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Technological Status and Upgradation of SMES

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INTRODUCTION

The demand for new technologies is usually directly related to new market opportunities. Once small producers become aware of new opportunities, the challenge shifts to acquiring the capacity to supply what the market demands. This often requires the acquisition of new skills, management techniques, and know-how, as well as tools and equipment — all important aspects of technology development. Because the processes of market development and technology mastery tend to be directly related, the primary sources of technology information, equipment, and advice and training on new production or processing technologies for small producers are the product buyers and input suppliers with whom the producers interact in their normal commercial dealings. A review of technology development and dissemination programs reveals there is likely to be strong demand from small producers for services that help them respond to new market opportunities and that are available on terms and conditions that permit them to profit from the adoption of new technologies.

Technological obsolescence has been a characteristic of small industry in India across a wide variety of sectors. In the early 90s, two survey-based studies have brought out that technological obsolescence of small industry affect quality and productivity adversely. These empirical studies indicated that small industry in general, is characterized by technological obsolescence and therefore, inferior quality as well as low productivity (Awasthi, Krishna and Sebastian, 1993; NCAER, 1993).

Subrahmanian, K K (1995) had also highlighted the lack of technological dynamism in Indian small industry. Policy Makers in India have considered technology development in small industry only from a single dimension, that is, through institutional technology transfer. This implies that small industry in India is perennially external technology dependant. How far technological infrastructure meant for small industry has helped the sector is another issue. But India has 361 small & medium enterprise (SME) clusters (which are overwhelmingly predominant with small industries and the share of medium and large industries is nominal) and 1656 artisan clusters (SIDO website). Given this, it is not difficult to comprehend that the technology infrastructure would have made, at the most, only a marginal impact on the sector as a whole. But technology development in small industry can be achieved even through in-house technological innovations as well as inter-firm linkages with large firms.

Technological innovation involves the situation ally new development and introduction of knowledge derived tools, artifacts, and devices by which people extend and interact with their environment (Tornatzky, L G and W Fleischer, 1990). It is primarily rooted in a firm's internal competencies (Kim, L and R R Nelson, 2000). a small firm can get technological inputs and technology through sub-contracting relationship with large firms on a continuous basis. In Japan, effective sub-contracting relationship between small and medium enterprises (SMEs) and large firms works as an important mechanism of technology transfer (Nagaoka, 1989). But in India, policy seems to have overlooked the ability of small firms to innovate (Bala Subrahmanya, M H, et. al, 2002) and the extent of ancillarisation, though increasing in recent years, is well below the potential (Planning Commission, 2002).

There is a need to explicitly recognize and exploit the 'innovation potential' of small enterprises. In developed countries small enterprises are promoted, among others, as the 'seed bed' of innovation (Bala Subrahmanya, M H, et. al, 2002). Small enterprises have the specific advantages of flexibility, concentration and internal communications for carrying out technological innovations (Rothwell, R and W Zegveld, 1982). Technological innovations contribute to competitiveness (Tornatzky, L G and M Fleischer, 1990).

The increase in the competitiveness of small industry will also be determined by the availability and quantum of finance. The demand for finance –implicit as well as explicit- from small industry will be substantial considering its size, structure, growth pattern, need for its restructuring and technology development (Bala Subrahmanya, M H, 2002a). Particularly, the investment demand for finance from small industry will increase considerably due to

technology upgradation & modernization, expansion (of efficient ones), quality improvement, R&D and technological innovations, environment related investments (industry specific)[1],

The R&D demand formed a meager 1.8% of the total investment demand of SMEs in 2001 but it went up to 4 % by 2006 (Asian Development Bank, 1997). To meet the growing and diversified investment demand requirements, it is essential to broaden the financial infrastructure, specifically to take care of the technological transformation of small industry and lay more thrust on adequate flow of finance to the sector (Bala Subrahmanya, M H, 2007a).

