spillovers could easily occur but have not. In particular, the improved fish handling techniques developed in response to the new EU standards have not been adopted by others in the cluster.

Both clusters have collective self-help organizations, but they differ in the way these have been used. The wide variety of horizontal and vertical linkages in the Western Cape cluster have given rise to different types of joint action. The Lake Victoria cluster, on the other hand, has forged *ad hoc* linkages to enable it to respond to a specific shock, but these have not been institutionalized. Furthermore, its most institutionalized linkage—the fishermen's cooperative—has not resulted in effective action.

Horizontal cooperation between Western Cape firms at similar stages of the production process is common (October, 1996, pp. 13–15). Firms cooperate to handle large orders, present joint clothing ranges, share information, use marketing agents jointly, and lend machinery. Cooperation on producing for the export market is growing. The cluster is also characterized by specialization and subcontracting. Horizontal multilateral cooperation is institutionalized in various associations and organizations. There are two employer organizations: the Cape Clothing Manufactures Association and the Garment Manufacturers Association (October, 1996, p. 15). The associations are attempting to undertake new roles, including the screening of foreign exports of fabrics and other inputs, disseminating industry information, and developing special programs to assist small firms. The Garment Manufacturers Association is frequently used as a source of information by manufacturers needing specialized "Cut-Make-and-Trim" firms. The relationships formed within the Association have also led to sharing of orders, passing on of work, and sharing of information (October, 1996, p. 16).

The Western Cape cluster also has significant vertical linkages. There is growing cooperation between retailers and manufacturers on clothing design and fabric selection. Groups of companies who are not direct competitors use the same agent to market their products nationally. A potentially more important type of agent has arisen in the export market. Several Cape Town companies exporting to Germany use the same agents. These agents apparently play an important role in transferring information, design techniques, and ensuring quality standards (October, 1996, p. 15). It is not clear how this process began. The firms may have approached the agent together, or the agent may have contacted the firms, either as a group or one by one. Only in the first case would the contact be the result of joint action. Regardless of who took the initiative, the advent of such specialized agents represents an important step in the development of the cluster.

The Lake Victoria fish cluster has faced two challenges that might have been the focus of joint action. The first—falling fish supplies—is a "commons" problem that requires either fair and effective external management or internal self-regulation (Hardin, 1968; McGoodwin, 1990). According to Mitullah (1998), the external management has been poor. Self-regulation would require joint action in Uhanya and other beaches. Although the Yimbo Fishermen's Cooperative Society (YFCS) would appear to be a ready-made vehicle for such action, especially since 90% of the fishermen are members, the present cooperative appears to be ineffective, and attempts to register an alternative association have been blocked by YFCS officials (Mitullah, 1998). Furthermore, many fishermen appear more committed to their ethnic welfare associations than to either YFCS or its alternative.

The lack of joint action on fish supplies contrasts sharply with the decisive response to the EU ban. The industrial processors worked with the government to arrange for the inspection, to see that it was well carried out, and to disseminate its results. Following this horizontal action of fish processors, it was up to individual firms to decide whether to implement the factory-level changes necessary for export to EU countries. At Uhanya Beach, a strong vertical linkage between the beach's largest trader and one of the industrial processors resulted in the development of new facilities and procedures to satisfy EU requirements for fish handling between the Lake and the processors' trucks.

Interestingly, the cooperation among the industrial processors was apparently purely *ad hoc*. Once the crisis subsided, they reverted to their previous isolation. Although their small numbers, geographic proximity, and for

the majority, ethnic affinity, would seem the ideal backdrop for cooperation, they tend to keep to themselves, if not mistrust each other.

Many of the industrial processors also have strong vertical linkages to particular importers in Europe, but these linkages apparently did not result in assistance or investments to enable the factories to meet EU standards. Rather each factory that chose to upgrade its facilities did so on its own with internal or borrowed capital.

(d) *Summary*

This detailed analysis can be briefly summarized under the main headings of collective efficiency.

Improved *market access* is the most universal benefit of clustering, but the nature of the improvement varied among the three groups of clusters. The markets accessed by firms in "groundwork" clusters were still mostly localized and low-income. Industrializing clusters also appealed mainly to local markets, though Suame draws customers from somewhat farther away. What distinguishes these clusters is that at least some firms are using or aspiring to use the higher level technologies that enable them to make better quality products. In Suame, the engineering workshops perform this function for both metalwork and vehicle repair firms. Ziwani has not yet obtained the technology it needs to move to higher level markets, but the awareness and efforts of the association are promising. The two complex industrial clusters are operating in the high level national and export markets usually associated with clusters in the literature.

