

Developing countries and incipient industrialization: a case study of enterprise clustering and inter-firm relations in small and medium-scale manufacturing industries in Lobatse, Botswana

J. NAKIZITO AND M.B.K. DARKOH¹

ABSTRACT

Botswana's small and large towns offer good examples of incipient industrialization and enterprise clustering in a developing economy. Using data from Lobatse, a small industrial centre in Botswana, this brief paper shows that clustering in developing countries does not necessarily induce high inter-firm relationships as is the case in industrialized countries. Relations are limited among firms within clusters.

Introduction

THE SMALL OR MEDIUM-SCALE SUBSECTOR is now widely recognized by governments, businesses and the academic community as playing a vital role in the development of an economy. There is recent international literature suggesting that when these firms operate in clusters, it may help them overcome many growth constraints by promoting collective efficiency, facilitating the growth of firms in small steps and making it easier to respond to opportunities and crises (McCormick 1999). Much of the literature is on developed countries and, more recently, also on Latin America and Asia. There is very little material on Africa.

¹ Both in the Department of Environmental Science, University of Botswana, Gaborone, Botswana.

The term "cluster" has been used in different ways in the literature relating to industrial development. Porter (1990), for example, uses the term as a means of identifying a group of firms that are engaged in related or similar activities within a national economy. To Porter, the relationships within an industry cluster benefit from firms being located near one another, but he does not emphasize geographical proximity as a defining characteristic of clusters. Schmitz (1992), however, makes an explicitly geographic use of the term, defining clusters as geographic and sectoral agglomeration of enterprises. McCormick (1999) notes that the latter approach is rooted in Marshall's (1890) observation on textile and metal industries in the nineteenth century that economic gains could be realized when small firms within a specific industrial activity clustered in close proximity to each other. In such a setting, individual firms could specialize in a particular stage of the production process. It is this specialized pool available to all firms within the cultural and social value that constitutes what Marshall termed the local "Industrial Atmosphere" (Marshall 1919).

Clustering brings gains that are not likely to be attained by individual firms if they were located in isolation. It is the concept of collective efficiency, defined as the competitive advantage derived from local external economies and joint action (Schmitz 1995), which helps the firms to capture these gains, though such gains may not necessarily result from clustering. The concept can be examined from two angles, that is, the vertical and horizontal inter-firm relations. If these relationships are highly developed collective efficiency is likely.

The existence of clusters could be a result of a number of factors that include spontaneity, urban zoning regulations, entrepreneurship or forced agglomeration. The absence of a location policy in Botswana has greatly affected small enterprises in such a way that some firms may be forced to agglomerate in spaces within urban centres, some of which may not even meet the necessary conditions for firm location. Whatever is the initial cause of clustering may not be important as the processes and forms of interaction existing in the clusters. Such processes could be firm relations, geographical proximity, entrepreneurs' mutual support

and the emergence of auxiliary services to meet the needs of the businesses in the agglomeration of firms.

The major objective of this paper is to find out whether there are any industrial clusters in Lobatse and, if there are, to determine the existing inter-firm relations within the clusters. For the purposes of this investigation, small- and medium-scale industries are regarded as any units engaging in processing and manufacturing, found in the informal and the formal sector employing less than one hundred persons. This definition is basically the same as that proposed by the Small, Medium and Micro Enterprises (SMMEs) Task Force of Botswana, (Republic of Botswana 1999). The study's general hypothesis is that there are industrial clusters in Lobatse that result in high inter-firm relations. For operational purposes, the study adopts Schmitz's definition of clustering, that is, the spatial agglomeration of small and medium-scale manufacturing enterprises. As McCormick (1999: 1532) explains, Schmitz's approach to clustering is more applicable in regions of incipient industrialization like Africa where poor infrastructure, weak information systems and cultures that place high value on face-to-face communication are the norm.

