GENERAL REVIEW STUDY OF SMALL & MEDIUM ENTERPRISE (SME) CLUSTERS IN INDIA

1. Macro-Economic Posture of Indian Economy

The economic performance of India has often been equated with the slow growth rate of around 3.5 % never quite entering into the 'take off' stage of the Rostow's model. Some economists believed, as though the nation was destined for it. At the time of India's independence in the year 1947, the nation had a plethora of serious problems to face, viz. shortage of food-grains, poor infrastructure, lack of financial resources, high rate of illiteracy and poor industrial base. To build the nation's economy, following the socialist path of development an overwhelming importance was attached to the public sector units, which the first Prime Minister of India called them "Modern Temples of India".

Private sector was highly regulated :

The Industrial Policy Resolution of 1948, which marked the evolution of Indian Industrial Policy, outlined the broad contours of the policy and defined the role of the state in industrial development both as an entrepreneur and a regulatory authority. In order to optimize the utilization of scarce resources and reduce the threat of re-colonization by the multinationals, centralized planning was adopted with wide ranging controls on private trade, investment, land ownership and foreign exchange.

The foundations of the policy for the small scale industry were laid in the Second Five Year Plan. In 1956, the government announced its second industrial policy which unambiguously chose equity as the guiding principle for small industry development. The operative statement says: "small scale industries provide immediate large scale employment, offer a method of ensuing a more equitable distribution of national income and facilitate an effective mobilization of resources of capital and skill which might otherwise remain unutilised".

1977 Policy Statement

A high watermark in the evolution of the policy for small industry was the 'Industrial Policy Statement' of 1977. It was then that the protection of small industry touched its acme; the guarded initiatives of earlier years were cast aside by a heightened zeal for an expanded role for this sector, in particular, the reservation of products for exclusive manufacturing by the small industry, begun in 1967, was greatly extended to many more products. The important planks of the 1977 industrial policy statement were:

* Whatever can be produced by small, cottage industries must only be so produced.

* The number of products reserved for SSI was increased from 180 to 504 an further to 836 items in 1996.

* Special attention to be given to the `Tiny Sector' defined as enterprises with investment in plant and machinery of upto Rs. 1 lakh and situated in towns and in villages with population less than 50,000.

* Special Legislation will be introduced to give due recognition and adequate protection to the self-employed in cottage and household industries.

* The focal point of development for small sector and cottage industries will be taken away from big cities and state capitals to the district headquarters. In each district, there will be one agency to deal with all requirements of small and village industries. This will be called "District Industries Center".

* Special arrangements for marketing of the products of Small Scale Sector will be made by providing services such as product standardization, quality control, marketing surveys, etc.

1980 Policy Statement

The recognition of the importance of ancillary industry found expression in the policy statement of 1980 which laid emphasis on ancillaries. Moreover, the program for the development of rural and backward areas was accelerated.

The Industrial Policy Statement of 1985 made incremental changes and took into account the impact of inflation. The investment ceiling for SSI was raised to Rs. 35 lakh and for ancillaries to Rs. 45 lakh.

Leading to a liberal regime :

The Industrial Policy of July 1991 marks a conscious shift from the regulated and controlled policy to a liberal one. Most of the medium and large industrial units, with a few exceptions, would no longer need licenses. Full foreign ownership will henceforth be possible in export - oriented enterprises. Import of capital goods has been significantly made free from restrictions. Foreign equity participation is also encouraged. The openness that has come with the ongoing economic reform process during the last five years has hastened several changes and the debate has shifted from the *'whys'* to *'hows'* indicating high level of acceptability of the reform process. With the lifting of several trade and investment related restrictions, India is witnessing a mini-revolution in its economic growth faced with the challenges of global market and competitiveness.

Impact is felt now :

The impact of these reforms that were started in the year 1991-92, is now becoming clear as per the Economic Survey for 1995-96. Salient features of the economic growth in the post-liberalization era are given as under;

a. Growth of GDP at factor cost during 1995-96 is estimated to be 6.2% in 1994-95 that has gone up from a level of 0.8% in the crisis year of 1991-92.

b. After a low employment growth during the crisis year of 1991-92, annual total employment growth has averaged at 6.3 million jobs per year over 1992-93 to 1994-95 and has reached 7.2 million during 1994-95. The Gross domestic savings rates touched a record high of 24.4%. Real gross and capital formation also reached a record of 22.2% in 1994-95.

c. After declining by 6.2% in the crisis year 1991-92, the growth of real wages of unskilled agricultural labor averaged 5.1% per annum in the following three years.

d. Provisional estimates by the Planning Commission indicate that in 1993-94, the incidence of poverty had declined to below 19% of India's population.

e. After registering a decline in the dollar value of exports in 1991-92, the country has witnessed a strong three year boom with annual export growth averaging 19% during the period 1993 to 1996.

f. The country's external debt growth situation showed a marked improvement by averaging at $2.2 billion per year during the period 1991 to 1995 as against an average of $ 4.9 billion during the period from 1986 to 1991.

g. The industrial sector has shown a growth of 12 % in the year 1995-96.

h. The agricultural production has increased from 168 million tonnes in 1991-92 to 191 million tonnes in the year 1994-95.

Some problems remain to be solved :

Despite the impressive performance of the economy during the last few years, the per capita GNP is still very low and is US dollar 310 a year. There exists a large disparity in the income levels. About 250 million people in the middle class constitute a major market for domestic and imported goods while an estimated 30% of her population lives below poverty line. Second, inflation is an area of concern and continues to be around 10% during the period 1991-92 to 1994-95. It is only in the last year that the rate of inflation has declined to about 6%. Third, the balance of payments situation is an area of concern. Imports in the Indian economy have been fueled up by liberalization while rate of growth in exports has not been able to keep pace with it. The table below presents the figures for the balance of payments.

Table 1 : Balance of Payments (in US $ million)

Year	Exports	Imports	Trade Balance
1991-92	18,266	21,064	-2,798
1992-93	18,869	23,237	-4,368
1993-94	22,683	25,069	-2,386
1994-95	26,857	31,840	-4,983
1995-96	32,467	41,405	-8,938

2. Small Scale Industry in India

SSI, a vehicle to achieve multi-fold objectives :

Small scale[1] sector has remained high on the agenda of all political parties, intelligentsia and policy makers since Independence as a legacy of Gandhian[2] philosophy. The special thrust to this sector has been with the multiple objectives of employment generation, regional dispersal of industries and as a seedbed for Entrepreneurship. The contribution of small scale industries (SSIs) has been remarkable in the industrial development of the country. It has a share of 40% in the industrial production. 35% of the total manufactured exports of the country are directly accounted for by this sector. In terms of employment generated, this sector is next only to agriculture employing approximately 14 million people. *As per the classification of Indian Small Scale Industry, the activities of trading and services (leaving aside few industrial services) are not included in this classification of Small Industries.*

Several of these objectives have been fulfilled with SSI growth :

The growth of the SSI has been prominent. In 1980-81, the number of SSI units was 8.74 lakhs * whereas at the end of 1995-96 the number had gone up to 28 lakhs. The total value of output in 1993-94 at current prices was Rs. 241,648 crores ** and exports were of the order of Rs. 24,000 crores. To compare the increase, figures from the two All India Censuses in 1972 and 1988 depict the production increase from Rs. 2,603 crores to Rs. 13,528 crores, both at 1972-73 prices thus representing an increase of 420 % during that period[3]. Overall, the small industry sector has done quite well and has enabled the country to achieve considerable industrial growth and diversification. Being generally low capital intensive, SSIs suit the Indian economic environment with scarce financial resources and large population base. In addition, it is highly labor intensive and has a scope for building upon the traditional skills and knowledge.

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1 Small scale unit is defined as one with a maximum investment of Rs. 6 million in plant & machinery. While there is no minimum limit to it, the upper ceiling is relaxed for exporting firms and ancillary firms. This limit is slated to increase to a figure of Rs. 30 millions following recent policy changes in early 1997.

2 Mahatma Gandhi, father of India and chief architect for the nation's independence used the ideology of economic self reliance at village level to not only reduce India's dependence on British but also to generate mass employment.

* One lakh = 100 000 (0.1 million)

** One crore = 10 millions = one hundred lakhs

3 Modern Small Industry, 1972 and 1987-88, Aspects of Growth and Structural Change, J.C. Sandesara, Economic and Political Weekly, February 6, 1993.

