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**DEVELOPMENT OF CLUSTERS AND
NETWORKS OF SMEs**

THE UNIDO PROGRAMME

by

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WHY THIS PROGRAMME

The guiding principle of UNIDO's approach towards small and medium enterprises is that these enterprises can play a key role in triggering and sustaining economic growth and development in developing countries. Their contribution to employment generation, income growth, and to a wider distribution of wealth and opportunities is well known and represents a viable development option for most developing countries. However, SME's potential is not fully fulfilled because of a particular set of problems characterizing these enterprises which are related to their size.

First of all, individual SMEs experience difficulties in achieving economies of scale in purchasing inputs (equipment, raw materials, finance, consulting services) and are often unable to exploit market opportunities which require large production quantities, homogenous standards, and economies of scale. Small size also constitutes a significant hindrance to the internalization of functions such as market intelligence, logistics and technology innovation and at the same time hinders the achievement of specialized and effective internal division of labour. Moreover, SMEs face a continuous and fierce struggle to preserve their narrow profit margins, small-scale production runs. In developing countries are often locked in their routines and unable to introduce improvements to their products and processes and look beyond the boundaries of their current market to capture new market opportunities.

At a deeper scrutiny, however, it becomes clear that many of these obstacles are not due to SME's isolation rather than of the size factor. As a consequence, they can be tackled in a more effective and sustainable manner through greater cooperation among SMEs as well as between SMEs and institutions in their surrounding environment.

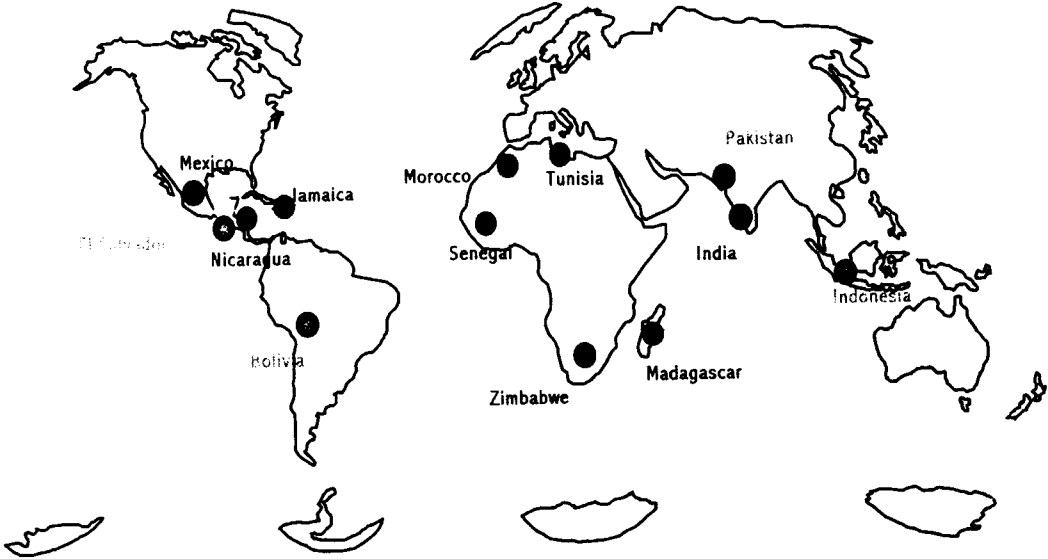
Through **networking**, individual SMEs can address the problems related to their size and improve their competitive position. By coordinating their activities, enterprises can collectively achieve economies of scale beyond the reach of individual small firms and can obtain bulk discounts, achieve optimal scale in the use of machinery and pool together their production capacity to secure large-scale orders. Inter-enterprise cooperation can also allow SMEs to specialize in their business and give way to an external division of labour thus enhancing their productivity. Joint work also allows enterprises to learn from each other, exchange ideas and experiences and make a collective attempt to improve product quality and occupy more profitable market segments.

Evidence from developing and developed countries shows that cooperative relations are more likely to happen when enterprises operate close to each other and share common interests, such as a product market or needs for infrastructure or challenging external conditions. Within such groups or **clusters**, joint enterprises' initiatives are stronger (because of

of interested parties). more cost-effective (because fixed costs can be shared) and easier to coordinate (because of proximity which favors mutual knowledge and trust).

Recognizing the benefits of networking as a business strategy, UNIDO 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 where they have been completed.

On-going, planned and completed projects:



- : projects under design
- Blue: on-going projects
- Black: completed project

THE MAIN FEATURES OF THE PROGRAMME: APPROACH AND EXAMPLES FROM EXPERIENCE

The projects which are part of the UNIDO Programme on clusters and networks development are customized to the characteristics of the countries, of their SME sector and to the local policies and initiatives for private sector development. Broadly speaking, however, three aspects prevail in all such projects:

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

In UNIDO's definition, "**clusters**" are sectoral and geographical concentrations of enterprises which produce and sell a range of related or complementary products and are, thus, faced with common challenges and opportunities. These concentrations give rise to external economies (such as the emergence of specialized suppliers of raw materials and components or the growth of a pool of sector-specific skills) and favor the emergence of specialized services in technical, managerial and financial matters.