Review of the literature

Attempts to study clustering of small enterprise development in developing countries are a relatively recent development that does not go beyond the late 1980s. The few studies that have been carried out in this field cover a number of developing economies like Brazil (Schmitz 1993), Ghana (Dawson 1992), India (Kashyap 1992), Indonesia (Weijland 1992), Kenya (McCormick 1993, 1997, 1998; Kinyanjui 1998), Mexico (Rabellotti 1993), Peru (Villaran 1993), Tanzania (Hansohm 1992), South Korea (Levy 1991), Sudan (Hansohm 1992), and Zimbabwe (Sverrisson 1992). Some of the studies are still under way and as yet report only initial findings. Few adequately examine the inter-firm relationships within clusters. At present there are no studies that have been done in relation to industrial clustering in Botswana; the literature reviewed, therefore, is drawn from other developing countries. The empirical framework of

this review rests on the objective of the study, which, as outlined above, is the determination of inter-firm relations within clusters.

Generally, firms are expected to be rivals because of their competition for resources, power, technology, market, space and even labour. As a result, one would expect firms to work in isolation and independently so as to guard their market and other factors of production. Studies on industrial clusters, however, paint a different picture and there is increasing evidence from the literature that firm relationships exist.

Clustering facilitates vertical product relations between firms; relations that range from orchestration by large firms to arrangements amongst small firms and from casual exchange of information and tools to close inter-firm collaboration. Vertical subcontracting and the specialized division of labour have been observed in many the small-firm clusters of developing countries. In some cases process specialization is at an early stage and mainly constitutes the provision of specialized services by a few individual units to other firms in the cluster. Aeroe (1992) notes that in a woodworking cluster in three small towns in Tanzania, only one unit (in a sample of 73) is process specialized.

There are indications that, despite the absence of inter-firm division of labour, clustering does encourage firms to co-operate. Sverrisson's study on small woodworking units in intermediate towns of Kenya and Zimbabwe testifies that the main form of technical linkage is the borrowing back and forth of sophisticated and rare tools, which proceeded very much on informal terms (Sverrisson 1992). Similarly, Aeroe (1992) has observed that workshops in Tanzania's carpentry clusters exchanged tools, ideas and designs.

In cases where manufacturing processes are technically more sophisticated, inter-firm relation based on a vertical division of labour among small firms are often an important aspect of production organization. Levy reports that Taiwan's overwhelming small firm footwear industry is distinguished by a proliferation of subcontracting relations and finds that it is rare for a Taiwanese footwear firm to perform in-house more than at most two of the various sub- processes of footwear production (Levy, 1991).

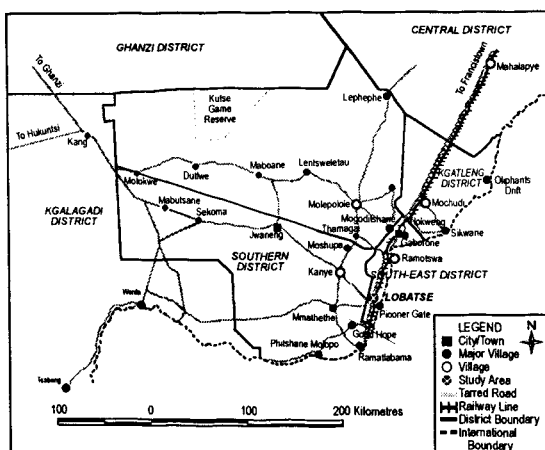
Vertical production relations are also experienced in footwear clusters in Brazil (Sinos Valley) and India (Agra), which are characterized by extensive specialization and vertical firm linkages. The Sinos Valley is striking for the exhaustive range of inputs, components and intermediate products that are required for the manufacturing of shoes. Despite some large firms in the Sinos Valley becoming vertically integrated, most small and medium sized shoe firms within the cluster produce only parts of shoes.

Process specialization is also an important feature in the success of the Indian cotton knitwear industry. Tiruppur's knitwear enterprises are involved in interactive networks with local specialist job-firms that undertake cloth fabrication, calendaring, bleaching and finishing, among others (Cawthorne 1993). Cawthorne also draws attention to the process of the division of labour within firms, where, to keep labour supervision costs and capital investments low, firms often split production activities across semi-independent units specialized for urban and production organization functions.

