

*Development of **Clusters** and Networks of **SMEs***



The UNIDO Programme



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
economy environment employment

PRIVATE SECTOR DEVELOPMENT BRANCH
INVESTMENT PROMOTION AND INSTITUTIONAL CAPACITY BUILDING DIVISION

DEVELOPMENT OF CLUSTERS AND NETWORKS OF SMEs

The UNIDO Programme



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna, 2001

Contents

	<i>Page</i>
1. Challenges	5
2. UNIDO's response: approach and experience	7
Cluster development	8
World-wide phenomenon	8
Participatory approach to vision-building	10
Pune food processing cluster (India): identification of a common strategy	10
Bagru cluster (India): building trust	11
Capability-building based on shared targets	12
Ludhiana cluster (India): stakeholders participation	13
Boaco and Chontales cluster (Nicaragua): institutional networking	14
Sustainability of the cluster development process	15
Horizontal networks	16
Woodworking network in Masaya (Nicaragua)	17
Networks and beyond: Senegal and Zimbabwe	18
Vertical networks	19
Nicaragua: vertical linkages unit within the Chamber of Industry	20
Function of brokers	21
Nicaragua, India and Honduras	22
3. UNIDO methodologies and tools	27
Cluster approach	27
Morocco: leather cluster	28
Networking approach	28
Joint learning programmes	29
Complementarity with other UNIDO programmes	30
Bibliography	31



Introduction

The Programme “Development of Clusters and Networks of SMEs” is one of the programmes implemented by the UNIDO Private Sector Development Branch.

It responds to developing countries’ request of technical assistance to help their Small and Medium Enterprises (SMEs) become more competitive by fostering inter-enterprise linkages as well as collaborative relations with local support institutions. It aims at helping SMEs combining their strengths and jointly take advantage of market opportunities or solve common problems with a combined effort.

The programme covers different modalities of inter-enterprise and enterprise/institutions collaboration: horizontal networking (among SMEs), vertical networking (among SMEs and larger enterprises) and clustering where larger concentrations of enterprises operating in the same locality and belonging to same or complementary sectors are concerned.

Aside describing the programme’s approach and some examples from experience, this paper also describes the methodologies and tools that have been devised to build local institutional capabilities to promote clusters and networks.

The guiding principle of the United Nations Industrial Development Organization's (UNIDO's) approach towards small- and medium-scale enterprises (SMEs) is that they can play a key role in economic growth and equitable development in developing countries. Their contribution to employment generation, poverty reduction and wider distribution of wealth and opportunities represents a major window of opportunity for most developing countries. However, the potential role of SMEs is often not realized because of a set of problems commonly related to size.

Individual SMEs experience difficulties in achieving economies of scale in the purchase of such inputs as equipment, raw materials, finance and consulting services and are often unable to take advantage of market opportunities that require large production quantities, homogenous standards and regular supply. Small size is also a constraint on internalization of functions such as training, market intelligence, logistics and technology innovation, while preventing the achievement of a specialized and effective internal division of labour. To preserve their narrow profit margins, small-scale entrepreneurs in developing countries are often unable to introduce innovative improvements to products and processes and this limits the scope of firms to take advantage of new market opportunities.

On a closer observation, however, it is clear that many of these obstacles are the result of SME's **isolation** rather than their size. Therefore, closer cooperation among SMEs as well as between SMEs and the institutions in their surrounding environment, holds the key to overcoming them.

Networking offers an important route for individual SMEs to address their problems as well as to improve their competitive position. By coordinating their activities, enterprises can collectively achieve economies of scale beyond the reach of individual small-scale firms and obtain bulk-purchase inputs, achieve optimal scale in the use of machinery and pool production capacities to meet large-scale orders. Inter-enterprise cooperation also enables SMEs to specialize in their core businesses and give way to an external division of labour thus improving their efficiency in production. Joint work also encourages enterprises to learn from each other, exchange ideas and experience to improve product quality and take over more profitable market segments.

Evidence from developing and developed countries shows that cooperative relations and joint action are more likely when enterprises operate in proximity and share business interests such as markets for products, infrastructure needs or challenging external competition. Within such groups, or **clusters**, enterprises' joint initiatives are stronger, because of the critical mass of interested parties, more cost-effective due to shared fixed costs and easier to coordinate, with proximity fostering mutual knowledge and trust.

UNIDO, therefore, has launched a programme to promote linkages among SMEs as well as between enterprises and their institutional environment. The following map shows where projects focused on networking are being implemented or designed and have been completed.



On-going, planned and completed projects:

- projects under design
- on-going projects
- completed project



2

UNIDO's response: approach and experience

The projects in UNIDO's programme on clusters and networks development are customized to the requirements of individual countries, their SME sector and local policies and initiatives for private sector development. Broadly speaking, there are three aspects to such projects:

- o organization and development of clusters
- o development of networks of SMEs
- o development of linkages between SMEs and larger enterprises



UNIDO defines **clusters** as sectoral and geographical concentrations of enterprises that produce and sell a range of related or complementary products and, thus, face common challenges and opportunities. These concentrations can give rise to external economies such as emergence of specialized suppliers of raw materials and components or growth of a pool of sector-specific skills and foster development of specialized services in technical, managerial and financial matters. **Networks** are groups of firms that cooperate on a joint development project complementing each other and specializing in order to overcome common problems, achieve collective efficiency and penetrate markets beyond their individual reach. Networks formed by SMEs only are termed horizontal, to distinguish them from those where one or more large-scale enterprises are involved which are of the vertical type. Whether horizontal or vertical, networks can be developed within or independently of clusters.



In some projects the cluster aspect prevails and the promotion of networks is pursued as part of the cluster development strategy. In other projects, activities start with development of horizontal or vertical networks and, then, as networking intensifies and more and more enterprises are involved, the territorial, or cluster, dimension starts to emerge with the involvement of business development service (BDS) providers, associations of enterprises and governmental institutions.