Technology Development and Technology Supply Services

Successful technology development programs undertaken by NGOs have generally recognized the existence of market demands for new production technologies and have incorporated various mechanisms to respond to these demands in their program operations. Commercial Networks and Microenterprises at District level as well as in the Global Economy

Many of the technical assistance efforts that were directed at small and cottage industries or 30 years ago were formulated to help deal with problems caused by their isolation from the marketplace, lack of competition in input and product markets, difficulties in accessing information from outside of their local communities, and policy and regulatory barriers caused by seriously misguided governmental actions. Even though many of these conditions are still present and continue to affect micro enterprises in many parts of the world, positive developments in areas such as communications technologies, public policy reforms, financial sector reforms, market liberalization, and global competition have begun to alter the environments in which MSEs operate and the opportunities available to them. These changes, taken together, have opened up new, higher value market opportunities for products and services that are within the reach of micro and small-scale entrepreneurs. Smaller enterprises in some district have been highly successful in taking advantage of such new opportunities.

The principal dilemma involves deciding what types of services should be paid for by the immediate beneficiaries and what types produce sufficient external benefits that they justify expenditures of development funds. Measurement of development impacts involves cost-benefit calculations that attempt to assess the ripple effects of particular programs — the broader set of social and economic benefits that accrue to the wider community. Calculating such benefits is more complex and costly than calculating the profitability or cost-recovery performance of particular programs or service packages. There have been considerable shifts in thinking about how programs offering business development services to MSEs should be designed and managed. Provisions for revenue generation, which were formerly resisted by donors as being contractually messy, are now commonplace. Costrecovery mechanisms are being looked upon both as a way of reducing the need for longer-term public subsidies and as a critical measure for assessing the value of particular types of services to MSE clients. Viewpoints on the role of commercial networks or intermediaries in business development service promotion efforts also appear to have changed considerably The policy of the government was to support the small-scale industries at the expense of the large industries to generate more employment, increase national industrial output and increase the share in export in certain cases. Thus, the scenario was that the large-scale industries were extending their hand towards the SSI units for the survival of the latter. The wheels have turned now. A big opportunity is knocking at the doors of the SSI units. Because of economic gains, the large-scale units now want to tie up with the SSI units and outsource a number of their operational activities. So, though the SSIunits had started off as the supported and protected * As per the Report of the Fiscal Commission (1949- 50). " the small scale industry is one, which is operated mainly with hired labour, usually ten to fifty hands." So in the industrial development and regulation act, 1951, the Government provided for exemption from registration to units employing less than fifty workers with power and less than one hundred workers without power. During 1954-55, the Government of India set up the Central Small Scale Industries Organization and the Small Industries Board. The SSI units had been defined at that time as : "A unit employing less than fifty persons, without the usage of power and capital assets not exceeding rupees five lakhs." Let us concentrate on the more recent definition. As per the industrial policy Regulation, 1980, SSI units have been defined as follows "Any unit having an investment of rupees twenty lakhs in capital equipment and rupees twenty five lakhs investments in ancillary units is considered as a small scale unit." In 1990, the investment ceiling in plant and machinery was raised to rupees sixty lakhs and for ancillary units to rupees seventy five lakhs. Based on the recommendations of the Abid Hussain Committee report submitted in 1977, the investment limit on plant and machinery for small scale industries was further raised to rupees three crores, which was brought down to rupees one crore from the year 2000, and there is no restriction on the number of people or the usage of power. The definition of SSI units has been changed from time to time to make this sector effective with the change in economy. The government has always tried to give a boost to this sector, because it helps in generating employment opportunities, helps in developing entrepreneurial skills among individuals, it widens the industrial base, removes regional the 'extending support' relationship of yesterday disparities and helps in effective utilization of the economic resources. SSI units bring other benefits also; with an increase in the total