Labor market pooling is weak or disabling in most of the clusters. It is disabling in one of the "groundwork" clusters, and of limited benefit in the other. Similarly, neither of the industrializing clusters seems to benefit much from labor market pooling. For the complex industrial clusters, labor market pooling is positive for the Western Cape cluster, but of limited value to the Lake Victoria fish cluster.

Intermediate input effects are also generally weak. For the first two groups of clusters, intermediate input effects are stronger for vehicle repair clusters than for the others, possibly because vehicle repair requires a wide range of inputs. The two complex industrial clusters both register positive intermediate input effects, though these are much more developed in the Western Cape cluster than they are for the Lake Victoria cluster.

At first glance, *technological spillovers* seem related to the level of cluster development. For "groundwork" clusters, they are weak or disabling. In industrializing clusters, they are more important though still limited. The complex clusters, however, present an anomaly. The open-door policy of some of the technologically sophisticated producers in the Western Cape suggests the opportunity for important technological spillovers, yet it is not clear to what extent they have been taken up by other firms in the cluster. The Lake Victoria fish cluster diverges from the pattern even more strongly. Technologies are fairly basic, but still most industrial processors maintain the usual Kenyan closed factory stance. Fishermen use artisanal techniques that are widely known, so positive spillover effects at this level are minimal.

Joint action, especially multilateral horizontal action, also appears to be related to the overall level of cluster development, though the relationship is weaker with the "complex" clusters. "Groundwork" clusters either have no association or an association focused mainly on supply-side constraints. The wheelbarrow producers' group in Kamukunji demonstrates potentially important production linkages. Production linkages are similarly important in the industrializing clusters. Suame's weak association contrasts with the Ziwani association, which seems active and ready to take on both supply and market constraints. The complex industrial clusters differ both from one another and from the other two groups. In the Western Cape, joint action is institutionalized in associations and subcontracting relations, and various types of temporary bilateral and multilateral cooperative arrangements are common. In contrast, *ad hoc* collaboration predominates in the Lake Victoria fish cluster. The main institution, the fishermen's cooperative, is widely held to be ineffective, and the welfare associations are not concerned with advancing the cluster economically.

5. COLLECTIVE EFFICIENCY AND BEYOND

The collective efficiency framework has proved to be a useful tool for analyzing the performance of these six African enterprise clusters and explaining their ability to contrib-

ute to the industrialization process, but like any model, it cannot explain all of the variations among real-world clusters.

Clusters are contributing to industrialization in Africa. Grouping the six case study clusters has revealed important differences among them and has shown that each group has its own part to play in the industrialization process. The "groundwork" clusters prepare the way for industrialization by improving producers' access to markets, thus enabling them to produce more. The "industrializing" clusters have much clearer signs of emerging collective efficiency. The greater specialization and differentiation of firms lead to bilateral production linkages and ultimately to higher efficiency. Higher level technologies in at least some of the firms set the stage for positive technological spillovers. Associations in industrializing clusters also seem ready to take up issues of markets and technology, rather than confining themselves to basic infrastructural and input needs. The "complex industrial" clusters aim for wider markets, both national and foreign, and are generally able to produce competitively. In some cases, like the Western Cape clothing cluster, the cluster is really an emerging industrial district with positive external economies and institutions to facilitate joint action. In others, such as the Lake Victoria fish cluster, the link between clustering and the industrialization process is much more fragile.

Of the many theoretical benefits of clustering, four appear to be especially important to cluster performance and, ultimately, to industrialization in the African context. The first is the improved market access that accompanies clustering in every case and allows clustered firms to increase production. Since most producers in the small enterprise clusters, and some of those in the complex clusters are operating at suboptimal scale, increased production can lead to gains in efficiency. Even if the clustered firms are already producing efficiently, increased sales can translate into higher profits, at least some of which can be reinvested.

The second benefit is the improved potential for technological upgrading. Clustering can facilitate technical change, by making it easier for government to provide the infrastructure needed to support higher level technologies, and by encouraging the adoption of new product and process ideas. The cases show, however, that spillovers are beneficial only when the technology shared is itself good. Kinyanjui (1998) observes that vehicle repairers are very willing to share repair techniques with their colleagues, but this often involves passing on bad practices. The cases also show that even when higher level technologies are present in a cluster, they do not automatically spill over to other firms.