Cluster development

Numerous examples, in both industrialized and developing countries, demonstrate that SME clusters have established themselves as important and dynamic players within the

international market responding to global competition challenges by capitalizing on local opportunities and collective competitive advantage.

World-wide phenomenon

The dynamism and economic success of the numerous SME clusters operating in Italy, in sectors as diverse as textiles, leather, jewellery, optical frames and others, has been well documented. Further examples of competitive SME clusters can be drawn from other OECD countries such as Germany, Japan, France and the United States. SME clusters are, likewise, common to developing economies. Tirupur, in the Indian state of Tamil Nadu, for example, hosts an agglomeration of more than 7,000 SMEs, which, in 1999 alone, exported US\$650 million worth of cotton hosiery to the EU, Japan and the USA representing over 80 per cent of all Indian exports of such goods. Similar examples can be drawn from neighbouring Pakistan as well as from Brazil, Chile and Mexico.

Mere concentration of enterprises operating in the same sector is, however, no guarantee of success, since the advantages associated with clustering do not always emerge automatically.

In many developing countries, SME agglomerations are a widespread phenomenon. On the outskirts of many cities, significant numbers of micro- and small-scale enterprises often operate close to one another and produce similar goods. While in metalworking, woodworking and textile clusters of this kind are common, few of them share the virtues of successful cluster models. In most of the cases, cooperation among firms is accidental or non-existent. Although working and often living in close proximity, entrepreneurs do not share business information, discuss common problems or organize joint activities. SMEs have only sporadic relationships with providers of business

development services (BDS) and are not accustomed to presenting articulated calls for action to local policymakers. These clusters are characterized by low levels of trust, latent conflicts and cut-throat competition among firms. As a result, they are locked within a vicious circle of stagnation and poverty.

The transition from this stage of disorganization and stagnation to one of organization and achievement is difficult. The building of trust, constructive dialogue among cluster actors, exchange of information, identification of common strategic objectives, agreement on a joint development strategy and its systematic and coherent implementation require substantial efforts and commitment to common goals. Above all, this requires:

- o time to invest in reciprocal knowledge and coordination

- o development vision beyond the daily routine
- o long-term commitment

For various historical, social and economic reasons, some clusters have been able to fulfil these conditions and capitalize on common strengths and opportunities. In many other clusters, however, this does not happen spontaneously. In such cases external technical assistance can be beneficial to help trigger a process in which local entrepreneurs organize themselves and take advantage of common opportunities.

UNIDO can provide technical assistance to generate a shared development vision for clusters, channel disused knowledge and resources into common objectives and help implement jointly-identified actions.

What are the main aspects of the technical assistance provided by UNIDO to develop clusters?

- o Participatory approach to vision building
- o Capability-building actions based on shared targets
- o Sustainability of the cluster development process



Participatory approach to vision-building

When starting the work within a cluster the initial task is to **build trust** among cluster stakeholders—enterprises and institutions. In most cases, existing levels of trust among the cluster stakeholders are low. Often, entrepreneurs, as well as SME support institutions, local government and non-governmental organizations blame each other for the overall stagnation of the local economy. Small-scale enterprises are dissatisfied with the privileges that large-scale enterprises supposedly

enjoy and with services offered by support institutions, and all agree that public support is lacking.

Improving relations that have deteriorated over time—if ever they existed—is a *condicio sine qua non* not only to combine forces towards common targets but also to understand where problems really lie and define development options based on actual opportunities.

Pune food processing cluster (India): identification of a common strategy¹

When UNIDO started a project to support the food-processing cluster of Pune (India), local entrepreneurs indicated that the stringency of the Food Adulteration Act was the greatest obstacle to the growth of the cluster. Consequently, their major request was to relax the legislation and grant them exemption from audits. As the cluster diagnostic study advanced and included local government and providers of business services, especially product testing facilities, a more complex image of the cluster became apparent. Institutions believed that local entrepreneurs did not adequately value the importance of product safety and that they were excessively reliant on traditional operating practices to understand the use of modern testing equipment.

UNIDO, therefore, undertook an intensive awareness-building initiative—through bilateral as well as group meetings—to help various cluster actors to share their perceptions, refocus their problem analysis and identify in greater detail what prevented the Pune entrepreneurs to make use of existing testing facilities to meet government regulations.

As a result, the majority of cluster entrepreneurs were prepared to admit their ignorance about the law and their inability to keep up with its continuous amendments. When this issue was further discussed with local service providers, the focus increasingly shifted towards the need for an information point within the cluster where all relevant legislation could be rapidly consulted. Furthermore, it emerged that the cluster producers lacked any opportunity of dialogue with the food regulation agency at federal level because of the intense fragmentation of their re-presentative associations. As a result, the demand was increasingly raised for the establishment of an umbrella organization with sufficient critical mass and representation to liaise directly with New Delhi. The consultations also disclosed that the lack of sufficiently reliable and independent testing facilities reduced the capability of local producers to monitor their compliance. This realization led to a broader demand for the creation of a technical centre in Pune and helped introduce the producers to the more general issue of quality control.

¹ All examples presented in this document are drawn from UNIDO projects.

The above example illustrates that establishment of a dialogue within an underperforming cluster requires much assistance, which should be provided by a cluster broker. The broker is a professional, employed directly by UNIDO or delegated by a local support institution, whose task is to facilitate implementation of the cluster or networks development initiatives.² For such a task, brokers can draw on a range of tools (described in the section “UNIDO methodologies and tools”) a central feature of which is the diagnostic methodology, whose purpose is evaluate local conditions analysing, in particular, the following issues:

- Production system (composed of firms engaged in production, their suppliers and buyers)
- Skill development system
- Institutional coordination and enterprise representation system

Local historical, social and cultural conditions are of paramount importance in this phase as well as previous experiences that hamper or facilitate cohesion and synergies among cluster actors. The following case is an example of how to manage a difficult case of building trust.