Major provider of employment **:**

Employment in the manufacturing sector has been largely generated by the small scale sector. In the total manufacturing sector, the share of registered small scale enterprises (SSEs) is 48.8%. The household and non registered SSEs together contribute 37% of the employment generated. Together all SSEs, registered and unregistered (informal) generate employment to the extent of 85.8% of the manufacturing sector. The following figures refer to the year 1993-94 ;

Table 2 : Employment in the Manufacturing Sector

Type of firms	Employees (in lakhs)	Percent composition
Factory sector	**62.50**	**21.8**
-Large firms	40.60	14.2
-SSEs	21.90	7.6
Non Factory sector	**224.20**	**78.2**
- SSEs registered	118.10	41.2
- SSEs not registered	38.10	13.3
- household	68.00	23.7
Total	**286.70**	**100**
Total SSEs	**246.10**	**85.8**

SSI Sector produces wide range of products :

The small scale sector produces a wide range of products, from simple consumer goods to highly precision and sophisticated end-products. As ancillaries, it produces a variety of parts and components required by the large enterprises. The sector has emerged as a major supplier of mass consumption goods like leather articles, plastics and rubber goods, fabrics and ready-made garments, cosmetics, utensils, sheet metal components, soaps and detergents, processed food and vegetables, wooden and steel furniture and so on. More sophisticated items manufactured by the small scale sector now include television sets, electronic desk calculators, microwave components, air conditioning equipment, electric motors, auto-parts, drugs and pharmaceuticals.

Rural Enterprises

Rural and Traditional Sector enterprises largely from amongst the unregistered SSEs and non-farm sector contribute to about 15 % of the total output of Small Scale Industries but about 40% of the work force is employed in this sector. These industries are based on traditional skills and are based on simple manufacturing processes that are carried out by making use of hand tools mostly and in few cases by use of simple machines. This also explains the larger employment generated in these units.

3. Government's Promotional Policy and Support Network

New policies/measures for SSEs :

In order to help the sector integrate with the industry at large within liberalized economic framework, the government of India has announced new policy measures. In the present context, the following are of particular interest as announced in the year 1991 :

a. The investment ceiling for the purpose of definition of a small unit has been raised to Rs. 6 million (Rs. 7.5 million if the unit concerned undertakes to export 30 percent of its output or if it is an ancillary unit i.e. a firm supplying at least 50 percent of its output to large scale industries).

b. Other investors (including large scale enterprises and foreign investors) are now allowed 24 percent equity participation in a small scale unit

c. The Act on Delayed Payments to Small and Ancillary Enterprises has been promulgated. Under this act, buying/mother units will be required to pay interest on delayed payments for supplies bought from SSI units if the payments are delayed beyond the negotiated and agreed upon time period.

d. The Reserve Bank of India has announced a package of measures to ensure a better flow of credit to the SSI through measures such as expansion of 'single window' loan scheme. Banks are encouraged to open specialized SSI branches and to give greater priority to the sector in their annual credit budgets.

e. Access to inputs has been improved by giving SSI priority to allocation of iron and steel from public sector undertakings and by removing obstacles to imports of a range of raw materials and intermediate products.

f. The number of products which are reserved for SSI stands at 836 in 1994. This represents a decrease of only 7 items since the economic reform process has been initiated in 1991.

The Government of India during the pre liberalization period i.e. before 1991 had several incentives and subsidies for promotion of SSI sector. These included providing term finance at concessional rates of Interest, higher debt-equity ratio, capital investment subsidies to encourage investment in less developed areas, incentives for starting electronic industries etc.

The government promotional framework :

The central and state governments in India have together set up an elaborate 3 tier structure for promoting the small scale sector :

1. At national level, in pursuance of the recommendations of International Perspective Planning team (1953-54), several institutions have been set up. There is 'Central Small Industries Organization' (CSIO) which has been renamed as 'Small Industries Development Organization' (SIDO). During the last three and a half decades, this institution has emerged as the core promotional agency at the central level with a professional staff of more than

13,000 in the year 1993. It consists of 28 Small Industries Service Institutes (SISIs), 30 branch SISIs, 37 extension centers in specific products and 74 workshops as in the year 1993. However subsequently, some of these have been wound up due to their financial non-sustainability. These institutions provide technical and management consultancy, organize training programs, conduct techno-economic surveys, prepare project profiles and help prepare unit specific project reports.

Besides, there are four regional testing laboratories with state of the art equipment and 19 field testing stations which are meant to promote awareness on quality control and standardization, provide testing facilities, provide preshipment inspection as required by the 'Export Promotion Councils' and organize related training programs. In addition, there are two 'Prototype Development and Training Centers' (PDTC) to develop new technologies and upgrade the existing ones. There are a number of other technical institutions that are working closely with SIDO, which are more specialized in the fields of Tool designing, Electronics and Measuring instruments, Prototype development and Handtools etc. Four 'Central Tool Rooms' in Delhi, Calcutta, Bangalore and Ludhiana, have been set up under bilateral assistance programs.

Table 3 : Administrative Structure for Governance of Small Scale Industries

Industry	**Agency**	**Administrative Dept./Ministry**
Large/Medium Industries		Dept. of Industrial Policy and Promotion and Dept. of Industrial Development, Ministry of Industry
Small Scale Industries	Small Industries Development Organization	Dept. of Small Scale, Agro & Rural Industries, Ministry of Industry.
Powerlooms	Textile Commissioner	Ministry of Textiles.
Traditional Industries		
Khadi and Village Industries(KVI)	Khadi and Village Industries Commission	Dept. of Small Scale, Agro & Rural Industries, Ministry of Industry.
Handlooms	Development Commissioner (Handlooms)	Ministry of Textiles
Sericulture	Central Silk Board	Ministry of Textiles
Handicrafts	Development Commissioner (Handicrafts)	Ministry of Textiles
Coir Fibre	Coir Board	Dept. of Small Scale, Agro & Rural Industries, Ministry of Industry

In practice, the small scale industry sector serves as a residuary sector in the sense that all units that fall within a prescribed investment limit and are not recognized in a particular subsector are included in the small scale industries sector.

'National Small Industries Corporation' (NSIC) is another important institution set up in 1955 that supplies primarily imported machinery on easy finance terms, provides marketing assistance, operates 'Prototype Development and Training Centers' (PDTC) in specific fields such as machine tools, injection molding, leather manufacturing equipment etc. NISIET (now called National Institute of Entrepreneurship and Business Development i.e. NIESBUD) was set up to train and promote personnel, industrial managers and entrepreneurs.

Other national level institutions that are supporting the small scale sector are 'National Research Development Corporation' (NRDC), 'Bureau of Indian Standards' (BIS), 'National Productivity Council' (NPC), 'Consultancy Development Center' (CDC) and 'Electronics Test and Design Centers' (ETDC). The central financial institutions have also set up the Entrepreneurship Development Institute of India (EDII) at the national level to promote entrepreneurship.

All the above mentioned institutions are largely meant for the modern small scale industry. In order to promote khadi and village industries, a separate high level commission has been set up under the Ministry of Industry. Similarly for the handlooms, handicrafts, sericulture and other non-modern small units there are separate divisions to promote them.

2.. At the state level, the governments have set up institutions as follows :

- ❑ Small Industry Development Corporations (SIDCs) to develop infrastructure in the form of industrial plots and industrial sheds.
- ❑ State Financial Corporations (SFCs) to provide long term credit facilities.
- ❑ State Exports Promotion Corporations to provide marketing assistance for exports from the small scale sector.
- ❑ Technical Consultancy Organizations (TCOs) that provide technical, financial and marketing consultancy to the sector.
- ❑ Center for Entrepreneurship Development (CEDs) and Institute of Entrepreneurship Development (IEDs) have been set up to promote entrepreneurship through training.

3. At District level, in the year 1978, the central government launched a program of establishing District Industries Centers to provide under a single roof all the support services, clearances, licenses and certificates required by the small entrepreneurs. There are more than 400 such centers, one each in a district.

Institutional Finance for Small Scale Industries:

The following agencies through their various schemes provide finance to small scale industries sector under the overall policies and guidelines evolved by Reserve Bank of India.

At the National Level:

1. Small Industries Development Bank of India (Mainly through re-finance)
2. National Bank for Agriculture & Rural Development

3. National Small Industries Corporation
4. Khadi & Village Industries Commission
5. Nationalised Banks
6. Development Commissioner, Small Scale Industries (DCSSI)

At the State Level:

1. State Financial Corporations (SFCs)
2. State Industrial Development Corporation (SIDCs) - Infrastructure/Finance
3. State Cooperatives Banks
4. Khadi & Village Industries Board

At Regional & District Level:

1. Regional Rural Banks (RRBs)
2. District Central Cooperative Banks
3. Primary Cooperative Banks
4. Branches of State level institutions & nationalised banks about 65,000 in number
5. Khadi & Village Industries Commission
6. District Industries Center (DIC)

The non government promotion structure :

There are three national associations representing all type of industries, small and large. These are 'Federation of Indian Chambers of Commerce and Industries' (FICCI), Confederation of Indian Industries (CII) and 'Association of Chambers of Commerce and Industries' (ASSOCHAM). These associations represent mainly the interests of large scale industries. However, these associations have membership of small sector as well and represent mainly the policy related interests of SSI sector.