Kumasi's Suame district also displays signs of extensive inter-firm division of urbanization. Dawson (1992) reports that a number of enterprises develop specialized expertise, produce specific parts or acquire exclusive technological capabilities. A significant degree of co-operation that has developed enables small workshops with only limited equipment and staff to take on substantial pieces work, parts of which are shared or subcontracted out to neighbouring enterprises (Dawson 1992).

Although the predominant practice observed is that of restricting inter-firm subcontractual rules solely to small firms within the cluster, it cannot be ruled out that large-scale firms fall within the production arrangements. Dore's (1983) remarks on relational subcontracting in Japan, as well as Schmitz's (1992) observations on the Stuttgart region of South Germany indicate that not only can large firms be a part of the cluster, but that they often play the lead role by weaving webs of vertically delineated production subcontractual arrangement with small firms located in close proximity to the large units.

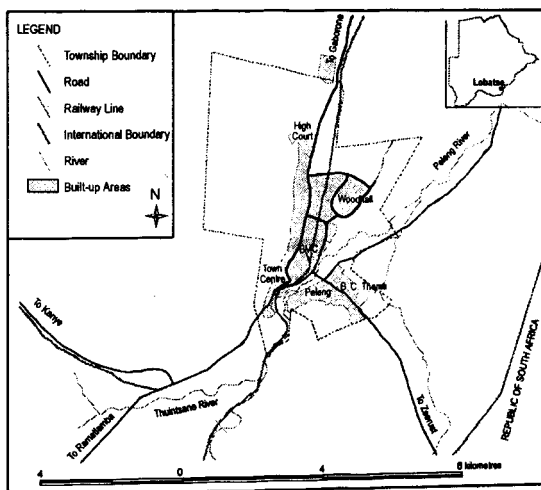
Fig. 1: Location of Lobatse in the Southeast District



Source: Digitised by R. K. Chalashika from Lobatse Development Plan, Map No. 4, 2000

Industrial clusters in South Korea stand out for the manner in which small and medium-sized firms are hierarchically networked with, and spatially concentrated around, large enterprises and industrial conglomerates. In such settings inter-firm product relations consist of extensive subcontracting chains and supplier arrangements that are organized from the mother firm. This pattern is similar in some respect to the Japanese model of “relational industrial subcontracting” (Dore 1983), which reflects the overall dominance of large scale *Chaebols* in South Korea’s industrial structure (Cho 1992).

Horizontal relations between firms are marked by competition; an important aspect of horizontal inter-firm relations with clusters. The Sinos valley (Schmitz, 1993) and Ludhiana (Tewari 1992) clusters are prime cases where local rivalries have a positive impact, yet co-operation between firms at a horizontal level is apparent. Horizontal competition within the cluster may not preclude co-operation but this can take place in precompetitive areas such as providing infrastructure or training between potentially competing producers. This is reflected in organizational responses by small firms faced with capital constraints

Fig 2. Lobatse Township

Source: Digitised by R. K. Chalashika from Lobatse planning Area Map prepared by DTRP, March 1981.

and market uncertainties that limit their ability to expand. This nature of horizontal co-operation is also observable in the Suame cluster (Dawson, 1992), in the traditional metal working sector in Nile, Sudan (Hansohm, 1992), and in the Agra footwear cluster (Knorringa, 1992).

Although none of the reviewed studies reports targeted support strategies aimed at small firm industrial districts, a number of policy initiatives and state institutions exist with the aim of assisting small firms with various incentives and real producer services. Examples of such state efforts include regional small business advisory centres in the Philippines (Tan 1991), the Malaysians Subcontractor Exchange Programme (Jamil and Said 1991) and the Korean Small and Medium Sized Promotion Corporation (Lee 1991).