Bagru cluster (India): building trust

Creating an environment of mutual trust among competing SMEs rarely proved as hard as in the case of the block printers of Bagru, a village near the city of Jaipur, in the Indian state of Rajasthan. The diagnostic study revealed that an attempt to cooperate had failed some 20 years before and that no progress had been made since. The reluctance of the firms to participate in even an introductory meeting indicated that years of bitter rivalry had made building trust remarkably difficult.

The strategy pursued by the UNIDO cluster broker was to focus on artisans’ sons, themselves block printers, in the hope that they did not yet share the same mutual mistrust and that their superior education would have given them a longer-term approach to business. A series of one-to-one interviews were conducted to identify their needs and priorities. It emerged that they shared a keen interest in strengthening marketing skills and would be willing to co-finance a suitable training course. In conjunction with a local non-governmental organization (NGO) and support from the Small Industries Development Bank of India (SIDBI), a market-orientation training programme was organized in Bagru for 23 artisans, with an average age of 21. Besides classes on marketing promotion, quality testing, product development, advertising and distribution, the programme included a visit to showrooms and representatives of artisan support agencies in Delhi and to the larger block-printers as well as trading houses in Jaipur.

The reaction was enthusiastic. The young artisans emerged more confident about their marketing skills. They also indicated increased interest in various existing artisan support schemes, of which they had been unaware before the programme. Their enthusiasm rapidly spread to their parents, who started to attend the follow-up meetings in which they had often declined to participate previously.

² More details on characteristics and tasks of brokers will be given in the section “Function of brokers.”



India - Bagru cluster, training of young artisans

Capability-building based on shared targets

Sensitizing and connecting cluster actors as well as producing cluster diagnostics are preliminary steps towards identification of a shared vision for the cluster and implementation of a joint action plan. These two steps are, by nature, a work-in-progress which evolves on the basis of learning-by-doing. At the early stages of cluster development, a cluster action plan is little more than a collection of activities loosely coordinated; cluster brokers initially concentrate on short-term strategies involving smaller groups of enterprises and institutions. As cluster development proceeds and a broader vision for the cluster starts to emerge, activities increasingly focus on a larger group of local actors and on longer-term issues.

At all stages, however, local actors fully and actively participate in the definition of joint activities, they are called to monitor progress in implementation; and they ensure that mutual commitments are maintained.

India - Ludhiana cluster, women trained by the UNIDO programme



Ludhiana cluster (India): stakeholders participation

The diagnostic study of the knitwear cluster of Ludhiana, in the Indian state of Punjab, comprising more than 10,000 small- and medium-scale firms, singled out how it had cornered nearly 90 per cent of the national market for woolen knitwear products. However, increasing liberalization of the Indian economy and the anticipated inflows of cheaper goods from countries such as Nepal and China, were bound to trigger a crisis. Therefore, the cluster had to expand from its domestic market and become more effective in the international arena. This move, however, required investment for the upgrading of production capacities, especially workers' skills, finishing technology and innovation.

Thanks to a UNIDO cluster broker, several local associations were revamped to take a more proactive role towards their members and cooperation was strengthened within a core of forward-looking cluster producers with a specific focus on exports. In time, this cooperation led to the formation of the Apparel Exporters Association of Ludhiana (APPEAL) as well as identification of a common agenda for action including initially visits to foreign fairs and, later, broader issues such as skill and technology upgrading.

Responding to the under-representation of skilled female workers within their firms, APPEAL members approached UNIDO for support. UNIDO brokered the first meeting between a delegation from APPEAL and the Department of Technical Education (Government of Punjab). Following extensive interactions, a memorandum of understanding was signed by the two parties for the establishment of a training cell within the local Government Polytechnic for Women (GPW). APPEAL provided GPW with a clearly articulated syllabus as well as the machinery on which the women could be trained. A major Japanese transnational company was also drawn into the project, donating more than US\$16,000 worth of equipment. Moreover, UNIDO ensured an effective tie-up with a local NGO, which helped potential trainees among young women from a poor area. Against the background of such a broad local partnership, the training programme was sanctioned for financial support by the Department of Science and Technology (Government of India).

The first training programme was launched by GPW in September 1999 for 20 trainees. It comprised theoretical and practical lessons, which lasted for three months. Over the subsequent year, seven group training sessions were carried out and more than 110 women trained, 80 per cent of whom found immediate employment in the cluster.

Owing to the commitment of cluster stakeholders, the costs related to all cluster activities were shared with local institutions and the private sector. UNIDO covered only 20 per cent of the cost of technical assistance, while the private sector covered 74 per cent and other institutions 6 per cent.

The greatest obstacle to cluster development is often lack of coordination, consistency and relevance rather than absence of support services available to enterprises. This implies that, in most instances, capability building

does not necessarily mean creation of new institutions or BDS but ***networking existing ones and bridging the gap between supply and demand.***

Boaco and Chontales cluster (Nicaragua): institutional networking

Boaco and Chontales, two neighbouring departments in the centre of Nicaragua with a strong, well-established specialization in the production of milk and milk products constitute one of the clusters assisted by a UNIDO project.

From the outset, UNIDO project brokers established close cooperation with other important institutions committed to the support and development of the milk and cheese sector. To facilitate joint action, a committee for institutional coordination was established. This proved to be a crucial step to institutionalize cooperative efforts and ensure their continuity in the medium to long term as well as to share tasks and activities to capitalize on available capabilities, skills and resources.

The process began with benchmarking against other Latin American clusters in Argentina, Chile, Colombia, Mexico and Uruguay, as well as in the Netherlands. Using an approach based on direct participation by local entrepreneurs and institutions, bottlenecks were then identified at different stages of the production chain and possible solutions highlighted as the basis for an action plan. This focused on improving the quality of cheese and diversifying the types marketed as well as on environmental and organizational aspects.