[1] Acs; Z.J. and D. B. Audretsch (1987), 'Innovation, Market Structure, and Firm Size,' *Review of Economics and Statistics,* 69

production, the prices of the commodities are export performance. Thus, there will be equitable distribution of income, wealth and economic power, which are the goals of any government. In short, SSI units are a powerful tool in the hands of the government to bring about economic self-sufficiency and economic spin off. SSI units and Five Year Plans In spite of criticisms form various quarters, the government has always given strong support to SSI units for the above mentioned reasons, by allotting a good percentage of the total planned outlay to this sector for improving its performance. Plan wise allotment and total outlay during the different five year plans has been depicted in the following chart: Five year plans Money alloted to Total SSI investment plan and development outlay (Rs. in crores) (Rs. in crores) 1st plan 42 2,069 2nd plan 187 4,800 3rd plan 241 7,500 4th plan 251 15,901.47 5th plan 388 38,853.24 6th plan 1,952 97, 500.00 7th plan 3,249.3 1,80,000.00 8th plan 6,334 4,34,100.00 In the 9th Plan, 821 items were identified and reserved exclusively for the SSI sector as a measure of protection. The impact of these investments was perceived later, and the results were very encouraging During the 5th Plan (1974-78), exports increased from Rs. 194 crores in 1974 to Rs. 440 crores in 1978. l During the 6th plan, there was an increase in production from Rs. 33,538 crores in 1979-80 to Rs. 65,730 crores in 1984-5. Exports from SSI units increased from Rs. 1,069 crores in 1979- 80 to Rs. 2,540.8 crores in 1984-85 l During the 7th plan, the exports in the SSI sector rose to the level of Rs. 7,625 crores in 1989-90, recording an annual growth rate of 26.6% l During the 8th plan, the export rose to a remarkable height of Rs. 39248.5 crores in 1996- 97l It is worth mentioning that the export during the period from 1980-81 to 2000-01 registered a record growth from Rs. 1,643 crores to Rs. Rs. 53,975 crores. SSI and the Industrial Policy Resolution The Industrial Policy Resolution at different points of time also contributed greatly to the enhancement of the performance of the SSI units In the Industrial Policy Resolution 1956, emphasis was placed on village and small-scale industries. Although no specific targets were mentioned, it suggested that the states protect the SSI units from the large-scale industries by way of tax differentials, direct subsidies and other means. l The Industrial Policy of 1977 actually laid emphasis on the SSI sector. It stated, "The main emphasis of the new Industrial Policy will be on the promotion of cottage and small industries, widely dispersed in the rural areas."[2]

THE PRODUCTIVITY IN THE SMALL MANUFACTURING ENTERPRISES IN THE CONTEXT OF DISTRICT MEERUT

Socio-economic progress of a neo-independent developing country rests on the pillars of maximum income for maximum possible people. In this context the small scale sector, especially the micro and small enterprises (MSEs) have a vital role to play. Substantially large mass of people can be gainfully employed in these enterprises that are extremely heterogeneous in nature. In India to the MSEs have played a crucial role in creating jobs and expanding the penetration of market based economic activities. Transformation of the occupational structure has been possible due to spread of the MSEs to a large extent. However, with changing times, the contribution of this segment has been questioned on grounds of the returns from these enterprises. It is often alleged that the MSEs have acted as a sink where people having no alternative opportunities are deposited. Consequently, productivity levels are low (Oberai and Chadha, 2001, Unni et al, 2001, Shah, 2002). Thus, though their role in employment generation and reduction of poverty is widely acknowledged, it is often argued that their contribution to national income is not substantial. It is thereby suggested that unless productivity level in the MSEs can be raised considerably, the objectives behind encouraging this sector would remain unfulfilled. The responsibility of all remaining errors is solely hers. Tries to explore the role of technology and access to services in determining productivity levels in the MSEs. The importance of various factors in improving productivity levels, and segments within MSEs where such policies are likely to be most successful, are also sought to be identified. There has been various ways by which small enterprises in India have been defined – in terms of their investment volume, registration status and employment size. We use the employment size criterion and concentrate on the unorganised manufacturing sector1. Thus, the focus is on the small manufacturing enterprises (SMEs) within the MSEs. Similarly, there can be multiple definitions regarding technology. In the present study technology is defined simply by the capital-labour ratio because of its conceptual simplicity and availability of comparable data. The reference period chosen for the study is the period 1994-95 to 2000-01, as determined by the two latest NSSO surveys on Unorganised Manufacturing Sector (the 51st and 56th Round Surveys). The study is carried on at the disaggregated level of 2-digit National Industrial Classification[3].