The exclusively small industry related associations are diversified geographically and sectorally and are supposed to have been linked with 'Federation of All India Small Scale Industries' (FASSI), 'Federation of Small and Medium Industries' (FOSMI) and also Indian Council of Small Industries (ICSI). However these institutions are weak in character due to their working for cross purposes and lack of dynamic perspective for small scale sector growth. They have virtually no linkages with the small industry in general and their local associations in specific. Another institution that is concerned with the small and medium enterprises is 'World Assembly of Small and Medium Enterprises' (WASME). There are only a few of the local associations that are involved in providing specific individual level services to the small industry. However, all the associations are involved in lobbying with the government to provide one or the other facilities or benefits to the sector.

4. Conceptual Frame-work for Development of a Cluster

Definition of a cluster :

At this juncture, it may be useful to understand the characteristics of a cluster. A cluster may be defined as a local agglomeration of enterprises (mainly SMEs, but often also including some large enterprises), which are producing and selling a range of related and complementary products and services. An example can be a localized leather industry which includes leather tanning units, leather finishing units, leather goods producers, leather garment manufacturers, designers, sub-contractors, merchant buyers and exporters etc. It must be, however, highlighted that a cluster is not merely a hardware, consisting of a group of industries located in a particular area .Its success and dynamism are highly dependent on the software i.e. the linkages and relationships that get established or are consciously established over a period of time. The precise definition of a cluster based on quantitative parameters may vary from country to country.

Typology reflects only a static view :

Clusters can be categorized in different ways. But before developing the typology, it is important to realize that such classifications may help to provide useful first static insight into the structure of a cluster, but need not present a dynamic picture of that. Therefore typology should not be used to generalize any policy prescriptions. Secondly, the categorization of a cluster into a specific type during the course of its evolution or later due to changes in the international scenario may change. This typology presented as under is therefore a first cut at taking stock and organizing the information on clusters in India and any further understanding of how the specific clusters function would require detailed analysis of each cluster.

A total of 138 clusters have been chosen as a sample to understand the current scenario of clusters in India. These clusters have been chosen and categorized based upon the judgment of informed persons, available write-ups and studies, each one cross checked & reconfirmed from several possible sources to improve the reliability of information. Due to the scarcity of research studies available for most of these clusters, this improvised method of data collection is entirely the responsibility of the researcher with a few possible limitations or differences in view point.

Typology based on stage of development :

An important way of categorization has been developed by the researchers of this study which is based upon the stage of development of a cluster at a static period of time. Development of a cluster could conceptually be divided into four distinct phases : namely the 'Initial phase', 'Growth phase', 'Maturity phase' and 'Extinction phase'. These four stages are depicted on an S-Curve in ***Annexure I*** enclosed. Some of the characteristics of a cluster in these phases of cluster development are given as under;

1. ***Initial Phase*** **:**

In this stage of cluster formation, only a handful of units establish themselves and based on their success, several other units come up in the subsequent stages. The formation of cluster may be natural, based upon high demand potential and private initiative or may be induced due to policy incentives, infrastructure availability or a large buying public sector unit. The reason may also be the availability of critical raw material or specific skills, as in case of most traditional clusters. The example of natural cluster based on raw material resources would be 'marble cutting' cluster at Kishangarh in Rajasthan while a demand based cluster would be 'ready-made garments' at Indore and Mumbai. The examples of induced clusters would be automobile component industry at Gurgaon due to the setting up of the public sector car manufacturing unit of 'Maruti Udyog limited' and another example may be cited as of petro-chemical based industry at Vadodra due to setting up of 'Indian Petrochemical Industries Ltd', another public sector undertaking.

The firms, in the initial stage, develop the man power and help setting up of ancillary or subcontracting firms. They also contribute to the development of support institutions and other enterprises with the rise of demand for them. The initial phase is likely to be characterized by slow growth and high costs. There are a few competitors in the cluster at this stage, so it is possible to pass on the cost to the consumer by charging higher than that in the later stages of development. An example of a cluster in the initial stage is floriculture industry at Bangalore, Pune and Gurgaon.

2. ***Growth Phase*** **:**

The second phase characterizes rapid development of the industry, intervention by support institutions including government institutions and consolidation of other raw material and service providers. New firms enter the market and thus the competition increases. This increased competition encourages technology development and expansion into new markets. The growth is usually fueled by the widening of national or international markets that the cluster caters to. Both in the spheres of marketing and management, innovative means are likely to be developed thus reducing the overall decline in the prices. Since the industries go through their cycles of recession and growth, a cluster that is not currently in the growth stage may reach that stage later. An example of the industry currently in the growth stage is “automotive components industry” that was pushed back from maturity stage because of the industry for new cars and other automotive vehicles had been allowed to be set up first during the early 1980s in India and subsequently with the onset of liberalization several MNCs set up their base in India. From the sample of 138 clusters under study it was observed that 38 of them are in the Growth Phase.

3. ***Maturity Phase :***

The third phase is characterized by the growth of the cluster slowing down due to over capacity generally created in the cluster and resultant very high competition amongst the units. The data seems to suggest that in the Indian context so far, the stage of maturity lasts longer than the previous two stages. During the maturity phase strong input of research & development may be needed to reduce costs, increase productivity and add new product features to stay ahead of the competition. As a natural outcome, weak units begin to wither away creating space for the healthier units to continue to survive. Several studies have shown how 'mature' clusters that were overwhelmed by technological change at one point of time, regenerated themselves back into the growth stage as a result of choices made by local actors and groups. This represents the transformation and re-invention.

The examples of the matured clusters would be “ the electric fans cluster ” in Calcutta, “sewing machines cluster “ in Ludhiana and 'stationery diesel engines cluster ' in Rajkot. Out of the 138 clusters, 100 of them seem to be in the category of mature clusters which represent 72.5 % of the clusters, reflecting the prevalence of a lengthy duration of this phase among the clusters.

4. ***Extinction Phase :***

If due to wide ranging technological changes that the cluster is unable to cope with or due to change in the life styles, a product is no longer in demand, the cluster may go to face extinction. Another reason may be the erosion of competitiveness because of increase in the labor costs in the cluster.

However the same industry may find itself viable in a different location where favorable conditions exist for the survival and growth of the cluster. One example of such a cluster is related to shoddy yarn made from recycled wool which shifted itself from Prato in Italy to Panipat in India where not only the skills existed due to the presence of textile industry and the cheap labor but also the favorable market for the shoddy yarn existed. During the last decade, Panipat has grown to be a cluster of 700 carding machines each on an investment of Rs. 7 million (USD 200,000). Now there is hardly any such unit in Prato in Italy. In the Indian case , tile industry cluster based in Mangalore with a history of 175 years has now gone into oblivion due to the stated reasons of scarcity of raw material and fire wood and accentuated with increased competition from China in the export market.

Exceptions may occur :

There may be exceptions to the above stages of development in some of the clusters. The growth and maturity phases may in certain cases be inseparable thus making it difficult to assign one of the two stages to such specific clusters. Secondly, the transition from one stage to another may not be smooth as reflected in the ‘S’ curve but could be quite jerky due to certain internal or external changes that may crop up.

Typology based on relationship of units within the clusters :

Another way of categorizing the clusters depends upon the type of relationship amongst the constituents of a cluster which may be important for the establishment and growth of not only an individual enterprise but also for the entire cluster. Such relations are dependent on the nature of production processes, ii) the policies of the government that may regulate the entry of firms into the market and thus their competition with medium & large firms and iii) on how the relationship it may have evolved over a period of time. Based on these relationships, the clusters can be classified as :

a) **Horizontal clusters :** This type of cluster is characterized by units which process the raw material to produce and subsequently market the finished product themselves. 76 of the 138 clusters are of horizontal type, constituting 55 % of the sample. Some of their examples are sports goods in Jallandhar, agricultural pumps cluster in Coimbatore etc. This may indicate the individualistic approach to business in clusters or no scope for division of units, as the different stages of production are confined to a unit itself.

b) **Large Unit Based :** A cluster which is established around a large unit or a few large units is called a large-unit based cluster. The relationship that exists between the small and the large units could be based on supply of some of the critical raw materials from large enterprises or on their working as subcontractors to the large firms which means they are either backward linked or forward linked. Development of a cluster of ancillary units is one of the examples of large unit based clusters.

Only 7 clusters may be classified as large units based ones out of 138. This represents only 5.07% of the total clusters. The main reason for this small number is that as many as 72 clusters are of traditional art and craft type where large units would not venture into. This is further corroborated by the fact that 74 of them make products that are reserved for manufacturing in small scale sector which may have led to the establishment of mainly horizontal type of clusters. However, even where the large firms have their strong presence, their relationship with small firms within the cluster may or may not be healthy and long term oriented as has been witnessed in the case of automotive components industry except in the case of Maruti Udyog Ltd. Small firms in such clusters therefore tend to shift to products with wider application or for the product for replacement markets through trader intermediaries, thus shifting to horizontal linkages rather than vertical ones. They could also undertake to produce the final product by developing trading and non trading links among themselves depending upon whether it could technically be feasible to do so.

c) **Vertically integrated clusters :** In vertical clusters the operations required in producing the finished product are divided and are carried out separately by different units, most of which are essentially SMEs, in order to distinguish from the large unit based clusters.