The implementation of the action plan, in coordination with local participants, has so far generated the following results:

- o Technical norms have been established and diffused for fresh milk and milk products (in cooperation with Ministry of Environment, Ministry of Health, Ministry of Agriculture and Ministry of Industry and Trade)
- o Five new products were launched on the market (training and technical assistance were provided in cooperation with INPYME³ and the Interamerican Development Bank)
- o Quality improvements, especially in the application of hygiene and production efficiency, with an average 25 per cent increase in yields
- o Reduced pollution of residual water by as much as 70 per cent
- o Creation of one cooperative (joint endeavour with PRODEGA⁴ and Fundación Niebrowsky) to regularize and improve milk supply to cheese producers and establish a joint purchasing system for other production inputs
- o Relocation of a number of cheese producers outside the urban area to reduce environmental impact
- o Subcontracting arrangement with a large multinational company to decentralize production of one type of cheese to some cooperatives in the clusters, with the multinational company supplying equipment and training the members of the cooperative to run the facility
- o Promotion of the establishment of a testing laboratory for milk quality assurance in cooperation with INPYME and Interamerican Development Bank
- o Promotion of an alliance among cooperatives with the task of representing the local sector and establishing a common technical service centre for the milk/cheese cluster
- o Support for creation of the Nicaraguan Chamber of the Milk Sector (CANISLAC) in cooperation with the National Programme for Competitiveness and the Milk Federation of Central America and the Caribbean (FECCALAC)

These achievements would not have been possible if the project had not focused on different levels of the supply and production chain and involved all important institutional actors, both at local and national level.

³ Instituto Nicaragüense de apoyo a la Pequeña y Mediana Empresa.

⁴ Proyecto de Desarrollo Ganadero.



Nicaragua - Boaco, milk testing laboratory

Sustainability of the cluster development process

Training programmes, technical assistance, joint learning workshops, presentation of best practices, creation of discussion fora and the like, constitute the implementation phase of a cluster action plan. They are meant to overcome the gaps identified through the diagnostic study of the SME support system. At the same time, however, these activities provide an opportunity for cluster participants to test each other's delivery capability, upgrade efficiency and effectiveness in relation to SME

needs and prepare to assume brokering functions to undertake common initiatives. The ultimate goal is to promote the emergence of an autonomous cluster governance framework ensuring that local development continues after completion of a UNIDO project.

How the progressive transfer of responsibilities to local actors is ensured will be illustrated in the section "Function of brokers".

Horizontal networks

Most of the general concepts applicable to clusters are also valid for networks. The main difference is that here the target is **groups of enterprises with a common business initiative**.

As previously mentioned, the reason why this programme has a specific emphasis on enterprise networks is because enterprises that are part of them are able to improve performance and overcome obstacles imposed by size. Among the main benefits that networks generate are:

- o *economies of scale and increased negotiation power* (reduced costs of raw materials due to collective purchases, access to markets that demand higher quality, incorporation of more expensive technologies, easier access to subcontracting relationships with large-scale enterprises, etc.)
- o *increased capacity for learning and innovation* (jointly SMEs are better able to obtain, select and filter information)
- o *increased capacity of strategic management* (networks are in a better position to take

strategic decisions since they are able to reduce factors of uncertainty)

As with clusters, networks are not easy to establish despite their potential advantages, because individual enterprises are rarely willing to assume the costs that joint initiatives imply such as those of coordinating and achieving a consensus among different, often competitor-partners. Coupled with mistrust and fear of opportunistic behaviour, this often blocks cooperative initiatives.

Brokers, however, can help entrepreneurs lower costs and kick-start joint initiatives. The **steps of this process** are similar to the ones described for cluster development:

1. *Promotional and motivational activities of potential network partners*
2. *Assistance in strategic planning of network activities*
3. *Pilot projects* (usually short-term activities to promote trust)
4. *Strategic projects* (longer-term and of more strategic nature)
5. *Self-management*



India - Sanganer,
network of hand-block printers

Woodworking network in Masaya (Nicaragua)

Masaya, a town in southwestern Nicaragua, is at the centre of a relatively high concentration of woodworkers. Fifteen of these micro- and small-scale entrepreneurs, who live and work in the same quarter of the town, decided to participate in the UNIDO networking project to become more competitive by joining forces.

The initiative proved successful since the group is now producing for a higher quality segment of the local market, exporting three models of rocking chairs to the United Kingdom and participating in trade fairs with a common catalogue and quality standards.

After nearly three years of working together, the group represents an interesting case study. As its first joint activity, the group opened a shop selling production inputs, which were scarce and expensive on the local market. As well as benefiting members of the network the shop introduced competition into the local market, forcing other retailers to lower their prices of inputs to the advantage of all local woodworkers.

The possibility to export to the United Kingdom constituted a powerful incentive to restructure production organization and processes. The networked enterprises jointly agreed on designs, prepared common product specifications allowing them to harmonize production standards and quality and set up a group quality control system. Moreover, they started to purchase wood in bulk allowing them to obtain cheaper prices.

The history of the group has not been without crises and obstacles. For example, its membership changes due to expulsion of those who proved opportunistic at the expense of collective initiatives. The reconfiguration of the network has been crucial in leading to a more confident group, in which rules are well established and, most of all, respected. At the same time this group is not isolated from the rest of the productive community. Recently, for instance, a new member joined and more are likely to be integrated depending on common projects that will be developed.

Three types of initiatives have proven crucial to increase trust and consolidate this network: definition of written rules for group initiatives; activities to facilitate mutual knowledge such as joint participation in trade fairs; and other initiatives for fostering group identification such as the creation of a common business card and catalogue. Undertaking low risk activities, to demonstrate the advantages of collaboration has proven a crucial preliminary step to building trust and fostering more strategic projects.