TECHNOLOGY AND LABOUR PRODUCTIVITY

It is generally argued that technology plays an important role in determining the productivity level. Consequently, the association between capital-labour

[2] Carlsson, B. (1992), "The Rise of Small Business : Causes and Consequences', In W. J. Adams (Ed.), *Singular Europe, Economy and Policy of the European Community after 1992*, University of Michigan Press, Ann Arbor, Michigan.

[3] Carree, S. (2007), 'Patagonia : Blueprint for Green Business,' *Fortune*, May 29 Hamm, S. (2006), 'Passion for the Planet,' *Businessweek*, August 21

ratio and labour productivity has been explored for each of the activity groups separately with the states as observations. It is found that for almost all activities the association is significantly positive Even then, substantially high correlation coefficients are obtained for Food product, Tobacco-Beverage, Textile product, Wood product, Paper product, Basic chemical, Rubber & plastic, Metal product and Electrical & Non-electrical equipment sectors. This signifies that the level of technology employed determines the labour productivity level in the SMEs.

IMPROVEMENTS IN TECHNOLOGY AND LABOUR PRODUCTIVITY LEVELS

The close association between base level productivity and technology prompt us to examine the dynamic aspect of it. Consequently we examined the relationship between growth in capital-labour ratio and growth in labour productivity2. It is observed that the association is positive for almost all activity groups Among them, the coefficients are significant for Tobacco-Beverage and Transport equipment sectors for all the three segments in both rural and urban areas; for Textile product, Leather product, Basic chemical, Rubber & plastic, Non-metallic mineral product and Basic metal sectors in the rural areas; and the Machinery-Equipment sector in the urban areas. Thus it is evident that improvement in technology has gone hand in hand with rise in labour productivity level, thereby underlining the importance of technology as a determinant of productivity[4].

TECHNOLOGY AND TOTAL FACTOR PRODUCTIVITY

The relationship between capital-labour ratio and partial productivity levels are sometimes questioned on grounds of factor substitution effect. It is argued that mere substitution of one factor by another will lead to changes in partial productivity levels and a 'capital deepening' technological change will cause rising labour productivity and declining capital productivity. Under such circumstances, productivity levels are sought to be measured by total factor productivity (TFP).

In many developing countries women are prevented or constrained from making an economic contribution through employment and entrepreneurship. Inasmuch as it is crucial that policies are not biased in favour of large enterprises or foreign investors, it is equally important that they do not exclude a large segment of a country's human resources from generating wealth and facilitating development. Moreover, research has shown that women's incomes are more likely than men's to contribute towards improving the well-being of the family and society. Women entrepreneurs have also proved to be less of a risk than men in repaying loans. Research shows that although many women own or run microenterprises (and in many cases form the majority of micro-entrepreneurs), few of them enter the formal sector, and, as a result, only a small number of women's microbusinesses graduate into SMEs. The reasons for this vary from country to country. In general, the existence and persistence of customary and traditional practices, which, in some cases, result in discriminatory laws, create a multitude of obstacles for women entrepreneurs in addition to those normally faced by all SME entrepreneurs. It is therefore important for developing countries to identify the types of support measures that may be necessary to promote women's entrepreneurship and facilitate their full contribution to the development of their countries work system should be conceived as a set of activities making up an integrated unit, than a mere collection of individual jobs. The work Design of system is an extended social process and shaped by a range of social patterns over time.