The study area and research methodology

Lobatse is a small industrial town, located 70 km from the capital city of Gaborone in the Southeast District of Botswana. It is only 5 km from the South African border (Figs. 1 and 2). It has a population of 26,052 (Republic of Botswana 1997) growing at the rate of 3.2 per cent per

annum. Its importance as an industrial centre in Botswana is underlined by the fact that it has the largest abattoir in Africa, which is run by the Botswana Meat Commission, a slaughter and marketing parastatal, besides a number of other fast-growing small, medium and large-scale industries. The town has also a strategic geographic location in that it is the hub of the road network that links other villages and towns such as Tsabong, Kanye, Jwaneng, Ghanzi and Gaborone as well as those in South Africa situated at the line of rail.

According to Botswana's National Settlement Policy (Government of Botswana 1996), Lobatse is a primary centre, servicing not only the residents of Lobatse and the south-east district but also the western parts of the country. The rate and character of Lobatse's growth is also influenced, to a considerable extent, by its relationship to its hinterland and by the events taking place there. The town is a market centre for the goods and services from the hinterland. Agro-based industries dominate the manufacturing sector of the town, with beef processing employing a fifth of the total labour force. Lobatse's role in the region is that of an administrative, commercial, employment and communication centre. Also, by virtue of the existence of the Botswana Meat Commission, the town has a wider role in the economy of the country. Other large-scale manufacturing enterprises that are still developing include BMC Tannery, Sugar Industries Ltd, Lobatse Clay Works and Lobatse Breweries. With the introduction of the Financial Assistance Policy which gives grants to local entrepreneurs to set up businesses, industrial development is expected to be on the increase in Lobatse.

The research for this study was conducted in 2000 (Nakizito 2000). To develop a sampling frame, a preliminary reconnaissance survey of small- and medium-scale manufacturing enterprises in Lobatse town was conducted by the authors in January 2000 when a total population of 41 small and medium-scale establishments were identified (Table I). A detailed survey of all the 41 industrial establishments was carried out in February to determine the structural characteristics and inter-relationships of these establishments. It was found that out of this population, 34 firms are concentrated in two areas which are Woodhall industrial site and Peleng.

In Woodhall industrial site, a total of 23 establishments were identified while 11 were found in Peleng (Table II). In both clusters there is a mixture of different industries. It cannot, therefore, be concluded that a certain industry dominates the manufacturing activity in either cluster. However, the clusters have evolved some kind of relationship, which is depicted through various ways.

Table I: Industries covered in the survey

Category of industry	No of units
Dry food packing	2
Meat and meat products	1
Tannery	1
Leather products	1
Dairy products	3
Wooden products	4
Crafts	1
Ceramics	1
Bricks and blocks	5
Metal and auto works	6
Plastics	1
Bakery	2
Printing and publishing	4
Knitting and sewing	3
Beverages	3
Chemical products	1
Paper and paper products	2
Total	41

SOURCE: AUTHOR'S FIELD SURVEY 2000

In order to find out which industrial establishments dominate each cluster, the population of 34 firms identified was grouped into 15 categories based on the products manufactured. These categories are: dry food packing, meat and meat products, wooden products, textiles, printing and publishing, paper and paper products, chemical products, beverages, bakery, plastics, metal and auto works, bricks and blocks,

ceramics, leather products and dairy products. For the detailed study, the entire population was taken into consideration conducting face-to-face interviews (using both formal and open-ended questionnaires) with managers and plant owners of all firms in the two clusters (Nakizito 2000).

Table II: Industrial establishments in the clusters found in Woodhall Industrial Area and Peleng