Clustering promotes joint action, which in turn helps firms to deal with external shocks. This is especially important in the risky business environment prevalent in most African countries. African economies are small players in the global economy, and exporting firms are extremely vulnerable to sudden changes in trade regimes, quality standards, and financing requirements. Even those producing for the domestic market face serious market risks, as we have seen in the case of the garment producers who were suddenly exposed to severe competition from secondhand clothes. Firms also face production risks and the generalized background risks associated with weak economies and volatile political situations (see McCormick, 1993). By acting together, producers increase their power to deal with both specific problems and the general uncertainty of the environment.

Finally, clustering enables firms to make good use of relatively small amounts of resources. Producers in a cluster can often get by with little capital and a small workforce. A seldom-needed piece of equipment can be borrowed or hired from the association. Even workers can be "borrowed" when they are not fully employed in their regular workshop (Kinyanjui, 1998). This allows a firm to develop by taking what Schmitz (1997) has called "riskable steps." Over time such incremental investment should allow more firms to grow, and should result in a more diverse industrial structure.

Useful as it is, the theory of collective efficiency left important cluster characteristics and behavior unexplained. For example, clusters like Kamukunji and the Eastlands garment producers are contributing to the industrialization process by building a productive environment. Yet the clusters themselves seem unable to advance. This is at least partly the result of their concentration on low-profit, low-quality goods. Collective efficiency alone cannot explain why this should be so. Rather the internal workings of the cluster have to be viewed against the backdrop of markets and available technology. Producers can improve product quality only when there is both a

demand for higher quality goods, and the availability of the technology to produce such goods. In poor countries such as Kenya, where consumers are mainly concerned with price, demand for higher quality goods is limited. Producers recognize this, and continue making what they know can be sold. Furthermore, the technology needed to make higher quality goods is not available in many clusters. Some, like Kamukunji, are constrained by lack of electricity. Others lack the capital to buy specialized machines.

A second example relates to the disabling and weak labor market pooling effects in the first two groups of clusters. The collective efficiency framework highlights the positive labor market pooling effects, but it cannot say why this should be so. For this we need again to examine the economic and institutional environment. Poverty and lack of access to education force many African young people into the labor market at an early age. Those going into crafts such as metalwork, carpentry, vehicle repair, or tailoring often begin as apprentices or trainees. Although the logical next step would be "employee," few manage to get employment. As a result of this mismatch between the pool of trained workers and available jobs, many of those trained opt for self-employment, creating disabling labor market pooling effects. In other cases, such as fishing and fish processing, skill requirements are low so that drawing on the pool of experienced workers offers few benefits.

The importance of intermediate input effects varies, not only between clusters, but also for the same cluster at different times. The significance of quick local access to intermediate inputs depends on their importance in the producer's cost structure, and the costs—including price, transactions costs, and opportunity costs—of obtaining them from alternative sources. Availability of inputs was not a common problem. But for the Suame cluster before market liberalization and for Lake Victoria's industrial fish processors, providing inputs within the cluster produced positive effects. For the other clusters, benefits were less, due no doubt to factors that are determined more by the macroeconomic environment than by the cluster's internal dynamics. Market liberalization in both Kenya and Ghana, by changing the availability and costs of inputs, altered the potential gains from intermediate input effects.

The analysis of linkages and joint action within the clusters failed to provide satisfactory explanations of their effects on cluster performance. In some clusters linkages gave rise to action that took the cluster to a higher level of development, while in others, apparently similar linkages did not have the same result. Detailed examination of joint action in these clusters suggests that it is necessary to consider the *content* as well as the *form* of joint action (McCormick, 1998b). In particular, cooperation in production and marketing seems to be more beneficial than supply-side cooperation. This needs more investigation, but one explanation may be that market liberalization, by heightening competition, has changed the relative importance of supply-side and demand-side cooperation. Liberalization has made many inputs both cheaper and more plentiful, thus reducing the benefits accruing to supply-side cooperation. At the same time, it has put new competitive pressure on firms' products. Production efficiency, improved quality, and marketing strategies have therefore assumed new importance.