SMALL SCALE INDUSTRY IN INDIA UNDER GLOBALISATION:

Small scale industry development has been one of the major planks of India's economic development strategy since independence. Today, small scale industry occupies a place of strategic importance in Indian economic structure due to its considerable contribution in terms of output, exports and employment. By the end of March 2002, there were 3.4 million small industry units, accounting for more than 40% of the gross value of output inthe manufacturing sector, about 35% of the total exports and provided employment to over 19.2 million persons, which is second only to agriculture (Planning Commission, 2002). This much contribution has emerged despite the sector being exposed to intensifying competition during the decade since 1991. Small scale industry in India has been confronted with growing competitive environment since 1991 due to (1) liberalisation of investment regimes in the 1990s, favouring foreign direct investment (FDI) at the international level, particularly in socialistic and developing countries.

Global, National and Sectoral Policy Changes: Implications for Small Industry. The 1990s was an eventful decade in terms of policy changes, nationally as well as internationally. Since the beginning of 1990s policy changes have been taking place at three different levels – global, national and sectoral, which have implications for small industry functioning and performance in India. The first and the foremost development is the "globalization" process at the international level. Globalization would mean free movement of factor inputs (both labour and capital) as well as output between countries. According to Stiglitz, J (2002), globalization is the closer integration of the countries and peoples of the world which has been brought about by the enormous reduction of costs of transportation and communication, and the breaking down of artificial barriers to the flows of goods, services, capital, knowledge, and (to a lesser extent)

[4] Jagadeesh, N. (2006), 'India's New Billionaires,' *Businessworld*, September 4.

people across borders. However, the developments that have been taking place since the early 90s are mostly with reference to the free movement of only one of the factor inputs, i.e., capital, commonly known as Foreign Direct Investment (or FDI) and free movements of goods, particularly from the developed to the developing countries. The liberalization of FDI regimes and the strengthening of international standards for the treatment of foreign investors allow foreign firms greater freedom in making international location decisions (UNCTAD, 2001). On an average, 58 countries have introduced changes in their investment regimes annually during 1991–2000. In 2000 alone, 69 countries made a total of 150 regulatory changes, out of which, 147 (98%) were more favourable to foreign investors (UNCTAD, 2001). As a result, global FDI inflow increased to US $ 1271 billion in 2000 from US $ 209 billion in 1990. The rate of growth of FDI inflow increased to about 21% in the early 1990s as compared to 17.4% in the 80s and further increased to about 41% in the late 1990s. The increased inflow of FDI has led to its greater share in gross capital formation in all industries together as well as manufacturing industries[5].

SMALL-SCALE UNITS IN THE ERA OF GLOBALIZATION:

Small-scale units in India have assumed significance not only for their contribution to the economy especially in the creation of employment but also for the special patronage they enjoy from the government. Despite numerous policy measures for the past four decades, Indian small-scale units have remained mostly tiny, technologically backward and lacking in competitive strength. 1 Notwithstanding their lack of competitive strength, small-scale industrial units of India could survive so far due to product and geographical market segmentation, and policy protection. The business environment has been changing drastically in the recent times reducing the importance of these three factors. For instance, economic policy reforms of the 90s that have aimed at liberalisation of domestic economic transactions and opening of the economy, are slowly taking away the policy protection to the small-scale units. In this context, it is important to gauge the future scenario for these units and the ways of dealing with it. Accordingly, this paper analyses the on-going changes in the business environment, the consequent structural transformation of industries and their implications for the small-scale units It was implicit in the Mahalanobis (1963: 72-73) that formed the basis for the development strategy of India and explicit in the famous Karve Committee (Committee on Village and Small Scale Industries, Second Five[6].