Woodhall Industrial Area

Name of firm	Product manufactured
Allied Manufacturers	Furniture, fixtures and repairs
Anthony's Knitwear	Textile
B. D General Welding	Metal and welding
Caroline's Garments	Textile
Dairy King	Dairy products, fruit juice
F. R. Bricks and Blocks	Bricks and blocks
Flo-tech Pipes and Irrigation	Metal products
Jala Steel Industry (Pty) Ltd	Metal products
Jealous Up Furniture Repairs and Carpentry	Furniture, fixtures and repairs
L. P. Engineering	Metal products
Lobatse Brigade Centre	Furniture, fixtures and repairs
Lobaste Juice Producers	Carbonated drinks
Lobatse Quality Foods	Food stuffs
Lobatse Toilet Paper manufacturers	Paper products
Lobatse Tow Bar Manufacturers	Metal products
Mmereki Dealers	Printing
Multi-Wood Works	Furniture, repairs and fixtures
Phoenix Bakery	Bakery products
Scorpion Clothing	Textile
Sun Plastics	Plastic bags
Senwelo Bricks	Bricks and blocks
Target Meat Industries	Meat and meat products
Zainab (Pty) Ltd.	Paper and paper products

Peleng

Name of firm	Product manufactured
B.M.C (Tannery)	Semi-processed leather
Drawtech (Pty) Ltd.	Printing
Inter-Trade Manufacturers (Pty) Ltd.	Sugar (packing)
Lobatse Handbags	Bags
Moagi and Sons Ltd.	Ice cream
Monakwe Brick Moulding	Bricks and blocks
Mosime Screen Printers	Screen printing
Phitshane (Pty) Ltd.	Picture frames
Femspi (Pty) Ltd.	Bricks and blocks
Shoe Matters and Leather Works	Repairs, leather products
Sky Bakery	Bread, cakes

SOURCE: AUTHORS' FIELD SURVEY 2000

Analysis of research findings

As already noted, an essential point of clustering is that it opens up efficiency gains that individual producers can rarely attain. Collective efficiency would be reflected in the firm relationships and interactions. Our discussion of the findings on inter-firm relations in the two industrial clusters found in Lobatse is structured according to the following topics: purchases of raw materials, sales of products, subcontracting, inter-firm co-operation and competition, which are the relations that have been identified during the survey.

Purchases of raw materials

To investigate the inter-firm linkages on raw materials, data on raw materials purchases was obtained from all the 23 firms in the Woodhall industrial site and 11 in Peleng. Sixteen firms in Woodhall industrial site, but none in Peleng, have this form of relationship within the cluster. Attempts were also made to establish the type of firms from which these 16 firms purchased their raw materials.

Results from the survey show that there are very weak linkages among manufacturing firms in Woodhall industrial area. Firms that

purchase raw materials from manufacturing firms in the cluster are few, with only one small-scale firm (involved in knitting and sewing) purchasing some of its raw materials from a medium-scale firm; and one wooden products firm purchasing some of its raw materials from a large-scale manufacturing firm. The paper and paper products industry, a medium-scale firm, is the only firm that has some backward linkages with small-scale firms; and the metal and metal products firm (medium-scale) has similar linkages with large-scale firms in the cluster.

It is, however, noted that backward linkages in general are fairly well developed in Woodhall industrial area with a relatively large number of small- and medium-scale manufacturing firms purchasing some raw materials from retail or wholesale shops. This depicts fairly well-developed inter-sectoral linkages with the commercial sector. From the survey, four small-scale (food packing, printing and publishing, wooden products) and two medium-scale firms (metal and metal products, printing and publishing) purchase raw materials from retail shops; while five small-scale firms (bakery products, wooden products, printing and publishing) and only one medium-scale beverage firm obtain their raw materials from wholesale shops.

Inter-firm sales

Another aspect that was investigated concerned inter-firm sales. All the respondents in the surveyed firms in both clusters were asked whether they sold any of their products to any other manufacturing firm in the surveyed area. Fifteen of the firms in Woodhall industrial site and six from Peleng gave positive responses and were asked to state the type of firms to which they were selling their products. From the responses, it was found that only one other small-scale firm in Woodhall dealing in metal and metal products and one small-scale firm in Peleng producing building materials sold their products to other small-scale firms.