Since a mixed character may emerge in several clusters, it may be a possible to develop an indicator that if more than half of the SMEs in particular cluster are large unit based, it could be called large unit based cluster. However, we have preferred to keep the mixed character a separate classification.

There is a high degree of inter-dependence among the small firms in the vertically integrated clusters. This is usually witnessed in the case of hosiery, textile processing and metal products, in all of which it is possible to split the production process and farm out to separate firms due to non perishable character of the product. Second, this becomes feasible if it requires a degree of specialization for each of the processes involved. This phenomenon may also be witnessed due to splitting up of units to remain small for easy management, for escaping labor regulations that come into force when the firm grows to become large and/or to enjoy the policy related advantages that the small firms are entitled to. Out of 138 clusters 17 clusters could be classified having units that had vertical linkages among themselves. In 38 other clusters a mix of horizontal and large unit based linkages seemed to exist. A summary of the types as elucidated above is given as follows :

Table 4 : Classification of Clusters based on their Structure

S.No.	Nature of cluster	Number of clusters
1	Horizontal only	76
2	Large unit based only	7
3	Vertically integrated only	17
4	Mixed character	38
Total		138

5. Sources of Information and Data Collection

Primary survey as main source of information :

There have been a few research studies carried out on the industry clusters in India. The available studies are not sufficient to draw any general conclusions about the clusters. Also, there does not seem to have been any research study carried out that could provide a macro view about the clusters in India. The present study makes the first such attempt. The following methodology has therefore been adopted for the study. The information collection has been based on;

a). **Primary Data Survey :** The primary data for 138 clusters was gathered through extensive discussions with entrepreneurs, small industry promotion officers, consultants and other experts in the area to understand the process of clusters formation and their growth. The data thus obtained through discussions was tabulated and structured for analysis as given in ***Annexure II***.

b). **Secondary Data Survey :** The secondary data wherever available has been used to supplement the primary data. It may, however be important to mention that in India a large number of smaller of the SSI units are not registered; do not maintain financial records and have no access to the financial and other support services provided by the government and its institutions. A list of 917 artisan based clusters has been obtained from the office of Development Commissioner, Handicrafts and analyzed, given as part of Annexure IV.

Sectoral data has been used :

There are some published reports of the Government on the statistics of Small Scale Industries and data pertaining to SMEs. This data, available on sectoral basis has been used in the absence of data on clusters as no detailed study on clusters has been carried out so far. A total of 138 clusters covering 16 states and 18 types of industries (NIC two digit level) have been considered in this study. A list of 138 clusters along with parameters on which information was analyzed is enclosed as Annexure II.

6. SME Clusters in the Indian Context

Size and heterogeneity in the cluster network *:*

It has been estimated that there exist about 350 SME clusters in India. These clusters are overwhelmingly predominant with small industries and the share of medium and large industries in the sales turnover, production and employment is nominal. The size in terms of the number of units and the quantum of output of clusters may vary significantly. Some of them are so big that they produce upto 70 to 80% of the total volume of that particular product produced in India. For example, the township of Panipat produces 75% of the total blankets produced in the country. Similarly Tirupur, a small township in the Coimbatore district of Tamilnadu contributes 80% of the country's cotton hosiery exports. Yet another example would be of the city of Agra, virtually a Footwear City with 800 registered and 6,000 unregistered small and cottage footwear production units, making 1.5 lakh pairs of shoes per day with a production value of 1.3 million dollars per day and exporting shoes worth US $ 57.14 million per year[4]. Similarly Ludhiana in Punjab produces 95% of the country's

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4 'Special feature on Leather and leather goods', The Economic Times, New Delhi, October 21, 1996.

woolen knitwear, 85% of the country's sewing machines and 60% of the nation's bicycle and bicycle parts.

On the other hand some clusters are very small also, but they are so specialized that about 100 workers each may work in these clusters. For the purpose of the present study clusters which have minimum of 100 registered units in a particular location have been taken. There may be another 50-100 unregistered units along with the registered ones.

Sectoral distribution of clusters selected :

Based upon 2 digit classification of NIC, distribution of clusters among important industry groups has been presented ;

Table : 5	***Classification of Clusters by Industry Group***		
S.No.	**Industry Group**	**NIC Code**	**No. of Clusters**
1	Machinery & Parts except electrical	35	20
2	Cotton Textiles	23	15
3	Chemical & Chemical Products	31	14
4	Metal Products	34	13
5	Hosiery & Garments	26	10
6	Food Products	21-20	9
7	Non-metallic Mineral Products	32	9
8	Electrical Machinery & Parts	36	8
9	Wool, Silk & Synthetic Fibre Textiles	24	8
10	Transport Equipment & Parts	37	7
11	Others 8 Categories	Several	25
	Total		138

State-wise Distribution **:**

The table below gives the state-wise distribution of industrial clusters in the country. It would be interesting to note that the industrially developed states of Maharashtra, Gujarat, Punjab, Rajasthan, Tamil Nadu and Haryana have the maximum number of clusters. The top six industrially developed states out of the 25 states in the country account for 54.3 % of the SSI units. Whereas 71% of the clusters are located in them. The common states among the two sets of data are Gujarat, Punjab, Uttar Pradesh and West Bengal. Surprisingly, the state of Madhya Pradesh which has the maximum number of small scale enterprises (12.7%) as per the IInd All India Survey of SSI, seems to have very few clusters (1.4%). Traditionally certain communities viz. Gujaratis, Marwaris and Punjabis have been a rich source of entrepreneurial talent and this could be one of the reasons for the growth of clusters in Maharashtra, Gujarat, Punjab and Haryana. A state-wise list of clusters is given as under;

Table : 6	*Statewise Distribution of Clusters in India*	
S.No.	**State**	**No. of clusters**
1	Maharashtra	25
2	Gujarat	20
3	Punjab	15
4	Rajasthan	14
5	Uttar Pradesh	13
6	Haryana	12
7	West Bengal	9
8	Tamil Nadu	8
9	Himachal Pradesh	5

***Region-wise Distribution* :**

Out of 138 clusters the largest concentration of clusters is in Western India which has 58 clusters and which is closely followed by Northern India wherein 52 clusters exist. The concentration in these two parts of the country can be attributed to the fact that these areas are rich in entrepreneurial talent and are industrially well developed. Also since these parts are agriculturally better developed, they provide a rich base for consumption of goods produced in SSI.

Table : 7	*Region-wise Distribution of Clusters in India*	
S.No.	**Region**	**No. of clusters**
1.	Eastern	13
2.	Southern	15
3.	Northern	52
4.	Western	58
	Total	138

Location-wise distribution :

This was analyzed for 4 categories, i.e., Metropolitan City based clusters, City based clusters, Town based clusters and Small Town/Rural area based clusters. The study indicates that majority of the clusters, that is, 80.43% are located either in cities or towns. Only 13 of the 138 clusters are based in rural or small town areas representing a mere 9.4% of the total.

Rural clusters :

It was observed that cluster formation in rural areas has taken place for the products where there is less need for infrastructure and supply of raw material along with, marketing of products is done by other agencies, institutions or firms external to the producing firms. This reflects that although 42% of the registered SSI units are in rural areas according to the 'Second All India Census', the number of modern SME clusters that exist in rural areas or small towns are much lesser (9.4%). One possible reason for this variation can be that the units that have come up in rural areas are small firms which cater to limited local markets that are not significant enough to induce formation of a cluster. Quoting from the same source, the investment in SSI units (42% in number) in the rural areas is only 29.4%. The clusters in metropolitan cities are either demand based arising from large population or they cater to export markets or to the large mother units as ancillaries to them. The detailed break up of the locations of these clusters is given as under;

Table : 8 Location-wise Distribution of clusters in India

S.No.	Location	No. of Clusters
1.	City	50
2.	Metro	14
3.	Town	61
4.	Small Town/Rural	13
	Total	**138**

Artisan Based Clusters:

India has a very rich and diverse base of artisan related industry which is highly employment intensive, eco friendly characterized by low energy usage and fulfilling the local market needs several clusters have existed in these areas for centuries. It is estimated that almost 2000 such clusters may exist in the country. An exploration into their classification and qualitative analysis will be fascinating but is beyond the purview of this study. For those who are interested in this sector, a brief report on artisan related clusters, mainly existing in the rural areas is given in Annexure IV. A product wise and state wise classification of 917 such clusters as stated earlier is included in this Annexure. Some of these clusters have also adopted mechanised processes and therefore also figure in the list of 138 clusters detailed under Annexure I.