GARMENTS

The garment industry is one of the dynamic sectors of the Indian economy, which is growing at a rate of 20 per cent per annum for the past two decades. 40 It is also one of the major employment generating industries and larger earners of foreign exchange for the country. The direct employment of the industry was about 0.6 million persons in 1980 and has gone up to around 2.0 million persons in 1992.41 The exports of garments were worth US $ 2.58 billion in 1990-91 and have risen to US $ 4.91 billion by 1997-98. 42 These exports accounted for about 9 per cent of total Indian exports in 1981-82. The share has almost doubled to 17 per cent by 1994-95. We begin the discussion with a description of the garment production process as it enables one to understand the industry structure better. Production of garments involves a sequence of designing, pattern making, fabric processing and testing, cutting, stitching, zipping/ button work and finishing. Design is a highly creative and skilled activity. Pattern making is a process in which design is translated into a pattern on a cardboard or a particular paper for different sizes and shapes. It is again a skilled job. Fabric is cut according to the given specifications by placing it on the relevant pattern marker. Before it is cut, grey fabric is processed for colour, prints, etc., and tested for things like texture and inflammability.

INNOVATION

Innovation refers to creating new resources or combining existing resources in new ways to develop and commercialize new products, move into the new markets, and/or services, and acquire new customers (Swedberg, 2000). Innovation provides the entrepreneur a chance to become a first mover, by which he/she can gain profit because of monopoly until a competitor imitates its new product or finds a substitute. Small firms will become superior if the optimal development costs are low. Small firms will tend to specialize more in the research phase and in smaller development processes (Swedberg, 2000). Their comparative advantages over large firms in innovation come from their flexibility and speed of response. Some factors that have been found to be influential for innovation in SMEs are classified into two categories, namely, internal and external. Internal factors are self-motivation, technical education, and work experience. Relationship Differentiate product market Perfect competition market External factors include customer touch, subcontracting relationship with a large firm, research institute interaction, and

[5] McClelland, D. A. (1961), *The Achieving Society*, Van Nostrand, Princeton, New Jersey

[6] Mcredith, J. (1987), "The Strategic Advantages of New Manufacturing Technologies for Small Firms,' *Strategic Management Journal,* 8.

government and non-government promoted SME support organization, financial organization and competition and technology change

SMES: THE INDIAN SCENARIO

With the advent of planned economy from 1951 and the subsequent industrial policy followed by Government of India, both planners and Government earmarked a special role for small-scale industries (SSI) and medium scale industries in the Indian economy. Due protection was accorded to both sectors, and particularly for small-scale industries from 1951 to 1991, till the nation adopted a policy of liberalization and globalization. Certain products were reserved for small-scale units for a long time, though this list of products is decreasing due to change in industrial policies and climate. SSIs always represented the model of socio-economic policies of Government of India which emphasized judicious use of foreign exchange for import of capital goods and inputs, labour intensive mode of production, employment generation, non-concentration of diffusion of economic power in the hands of few (as in the case of big houses), discouraging monopolistic practices of production and marketing, and finally effective contribution to foreign exchange earning of the nation with low import-intensive operations[7].

The small scale industrial sector of the Indian economy encompasses in itself almost all of the products produced by the Indian industries within the economy. Most of the times the products produced by the small and medium enterprises comprise of the intermediary products produced by the large-scale industries. They also include semi processing units and processing units, which are an important link between exports and re-exports. Thus, SMEs act both as a backward and forward linkage to the overall industrial sector of the Indian economy. Interestingly, the segment plays a crucial role in spreading the benefits of economic growth among the masses by drawing surplus workforce from the farm. SMEs exist in almost all-major sectors in the Indian industry such as Food Processing, Agricultural Inputs, Chemicals & Pharmaceuticals, Electrical & Electronics, Medical & surgical equipment, Textiles and Garments, Gems and Jewellery, Leather and leather goods, Meat products, Bioengineering, Sports goods, Plastics products, Computer Software *etc*.