The network is currently exploring new ideas including the creation of a selling point of wood which, due to restricted supplies of good quality wood on the legal market, should, again, bring benefits to all local furniture producers. Another project aims to relocate all members to a common working place, where they could use each other's machines, buy new ones together and reorganize their production. Implementation of both projects is only possible through the network because, as enterprises act together, they have more leverage to access the loan market and offer sufficient guarantees to receive long term loans.

Networks are also entry points that have impact on other levels of the enterprise support system.

Networks and beyond: Senegal and Zimbabwe

Senegal: from networks to associations to policy

In the Senegal project, which began in 2001, policy level problems affecting the SME sector have been identified while conducting the initial diagnostic study. Common to many of them is the inability of the SME sector to efficiently defend its interest, which is also due to inefficient and badly organized SME representative institutions. In order to stimulate change and improve the policy framework, enterprises need to voice more strongly their concerns and needs. Networks are being promoted within the project in order to help enterprises increase awareness of challenges, problems and opportunities, thus making them better able to support the work of associations and, ultimately, influence policy level changes.

Zimbabwe: networks and BDS upgrading

Similar to the Senegalese case, in Zimbabwe networks are more than an end in themselves. By building networks, the project also aims at triggering the restructuring of several business development service providers for technical and managerial skills, quality management services, design services and the like. The idea is to organize demand for those services in a more systematic way in order to have a consolidated approach towards BDS providers and - through the networks - stimulate the offer of upgraded and more efficient services.



Nicaragua - Masaya, detail of chair making



Nicaragua - Masaya, rocking chair for export

Vertical networks

Besides offering a potential market for SMEs, larger manufacturers in a developing country as technological leaders can offer interesting learning and modernization opportunities for smaller firms able to interact with them. Most of these industrial leaders recognize that there are benefits in delivery time, customer service responsiveness, transportation costs and the like, in working with local suppliers. But often do not see it as their job to invest time and money into developing such sources. They, therefore, often prefer foreign suppliers due to concerns about local firms' ability to satisfy their requirements in terms of quality, reliability of deliveries, and low purchase prices. The UNIDO methodology for vertical networks aims to overcome these concerns and **facilitate establishment of collaborative relations between large- and small-scale enterprises**.

The approach emphasizes upgrading of suppliers' capabilities but with close involvement of the larger client enterprises from the outset. The following are the main phases of the process:

1. *Evaluation of potential and current suppliers*
2. *Round-table discussions between client and supplier firms*
3. *Detailed analyses to determine areas of improvement with the suppliers' operation*
4. *Integrated improvement plans implementation*

Integrated improvement plans are developed and implemented for all firms involved including the larger ones. These plans usually start with training in leadership skills, teamwork, planning and modern production and quality assurance techniques. Next, the plans typically propose such actions as improvements in production processes and

plant layout to minimize cycle time and costs, reduction of inventories to free up working capital, and implementation of total quality systems. The plan may later call for modest investments in modern equipment, but, at the beginning, the focus is clearly on improvements involving minimal capital requirements. The broker helps in the execution of integrated improvement plans, generally, during a six-month period working directly with suppliers as well as coordinating assistance from other outside specialists.

The **main advantages** of this kind of approach are:

- SMEs have clients identified from the outset who are involved in the process. This means that supplier upgrading is not generic but is geared towards a concrete objective. This is a powerful incentive for change and improvement.
- The programme's success is measured by the firms themselves, which decide whether to enter into the partnership.
- The improvement plan integrates training, technical assistance and financing.
- Financial intermediaries are willing to lend to small businesses, which might otherwise be ineligible, because of affiliations with large, reputable customers.

This approach has a **multiplier effect** in countries where it is used. Once large manufacturers have seen that a few local suppliers can satisfy their needs and that working with local suppliers has advantages over importing, they develop other local sources. The customer firms are trained in

UNIDO supplier development methodology so that they can continue carrying out this work on their own with other SMEs. In addition, as other small manufacturers see the success of certain SMEs as suppliers to local industry, they are motivated to make the necessary changes

to their own businesses to enter this market. Finally, a country with a better-developed network of suppliers is much more attractive to potential investors in the country's industrial sector.

Nicaragua: vertical linkages unit within the Chamber of Industry

Nicaraguan industry suffers from low levels of local integration, with most supplies being imported. To address the problem, a project was designed in 1999 to establish a unit to foster linkages between SMEs and large-scale enterprises. To ensure local ownership and sustainability, it was decided to work with a local partner who would learn UNIDO's methodology for vertical network development and, then, gradually assume operation of the unit. As the organization encompassing the majority of formal-sector industrial firms in the country, the Chamber of Industry (CADIN), was chosen. The Chamber's position facilitates promotion of supply network development among the country's industrial leaders, and the service complements others offered by CADIN's Industry Support Unit. The sustainability plan established with CADIN calls for a gradual phase-in of fees to be charged for the supply network development package.

The UNIDO/CADIN unit started by presenting the concept to the most reputable manufacturers in the country, obtaining their confidence to participate in the programme. Together with the four large companies that initially took part, potential strategic local suppliers were identified. The participant group that resulted consists of a manufacturer and distributor of footwear collaborating with local shoemakers to supplement its own production; a rum producer teamed up with suppliers of plastic bottles and printed labels; an ice cream and yoghurt factory joined forces with manufacturers of cardboard boxes and refrigeration equipment; and a coffee and cereals processor worked with suppliers of peanuts and plastic jars, as well as the National Metrology Laboratory, which provides scale calibration services.

One of the biggest challenges to establishing the unit was the identification of complementary technical and financial resources. Nicaragua does not have a well-established business development services sector, nor is there a national development bank. To fill these gaps, UNIDO is promoting the creation of consulting groups within the country's universities and, within the private banking sector, the development of innovative financing methods for the supplier firms, drawing on the backing of customer firms. CADIN, itself, is establishing a group of production and quality assurance experts who can be called upon as part of the integrated improvement plans for programme participants. The newly formed consulting groups will bid competitively for provision of training and technical assistance to the SMEs being attended by the UNIDO/CADIN unit. Services provided by these groups will then be paid for partly by recipients of the services and by donors.