Barr's (1998) analysis of networks suggests another dimension to the issue of joint action. Using data from Ghana, she shows that the local networks characteristic of small enterprises tend to be aimed at reducing uncertainty rather than enhancing enterprise performance. Her observation seems to be borne out in certain actions of clustered firms. The Ziwani association worked very hard to secure the cluster land. The Kamukunji association is involved in maintaining security. Uhanya Beach has widespread participation in welfare associations designed to help members in illness or other hardship. In each case, individual or joint action seems aimed at reducing exposure to risk. Common to these clusters and most others in Africa is an institutional environment in which property rights and contract rules are both inadequate and poorly enforced, and the national superstructure provides little or no safety net for the economically vulnerable. The weakness of the institutional framework at the national level encourages entrepreneurs to devote energy to forming or participating in local alternatives. Initiatives of this type protect producers and their households from calamity, but do not necessarily improve performance.

Finally, the collective efficiency approach identified lack of effective joint action as a key reason why fishermen in the Lake Victoria cluster lack bargaining power. The theoretical model also revealed the lack of a key intermediate input: ice. The approach could not,

however, explain why there was no joint action or why the cooperative had not taken up the opportunity to produce ice. To the extent that explanations for these conundrums exist, they lie beyond the variables included in the collective efficiency model. They require examination of Kenyan politics and political institutions.

These examples highlight the importance of factors that are outside the collective efficiency framework. The small size of markets, oversupply of labor, and weak institutions characteristic of many African countries mean that external economies and joint action do not always work in the ways predicted by the collective efficiency model. This is an important finding that explains some of the variations between otherwise similar clusters.

A final question remains: Why are there so few examples of successful industrial clusters in Africa? The answer could, of course, lie in my selection of cases; successful clusters may exist, but were not included in my analysis because they have not been researched or my search for information failed to locate them. I do not think that this is the problem. Not only did I try to cast a wide net for formal research results, but I was also on the alert for informal accounts of African clusters. I believe that the picture of clustering that has emerged from this analysis is fairly accurate: Africa has many "groundwork" clusters, some "industrializing" clusters, but only a few "complex industrial" clusters, and even those in the last category tend to be smaller and less well developed than their counterparts in other parts of the world.

Collective efficiency, with its emphasis on the internal dynamics of clusters, cannot fully explain Africa's lack of complex clusters. We need once again to look at the social and economic environment for clustering. The analysis has shown that clustering can help to overcome barriers to firm growth and development, but sometimes these barriers are so big that the power of the clustering dynamic is seriously reduced. For example, clustering facilitates access to markets, but if the market is very small, the access may still not bring about much growth. The problem is even worse where trading networks are underdeveloped. This is the situation faced by many small-enterprise clusters in Africa and may explain their inability to support a variety of producing, trading, and service firms.

Clustering in Africa has also taken place in the context of an overabundance of labor. This means that labor market pooling effects have not worked as expected. Instead of drawing workers from a pool of specialized labor, cluster firms have relied on unskilled labor and trainees. Since they are poorly paid, these often set up their own firms as soon as they can. This leads to the formation of many tiny, inefficient enterprises that compete with one another.

Finally, clustering in Africa occurs in an environment of weak political and economic institutions. Where the institutions of government have been corrupted to serve individual ends, external economies are weakened and joint action frustrated. Similarly, when economic institutions such as contract enforcement are weak, market exchange is limited. When the society lacks institutions to provide for emergencies such as illness, death, or financial catastrophe, prudent individuals develop their own safety nets.

How, then, can the collective efficiency approach be made more useful for analyzing African clusters? The analysis of these six clusters suggests two ways. The first involves a relatively minor "deepening" of the active side of the collective efficiency framework. Whether joint action is vertical or horizontal, bilateral or multilateral is a useful starting point, but it is not always sufficient for understanding its impact on cluster development. The content is at least as important as its form. Other contributions to this Special Issue provide such analyses.

The second adjustment requires going beyond the basic dimensions of active and passive collective efficiency to the institutional context for clustering. As we have seen, the institutional environment affects the way clusters operate and may go a long way in explaining the dearth of successful complex industrial clusters in Africa. The impact of product and labor markets, contract enforcement, and the institutions of government is clear. Several of the cases point to the importance of other institutions: the ways in which people socialize within and beyond their own ethnic group; the relative rewards assigned to academic and technical expertise; the ways in which different communities provide for the needs of their members; the rules surrounding trust. These and other institutions require intensive research, not only for the sake of a better understanding of clusters, but also for a keener appreciation of the limits and possibilities facing all of African business.