TECHNOLOGICAL STATUS OF SME'S

Technology and modernization of the industry, particularly of the small sectors going to play a very important role . So far as the small sector is concerned, the thrust of technology policy has been on indigenization and development of improved technologies through indigenous efforts till a few year ago. But this approach is undergoing a change . In the changing technology environment, very fast and astounding technology changes are taking place in almost all the fields[8].

INDIAN TECHNOLOGY SCENARIO

Coming to Indian small scale sector , the thrust of technology policy has been on indigenization and development of the improved technology through indigenous R&D centers . At present goods , consumer items,, components ,intermediates and many sophisticated products, numbering more than 8000 , both for domestic use and for export , are being produced by the small units. Out of 836 items are reserved for exclusive production by ssi sector . The policy were frame on the assumption that the small scale industries apply labour intensive and would manufacture economically a large volume of goods.

(iii) Modernization and Technology Up gradation

The liberalization policy of the Indian government has exposed the industry to the simultaneous challenges of growth and competition. The industry, including small sector, has to formulate its responses by being sensitive to technology and showing resilience to the new environment. The technological and information revolution of the last few decades of 20th century has given overriding importance to knowledge and information manufacturing, marketing and servicing as opposed to capital, material and labour intensive operations. Because of these factors, the typical cost of manufacturing today is about 25% of the end user price and value is added not by labour alone but through R & D inputs, engineering, financing and marketing functions. Even the material inputs are sometimes very low such as the cost of materials in the chip is barely 1% and balance represents value addition through knowledge, R & D, engineering inputs etc. Distribution, warehousing, financing, retail marketing and other services have also shown tremendous potential for job creation other than manufacturing operations done. Computerization and the spread of information technology has not only reduced the distinction between manufacturing and services sectors but also increased the share of services sectors in the GDP of all economics as happened in the developed world[9].

The application of micro-electronics in powerlooms, handlooms, computer aided designs and in other labour intensive sectors, would make this employment oriented sector viable and globally competitive, otherwise it might be left out. But, at the same time, the infusion of new technology and upgradation of the existing ones has to be a continuous process.

[7] Phillips, B. D. (1985), "The Effect of Industry Deregulation on the Small Business Sector," *Business Economics,* 20.

[8] Prusa, T. J. and J. A. Schmitz, Jr. (1991), 'Are New Firms an Important Source of Innovation : Evidence from the Software Industry,' *Economics Letters,* 35.

[9] Schumpeter, J. A. (1934), *The Theory of Economic Development*; Harvard University Press, Cambridge, Massachusetts.

Table 1 : Status of Industrialization in Districts of Uttar Pardesh, 2009

District	Khadi/Gram Udyog units	Small-Scale Industries (SSIs)	Total employees of Khadi units	Total employees of SSIs Factories Act	No. of factories	No. of Workers
Buland shahar	1608	3463	2154	14906	9	486
J P Nagar	47	614	104	823	5	375
Muradabad	1299	185	1305	364		
Bagpat	190	422	400	985	7	33
Meerut	1523	542	1759	1175	49	3189
Gazhiabad	1689	1106	2637	1660	2	94
Bijnore	72	289	143	627		
Rampur	1129	254	2162	613	34	780
Bareily		155		231	1	160
Muzaffar Ngar	2529	346	8651	1353	171	22156
Saharanpur	1608	3463	2154	14906	127	14654
Lukhnow						
Kanpur						

Shorter product life cycles would make innovation necessary and this can be a competitive advantages for the small firms who can face the challenges relatively easily, can innovate and stay ahead. However, the shorter product life-cycles and high cost would also complicate the process of technology acquisition and transfer. This will put R & D and facilitating institutions under pressure and they have to change their mind set to meet the need of the hour. There is need to change the functioning of these institutions to suit the industry and meet their needs particularly of the SMEs. It is obvious that key to enhance global competitiveness will not be inexpensive labour, but will involve usage of high technology by SMEs.