"**Networks**" on the other side 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 conquer markets beyond their individual reach. Networks formed by SMEs only are called horizontal to distinguish them from the ones where one or more large enterprises are involved (these are of the vertical type). Networks whether horizontal or vertical can be developed in the clusters or independently of clusters.

The process of cluster development

There is a vast number of examples, in both industrialized and developing countries, of SME clusters that have established themselves as important and dynamic players within the international market responding to global competition challenges by fostering their local opportunities and competitive advantage. Such experiences constitute the key inspiration for the cluster development programme of UNIDO.

The clustering phenomenon is known world-wide

The dynamism and economic success of the numerous SME clusters operating in Italy (in sectors as diverse as textiles, leather, jewelry, optical frames, etc.) is well researched. Further examples of well performing SME clusters can be drawn from other OECD countries such as Germany, Japan, the USA and France. SME clusters are not, however, a peculiar feature of developed economies. For example, the town of Tirupur, in the Indian state of Tamil Nadu, hosts an agglomeration of over 7,000 SMEs that exported in 1999 alone over 650 million US dollar worth of cotton hosiery (over 80% of all Indian exports of such goods) to the USA, Japan and the EU. Very similar accounts can be drawn from neighboring Pakistan but also from Brazil, Chile and Mexico in South America.

The mere concentrations of enterprises operating in the same sector, however, is by no means guarantee of success. This is because the advantages associated with clustering do not always emerge automatically.

In many developing countries, SME agglomerations are in fact a widespread phenomenon. On the outskirts of many cities it is common to notice sizable concentrations of micro- and small enterprises operating close to one another and producing similar goods. Metalworking clusters of this kind or woodworking or textile ones are just very common and familiar images. However, very few of the virtues of a successful cluster can be recognized in these configurations. Cooperation among firms is, in most of the cases, accidental or inexistent. Entrepreneurs, although working and many times living within distance of a few meters, do not share business information, or discuss their common problems, nor organize themselves to implement self-help actions. SMEs have only occasional relationships with providers of business development services (BDS) and are not accustomed to presenting articulated calls for action to the local policy makers. These clusters are characterized by low levels of trust, latent conflicts, and cut-throat competition among firms. As an outcome, they are locked within a vicious cycle of stagnation and poverty.

The transition from this stage of disorganization and stagnation to one of organization and achievement is not easy. The development of trust, constructive dialogue among the cluster actors, exchange of information, identification of common strategic objectives, the agreement on a joint development strategy and especially its systematic and coherent implementation, require substantial efforts and commitment to the common goals. More than anything, this requires:

- time to invest in reciprocal knowledge and coordination
- development vision beyond the daily routine

- long-term commitment.

Some clusters, for different historical, social and economic reasons have been able to cater for these resources within their boundaries and have been able to capitalize their latent common strengths and opportunities. In many other clusters, however, this does not happen spontaneously.

In these cases, external technical assistance can be beneficial to help trigger a process in which the local actors organize themselves and capture the common opportunities.

UNIDO can provide this type of technical assistance with the purpose of fostering local capabilities to generate a shared development vision for the cluster, organizing the dispersed knowledge and resources towards common objectives and helping the implementation of jointly-identified actions.

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

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

The participatory approach to vision-building

When starting the work within a cluster the first and foremost task is to initiate the process of *trust building* among cluster stakeholders – enterprises and institutions. In most cases, prevailing trust levels among the cluster stakeholders are quite low and often entrepreneurs, but also SME support institutions, local government and non-governmental organizations have grown accustomed to accuse each other for the overall stagnation of the local economy. Small enterprises are unhappy about privileges that large enterprises supposedly enjoy, they are dissatisfied about (if not unaware of) the services offered by support institutions and all agree on the fact that public support is lacking. Such conflict burns out much needed human resources and prevents the identification of the real determinants of the ongoing crisis.

The *establishment of a dialogue* to reconstruct 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.

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

When the UNIDO team started a project to support the food-processing cluster of Pune (India), the local entrepreneurs indicated that the stringency of the Food Adulteration Act was the greatest obstacle to the growth of the cluster. As a consequence, their major request was to relax the legislation and grant them exemption from much-feared audits. When 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 was disclosed. Institutions had a strong opinion that the local entrepreneurs did not value adequately the importance of product safety and that they were excessively relying 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 - in an attempt to help the various cluster actors to discuss their perceptions, refocus their problem analysis and identify in greater detail what prevented the Pune entrepreneurs to make use of the existing testing facilities to meet Government regulations.

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

From the above example it is clear that the establishment of a dialogue within an underperforming cluster requires much assistance, which is 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 the implementation of the cluster or networks development initiatives². For such task the broker can count on a range of tools (described in details in section “UNIDO methodologies and tools”) a central feature of which is the diagnostic methodology, whose purpose is to shed light on the following issues:

- ⇒ *The production system (composed of firms engaged in production, their suppliers and buyers)*
- ⇒ *The skill development system*
- ⇒ *The institutional coordination and enterprise representation system*

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

It is important to notice that of foremost importance in this phase³ is the consideration of the *historical, social and cultural local background* as well as previous experiences that can hamper or facilitate the cohesion and synergies among cluster actors. The following case is an example of how to manage a difficult case of trust building.