The analysis of these clusters has clear practical implications. Government, donors, and

the business community, by supporting existing clusters and encouraging the development of new ones, can facilitate the industrialization process. Government can encourage clustering by offering improved infrastructure and other incentives to producers and related service providers to locate in designated areas. Government can also create a policy environment that favors business activity. Policies designed to stabilize markets and to allow borrowing by businesses of all sizes are key. Also important are policies that facilitate associational activity, not by creating associations "from above," but by providing an institutional framework that allows them to form, grow, and dissolve in response to their members' needs. Donors and business associations can work together to bring financial services, physical facilities, and information on technology and markets to clustered firms. Donors, especially in situations where government institutions are weak, may need to work directly with associations to develop programs to strengthen cluster operations. Business associations and chambers of commerce need to pay more attention to small enterprises. This may require them to reexamine potential barriers to small firm membership such as fee structures, meeting locations, and committee representation. With a larger small-firm membership, business associations can facilitate the kind of communication that could lead to cooperation between, say, a small enterprise cluster and larger firms in the same industry.

A final word: Clustering is only one chapter in the story of industrialization. But clearly, for African countries, most of which are in the early stages of the process, it may be a very important chapter.

NOTES

1. This notion of cluster, while it shares its geographic dimension with the growth centres described in the regional planning literature, is different in at least two important respects. The cluster is a work place, consisting of various types of business enterprises. Even if people reside within its boundaries, the analytical unit remains an enterprise grouping. The growth center, on the other hand, is an urban space that includes residential units, schools, places of worship, health facilities, etc. as well as businesses. The second difference is the sectoral concentration of the enterprise cluster, which need not be present in the growth center.

2. This point is elaborated in Schmitz (1997).

3. The literature on networks and linkages in business is large and growing. Useful summaries are contained in Mead (1994) and McCormick and Atieno (1997).

4. The terms *cooperation, collaboration,* and *joint action* are used interchangeably in this paper to mean working together for the same end, i.e., the active aspect of collective efficiency. *Linkages*, on the other hand, are ties between or among firms that may or may not result in joint action.

5. The main source documents were: For the garment markets, McCormick, Kinyanjui and Ongile (1997) and McCormick (1997); for Kamukunji, McCormick (1988); Hart (1994) King (1996) and Frijns *et al.* (1997); for Ziwani, Kinyanjui (1996–1998); for the Lake Victoria fish cluster, Mitullah (1996–1998); for Suame, Dawson (1988, 1992) and Riedel and Schmitz (1989); for the Western Cape clothing cluster, October (1996).

6. See, for example, studies of the construction industry in Tanzania (Ærøe, 1992a, b) and Zimbabwe (Rasmussen, 1992a, b), and of woodworking in Kenya and Zimbabwe (Sverrisson, 1992, 1993) and Nigeria (Olaniyan *et al.*, 1997), and of garments in Kwa Zulu Natal, South Africa (Harrison, 1997; Prinsloo, 1996).

7. The full cluster actually consists of fish processors in several towns, together with some 65 fishing villages (Ogutu, 1988). Our research included nearly all of the industrial processors, but focused on only one of the supply beaches (see Mitullah, 1998).

8. I am grateful to Poul Ove Pedersen for the term "passive exports." It is used here to describe those exports that happen by chance attraction rather than an actively pursued export strategy.

9. Mitullah (1998) also describes Kenya's domestic market which includes fresh, frozen, and artisanally processed fish. This, however, receives a very small proportion of the Nile perch catch.

REFERENCES

Ærøe, Anders (1992a) Rethinking industrialization—from a national to a local perspective: A case study of the industrialization process in Tanzania with particular emphasis on the construction industry. CDR Project Paper 92.3, Center for Development Research, Copenhagen.

Ærøe, Anders (1992b) New pathways in industrialization in Tanzania: Theoretical and strategic considerations. *IDS Bulletin* **23**(3), 15–20.

Alila, Patrick O. and McCormick, Dorothy (1997) Firm linkages in Kenya's tourism sector. Paper prepared as part of the *Multi-country Study of Private Enterprise Development, Kenya Case Study*, University of Nairobi, Institute for Development Studies, Nairobi.

Aryeetey, Ernest, Hettige, Hermamala, Nissanke, Machiko and Steel, William (1997) Financial market fragmentation and reforms in Ghana, Malawi, Nigeria, and Tanzania. *The World Bank Economic Review* **11**(2), 195–218.

Barr, Abigail M. (1995) The missing factor: Entrepreneurial networks, enterprises and economic growth in Ghana. Center for the Study of African Economies Working Paper WPS/95-11, University of Oxford, CSAE Publishing, Oxford.