Function of brokers

A characteristic of the cluster and networking approach is to rely on **brokers**—also referred to as intermediary agents or system integrators—for implementation. Their activities have been described in previous examples. But who are the brokers? What are the local institutions that can assume a brokering role? The answer varies from country to country. In some instances, it is a public sector agency that assumes the brokerage function, such as a local SME development agency. In others it is an association or an NGO. At the initial stage in UNIDO projects, brokers are local consultants recruited by the project itself to foster cluster or network development. They train local institutions in assuming the brokering function to guarantee sustainability. Although transfer of knowledge and responsibility is progressive work, it requires planning at the earliest possible stage to ensure a smooth continuation of activities.



Nicaragua—Boaco and Chontales

Since the outset of work in the Boaco/Chontales cluster, one of the main concerns has been finding a local institution that could take over the brokering function from the project consultants as well as promote the institutional network and foster implementation of the common action plan. After

a local foundation was identified, its Executive Director and a field agent were trained through a joint learning programme that UNIDO organized in Chile (see “UNIDO package and tools”) and on-the-job, by project consultants. An agreement was made with the foundation for, *inter alia*, a cost-sharing arrangement under which the project is currently subsidizing part of the salary of the field worker, who will be paid solely by the foundation once the training period is finished and the foundation will be able to assume fully its role as broker.

At the same time the “Alianza Lactea” union of cooperatives is consolidating to strengthen the collective initiatives of local milk and cheese entrepreneurs. The idea is that the “Alianza” will progressively assume a leading role in management of the cluster.



India—Jaipur

Colourful hand-block printing enjoys a long tradition in Jaipur, the capital of Rajasthan, where approximately 350 small firms do hand-block and screen printing employing nearly 10,000 workers. Since the 1980s, exports have risen with a growing worldwide demand for ethnic design and eco-friendly dyes. Traditional hand-block printers based around Jaipur, mainly in the villages of Bagru and Sanganer, failed to keep up with demand, especially in the 1990s, progressively giving way to locally based screen printers. As well as having lower production costs, the latter have been able to take advantage of the industry's reputation by using the same designs while substituting vegetable dyes with synthetic ones, even though textiles are often marketed as printed with natural dyes. Increasing competition from screen printers has forced block printers to squeeze their profit margins and increase the degree of self-exploitation.

A diagnostic study by UNIDO in 1997, identified an untapped capacity for the traditional artisans in the cluster to target profitable domestic and foreign markets. The vision and action plan developed for the cluster was based on the revaluation of the traditional form of production and improvement of the living standards of the artisans.

As part of the development of an autonomous governance system, the dormant artisan association, Calico Printers Co-operative Society (CALICO) was revitalized. Membership increased from 26 artisans to 120, and a common show room was created. In addition, several networks have been promoted to provide common services to their members, while the Consortium of Textile Exporters (COTEX) has been formed. New products and designs have been introduced with the assistance of the National Institute of Fashion Technology (NIFT) and a common brand image has been promoted. This has been accompanied by the introduction of courses on marketing and establishment of linkages with national and international markets through joint participation in trade fairs. A credit scheme has been promoted with the assistance of the Small Industries Development Bank of India (SIDBI). Finally, an NGO active at the cluster level, the Indian Institute for Rural Development (IIRD), is increasingly playing the role of the cluster development agent (or broker). This will ensure that UNIDO expertise in the field of network/cluster development devolves to a local institute and that an autonomous governance framework for the cluster of Jaipur will be sustainable after the completion of UNIDO assistance.

Honduras: brokers' sustainability

In the absence of a suitable local institution that could take over the function of the local team of network brokers trained by the UNIDO project in Honduras, a foundation was established "Centro de Recursos y Tecnología" (CERTEC), during the last year of project implementation (1997). Initial members of the foundation have all been major project counterpart institutions, while the staff of the foundation consists of brokers themselves, previous UNIDO national consultants. Since the first year of operation, CERTEC is generating revenues from fees charged for its services to enterprises and institutions. After more than three years following project completion, CERTEC is still in operation and is presently enlarging its line of services.

From these examples lessons can be drawn as to the crucial factors brokers must keep in mind to promote successful networks/clusters:

- o **Proximity.** Although the importance of proximity is debatable in the era of globalization, for inter-enterprise cooperation it is still an important factor. Experience shows that for micro- and small-scale enterprises, it promotes joint endeavours. It lowers transaction and learning costs not only because of physical closeness, but also because of the homogeneity of participants' social background which facilitates trust.
- o **Incentives.** The best incentives for establishment of a network or organization of a cluster are market opportunities and crises. Enterprises are very much encouraged to change their behaviour when they see an imminent reason for it. Crises can be triggered by, for instance, entry of new, stronger compe-



titors, as in the case of the screen printers in Jaipur, or by the introduction of stricter regulations, for instance in food safety as in the case of Boaco/Chontales. Market opportunities are, by far, among the best positive incentives for groups to organize. For this reason, often the starting point of broker work is to help assess market possibilities, organize participation in trade fairs and establish contacts with product distributors or buyers. However, finding markets is a starting point rather than the end of the process. To exploit new opportunities, most of the time a serious restructuring of production or organizational capabilities is needed. Once clients are found, it is common that groups of enterprises are not able to provide requested services or products due to failure in quality, delivery times or quantities.

- o **Progressive establishment of trust.** In the section on cluster development, it was emphasized that the establishment of trust is an on-going process, which translates into progressive integration of more participants into joint activities as well as establishment of more ambitious common objectives over time. Starting small and growing over time as trust increases is, usually, the best way to prevent conflicts and disappointments. The establishment of cluster action plans with clear outputs and responsibilities and, in the case of networks, of network statutes is an important step. They help clarify mutual roles and obligations, thus testing members reliability and performance. They should not, however, become bureaucratic requirements taking up too much of the enterprises/brokers attention and time.