The cluster of Bagru (India): Trust building

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 disclosed that an attempt to co-operate had failed some twenty years before and that no further move had been made ever since. The reluctance of the firms to participate even in an introductory meeting indicated that 20 years of bitter competition had made any trust-building initiative remarkably difficult.

The strategy therefore pursued by the UNIDO cluster broker was to shift the focus of its vision-building initiatives towards the artisans' sons (themselves block printers) in the hope that they may not yet share the same mutual mistrust and that their superior education would equip them with a longer-term approach to business. A series of one-to-one interviews were conducted to identify the needs and priorities of these young artisans. It thus emerged that they shared a keen interest in strengthening marketing skills, and that they would be willing to co-finance a suitably designed training course. In conjunction with a locally operating NGO and with the support of the Small Industries Development Bank of India (SIDBI), a market-orientation training programme (the need for which had been clearly signaled by the diagnostic study) was organized in Bagru for 23 young artisans with an average age of 21. Besides class teaching on marketing promotion, quality testing, product development, advertising and distribution, the programme included a visit to Delhi (to showrooms and representatives of artisan support agencies) and to Jaipur (to the larger block-printers as well as trading houses).

The reaction of the young artisans was enthusiastic. These young people emerged more confident about their marketing skills. They also reported a greater deal of interest towards various existing artisan support schemes (about which they admitted they had not known anything before the programme). Their enthusiasm rapidly spread to their parents who started to show up at the following meetings (often the very same people that had declined to participate earlier on and had actually displayed a great deal of aggressiveness).

Capability-building actions based on shared targets

Sensitizing and connecting cluster actors is not meant as an end in itself, but rather as a preliminary step forwards the identification of a shared vision of the cluster and the implementation of coordinated capacity-building actions. The definition and

² More details on their characteristics and tasks of brokers will be given in section "The function of brokers"

³ A methodology has been designed in order to conduct this first phase of the cluster work as mentioned in section "The UNIDO methodologies and tools for clusters and network development".

implementation of a cluster vision is necessarily a work-in-progress that builds upon the findings of the diagnostic study and that evolves on the basis of learning-by-doing. For this reason, it is common for cluster brokers to initially concentrate on short-term strategies for smaller groups of enterprises and institutions till, as cluster development proceeds, an all-encompassing vision for the cluster starts to emerge. Since vision-building follows a learning-by-doing path, its success depends crucially on a progressive exercise of *planning actions and assuming responsibilities*. At the earlier stages of cluster development, the cluster action plan is little more than a collection of activities loosely coordinated. As time progresses, however, it increasingly focuses on the shared needs of a larger group of local actors, is developed in consultation with them under the guidance of the cluster broker. This implies that local actors fully and actively participate in the definition of the action plan and use it to guide the implementation of the vision, check progress in implementation and ensure that mutual commitments are maintained. In this sense it is also an instrument that contributes to trust building .

The cluster of Boaco and Chontales (Nicaragua): Design and implementation of a joint action plan

One of the clusters assisted by the UNIDO project in Nicaragua is the one of Boaco/Chontales, two neighbouring towns located in the centre of Nicaragua, with a strong, well recognized specialisation in the production of milk and milk products.

Since the very beginning of the work within the cluster, the project brokers established an intensive co-operation with other important institutions committed to the support and development of the milk and cheese sector (mainly INPYME, INCAE, Ministry of Environment, Ministry of Health, IDR, Ministry of Agriculture, Ministry of Industry and Trade). In order to facilitate joint action a committee for institutional coordination was established. This proved to be a crucial step first of all to institutionalise the cooperation efforts and ensure their continuity in the medium/long term and also in order to share tasks and activities maximizing the use of available capabilities, skills and resources.

In order to start the process of vision building, a benchmarking with other Latin-American clusters (Colombia, Uruguay, Argentina, Chile, Mexico) and European ones (The Netherlands) was developed. Then, using a participatory approach based on the direct participation of the local entrepreneurs and institutions, a number of bottlenecks was identified at different stages of the production chain and a number of possible solutions highlighted generating the basis for the development of an action plan. The concrete actions focused on improving the quality of cheese, on the diversification of the marketed types as well as on environmental and organizational aspects.

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

- Technical norms have been established and diffused for fresh milk and milk products (activity executed in cooperation with Ministry of Environment, Ministry of Health, Ministry of Agriculture, Ministry of Industry and Trade)
- Product diversification: five new types were launched on the market (training and technical assistance were provided in cooperation with INPYME and Interamerican Development Bank)

- Quality improvements (especially in the application of hygienic rules) and production efficiency (average increase of yields equivalent to 25%)
- Reduced pollution of residual water (up to 70%)
- Creation of one cooperative (joint endeavour with PRODEGA and Fundacion Niebrowsky) in order to regularize and improve milk supply to cheese producers and establish a joint purchasing systems for the other production inputs;
- Project of relocation of a number of cheese producers outside the urban area in order to improve environmental impact;
- Subcontracting arrangement with a large multinational company in order to decentralize the production of a certain type of cheese to some cooperatives of the clusters (the multinational company would supply the equipment and train the members of the cooperative who should run the facility);
- Promotion of the “Alianza Lactea”, an alliance among cooperatives with the task of representing the local sector and establishing a common technical service centre for the milk/cheese cluster;
- Support to the creation of CANISLAC (Camara Nicaragüense del Sector Lacteo – Nicaraguan Chamber of the Milk Sector) in cooperation with the National Programme for Competitiveness and FECCALAC (Milk Federation of Central America and the Caribbean).