The survey also shows that as few as two firms producing beverages in Woodhall industrial area and only one in Peleng, producing building materials, sell their products to medium-scale firms. From this it can be concluded that most of the firms sell their products to more than one

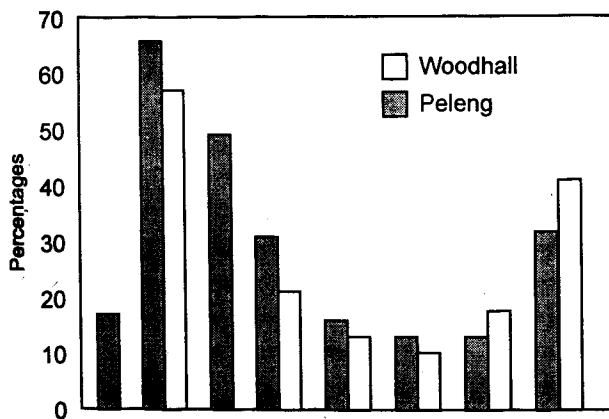
category of firms in the cluster. Three firms producing building materials, two printing and publishing firms, one dry food packing and one beverages firm have forward linkages with small- and medium-scale manufacturing firms in the local area. Industries like those producing plastic bags, building materials and printing sell their products to all categories of firms in the clusters. It was also found out in the survey that a good number (63.4 per cent) of the reporting firms sell directly to individuals and households. There is, however, a strong forward non-production linkage with individuals and households and a weak forward production linkage with the rest of the sector within the cluster. In the literature review most of the clusters studied are exporters. In contrast, producers in Lobatse mostly rely on the local and national market for their market requirements. As Liedholm and Mead (1998) point out, in the context of several developing countries, this may be due to the fact that most of the items produced and traded by small- and medium-scale firms are light consumer goods and, therefore, sold directly to the urban and rural households. They further point out that "recent studies have revealed without exception a strong positive relationship between changes in household income and changes in demand for a range of small-scale industry goods".

During the survey it was also found out that 75.6 per cent and 70 per cent respectively of firms in Woodhall industrial site and Peleng reported that customers come to their firms to buy products, and only 46.3 per cent of entrepreneurs reported travelling to sell products to other places. This shows that the main sources of customers for the small- and medium-scale manufacturers in the two clusters are individual buyers who often walk to the clusters. This is indicative of the presence of highly localized market access, one of the most universal benefits of clustering. It is also easily apparent that many of the small and medium firms have yet to use improved technology and aspire to make better quality products to serve a wider market.

Subcontracting activity within manufacturing firms

This is another aspect of inter-firm relations that was sought during the study. This has been viewed in terms of subcontracting arrangements.

Fig. 3: Inter-firm relations within Woodhall Industrial Site and Peleng



KEY:

- | | |
|-------------------------------|--------------------------|
| 1 Production of raw materials | 5 Marketing products |
| 2 Inter-firm sales | 6 Training workers |
| 3 Subcontracting | 7 Purchase of inputs |
| 4 Lending machinery | 8 Production development |

SOURCE: AUTHORS' OWN CONSTRUCT 2000

Contrary to expectations, this kind of vertical inter-firm relationship is not well developed in either cluster. All manufacturing firms in the two clusters reported that they do not subcontract work to other firms, and at the same time, an overwhelming majority (95.1 per cent) reported that they do not receive subcontracting work from other firms. From this one can conclude that, in Lobatse, the small and medium firms operate separately from each other to produce distinct products. Only 4.9 per cent of the firms in Woodhall industrial site reported that they were working as subcontractors for other firms, though these were not located in the same cluster. These are in the textile and clothing industry and metal industry. Little subcontracting was therefore observed among

firms operating in Lobatse. The firms reported performing most of their manufacturing activities by themselves. This lack of subcontracting among the firms in the clusters is perhaps a fundamental difference between clusters in the industrialized and developing countries.

Co-operation among firms

During the survey another basic relationship was detected. This was in the form of co-operation, which was expressed in various ways by different firms. Although all the surveyed firms stated that there were no formal arrangements with other firms within the same area, the major ways of co-operation among different firms included production development, lending machinery, marketing products, training workers and purchasing inputs. Lending tools is a common form of co-operation in the wood, furniture and fixture industries. In the textile and clothing industry training workers is common. All these forms of relationships are summarized in Fig. 3.