Whether cluster formation is an induced phenomenon ? :

From the classification of 138 SME clusters, it is interesting to explore answers to some of the important issues , of which one is whether clusters can be induced. The clusters can further be classed into two broad categories as Natural and Induced. Natural clusters are those which have come up on their own without the active and calculated or conscious involvement of the government in developing them. It is the private initiative of the entrepreneurs that seems to be the only reason behind. The government may have played a role in furthering the development of these clusters once these were established.

Most of the clusters are natural :

The induced clusters are those where government takes a decision and makes a conscious effort that results in the concentration of similar units in that area. On a close examination, we could classify 125 clusters out of 138 as natural. This means 90.57% of the clusters that exist in the country have come up on their own. This seems to be in line with the pattern of cluster development at the international level.

Table : 9	***Distribution of clusters based on their origin***	
S.No.	Type of Cluster	No. of Clusters
1	Natural	125
2	Induced	13
	Total	**138**

Factors that led to the cluster development :

It would be worthwhile to examine whether these clusters are based on resources, market or infrastructure. Although there may be more than one reasons that have contributed to the coming up and growth of clusters, the researchers have chosen for the sake of fair analysis the most impending reason in their opinion. While 99 of the 138 clusters seem to be market based, only 6 of them seem to have come up primarily because of conducive infrastructure. Rest of the 33 clusters may be catagorised as resource - based. The resources here include both raw material and skilled labor.

Infrastructure has a bearing in modern technology based clusters :

Development of infrastructure based clusters is a relatively new phenomenon and these are mainly induced clusters. Such clusters are in the field of electronics, software, floriculture and biotechnology. The reason why infrastructure based clusters are government induced is that infrastructure has been and still remains primarily the responsibility of the government. One of most common examples is the electronics industry based clusters, wherein the establishment of software parks with state of the art communication facilities has induced several firms of similar kind to set up their operations in and around the metropolitan cities.

Other such example may be bio-technology and floriculture based products. These not only require good common technical and research based facilities but also well developed aviation facilities structure in order to cater to the international market. Due to a comparatively easy access to current and reliable information, the likelihood of modernization taking place in such clusters also increases. The Classification of Clusters according to their primary lead factor is given as under;

Table : 10 Distribution of clusters according to their primary lead factor

S.No.	Basis of Cluster	No. of Clusters
1	Resource Based	33
2	Market Based	99
3	Infrastructure Based	6
	Total	**138**

Co-existence of Modern & Traditional Clusters :

India is one of the oldest civilizations and it is very common to find traditional skill based industrial clusters. Out of 138 clusters, 72 clusters are based on traditional art and craft skills. Some of the units within the same clusters have also adopted modern technology and upgraded their skills while others continue to function in the same old manner. The overlapping is thus reflected in several clusters. 108 clusters have modern SSI units where as only 30 clusters do not seem to have any modern SSI units. This gives a very peculiar picture of the Indian clusters which may be common in most developing countries. While approximately 52% of the clusters are based on traditional skills, 78.26% of the clusters have modern SSI. This means that in several of the traditional sectors, modern small units producing the same goods through mechanised means also exist.

Thus it would be reasonable to conclude that there is a diversity in the industrial units even within the clusters. On the one hand modern SSI has been established where improved skills and technologies are being put into use, on the other hand traditional skills and tools are also used in the production process in several other clusters and sometimes in the same clusters as well. This has an important implication. Any program or policy that has to be initiated for development of such clusters, would therefore, have to take into account such diversities within the clusters as well.

Table: 11 Distribution of clusters based on type of goods produced

S.No.	Type of Cluster	Yes	No	Total

1	Traditional (Art & Craft)	72	66	138
2	Traditional Consumer Goods	59	79	138
3	Modern SSI	108	30	138

Reservation policy and clusters :

In order to provide a protective shield to SSI in India, government has reserved certain items for their exclusive manufacture in the small sector. The medium and large scale units are not permitted to make these items. In some of the industries, large and medium scale units had been set up before the reservation policy for that particular product was enforced. There are 74 clusters making products that are reserved for SSI and 64 clusters make products which are not reserved for SSI out of the sample of 138. Whether reservation policy has encouraged establishment of clusters is a question that is difficult to answer, since adequate data is not available on this issue. But the fact that most of the clusters produce reserved items since long, even before the reservation was enforced in the year 1967, reflects the little impact of the policy on cluster development. This seems to be in line with the impact of reservation policy on SMEs in general as well.

Table: 12 Clusters producing products reserved for small scale industry

S.No.	**Product Category**	**No. of Clusters**
1.	Reserved for SSI	74
2.	Unreserved	64
	Total	**138**

7. Performance of SME Clusters in India

Exports from SSI are healthy :

The small scale sector in India contributes directly to 35% of the total exports from the country. It is estimated that another 15% of the exports are indirectly contributed by this sector. Some of the major items of exports, e.g., 'Hosiery and Garments', 'Leather and leather products', 'Diamonds, Gems & Jewelry' have large clusters in more than one locations and these contribute significantly to the exports. As per the statistics of 'Center for Monitoring of Indian Economy', total exports for the year 1995-96 were USD 31,828 million. Small scale sector has been contributing significantly to the export basket.

Select major product groups contribute the most :

The five top product groups in the manufacturing sector that contribute the maximum to exports are given as under;

Table : 13 Export of Principal Commodities in the manufacturing Sector			
S.No.	**Product Group**	**Exports in 1995-96 in USD (million)**	**Percentage of total exports of India**
1	Gems & Jewelry	5,243.6	16.5
2	Textiles (excl. handicrafts)	4,279.2	13.4
3	Ready-made Garments	3,624.9	11.4
4	Leather & L. Products	1,722.7	5.4
5	Handicrafts	1100 approx.	3.5
	Total	**15,970.4**	**50.2**

It is in these five products that small and medium sector has shown its strong presence and the specialization that has developed in each of these areas has led to the formation of clusters. 'Gems & Jewelry' exports are largely contributed from Surat which is the biggest cluster in this area. There are similar other clusters in Tiruchirapalli and Jaipur that contribute a part of the exports in this product group. It may be estimated that almost all the exports in this category are generated from the above mentioned clusters.

In textiles, there are major clusters of Panipat, Sanganer, Palli, Jodhpur, Jetpur, Surat, Mysore, Sambhalpur, Bhiwandi and Bhilwara which together contribute largely to the exports. It may be difficult to quantify their contribution but a rough estimate would reflect that about two thirds of the exports are from these clusters. Ready-made garments is an exclusive preserve of small scale industry and most of its exports are generated from the clusters that are based in Ahmedabad, Bangalore, Delhi and Mumbai. The hosiery based exports are produced mainly in the clusters of Tirupur, Ludhiana, Calcutta and Delhi. In the cotton hosiery, Tirupur alone contributes 80% of the country's exports. So all the exports in ready-made garments can be estimated to have been produced in these clusters.

'Leather and leather garments' is another major export earner which is mainly concentrated in Madras, Kanpur, Agra and Howrah. Handicrafts as a product group is the preserve of small scale units which have developed sectoral specialization in selected towns e.g. for brassware in Moradabad, handmade paper in Jaipur, hand made filigree in Cuttack and textile based handicrafts in Pipli of Orissa.

Based upon the analysis given above, it is conservatively estimated that the SME clusters contribute to approximately 60 % of the Indian manufacturing exports totaling to a figure of USD 19,000 million. A further break-up was made on the basis of potential for exports from the sample of 138 clusters. The high potential items would mean better international market prospects and where the Indian firms are likely to enjoy comparative advantages due to skills, raw material resources or low labor costs etc. Based on this, 72 clusters have products which have high potential for exports, 47 are with medium potential and only 19 clusters seem to have low potential for exports. When 52.17% clusters are in the group of high potential items, there is a strong possibility to intervene through different means further in developing these clusters in order to increase the exports of the country. Thus, 86.23% of the clusters produce items that have medium to high export potential.

***Productivity* :**

The quantitative data for evaluation of productivity of Indian clusters is not readily available and the various research studies that have been carried out to compare the efficiency of small and large firms have proved inconclusive due to varying nature of products and diversity in factors that have a bearing on the efficiency and productivity. However the impression gained during discussions with experts is that productivity in Indian clusters leaves a high scope for improvement especially when compared to international standards.

Some of the reasons that have been attributed to low productivity are the use of traditional tools, old techniques and outdated technology, poor labor productivity and bottlenecks of infrastructure in some of the product lines. Some of the clusters have developed innovative ways to increase the productivity, but the gains have not been substantially widespread.

Employment generation :

It is well known that small sector is highly employment intensive which currently employs more than 14 million people. The total employment in small scale sector increased from 16.53 lakhs in 1972 to 36.66 lakhs in 1987-88 registering a cumulative growth rate of 5.1 percent per annum. The average employment per unit has however, come down from 12 to 6 in the same period. Data from second 'All India Survey of SSI' reveals that maximum employment is generated in the sectors of 'Food Products' (13.1%) followed by 'Non-metallic mineral products' (12.2%) and 'Metal products' (10.2%).