It should be underlined that these results would have been simply unachievable if the action had not focused at different levels of the chain (milk producers, milk collectors, processing cooperatives, testing laboratories, cheese retailers) and had not involved the cooperation of all important institutional actors (both at local and national level).

Sustainability of the cluster development process

As introduced above, *training programs, technical assistance, joint learning workshops, presentation of best practices, creation of discussion fora*, etc. constitute the implementation phase of the cluster action plan. As such, they are meant to overcome the gaps identified through the diagnostic study in the SME support system. At the same time, however, these activities provide an opportunity for the cluster actors to test each other’s delivery capability and to enable them to take over the brokering function i.e. the capacity to initiate and implement the common initiatives. The ultimate goal is thus to promote the emergence of an autonomous cluster governance framework ensuring that the local development process continues also after the completion of the UNIDO project.

It has been a frequent observation that the greatest obstacle to cluster development is often not the absence of support services available to the enterprises but rather their lack of coordination, consistency and relevance. This implies that in most instances capability building actions do not necessarily mean creation of new institutions or BDS but rather *networking existing ones and bridging the gap between demand and supply*.

The importance of institutional networking has already been illustrated in the Nicaraguan example above. Another such example is the Ludhiana cluster described below.

The Ludhiana cluster (India): Institutional networking

The diagnostic study of the knitwear cluster of Ludhiana, in the Indian state of Punjab, singled out how this cluster, composed of over 10,000 small- and medium-scale firms, had a significant position in the national market for woolen knitwear products (accounting for nearly 90% of the national market). However, the increasing liberalization of the Indian economy and the rapidly approaching inflow of cheaper goods (from countries such as Nepal and China) were bound to trigger a crisis, unless the cluster moved to higher segments of the domestic market and approached more effectively the international one. This move, however, required investment for the upgrading of production capacities (especially workers' skills, finishing technology, and innovation).

As an outcome of intense vision building undertaken by the UNIDO cluster broker, several local associations were revamped (to take a more pro-active role towards their associates) and a much stronger cooperation was established within a core of visionary cluster producers with a specific focus on exports. In time, this cooperation led to the formation of the Apparel Exporters Association of Ludhiana (APPEAL) and the identification of a common agenda for action (including initially visits to foreign fairs, but progressively also covering broader issues like skill and technological upgrading). Realizing the severe under-representation of skilled female workers within their firms, APPEAL members approached UNIDO in search for support. UNIDO brokered the first meeting between a delegation from APPEAL and the Department of Technical Education (Government of Punjab). As a result of prolonged 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). Under the terms of the memorandum, APPEAL provided GPW with a clearly articulated syllabus as well as the machinery (stitching and lock machines) that the women could be trained on. A major Japanese TNC was also drawn into the project, donating over 16,000 US DOLLAR worth of equipment. Moreover, UNIDO ensured an effective tie-up with a local NGO, who helped with the identification of 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 and it comprised theoretical and practical lessons, which lasted for three months. Over the subsequent year, 7 batches were completed and more than 110 women trained, 80% of whom found an immediate employment opportunity in the cluster.

It should be emphasized that thanks to the commitment of cluster stakeholders, the costs related to all cluster activities mentioned above have been shared together with local institutions and private sector. UNIDO has only covered 20% of the cost of the technical assistance provided, while the private sector has covered 74% and the other institutions 6%.

Horizontal Networks

Most of the concepts and the methodological steps described above in relation to clusters apply also for networks – the main difference being that here the target of the action is *groups of enterprises with a common business initiative* (instead of regional systems of enterprises and institutions).

As already mentioned at the very beginning, the reason why this programme has a specific emphasis on enterprise networks is because enterprises that participate in them are able to improve their performances and overcome the obstacles imposed by their small size. Among the main benefits that networks generate are:

- ⇒ *increased capacity of learning and innovation (jointly the SMEs are better able to obtain, select and filter information)*
- ⇒ *increased capacity of strategic management (networks are in a better position to take strategic decisions since they are able to reduce uncertainty factors)*
- ⇒ *economies of scale and increased negotiation power (i.e. reduced costs of raw material due to common purchase actions, access to markets that demand higher qualities, possibility to incorporate more expensive technologies, easier access to subcontracting relationships with large scale enterprises, etc..)*

However, just as clusters, also networks, in spite of their potential advantages, are not easy to establish.

Why?

For two basic factors:

- Transaction costs, including especially information costs and coordination costs
- Learning costs (the costs of implementing changes, such as modifications of production processes or organizational practices or taking other partner's opinions into consideration while taking decisions).

The above, coupled with a frequent mistrust and fear of opportunistic behaviour, often results in the blockage of cooperative initiatives.

Also in this case, brokers can help entrepreneurs lower the above mentioned costs and kick-start joint initiatives. The *steps of this process* are similar to the ones described for cluster development. They can be summarized into 5 steps.