Barr, Abigail M. (1998) Enterprise performance and the functional diversity of social capital. Center for the Study of African Economies Working Paper WPS/98-1, University of Oxford, CSAE Publishing, Oxford.

Bazan, Luiza and Schmitz, Hubert (1997) Social capital and export growth: An industrial community in Southern Brazil. IDS Discussion Paper No. 361, Institute of Development Studies, University of Sussex, Birghton.

Becattini, G. (1989) Sectors and/or districts: Some remarks on the conceptual foundations of industrial economics. In *Small Firms and Industrial Districts in Italy*, eds. E. Goodman and J. Bamford. Routledge, London.

Bell, Martin and Pavitt, Keith (1995) The development of technological capabilities. In *Trade, Technology, and International Competitiveness*, ed. Irfan ul Haque. EDI Development Studies. The World Bank, Washington, DC.

Chenery, Hollis, Robinson, Sherman and Syrquin, Moshe (1986) *Industrialization and Growth: A Comparative Study*. A World Bank Research Publication, Oxford University Press, New York.

Dawson, Jonathan (1988) Small-scale industry development in Ghana: A case study of Kumasi. Presented to ESCOR, Overseas Development Administration, London.

Dawson, Jonathan (1992) The relevance of the flexible specialization paradigm for small-scale industrial restructuring in Ghana. *IDS Bulletin* **23**(3), 34–38.

Evans, Peter (1995) *Embedded Autonomy. States and Industrial Transformation*. Princeton University Press, Princeton, NJ.

Fafchamps, Marcel (1996) The enforcement of commercial contracts in Ghana. *World Development* **24**(3), 427–448.

Frijns, Jos, Kirai, Paul, Malombe, Joyce, and van Vliet, Bas (1997) *Pollution Control of Small-scale Metal Industries in Nairobi*. Housing and Building Research Institute, Nairobi.

Fukayama, Francis (1995) *Trust: The Social Virtues and the Creation of Prosperity*. Penguin, London.

Granovetter, Mark (1985) Economic action and social structure: The problem of embeddedness. *American Journal of Sociology* **91**, 481–510.

Granovetter, Mark (1992) Economic institutions as social constructions: A framework for analysis. *Acta Sociologica* **35**, 3–11.

Granovetter, Mark (1995) The economic sociology of firms and entrepreneurs. In *The Economic Sociology of Immigration: Essays on Networks, Ethnicity, and Entrepreneurship*, ed. Alejandro Portespp, pp. 128–165. Russell Sage Foundation, New York.

Hardin, Garrett (1968) The tragedy of the commons. *Science* **162**, 1234–1248.

Harrison, Karen (1997) Industrial response to globalisation within a medium-sized town: A focus on the clothing manufacturing sector in Port Shepstone. *Transformation* **32**, 79–101.

Hart, Marion (1994) Study to profile Jua Kali associations relevant to the FIT Programme. Farm Implements and Tools (FIT), Nairobi.

Hart, Oliver (1995) *Firms, Contracts, and Financial Structure*. Clarendon Press, Oxford.

Humphrey, John (1995) Industrial reorganisation in developing countries: From models to trajectories. *World Development* **23**(1), 149–162.

Kenya, Republic of (1995) *Fisheries Annual Statistical Bulletin*. Ministry of Tourism and Wildlife, Nairobi.

Kimuyu, Peter (1997) Enterprise attributes and corporate disputes in Kenya. DP No. 001/97, Institute for Policy Analysis and Research, Nairobi.

King, Kenneth (1996) *Jua Kali Kenya: Change & Development in an Informal Economy, 1970-95*. East African Educational Publishers, Nairobi.

Kinyanjui, Mary Njeri (1996) Ziwani and Kigandaini *Jua Kali* enterprise clusters: Geographical Proximity or Collective Efficiency. IDS Working Paper No. 508, University of Nairobi, Institute for Development Studies, Nairobi.

Kinyanjui, Mary Njeri (1997) Tapping opportunities in enterprise clusters in Kenya: The case of enterprises in Ziwani and Kigandaini. Paper prepared for research project on *Collective Efficiency and Small Enterprise in Kenya* and presented at Institute of Development Studies, Sussex, UK. University of Nairobi, Institute for Development Studies, Nairobi.

Kinyanjui, Mary Njeri (1998) Vehicle repair clusters in Kenya: Alternative strategies for slowly industrializing countries. Report prepared for research project on *Collective Efficiency and Small Enterprise in Kenya*, University of Nairobi, Institute for Development Studies, Nairobi.