India - UNIDO brokers finalizing details of a training programme

- o **Openness.** Clusters are open systems, and networks are flexible structures. Clusters must look outside their boundaries to understand global trends and adjust their strategies. External linkages, participation in global production chains, exposure to international best practices and benchmarking are of crucial importance to avoid isolation and implosion. In the case of networks, openness translates into networks' capacity to deal with member exits or entries depending on performance and changing features of collective action. At the same time, it refers to the need to avoid introversion but, on the contrary, be able to link up with other instances such as associations or other networks. Network configuration can evolve over time and give way to new forms of inter-enterprise collaboration. This is why network dismantling after a certain period of collaboration and after achieving set targets is not necessarily negative if the enterprises have acquired the capability to establish new and different relationships.

As elaborated above, brokers do not provide pre-defined standard services. Their task is to assess the potential of the cluster, they serve and help local participants to define and implement action plans ***depending on their needs and strategic opportunities***. This precludes such a thing as a standard technical assistance package for cluster development. The steps outlined in each of the previous sections on cluster, horizontal and vertical networks are a common approach in UNIDO projects. However, the content of each type of assistance—training, technical assistance, institutional capability building, improvements of the regulatory and policy framework—are adjusted to local conditions.

Nevertheless, a number of tools and methodologies can greatly facilitate the work of brokers to understand and analyse local conditions and help clients design and implement strategies.





Drawing on its experience in SME network and cluster development, and in SME support to developing countries generally, UNIDO has developed specialized expertise, which has been translated into a series of tools and methodologies. These instruments are ***available to staff and counterparts of UNIDO technical assistance***

Cluster approach

Cluster development methodology. This is a practical approach to help practitioners undertake a cluster diagnostic analysis, identify a vision, prioritize activities and implement and monitor them. It includes case studies drawn from under-achieving and performing clusters and modules to tackle specific problems within a cluster context such as low information technology penetration, low process and product quality and low managerial and technical skill levels. A specific methodology to assess the impact of cluster development at the level of firms, their associations and clusters as a whole is also available.

Training course for cluster brokers. The cluster methodology has been adapted to a training course including a training manual as well as a set of reading materials and videos that

projects to support cluster and network development. The instruments are adaptable to each country and region, and comprise:

- Support tools for design, implementation and evaluation of cluster/network projects
- Programmes for training of brokers

comprises two weeks of class training and six weeks of supervised fieldwork.

Local development methodology. Based on the cluster experience, this methodology has been developed for applications in regions with less concentration of enterprises or more sectorially dispersed ones. Applicable to less developed regions in poorer countries it is based, like the cluster methodology, on the aim of promoting collective efficiency and joint actions.

Cluster-to-cluster cooperation. Among the initiatives for cluster promotion, UNIDO endeavours to connect clusters that can learn from each other. Benchmarking, study tours and exchange of brokers or technicians are activities implemented as illustrated in the case of Morocco.

UNIDO's restructuring of the leather cluster of Fez includes cooperation with the Italian leather cluster of Santa Croce. As well as exchange of technological information and training on leather finishing for Moroccan entrepreneurs, it involves training in Italy for representatives of Moroccan BDS institutions, who will learn how to gear their assistance programmes towards a cluster focus.

Networking approach

Manual on network promotion. A methodology for network development, horizontal as well as vertical, is contained in a manual to assist network brokers. It focuses on the conceptual framework for network promotion, operational steps involved in network development process, actors and institutions needed for its implementation and examples of networks and network brokers.

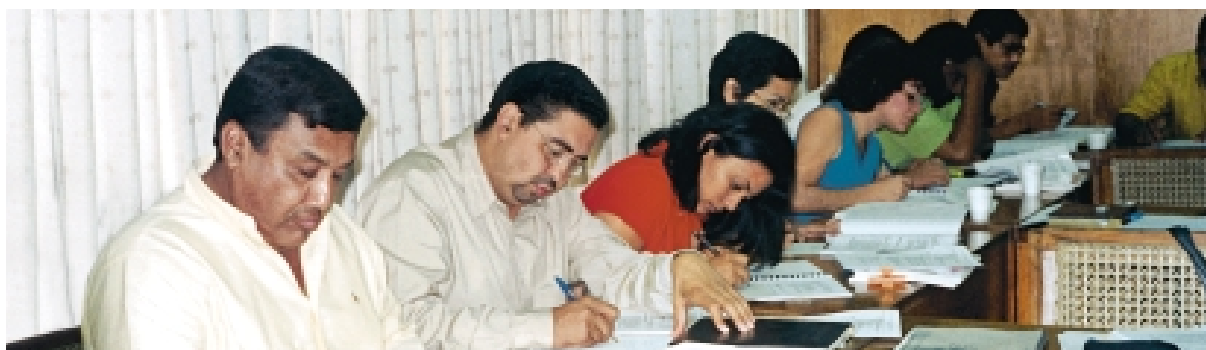
A set of tools complementary to the manual includes:

- o *for horizontal networks:* guidelines on how to elaborate network business plans, description of legal forms the network can assume, guidelines on promotion of leadership, group dynamics and conflict resolution
- o *for vertical networks:* guidelines for enterprise audits, tools for assisting seminars on strategic planning, modern enterprise management techniques and the like

Two training courses (one for horizontal and one for vertical networks) have been developed for building broker capabilities, which include class training and supervised fieldwork over a period of one year. In addition, local workshops are held regularly in order to promote ex-change of experiences between brokers on the promotion of inter-firm cooperation.

NET—Network Evaluation Tool: This guides the various steps of network establishment and evaluates network performance. It is based on a matrix including the various phases of network establishment and seven indicators whose performance is recorded in each phase and benchmarked against target values. The indicators are group cohesion, internal organization, strategic analysis capability, strategic planning capability, restructuring of production, economic performance and capability to connect to an institutional environment.