1. *Promotion and motivation activities of the potential network partners,*
2. *Assistance in strategic planning of the network activities,*
3. *Pilot projects* (usually short-term activities to engender optimism and trust),
4. *Strategic projects* (of longer-term and more strategic nature),
5. *Self-management phase.*

The case of a woodworking network in Masaya (Nicaragua)

Masaya, a town in southwestern Nicaragua not far from the capital Managua, is at the centre of an area with a relative high concentration of woodworkers⁴. Fifteen of these micro and small entrepreneurs, who live and work in the same quarter of the town, decided to participate in the UNIDO networking project motivated by the idea of becoming more competitive by working together.

This initiative proved to be the right one since the group is now producing for a higher quality segment of the local market, is regularly exporting three models of rocking chairs to the U.K. and it is actively participating in trade fairs with a common catalogue and agreed quality policies.

The history of the group - almost three years of working together - presents interesting aspects. As their first joint activity, they opened together a shop selling production inputs, which were scarce and quite expensive in the local market. This shop not only benefited the members of the network but also, introducing a competitor in the local market, induced other retailers to lower the input prices to the advantage to all local woodworkers.

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

The history of the group has not been without crisis and obstacles. A problem the group had to deal with was changes in group membership due to the elimination of those members who, in the development of the collective actions, demonstrated an opportunistic behaviour. The reconfiguration of the network has been very important because it has led to a more confident group, in which the rules are well established and, most of all, respected. At the same time this group is not closed from the rest of the productive community. Recently, in fact, a new member joined and further new members are likely to be integrated depending on the common projects which will be developed.

The changes in membership and member behaviour show how important is, for the medium-long term success of a network project, the development of a feeling of belonging to the group and of trust between the members. In the case of this furniture maker network, this was achieved also with the

⁴ In the town of Masaya there are about 400 micro, small and medium enterprises in the wood-working sector within 15 Km around Masaya there are other towns traditionally important for the production of furniture and

definition of written rules for regulating group initiatives, through activities that facilitate mutual knowledge and trust building (such as joint participation in trade fairs) and other initiatives for fostering identification with the group (such as the creation of a common business card and catalogue). The implementation, at the beginning, of low risk activities, just to test the advantages of collaboration, has proven a crucial preliminary step to build trust and enable further more strategic projects.

The network is presently exploring new ideas including the creation of a selling point of wood which, due to the scarce local offer of good quality wood on the legal market, should, again, spill over benefits to all local furniture producers. Another project aims at transferring all members to a common working place, where they could use each other's machines, buy together new ones and reorganise their production in series. The implementation of both projects will only be possible thanks to the existence of the network because, as they act together, the enterprises have more facilities to access the loan market and present enough guaranties as to receive a long term loan.

Networks are also entry point to impact on other levels of the enterprise support system. The following examples illustrate this point.

Networks and beyond: the cases of Senegal and Zimbabwe

Senegal: from networks to associations to policy level

In the Senegal project (implementation started in 2001) networks will be created not only in order to advance enterprise business opportunities but also as a way to organize private sector starting from the very basis. Various policy level problems have been identified while conducting the initial diagnostic study. At the basis of many of them is the inability of the SME sector to efficiently defend their interest. This is also due to inefficient and badly organized SME representative institutions. In order to impulse their change and professionalism, enterprises need to voice in a stronger manner their concerns and requests. Networks will help enterprises increase their awareness of their challenges, problems and opportunities thus making them able to better support the work of association and ultimately influence policy level changes.

Zimbabwe: networks and BDS upgrading

Similarly to the Senegal case also in Zimbabwe (implementation started in 2001) networks are not the solely end of project strategy. By building up networks the project also aims at pulling the restructuring of several business development service providers (in technical and managerial skills, quality management services, design services). The idea is to organize the demand of those services in a more solid way (the networks) in order to have a consolidated approach towards BDS providers and induce the offer of upgraded and more efficient services.

Vertical Networks

other wood products: Granada, Masatepe, Niuginomo and Nandasmó.

Not only do the larger manufacturers in a developing country represent a potential market for SMEs, but also, as the technological leaders within the country, they have the capability to be the driving forces behind the modernisation of the industrial sector as a whole. Most of these industrial leaders recognize that there are benefits (delivery time, customer service responsiveness, transportation costs) to working with local sources of supply, but often do not see it as their job to invest time and money into developing local suppliers. For this reason, large manufacturers in developing countries have preferred foreign suppliers due to concerns about local firms' ability to satisfy their requirements for product quality, reliability in deliveries, and low purchase prices. The UNIDO methodology for vertical networks seeks to mitigate those concerns and *facilitate the establishment of collaborative relations between large and smaller enterprises*.

The emphasis of the approach is clearly on the upgrading of suppliers' capabilities but with a strong involvement, from the very beginning, of the larger – client – enterprise. The following are the main phases of the process:

1. *Evaluation of potential and current suppliers.*
2. *Round-tables between the client and supplier firms.*
3. *Detailed analyses to determine areas of improvement within the suppliers' operations.*
4. *Integrated Improvement Plans*

These plans are then developed and implemented for all the firms involved (including the client 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 to the production process and plant layout to minimize cycle time and minimize costs, reduction of inventories to free up working capital, and implementation of total quality systems. The plan might later call for small investments in modern equipment, but at the beginning the focus is clearly on actions carrying minimal capital requirements. The broker helps in the execution of the Integrated Improvement Plans generally during a 6-month period. He or she spends extensive amount of time working directly with the suppliers, as well as coordinating interventions by other outside specialists.