The figure depicts the strong forward (non-production) linkage between the firms within the clusters. The backward (non-production, essentially financial) linkage, established through borrowing, either capital for start-up or for expansion, is extremely weak. In terms of training and apprenticeship the responding firms show weak backward (non-production) linkages as only 14 per cent and 10 per cent in Woodhall industrial site and Peleng respectively rely on such training. The remaining firms develop their skills either through self-training or family traditions.

The evidence on linkages, therefore, is indicative of the fact that small- and medium-scale manufacturing firms in Lobatse are characterized, on the one hand by weak forward and strong backward production linkages and strong forward, but weak backward, non-production (financial and training) linkages on the other. The evidence of generally low linkages is not surprising because the majority of the firms are of relatively recent origin and need time to consolidate their business activities, supply and market outlets. The overall average age of the small and medium-scale manufacturing enterprises is 3.8 years. As few as 7.3 per cent of the 34 firms in the two clusters have been

operating for more than eight years and as many as 85.4 per cent came into operation over the last five years or so. The other important factors explaining the low linkages are the very limited capacity to accept large orders because of lack of capital for expansion, poor processing facilities, low levels of technology and inexperienced managers using improper management techniques.

During the survey further information concerning relationships among the responding firms was sought on the extent to which firms exchange ideas or discuss problems and strategies with other firms and on frequency of firm managers visiting each other. Thirty-two exchanged ideas occasionally with each other, while two firms stated that they did so frequently. For responses on visiting other firms, two of the surveyed firms stated that they had never been to any other firm's site; 28 did so occasionally, while four often did so.

Inter-firm competition within clusters

Scope for conflict is greatest at horizontal level where producers are often in competition. With reference to inter-firm competition, the key questions put to the responding firms were about the location or sources of their main competitors. Data was obtained from all 34 firms. Three sources of main competitors were distinguished; competition from the local area, from other parts of the country and from abroad. About 22 per cent of all firms reported that their main competitors are located locally; 41 per cent have competitors in other parts of the country and the remaining 37 per cent face competition from abroad. Responses on the nature of competitors show that most of them are large-scale firms.

Although inter-firm relations vary greatly, the study findings show that such relationships are limited among the firms within the clusters. This indicates that clustering has not necessarily led to much collective efficiency. Clustering in Lobatse has not induced all types of inter-firm relations, as is the case with clusters in other developing countries.

Conclusion

The study set out to determine the existing inter-firm relationships within the clusters. Two clusters have been identified in Woodhall industrial

site and in Peleng. Results from the survey, however, indicate that our hypothesis of high inter-firm relations is not supported. Little evidence of linkages and networking exist. There is little subcontracting in the clusters as each firm does all its production by itself. Small- and medium-scale manufacturing enterprises in Lobatse operate separately from each other to produce distinct products. A minimal division of labour at firm level was also observed during the survey, whereby firms perform all activities by themselves in their premises. The weak inter-firm relations may be symptomatic of a small urban economy in an incipient stage of industrialization.

Much as our survey reveals weak inter-firm relations within the clusters, there are enough examples to suggest that clustering, as a phenomenon, is of significance to the industrial organization of small- and medium-scale enterprises. Proximity is a necessity not only for more efficient access to inputs and outputs necessary for production, but also for ability to cultivate contacts to powerful local people and for the development of an affinity among the small enterprises (Aeroe 1991). As a consequence, clustering should be encouraged because distinctive economies of concentration can appear when groups of enterprises in one location are linked together in complex webs of functional relationships that offer economies of kinds otherwise available only to very large firms. Small establishments can reap a plenitude of such economies, but large establishments, too, can benefit from close functional linkages with other plants in the same geographical location. Policies directed towards the co-ordination of inter-firm relations, the identification and support of appropriate market outlets, the creation of an adequate local technological capacity, the operation of a local labour market and protection against cheap imported goods are all necessary elements of any industrial strategy to promote inter-firm linkages, enhance competitive advantage of local firms and reap benefits from clustering.

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