The industry groups that have the maximum concentration of the clusters is 'Machinery and Parts except electrical', 'Cotton textiles' and 'Chemical and chemical products' as per the analysis in previous paragraphs which contribute to employment generation to the extent of 7.62%, 0.67 % and 8.57 % respectively of the total employment in the Small scale sector. Although it is difficult to estimate the quantum of actual employment generated by the clusters, yet it does help to provide an indicator to the fact that clusters of SMEs are highly employment intensive.

8. Policies & Laws Relating to SME Clusters

No policy specifically for the clusters :

There is no special policy either of the central government or state governments for the promotion of the SME clusters in general. The industrial policy related to small scale sector is a small component of the industrial policy in general which relates to the entire small scale sector rather than based on national or regional priorities by focusing on certain industrial group or cluster of industries. The state governments have however provided special policy incentives for the electronics and agro-processing industry but these are also directed towards the sectors as a whole instead of clusters. There have been however attempts to strengthen the clusters by providing support through the general schemes related to technology upgradation, infrastructure provision and training through various institutions at the national and state levels. Some of the industrial estates developed especially for a particular industry have been developed, but their intensity and significance is at best limited.

Yet supportive of clusters through its general framework :

The central government, without a specific policy framework, has generally been supportive to development of clusters through its general SSI policy. This support has especially been available in their growth stage, while in the initial stages of cluster formation, it was the private initiative and the profits that led to agglomeration of units. The initiatives of the government were taken in establishing institutions at the cluster level for technology upgradation, training, providing infrastructure and for facilitating business operations. Some of the examples of the institutional support provided under the general framework of policy are given as under;

a. A bourse was established at Surat for trading in diamonds. The trading was earlier done in Mumbai while the production was mainly based in Surat. With the opening of the bourse at Surat, the industry got benefited considerably. 'Indian Diamond Institute' was set up in Surat for technology upgradation and for imparting training to labor in skill development. 'Diamond Industrial Park' with facilities to house approximately 300 units has also been established at Surat.

b. For shoddy yarn and other textile units engaged in international trade, a customs office has been established at Panipat in Haryana so that the small entrepreneurs can get their custom related documentation completed within the town, itself.

c. The 'National Institutes of Fashion Technology' (NIFT) have been established in New Delhi and Gandhinagar for providing information and forecast on latest fashions and for developing the industry technologically. Besides, the institutes train manpower to meet the needs of the industry.

d. 'Footwear Design & Development Centers' have been established at NOIDA, Agra, Madras and Kanpur where the footwear clusters exist. These centers provide consultancy services for factory set up, lay outs, technology, trouble shooting, cost reduction and productivity improvement.

e. The 'Central Glass and Ceramics Research Institute' (CGCRI) has centers in Calcutta, Khurja and Naroda. The Institute provides services to the entrepreneurs on technology upgradation and training of skilled manpower.

f. The 'Central Leather Research Institute' at Chennai performs the function of designing and development, information dissemination, technology upgradation and training of skilled persons.

But all of them through the government machinery :

One of the important characteristics of this support has been centralization of this initiative through the government institutions. It has led to setting up of a large number of government sponsored institutions that are supposed to provide assistance directly to the small units. The functioning of these institutions is regulated under a framework of centrally designed rules and regulations. Wherever the state government institutions have been set up, they have tried to emulate the central govt. structure; sometimes even leading to avoidable duplication.

Lack of involvement of industry associations :

Another aspect of the policy planning is that delivery mechanism of assistance has so far always targeted the individual units rather than focusing to build strong institutions not only for delivery of the policy based incentives but also for the sector specific services such as information provision, technology support and common facilities. Little initiative has been taken to help develop the capabilities of the private sector to start self help programs. Now that the government wants to use the private associations to set up these delivery mechanisms, it finds only a select few that are worthwhile and strong enough to shoulder the responsibility. The major problems of the associations in or outside the clusters relate to lack of financial resources, poor democratic set-up, lack of vision and involvement in petty politics rather than provision of services to its members with a long term perspective to improve their competitiveness.

Industrial Education & Labor Training :

India has a good infrastructure for industrial education. There are approximately 5,000 science and technology related institutions providing training to about eight lakh students every year. Even in the traditional sectors, large skilled work force is available. India has very large skilled & technical man-power. Indians have a strong inclination for scientific, commercial and management education and it is this education that has built up a reservoir of specialized man-power. There is well diversified network of Industrial Training Institutes (ITIs) in almost every district providing training that does not relate to the need of specific aspects of the locally based industry.

While some of the industries have facilities to provide on-the-job training, others would depend on training institutions. Till now the maintenance of these training institutions was the responsibility of the Government but now industry is being looked at as a possible contributor. In a few cases the associations of the industries have taken up the job of importing training and re-training. Despite several institutions of the government, there is a strongly felt need for relevant practical training for the existing entrepreneurs, labor and supervisors. Either the existing institutions are too general in their training framework or when sector specific, they are limited for the fresh students. The short term duration courses run in some of the institutions set up in clusters are more of an ad-hoc measure that cater to the needs of a limited few.

The growth of SSI also depends on the availability of infrastructure, which has been the responsibility of the state governments. The 'State Industrial Development Corporations' are given the responsibility of developing infrastructure in the form of industrial estates for the industry. For the other infrastructure facilities within the industrial estates, entrepreneurs have to approach different agencies for electric power, water supply and telephone connection. Having developed an industrial estate, problems related to maintenance of the facilities are often highlighted. Leaving aside a few industrial estates like software technology parks, the industrial estates do not provide infrastructure as per the requirements of a particular cluster. In the post liberalization era, government has invited private entrepreneurs in infrastructure building through its much publicised scheme of 'Build, Own, Lease & Transfer' (BOLT).

Limited private initiative is being now invited :

In a few specialized industrial estates for electronics, export oriented units have been established both by the government and private institutions but mainly by the former. These estates also have some of the central facilities needed by the industrial units. This has helped in the formation of modern technology based clusters of SMEs at these places. The rural areas suffer from a high degree of lack of infrastructure facilities. Not to mention electricity and telephone facilities, even roads are not metalled and access to rural areas in many of the states is a problem. Thus integration of rural industries in the national main-stream of high value added industries based on local resources is proving to be difficult. This in fact has proved to be a deterrent to the growth of clusters in rural areas.

Most cluster - based enterprises based in informal locations :

With the above scenario, it is common to witness most of the cluster - based enterprises to be based in unauthorized locations for industries. Most of the tiny and smaller units operate from entrepreneur’s homes. Only the bigger end of small scale units and medium scale units are set up in industrial estates with a formal infrastructure. The private industrial estates are very few and mainly limited to the industrially developed states of Maharashtra and Gujarat. There are several disadvantages associated with operations based in home and unauthorized locations. Not only such units have problems in expansion and modernization due to space constraints, they may also be denied registration as SSI units and thus denied access to credit and other support facilities.

***Savings & Credit Institutions* :**

There is a large net-work of agencies for performing the finance function. Banking, however, has been controlled by the government and only after liberalization a few private banks have been established. The purpose of controlling the financial institutions was to channelise funds to the sectors which needed capital for development and where returns were not necessarily as high. The interest rates were fixed by Government till very recently (in the year 1996) with a view to ensure flow of low cost capital to SSI. It is important to highlight that financial institutions do not have a special policy or a program for providing support to units in a cluster. The assistance is provided on the lines of a general policy sometimes even ignoring the special requirements of an industry or a cluster. For example, the working capital needs of the food industry fluctuate as the raw material is seasonal but the financial institutions because of their general norms find it difficult to support such demands. Thus it may be worthwhile trying cluster specific credit supply as is prevalent in Italy.

Large banking sector for industry :

The banking sector is complex and large. There are 28 commercial banks with a very widely dispersed network and there are 13 private banks. The largest among the banks is 'State Bank of India' with seven thousand branches and 230,000 employees. The commercial banks provide for both the fixed capital and working capital. Co-operative Banks at district level were established to help the small entrepreneurs but these banks have quite often been managed by the government justifying it to be in the public interest. This has led to the loss of a tremendous opportunity for the co-operative banks to be of specific interests to the clusters.

Also a large set up of financial institutions :

Specialized financial institutions for industrial development have been established at the national and state levels with almost overlapping functions. At national level there are 8 institutions that mainly cater to the needs of medium and large scale sector. The most important among them are Industrial Development Bank of India (IDBI), Industrial Finance Corporation of India (IFCI) and Industrial Credit & Investment Corporation of India (ICICI). They have set up among themselves almost 20 technical consultancy organisations (TCOs) in order to provide support to SMEs but they have also not related themselves to the need for cluster development either as their main or a subsidiary activity.