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

- ⇒ First, the SMEs have clients identified from the outset who are involved in the process. This means that the supplier upgrading is not generic but it is geared towards a concrete objective. This is a powerful incentive for change and improvement.
- ⇒ Second, the success of the programme is measured by the firms themselves (who decide whether to enter into the partnership or not).
- ⇒ Third, the improvement plan is an integrated one, including not just training, or technical assistance, or financing, but a combination of all these elements at the appropriate moment.
- ⇒ Fourth, financial intermediaries are willing to lend to small businesses, which might otherwise be ineligible, because of the ties the SMEs have with large, reputable customers.

This approach has a *multiplying effect* in the countries where it is implemented. 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 actively look to develop other local sources and repatriate supplies currently imported. The customer firms are trained in the UNIDO supplier development methodology, as well as the evaluation system, so that they can continue carrying out

this work on their own with other SMEs. In addition, as the small-scale manufacturing sector starts seeing the success of certain SMEs as suppliers to local industry, the rest 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: The Vertical Linkages Unit within the Chamber of Industry

Nicaraguan industry is characterised by low levels of local integration, with most supplies being imported. In order to address this problem, in 1999 a project was designed to establish a unit to foster linkages between SMEs and LEs (Large Enterprises). In order to guarantee 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 organisation 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 the concept 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 Vertical Linkages Unit started by presenting the concept to the most reputable manufacturers in the country, obtaining their confidence to participate in the program. Together with the four large companies that initially adhered, 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 his own production; a rum producer teamed up with suppliers of plastic bottles and printed labels; an ice cream and yoghurt factory paired off with manufacturers of cardboard boxes and refrigeration equipment; and a coffee and cereals processor working with suppliers of peanuts and plastic jars, as well as the National Metrology Laboratory, which provides scale calibration services.

One of the biggest challenges in the establishment of the Vertical Linkages 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. In order to fill these gaps, UNIDO is promoting the creation of consulting groups within the country's universities and is promoting, within the private banking sector, the development of innovative financing methods for the supplier firms, drawing upon the backing of the customer-firms. CADIN itself is also establishing a group of experts in production and quality assurance that can be called upon as part of the Integrated Improvement Plans for the program participants. The newly formed consulting groups will bid competitively on the provision of training and technical assistance to the SMEs being attending to by the Vertical Linkage Unit. Interventions by these groups will then be paid for partly by the recipients of the services, partly by the Ministry of Industry and Commerce and partly by other donors.

The function of brokers

One of the most characteristic feature of the cluster approach is that it relies on *brokers* (or intermediary agents or system integrators) for its implementation. Their tasks and functions have also been illustrated in the examples above. The question now is: who are the brokers? What are the local institutions that can assume a brokering role? The answer necessary varies from country to country: in some instances it is a public sector agency who assumes the brokerage function (such as a local SME development agency). In other contexts it is an association or an NGO. Before analyzing the examples, it is important to emphasize that in UNIDO projects brokers at the initial stage are local consultants recruited by the project itself to trigger cluster or networks development but also to train local institutions in assuming the brokering function to guarantee sustainability. The transfer of knowledge and responsibility is a progressive work that happens all along the duration of the projects but that should be planned as the earliest possible stage in order to ensure a smooth continuation of the activities.

Cases of brokers: Nicaragua, India and Honduras

Nicaragua – Boaco and Chontales

Since the very beginning of the work in the cluster of Boaco/ Chontales, one of the main concerns has been the identification of a local institution who could take over the brokering function from the project consultants and lead the process of dynamizing the institutional network and foster the implementation of the common action plan. A local foundation was identified for this. The executive director of the foundation and a field agent were trained (at the expenses on the foundation) through a Joint Learning Programme UNIDO organized in Chile (see last section “UNIDO package and tools” for description of this programme) and on-the-job by project consultants. An agreement was made with the foundation envisaging, inter alia, a cost -sharing arrangement by which the project is presently subsidizing part of the salary of the field worker who will be totally paid by the foundation once the training period is finished and the foundation will be able to assume totally its role of broker.

At the same time the “Alianza Lactea” (a union of cooperative as described above) is also being consolidated in order to give strength to the collective actions of the local milk and cheese entrepreneurs. The idea is that this Alianza will progressively assume a leading role in the governance system of the cluster.

India – Jaipur

Colorful hand-block printing enjoys a long tradition in Jaipur, the capital of Rajasthan, where approximately 350 small firms engage in both hand-block and screen printing and provide employment to almost 10,000 workers. Since the 1980s exports have picked up as a consequence of the growing worldwide appreciation for ethnic design and eco-friendly dyes. Traditional hand-block printers based around the city of Jaipur, mainly in the villages of Bagru and Sanganer, failed to keep up with growing demand, especially in the 1990s, progressively giving way to locally based screen printers. The latter not only enjoy lower production costs, but they have been able to take advantage of the industry’s reputation by picking up the same designs while doing away with vegetable dyes in favor of synthetic ones (even though the textiles are often marketed as having been printed with natural dyes). The increasing competition from the screen printers has forced the block printers to squeeze their profit margins and increase the degree of self-exploitation.