Nicaragua - training of brokers





Joint Learning Programme in Vienna

Joint learning programmes

The main feature of these programmes is that they bring **together professionals from different projects** to promote the exchange of ideas and experiences. Three programmes have, so far, been organized in Italy, Chile and Vienna. The first analysed the experience of Italian industrial districts, the second examined the Chilean experience of networking promotion and the third focused on methodology update and exchange of experiences between the teams of four on-going projects.

Lasting one week, these programmes attracted cluster brokers as well as representatives of BDS institutions from the invited countries: Argentina, Chile, El Salvador, India, Mexico, Nicaragua, Senegal, Tunisia and Zimbabwe.

The joint learning programmes include:

- o Description of the conceptual framework of

clustering and networking and UNIDO methodology to promote it

- o Visits to and discussions with entrepreneurs to illustrate entrepreneurial network
- o Visits to and discussions with local BDS to understand their role and experience in cluster/network development
- o Information and examples of the institutional framework for promoting and managing networking initiatives
- o Description of practical instruments, such as analysis, monitoring and evaluation tools, to implement cluster/network initiatives
- o Exchange of information and experience among participants to lead to multi-country cooperation initiatives

Complementarity with other UNIDO programmes

The cluster/network development programme is one of the SME programmes managed within the Private Sector Development Branch of UNIDO. The Branch is also promoting other programmes that contribute to and take advantage of the cluster/network approach at various levels focused on:⁵

Business advisory services and business incubators: to provide SMEs with access to publications, referral services, loan packages, training, counselling and help with business planning, in particular, for start-ups

Rural entrepreneurship: focused on small- and micro-sized enterprises in rural areas, particularly in the least developed countries, such as those in sub-Saharan Africa

Partnership programme: an integrated approach to tackle industry-specific problems faced by SMEs, with solutions formulated through a multi-disciplinary team consisting of multinational companies, civil society organizations, universities, governments and UNIDO

Women entrepreneurship development: for policy and legal framework to bring women economic opportunities and institutional support for promoting women entrepreneurs

Policy framework for SMEs: development of SME support strategies, institutional arrangements for governance of the SME sector, local and regional dimensions of policies for SMEs, monitoring performance and skill requirements

In addition to complementarity with Private Sector Development Branch programmes, the

cluster/network development programme draws on other sources of expertise available at UNIDO, especially those of sectoral specialists in leather, textiles and food processing and those related to quality management, environment and cleaner production, subcontracting, investment promotion and industrial policy.

This broad range of expertise gives the programme a unique advantage in offering a comprehensive package of services tailored to the specific needs of a wide range of SME clusters and networks.

Increasingly, joint activities are being undertaken with universities, research institutions, development agencies and other organizations of the United Nations system to improve continuously the services offered by the programme as well as to broaden its outreach.



⁵ For more details of each of these programmes see the UNIDO web site (www.unido.org)

Bibliography

Best, M., 1990, *The new competition: institutions of industrial restructuring*, Cambridge, Harvard University Press

Roelandt, Hertog, 1999, *Cluster Analysis and Cluster-Based Policy*, Paris, OECD

Humphrey, J., Schmitz, H., 2000 *Governance and Upgrading: Linking Industrial Cluster and Global Value Chain Research*, IDS Working Papers, n.120

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

Marshall, A., 1990, *Industry and Trade*, London, Macmillian

Schmitz, H., 1995, *Collective efficiency: Growth path for small-scale industry*, in *Journal of Development Studies*, 1995, Vol. 31, No. 4, pp. 529-566

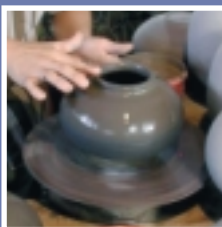
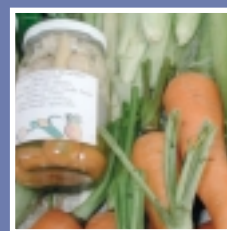
Sengenberger, W, Loveman, G.W., Piore, M. J., 1990, *The re-emergence of small enterprises: industrial restructuring in industrialised countries*, Geneva, ILO

UNIDO, 1995, *Principles for Promoting Clusters & Networks of SMEs*, Small and Medium Enterprises Programme, Discussion Paper, No. 1

UNIDO, 1999, *SME Cluster and Network Development in Developing Countries: the Experience of UNIDO*, Private Sector Development Branch, Working Paper No.2

UNIDO, 2000, *Cluster Development and Promotion of Business Development Services (BDS): UNIDO's Experience in India*, Private Sector Development Branch, Working Paper, No. 6

World Development, September 1999, Special Issue, *Industrial Clusters in Developing Countries*, Pergamon



For information on the UNIDO Programme "Development of Clusters and Networks of SMEs" contact:
 Director - Private Sector Development Branch - A- 1400 Vienna, Austria
 Tel. (+43 1) 26026-4820/4821 Fax (+43 1) 26026-6842 e-mail: cluster@unido.org

The designations employed and the presentation of material in this publication does not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries. The opinions, figures and estimates set forth are the responsibility of the authors and should not necessarily be considered as reflecting the views or carrying endorsement of UNIDO. The designations, "developed" and "developing" economies are intended for statistical convenience and do not necessarily express a judgement about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not imply endorsement by UNIDO. This document has not been formally edited.

Copyright © 2001 by the United Nations Industrial Development Organization (UNIDO).
 First published August 2001.

Produced by UNIDO
 Design: Quorum Italia
 Photography: UNIDO/Nancy Falcon-Castro and archive



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, A - 1400 Vienna, Austria
Telephone: (+43 1) 26026 Fax (+43 1) 26026-69
e-mail: unido@unido.org Internet: <http://www.unido.org>