Special financial institutions for SMEs :

For the small scale units, a separate bank has been carved out as a subsidiary of the Industrial Development Bank of India which refinances the State financial corporations and the scheduled banks for meeting the long term credit requirements of this industrial segment. This bank is called 'Small Industries Development Bank of India' (SIDBI) and was set up in the year 1991. In the recent past, the bank has also instituted special schemes for direct financing for bigger credit needs through its regional level branch network. One of the recent schemes introduced by SIDBI that has been particularly helpful in case of ancillaries and subcontracting with large firms is the 'Bill Discounting Scheme'. All the schemes relate to SMEs in general.

'State Financial Corporations' (SFCs) and 'State Industrial Development Corporations' (SIDCs) have been set up at state level to primarily cater to the long term credit needs of the small and medium scale units and to participate in the venture through equity stake. These units get refinancing from SIDBI for the approved schemes and also generate their own funds through the state government and now from the commercial borrowings from the market as well. These institutions are an important source of long term credit and of late SIDBI and SFCs have started providing funds for working capital as well. In line with the commercial banks, SFCs have remained a source of credit for SMEs in general.

***Marketing & Export Promotion* :**

There are several schemes for providing assistance to SSI in marketing and exports. For the central and state government purchase programs, there is a scheme of price preference for certain products in favor of small scale sector as against the medium and large units. This scheme which has been in existence for more than a decade has not however been of much help to the SME sector as a whole and clusters in particular.

Special institutions for the export promotion :

The Government has established 'Export Promotion Councils' for the products with high potential of exports. These councils provide information and advise to exporters. Their services also include providing assistance about market, technology and procedures for exports. Some of these councils also procure orders from buyers and pass them on to the prospective suppliers in the country. Indian Trade Promotion Organization, apart from services mentioned above organizes exhibitions, buyer-seller meets and promotional campaigns for the Indian Industry. Some of these institutions have set up their offices at places where the cluster for the product exists.

Similar is the case with the marketing assistance provided by NSIC and State Small Industries Corporations. The marketing assistance scheme formulated by SIDBI is a recent phenomenon. It seems to be heading in the right direction as it involves private sector participation also. Under the scheme, funding assistance is provided to the marketing entrepreneurs for marketing the produce of small scale industry.

Information provision becoming important recently :

Industry on its own has taken some initiatives. The Federation of Indian Chambers of Commerce & Industry (FICCI) has started 'BISNET', where information on trade inquires, technological offers, offers of joint ventures/collaborations etc. are made available on line through computers. Institutions such as 'National Small Industries Corporation' (NSIC) and 'Asia Pacific Center for Technology Transfer' (APCTT) in the government sponsored and supported institutions have also started providing on line information services to the entrepreneurs. In the private sector, 'Maharatta Chamber of Commerce & Industry' (MCCI) based in Pune and 'TANSTIA-FNF Center' in Madras have set up these ventures in the private sector. Similarly, some of the consultancy organisations also maintain product - wise information on external trade and domestic production etc.

But not catering to the needs of smaller firms :

The type of information usually needed by the tiny and very small enterprises is very specific to the state government rules affecting their operations. They may be interested in knowing about the suppliers of specific type of machinery suiting to their needs. Such grass root level and specific detailed information is not yet available on the information networks. Secondly, the information providers, in most of these clusters and local areas, do not virtually exist who can source and supply the necessary information. Thirdly, the sourcing of most information for the small entrepreneurs so far has been by informal channels where there may not be any payment involved. This leads to a tendency for the entrepreneurs to expect free information which may not be possible in the current scenario.

Technical Upgradation facilities are several but not very effective :

The technical upgradation facilities exist in large number in the country, but somehow these facilities remain closer to the academic world and at laboratory scale rather than being application oriented and closer to the industry. The commercial approach in their working is yet to be set in. Council for Scientific & Industrial Research (CSIR), a Government owned laboratory network is currently gearing towards increased commercial approach which further alienates the small sector through high costs and long gestation periods.

New product development leaves a lot of scope :

Introduction of new products in the market requires a strong product development base. India has limited capabilities in the area of 'Product design & development'. Most of the clusters and the SME units work on the designs or samples given to them by the domestic or foreign buyers. Broadly, there seems to be little innovation in product design and new product development in the clusters. This has its implications on the profit margins. The institutions promoted by the Government for developing new products/processes have not been able to fulfill the objectives with which they were started.

Pollution Control affecting several clusters :

The Indian Industry is characterized by small naturally occurring clusters. These clusters when started had very small size of units used low energy internsive technology and their number also was less. Hence, pollution was not a major problem. The government had set up no mechanism to control pollution then. The effluents discharged were in small quantities. As the growth in these clusters took place, the size and number of these units increased and along with this the effluents and hazards due to them also increased.

The norms for pollution control were also developed in the meanwhile due to an increased awareness world over about hazards of pollution. The Government. started enforcing these norms vigorously, with the result that many of the small scale units were asked to wind up till adequate measures for pollution control had been taken up. The industry with their limited capital base found it difficult to invest in pollution control equipment and thus delayed implementing measures required.

Industries like Food Processing, Leather and Textile Processing that have a significantly large number of clusters are currently facing the problem of pollution control. While some of the industries have joined hands to establish common pollution control facilities, others are still to initiate the action. Leather industry in Madras and Hosiery industry in Tirupur are such examples where industry has taken initiative and started these common facilities. This initiative, however, came only after the courts had directed the state authorities to issue notices for closure of the polluting units.

9. Experiences of Prior Cluster Development Programs

There are two institutions that have taken up cluster development projects besides the government initiatives explained in the previous sections. These are State Bank of India (SBI) and Small Industries Development Bank of India (SIDBI).

State Bank of India started the program under a project called 'SBI Project Uptech' in the year 1988-89 when they felt the need for upgrading the businesses of small enterprises including their management processes, quality, technology and markets but within the framework of what was attainable by the units. The clusters were chosen based on the criteria that there was scope for improvement and that the bank had funded a substantial number of units in those clusters. A survey was then carried out to assess the current status of the industry and the scope for improvements.

Subsequently 40-50 units were selected for the upgradation. A task force comprising of 4-5 bank officers was deputed along with externally identified technical consultants who helped the entrepreneurs to modernize their units. So far 6 such projects have been carried out where the funding for the deputed consultants was made over by the bank in the first 3 projects. Subsequently, a fee has been charged from the units themselves. The clusters selected have been Agro pump-set industry in Coimbatore, Diesel engines in Kolhapur, Huller rice mills in Palghat, Foundries in Agra, Glass units in Firozabad and Auto components in Pune. Each project takes 2-3 years to complete and that leads to demonstration effect on the other units to follow and change.

Small Industries Development Bank of India (SIDBI*)* that came into being as a subsidiary of IDBI in the year 1991 took up the initiative of cluster development during the first year of its operations under the area of Promotion & Development. The stated objectives of the program are creation of awareness on new products, processes & technologies, skill upgradation, development of technology related common facilities for the cluster, provision of unit specific modernization packages and promotion of energy conservation & introduction of environment friendly technologies.

SIDBI has so far selected 20 small industry clusters for technology upgradation. The product groups covered include locks, textile processing, bicycle & parts, scientific instruments, salt and salt based chemicals, powerloom, machine tools, rubber products, sea food products, glassware, gem & jewelry, brass & bell metal, blacksmithy, leather & leather products, foundries and hand tools.

The methodology adopted for the project is based on identification of technical experts who would then identify the units for technology upgradation and then help them prepare modernization plans which could then be used for funding from the state financial corporations and commercial banks. The expertise located was among the national and state level institutions such as National productivity council, Technical consultancy organisations (TCOs) and other voluntary organisations. SIDBI played an active role in coordinating the services of consultants and helping them to get in touch with the units. SIDBI also paid for the fee of the consultants. The outcome of the modernization program has been mixed with both successes and failures attributed to difficulties in getting finance for the units and due to unprofessional working of the selected institutions.

10. Emerging Issues, Lessons and Initiation Steps Undertaken

There are some important issues that emerge from the above analysis;

1. Can all types of clusters be promoted ? If not, then what type of clusters should be promoted ? Should they have a minimum level of dynamism and organization structure for the program initiative to be successful ?

2. What type of intervention mechanism should be adopted so that it results in financially and administratively a self sustainable cluster development system ? What should be the characteristics of these forms of industrial organisations ?. What type of relations should be promoted so that confidence and co-operation among the firms & suppliers themselves and with the support institutions grows ?

3. Who should initiate such an intervention and with what specific objectives ? What should be the role of private sector bodies, especially industry associations, and support institutions ? What should the government do, particularly with regards to the policy, taxes, infrastructure provision, enforcement of rules & regulations, bench marking etc.?