The diagnostic study conducted by UNIDO in 1997 identified an unexploited capacity for the traditional artisans in the cluster to target profitable national and world markets. The vision and action plan developed for the cluster envisaged the revaluation of the traditional form of production and the 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, with its membership increasing from 26 artisans to 120, and a common show room has been created. In addition, several networks have been promoted to provide common services to their members and an export consortium, 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 provision of courses in marketing and the 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. This will ensure that UNIDO expertise in the field of network/cluster development is passed upon a local actor and that an autonomous governance framework for the cluster of Jaipur will be sustainable even after the end of UNIDO assistance.

Honduras: brokers' sustainability

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

From the example illustrated in this document, some lessons can be drawn to illustrate some of the crucial factors brokers have to keep in mind to promote successful networks / clusters:

⇒ **Proximity.** It is frequently argued whether in the era of globalization proximity is still an important factor in inter-enterprise cooperation. Experience proves that especially for micro and small enterprises proximity is a great facilitator of joint endeavors since it lowers transaction and learning costs not only because of closeness of the actors but also because of the homogeneity of their social background which facilitates trust.

- ⇒ **Incentives.** The best incentives for the establishment of a network or for inducing the organization of a cluster are both market opportunities and crisis. Enterprises are very much encouraged to change their behavior when they see an imminent reason for it. Crisis can be determined for instance by the entry of new strong competitors (like in the case of the screen printers in Jaipur), by the introduction of stricter regulations (for instance in food safety like in the case of Boaco/Chontales) or even by natural catastrophes. Market opportunities are by far one of the best positive incentives for groups to get organized. This is why many times the starting point of the broker work is to help assessing market possibilities, organize participation in trade fairs, get contacts with product distributors or buyers. However, that finding markets is a starting point but not the end of the process. In fact in order to exploit open possibilities, most of the times a serious restructuring of the production capabilities or organizational ones is needed. It is not infrequent that once clients are found, groups of enterprises are not able to provide requested services or products due to failure in quality, delivery times, quantities.
- ⇒ **Progressive establishment of trust.** In section on cluster it was emphasized that the establishment of trust is an on-going process which translates into progressive integration of more and more actors into the joint activities and in establishing more and more ambitious common objectives over time. Starting small and grow over time inasmuch trust increases is – usually – the best way to prevent conflicts and disappointments. The establishment of cluster action plans with clear outputs and responsibilities and, as far as networks are concerned, of network statutes is an important step. They help clarifying mutual roles and obligations thus testing members reliability and performance. They should not, however, become self-finalized bureaucratic requirements occupying too much of the enterprises / brokers attention and time.
- ⇒ **Openness.** Clusters are not closed systems and networks are not rigid structures. Cluster must look outside their boundaries to understand global trends and adequate their strategies. External linkages, participation in global production chains, exposure to international best practices, benchmarking are of crucial importance to avoid isolation and implosion. In the case of networks openness translates into network's capacity to deal with member exits or entries depending on member performance and changing features of the collective action. At the same time it also refers to the need not to be too much inward-looking but, on the contrary, be able to hook up to 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 relations.

As evidenced above, brokers do not provide pre-defined standard services. Their task consists in assessing the potential of the cluster where they operate and help local actors in defining and implementing the action plans (as outlined earlier) *depending on their needs (as distinct from generic demand) and strategic opportunities*. For this reason, and for obvious differences between clusters, there is no such thing as standard technical assistance package for cluster development. The steps outlined above in each of the sections on cluster, horizontal and vertical networks are a common approach in cluster projects however the content of the single actions (training, technical assistance, institutional capability building, improvements of the regulatory and policy framework) strongly depend on the local conditions. Since conditions constantly change not only for internal factors to the

cluster or network but also for external changes in market, competitors, technology, the process of strategic planning is virtually a permanent one based on a plan-do-check-act cycle.

While emphasizing the fact that no standard services are applicable in a cluster or network development project, it should be recognized that some useful tools and methodologies can greatly facilitate the work of brokers and assist their endeavors to understand and analyze local the local reality and help local people designing and implementing their strategies. These methodologies and tools are described in the next section.

THE UNIDO METHODOLOGIES AND TOOLS FOR CLUSTERS AND NETWORK DEVELOPMENT

As a result of its long involvement in the field of SME network and cluster development, and more generally in the field of SME support in developing countries, UNIDO has accumulated a good deal of specialized expertise which has been systematized into a body of tools and methodologies. These instruments are made *available to staff and counterparts of UNIDO technical assistance projects* in order to facilitate their task of supporting cluster and network development. The instruments are flexible and adaptable to the reality of each country/region. They basically comprise:

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| <p>⇒ <i>Support tools for the design, implementation and evaluation of cluster/network projects</i></p> <p>⇒ <i>Programmes for training of brokers</i></p> |
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On the cluster approach