Knorringa, Peter (1996) *Economics of Collaboration: Indian Shoemakers between Market and Hierarchy*. Sage, New Delhi and London.

Krugman, P. (1991) *Geography and Trade.* MIT Press, Cambridge, MA.

Lall, Sanjaya (1990) *Building Industrial Competitiveness in Developing Countries.* Development Center of the Organization for Economic Co-operation and Development, Paris.

Langlois, Richard N. and Robertson, Paul L. (1995) *Firms, Markets and Economic Change: A Dynamic Theory of Business Institutions*. Routledge, New York and London.

Marshall, Alfred (1890) *Principles of Economics.* Macmillan, London.

McCormick, Dorothy (1988) Small enterprise in Nairobi: Golden opportunity or dead end? Ph.D. dissertation, The Johns Hopkins University, Baltimore, MD.

McCormick, Dorothy (1993) Risk and firm growth: The dilemma of Nairobi's small-scale manufacturers. IDS Discussion Paper No. 291, University of Nairobi, Institute for Development Studies, Nairobi.

McCormick, Dorothy (1997) Industrial district or garment ghetto: Nairobi's mini-manufacturers. In *Enterprise Clusters and Networks in Developing Countries*, ed. Meine Pieter van Dijk and Roberta Rabellotti. EADI Series 20, Frank Cass, London.

McCormick, Dorothy (1998a) Enterprise clusters in Africa: From collective efficiency to industrialization. Report prepared as part of a research project on Collective Efficiency and Small Enterprise in Kenya, University of Nairobi, Institute for Development Studies, Nairobi.

McCormick, Dorothy (1998b) Enterprise clusters in Africa: Linkages for growth and development. Paper presented at a conference entitled *Enterprise in Africa: Between Poverty and Growth*, organized by the Center of African Studies, University of Edinburgh, Edinburgh.

McCormick, Dorothy (1998c) Enterprise clusters in Africa: On the way to industrialization? IDS Discussion Paper No. 366, Institute of Development Studies, University of Sussex, Brighton.

McCormick, Dorothy and Atieno, Rosemary (1997) Firm linkages: Importance for industrial structure and performance. Paper presented at National Workshop on Multi-Country Study of Private Enterprise Development. University of Nairobi, Institute for Development Studies, Nairobi.

McCormick, Dorothy, Kinyanjui, Mary N. and Ongile, Grace (1997) Growth and barriers to growth among Nairobi's small and medium-sized garment producers. *World Development* **25**(7), 1095–1110.

McGoodwin, James R. (1990) *Crisis in the World's Fisheries: People, Problems, and Policies*. Stanford University Press, Stanford, CA.

Mead, Donald C. (1994) Linkages within the private sector: A review of current thinking. FIT Working Paper No. 3, International Labor Office, Geneva.

Mitullah, Winnie V. (1996) Collective efficiency in the fish industry: Lessons from Uhanya Beach Census. IDS Working Paper No. 509, University of Nairobi, Institute for Development Studies, Nairobi.

Mitullah, Winnie V. (1997) Firm interactions in Uhanya Cluster: The dynamics of small scale fish processing. Paper prepared for research project on *Collective Efficiency and Small Enterprise in Kenya* and presented at Institute of Development Studies, Sussex, UK, University of Nairobi, Institute for Development Studies, Nairobi.

Mitullah, Winnie V. (1998) Fishing and processing cluster in Lake Victoria. Report prepared for research project on *Collective Efficiency and Small Enterprise in Kenya,* University of Nairobi, Institute for Development Studies, Nairobi.

Nadvi, Khalid (1996) Small firm industrial districts in Pakistan. Doctoral Thesis, Institute of Development Studies, University of Sussex, University of Sussex, Brighton.

Nadvi, Khalid (1997) The cutting edge: Collective efficiency and international competitiveness in Pakistan. IDS Discussion Paper No. 360, Institute of Development Studies, University of Sussex, Brighton.

Nadvi, Khalid (1998) Knowing me—knowing you. IDS Discussion Paper No. 364, Institute of Development Studies, University of Sussex, Brighton.

Nadvi, Khalid and Schmitz, Hubert (1994) Industrial clusters in less developed countries: Review of experiences and research agenda. IDS Discussion Paper No. 339, Institute of Development Studies, University of Sussex, Brighton.

North, Douglass C. (1990) *Institutions, Institutional Change and Economic Performance*. Cambridge University Press, Cambridge.