The analysis provides important lessons. First, clusters are difficult to create unless they are infrastructure based and a conducive infrastructure is created to facilitate that. Among others, it seems that some form of organization should exist before an intervention could be useful. Second, there are large unit based clusters and it may be more useful to associate the large sector enterprises along with the SMEs to make the intervention successful. Third, the product that the cluster produces, should be viable to manufacture and market, in the prevailing market conditions. This means that a cluster with positive market scenario can revive itself from maturity stage into growth stage. Fourth, discrete and uncoordinated interventions are difficult to provide a sustainable worthwhile impact. Fifth, in the Indian scenario where infrastructure and provision of finance is still largely provided and regulated through the government or its institutions, the involvement of such institutions will not only be necessary but also has to be innovative to cater to the specific needs. Sixth, the intervention mechanism for each cluster needs to be tailor-made to ensure its success.

Fortunately these lessons are substantiated by the experiences of other clusters in the world. UNIDO has an important role to play in terms of providing insights into such experiences and their impact in other countries. This can lead to development of better methodologies and relevant information. Besides, it also has enriched experience in assisting such clusters by identifying and arranging services pertinent for the clusters.

With an estimated 350 SME clusters in India contributing towards 60% of India's exports along with a large employment potential, there is no denying that SME clusters have a significant bearing on the nation's economy. Any such program initiated is thus likely to have a high potential to positively effect the nation's industrial development through a competitive, vibrant and dynamic SME sector. Secondly, the program will contribute to development of a new initiative that builds upon the experiences of the various assistance programs. Thirdly, the success of this program should be built around the private sector initiative ably supported by the government and other support institutions.

In the light of the importance of SME clusters in India, a conscious effort to promote industrial development through cluster approach needs to be taken up. Some of the initiatives undertaken so far by a few institutions have focused mainly on individual enterprises. Secondly, the efforts in the past have focused largely on technical oriented project activities by bringing in outside (i.e. external to the clusters) expertise and funding to deliver various services mainly from the supply side. Thirdly, these initiatives have come about by the institutions in isolation to each other rather than with a common objective agreed and acted upon by the actors.

But for the initiatives to succeed and benefit the local firms in the long run, they must be embedded within a well developed socio-political institutional infrastructure that provides support for the deficiencies of the overall business relationship rather than limiting to technical aspects. Gaining from the international experiences of the developmental institutions both in the developed and the developing countries, there is a need to initiate a program that meets the following parameters ;

- Focused assistance at clusters producing similar or inter-related range of goods and services,
- Demand based assistance formulated and implemented by the industry itself,
- Flexible instruments of assistance to meet specific needs of the cluster, and
- Close monitoring and assistance to spur continuous development and innovation.

Bibliography

1. 'Big change in small scale', Business India, January 2-15, 1995.

2. 'Bootstrapping Reform : Rebuilding firms, the welfare state and unions', Charles F. Sabel, Politics & Society, Vol. 23, No. 1, March 1995, Sage Publications Inc.

3. 'Industrial Clusters in Less Developed Countries : Review of experiences and Research agenda', Khalid Nadvi and Hubert Schmitz, Discussion paper, 339, Institute of Development Studies.

4. 'Long-term supplier Relations and Product-Market Structure, Susan Harper, Case Western Reserve University, Oxford University Press, 1992.

5. 'Modern Small Industry, 1972 and 1987-88, Aspects of Growth and Structural Change', J.C. Sandesara, Economic & Political weekly, February 6, 1993.

6. Mighty oaks from little acorns : Can Micro-Enterprise serve as the seedbed of Industrialisation?', Barbara Grosh, Syrancuse University and Gloria Somolekae, University of Botswana.

7. 'Principles for promoting clusters & networks of SMEs', John Humphery & Hubert Schmitz, No. 1, Discussion Paper, UNIDO (SME Programs), October, 1995.

8. 'Small Firms and their helpers : Lessons on Demand', Tendler Judith and Monica Alves Amorim, Massachusetts Institute of Technology, Cambridge, USA, World Development, Vol. 24, No. 3, 1996.

9. 'Supplier Participation and Worker participation : Is there a linkage ?', Susan Harper, David I. Levine, Department of Economics, Case Western Reserve University, Cleveland, December 1993.

10. 'Stabilisation through Reorganisation ?', Charles F. Sabel and Jane E. Prokop, Corporate Governance in Central Europe and Russia, June 1995.

11. 'SIDBI's initiatives in modernization and technology upgradation of SSI sector', Small Industries Development Bank of India, 1996.

12. Subcontracting relations in the age of flexibility : Some issues of relevance from Indian manufacturing, Meenu Tewari, Massachusetts Institute of Technology, May, 1994.

13. The Economist, A survey of India, January 21, 1995.

14. 'The re-emphasis on small enterprises, a review article', S. Nanjundan.

An Overview of Artisan Based Rural Clusters in India

For a country like India where 77% of the population lives in villages any study of this nature would have been incomplete without the mention of rural industries and clusters that exist in this sector. India had initiated the program for rural industrialization in 1957 by starting the Khadi and Village Industries Program followed by Rural Industries program in 1962. Some of the State Governments also came forward to promote industries in rural areas. The assumption made was that by providing subsidies and incentives to the units the rural industrialization would take place. However, in reality several units that came up attracted by these incentives and subsidies did not last long because of limited markets, lack of raw material, inappropriate skills and above all inadequate infrastructure. Thus while rural industrialization continued to be promoted in India although with a low success rate industries continued to grow in the urban areas. Some of the key constraints in the rural industries and hence the development of clusters in rural areas may be :

(i) Lack of education and awareness among the rural entrepreneurs and artisans,

(ii) Lack of organization among the entrepreneurs ,

(iii) Lack of marketing skills,

(iv) Dependency proneness on Government,

(v) Limited reach and effectiveness of the development assistance

(vi) Lack of infrastructure facilities such as electricity and roads

Rural Clusters in India

According to an estimate there are about 2000 rural clusters in India. These are mainly skill based clusters which have grown in size with the passage of time. These clusters consist of unorganized sector tiny units with very little access to market, information and technology. The individual units have independent identities and linkages with the system are virtually non-existent. The existing linkages if any are more in the form of economic exploitation of the makers by the ones having financial muscle power. Due to lack of information and existence of herd mentality, large number of these clusters have created spare capacities. This spare capacity leads to a situation in these clusters by which the entrepreneurs compete basically on low prices. Another characteristic of these clusters is that they are skill based and make use of very simple manufacturing processes and techniques. The products are made by simple hand tools and in rare cases by simple machines without the use of any modern technology methods. Inspite of all these characteristics and problems the rural clusters contribute to a large share of the exports from the SME sector and 40% of the total work force employed in SMEs is in the rural and artisan based industries.

As a part of this study a list of 917 clusters was compiled and analyzed. The enclosed tables indicate the geographical spread and the type of products manufactured by 917 clusters in India. These 917 clusters are located in 26 different states of India and manufacture 32 different types of products. It would be interesting to note that a large number of the clusters are in the textiles sector and even the Government of India having realized this has placed the 'Development Commissioner of Handicrafts' under the administrative set up of 'Ministry of Textiles 'for development of artisan related clusters in India.

It must be reiterated that information on these artisan based rural clusters is only indicative and no in-depth study was conducted at the field level for detailed analysis of the observations made here.

Table 14 : Geographical Spread Of 917 Artisan Based Rural Clusters

S.No.	State	No. of Clusters
1	Arunachal Pradesh	11
2	Assam	20
3	A&N Islands	7
4	Andhra Pradesh	43
5	Bihar	65
6	Delhi	2
7	Gujarat	67
8	Haryana	41
9	Himachal Pradesh	35
10	Jammu & Kashmir	55
11	Karnataka	54
12	Kerala	34
13	Lakshadweep	9
14	Maharashtra	41
15	Manipur	6
16	Mizoram	6
17	Madhya Pradesh	47
18	Nagaland	8
19	Orissa	41
20	Punjab	37
21	Rajasthan	98
22	Sikkim	2
23	Tripura	11
24	Tamil Nadu	61
25	Uttar Pradesh	85
26	West Bengal	31

Table 15 : Products Manufactured by 917 Artisan Based Clusters		
S.No	**Product**	**No. of Clusters**
1	Bidri	4
2	Cane & Bamboo	62
3	Carpets	31
4	Coil Twisting	5
5	Conch Shell	6
6	Dolls & Toys	50
7	Filigree & Silver ware	2
8	Folk Paintings	14
9	Furniture	14
10	Grass Leaf Reed & Fibre	30
11	Horn & Bone	12
12	Ivory	13
13	Jewelry	63
14	Leather Footwear	10
15	Leather Other articles	13
16	Metal Images Classical	9
17	Metal Image Folk	3
18	Metal Ware	80
19	Musical Instruments	7
20	Pottery & Clay	35
21	Rugs & Durries	28
22	Stone Carving	23
23	Stone Inlay	7
24	Terra-cotta	16
25	Textile Handloom	110
26	Textile Hand Embroidered	47
27	Textile Hand Printed	81
28	Theater, Costumes & Puppets	10
29	Wood Carving	69
30	Wood Inlay	16
31	Wood Turning & Liquerware	35
32	Zari	12