- ***Cluster development methodology.*** This is a practical methodological tool for cluster development, which helps practitioners to perform a cluster diagnostic analysis, identify a vision, prioritize activities, implement and monitor them. The methodology is enriched by case studies drawn from under-achieving and performing clusters and by a set of modules to tackle specific problems within a cluster context (such as low information technology penetration, low process and product quality, low managerial and technical skill levels, etc.). Moreover, a specific methodology to assess the impact of cluster development actions (at the level of the firms, of their associations and of the cluster as a whole) has also been developed.
- ***Training course for cluster brokers.*** The cluster methodology has been turned into a training course (including a training manual as well as a set of reading materials and videos) that includes 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 where the concentration of enterprises is less pronounced or more sectorially dispersed. It is a methodology applicable to less developed regions in poorer countries but still based, like the cluster methodology, on the idea of promoting collective efficiency and joint actions.
- ***Cluster-to-cluster cooperation.*** Among the various initiatives for cluster promotion, UNIDO endeavours to liaise clusters which can learn from each other. Benchmarking, study tours, exchange of brokers or technicians are activities which are implemented as described in the following box:

Morocco: leather cluster

The UNIDO assisted process of restructuring of the leather cluster of Fez (including relocation of units due to environmental reasons) includes, among other activities, a close cooperation with an Italian leather cluster: Santa Croce. This cooperation envisages not only exchanges of technological information and a training programme on leather finishing directed to the Moroccan entrepreneurs, but also a training programme in Italy offered to representatives of Moroccan BDS institutions who will learn how to gear their assistance programmes towards a cluster focus.

On the networking approach

- **Manual on network promotion.** A methodology for network development (of the horizontal as well as of the vertical kind) has been systematized into a manual to help network brokers carrying out their tasks. This manual includes the conceptual framework for network promotion, the operational steps involved in the network development process, the actors and institutions needed for its implementation and concrete examples of networks and network brokers.
- **A set of tools complementary to the manual** has been organized which includes:
 - **for the horizontal networks:** guidelines on how to elaborate network business plans, description of legal forms the network can assume, guidelines to brokers on some practical aspects such as promotion of leadership and group dynamics or conflict resolution.
 - **for the vertical networks:** guidelines for conducting enterprise audits, tools for assisting seminars on strategic planning, modern enterprise management techniques, etc.
- **Two training courses (one for horizontal, one for vertical networks)** have been developed for developing brokers' capabilities which include class training and supervised fieldwork spreading over a period of one year. In addition, local workshops are held regularly in order to promote the exchange of experiences between brokers on the promotion of inter-firm cooperation and networking.
- **NET – Network Evaluation Tool.** This is an instrument to guide the various steps of network establishment and at the same time to evaluate 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 seven indicators are: group cohesion, internal organization, strategic analysis capability, strategic planning capability, restructuring of production, economic performance, capability to connect to the institutional environment.

Joint learning programmes

The main features of these programmes is that they *join together professionals from different projects* to promote the exchange of ideas and experiences and that they are *organized in countries where interesting*

experiences exist of clusters and networks development. Two such programmes have so far been organized in Italy and in Chile: The first one to analyze the experience of Italian industrial districts and the second one to study the Chilean experience on networking promotion.

Both programmes lasted one week and saw the participation of cluster brokers but also representatives from BDS institutions from the countries invited to participate (India, Nicaragua, Tunisia, Mexico, Argentina, Chile, El Salvador).

The joint learning programmes include:

- Description of the conceptual framework of clustering and networking and the UNIDO methodology to promote it;
- Visits and discussions with entrepreneurs to illustrate examples of entrepreneurial networks;
- Visits and discussions with local BDS to illustrate their role and experience in cluster/network development actions;
- Information and examples of the institutional framework for promoting and managing networking initiatives;
- Description of practical instruments (analysis, monitoring and evaluation tools) to be applied in order to implement cluster/network initiatives;
- Exchange of information and experience among the various participants in order to give way to concrete multi-country cooperation initiatives.

Complementation with other UNIDO programmes

The Cluster/Network Development Programme is one of the SME focused programmes managed within the Private Sector Development Branch of UNIDO. This branch is promoting other programmes which contribute to and take advantage of the cluster/network approach at various levels. These other programmes are focused on⁵:

Business advisory services and business incubators (to provide SMEs with access to publications, referral services, loan packages, training, counseling 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 MNCs, civil society organizations, universities, governments and UNIDO);

Women Entrepreneurship Development (for adequate policy and legal framework to guarantee women equitable benefits from economic opportunities and institutional support for promoting women entrepreneurs);

Policy framework for SMEs (including SME development strategy support, institutional arrangements for governance of SME sector, local and regional dimensions of policies for SMEs, monitoring SME performance and skill requirements of SMEs).

⁵ for more details on each of these programme refer to UNIDO web site (www.unido.org)

In addition to complementation with the Private Sector Development Branch Programmes, the Cluster/Network Development Programme also draws upon other sources of expertise available at UNIDO and especially those of sectoral specialists (in particular in the field of leather, textile, food processing) and those related to quality management, environment and cleaner production, subcontracting, investment promotion and industrial policy.

This wide spectrum of complementary sources of expertise available to the UNIDO Cluster and Network Programme gives this Programme the unique advantage to offer a comprehensive package of services catering for the specific needs of a large typology of SME clusters and networks in a wide number of developing countries.

Finally it should be mentioned that joint activities are increasingly being undertaken also with universities, research institutions, development agencies and other organizations of the UN system in order to continuously improve the services offered by the programme as well as its outreach.