October, Lionel (1996) Sectors, clusters and regions: A study of the Cape clothing industry. Working Paper No. 2, University of Cape Town, Development Policy Research Unit, Cape Town.

Ogutu, G.E.M, ed. (1988) *Artisanal Fisheries of Lake Victoria, Kenya: Options for Management, Production, and Marketing.* Sirikon Publishers and IDRC, Nairobi.

Olaniyan, Olanrewaju, Olayiwola, Wumi K. and Alayande, Babatunde A. (1997) A small scale enterprises and adjustment to reforms in Nigeria: The case of clustered enterprises. University of Ibadan, Center for Econometric and Allied Research, Ibadan.

Pedersen, Poul Ove (1993) Clothing rural Zimbabwe: Sectoral strategies and local development. CDR Working Paper No. 93.7, Center for Development Research, Copenhagen.

Pedersen, Poul Ove and McCormick, Dorothy (1999) African business systems in a globalising world. *Journal of Modern African Studies* **37**(1), 109–135.

Piore, M.J. and Sabel, C.F. (1984) *The Second Industrial Divide: Possibilities for Prosperity*. Basic Books, Inc., New York.

Porter, Michael (1990) *The Competitive Advantage of Nations*. The Free Press, New York.

Prinsloo, Erica (1996) Sectors, clusters, and regions: The clothing industry in Durban. Working Paper No. 3, University of Cape Town, Development Policy Research Unit, Cape Town.

Putnam, Robert D. (1993) *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton University Press, Princeton, NJ.

Rasmussen, Jesper (1992a) *The Local Entrepreneurial Milieu: Enterprise Networks in Small Zimbabwean Towns*. Research Report No. 79, Department of Geography, Roskilde University and Center for Development Research, Copenhagen.

Rasmussen, Jesper (1992b) The small enterprise environment in Zimbabwe: Growing in the shadow of large enterprises. *IDS Bulletin* **23** (3), 21–27.

Riedel, Jürgen and Schmitz, Hubert (1989) *Grass-Root Industrialization in a Ghanaian Town*. Weltforum Verlag, München.

Schmitz, Hubert (1992) On the clustering of small firms. *IDS Bulletin* **23** (3), 64–69.

Schmitz, Hubert (1995) Collective efficiency: Growth path for small-scale industry. *Journal of Development Studies* **31**(4), 529–566.

Schmitz, Hubert (1997) Collective efficiency and increasing returns. IDS Working Paper 50, Institute of Development Studies, University of Sussex, Brighton.

Sengenberger, W. and Pyke, F. (1992) Industrial districts and local economic regeneration: Research and policy issues. In *Industrial Districts and Local Economic Regeneration*, ed. F. Pyke and W. Sengenberger. International Institute for Labor Studies, Geneva.

Snodgrass, Donald R. and Biggs, Tyler (1996) *Industrialization and the Small Firm: Patterns and Policies.* International Center for Economic Growth and the Harvard Institute for International Development, San Francisco.

Storper, Michael and Walker, Richard (1989) *The Capitalist Imperative: Territory, Technology, and Industrial Growth*. Basil Blackwell, New York and Oxford.

Sverrisson, Arni (1992) Flexible specialization and woodworking enterprises in Kenya and Zimbabwe. *IDS Bulletin* **23**(3), 28–34.

Sverrisson, Arni (1993) *Evolutionary Technical Change and Flexible Modernisation: Entrepreneurship and Industrialization in Kenya and Zimbabwe.* Lund Dissertations in Sociology, No. 3, Lund University Press, Lund.

UNIDO (1996) *Industrial Development Global Report*. Oxford University Press, Oxford.

van Dijk, Meine Pieter (1992) Technological dynamism in industrial districts: An alternative approach to industrialization in developing countries? Paper presented at a symposium on industrial districts and technology, organized by the United Nations Conference on Trade and Development, Geneva.

Whitley, Richard (1992) *Business Systems in East Asia: Firms, Markets, and Societies*. Sage, London.

Wilkens, Nick and Kane, Kevin (1997) SMME linkages and industrial clustering in South Africa. Paper presented at conference on *African Business Systems: Institutionalising Industrialization in the Era of Economic Reform*, Mombasa, Kenya.

Williamson, Oliver E. (1985) *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting*. The Free Press, New York.

Zeitlin, J. (ed.) (1989) Local Industrial Strategies. Special Issue of *Economy and Society* **18**(4).