Table 2 : Rate of Growth of Net Domestic Product at factor cost

(*Unit : in percent*)

		2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07
At Current prices	Uttar Pardsh	7.4	8.5	7.6	12.3	12.9	13.7	15.8
	Meerut	13.24	5.98	14.69	9.03	7.67	11.28	13.40
At 1999-2000 prices		4.1	5.6	3.4	8.6	7.3	9.4	9.6
	Meerut	10.28	2.98	7.16	6.27	6.20	8.24	8.55

Source: Directorate of Economics & Statistics of Uttar Pardesh and Central Statistical Organization

(v) Dimensions of Change

The process of technological changes is likely to be accelerated in the next decade and these changes will affect all industries though the degree of changes may vary from sector to sector. New technologies that would emerge would be knowledge-intensive and multidisciplinary. With the integration of the national economy with the global economy, the latest technology developments shall reach the door-steps of the entrepreneurs. Major dimensions of change for the facilitating institutions would include management of knowledge, technological information sourcing and the impact of information technology. The coming decade would also see change in technology acquisition in small sector. From self-acquired and equipment-embodied technologies, the shift will be to institutions facilitating technologies, laying stress on humana skills. All these developments would have a profound effect on the industrial scenario in every country also. So the SMEs sector has to evolve a system for ensuring optimum use of all resources backed by technology. Increasing emphasis on using energy efficient, clean and environment friendly technologies will pose an extra challenge to SMEs and their institutions[10].

[10] Timmons, J. A. (1994), *New Venture Creation : Entrepreneurship for the 21st Century,* 4th ed., Irwin Press, Burr Ridge, Illinois

Table 3 : Number of Small-Scale Industrial Units in Uttar Perdesh and Meerut (2001-02 and 2006-07)

Type of Industry	Meerut		Utter Pardesh	
	2001-02	2006-07	2001-02	2006-07
Small-scale Industry Units	106484	137618	10521190	12843774
Registered	15285	30268	1374974	2031910
Un-registered	91199	107350	9146216	10811864

Source: Outsourced from Annual Report 2001-02, 2003-04 Ministry of SSI, Giri Istitute Luckhnow

(vi) Present Scenario of Technology Support to Small Industries Enterprises.

Large number of small firms would have to depend on others for acquiring technology. Critical information is closely guarded by the sellers of technology and the technology price would be determined by the relative bargaining position of the seller and buyer.

Also the technology which is in great demand would not always be available for sale e.g. the audio boom in the Hindi-film-music is based on the availability of inexpensive magnetic tapes. However Indian manufactures of magnetic tapes have found it impossible to obtain technology from any of the top manufacturers like Sony, TDK, JVC or Maxell. The indigenous firms could only obtain tie-ups with smaller firms from Hong Kong or Singapore. This would be equally true in other critical areas also where technologies are closely guarded for example Video heads.

In this context, facilitating institution would have to play a crucial role in evaluating and assessing technology alternatives and may also be required to assist in assimilation and absorption of technology. The facilitating institutions will have to see that the chosen technology is appropriate to the end user as high technology may not always be needed. Besides meeting the training needs of the small industry, they should modernize their facilities as per the changing environment and become major players in assisting the sector in technology evaluation, sourcing, acquisition and transfer. Besides, they have to provide facilities in up gradation of the existing technologies on commercial basis. Specialized firms, experts and NGOs will have to play a major role in this Endeavour[11].

REFERENCES

Deming W. E. (2001) Quantity, Productivity and Competitive Position Centre for Advanced Engg. Study, MIT USA.

Kumar S. R. (1995) Value for Money Deccan Herald.

Kapur, B. M. (1998) Globalization of the Indian corporate sector Journal of Indian Management Studies 8, Jan-Mar.

Luthans, F. (1998) Organizational Behaviour, Mc. Graw Hill International.

Mani, R.S.S. (1996) Talent Retention: Trails and controversies, The Hindu March 20, 1996.

Nair, M.R.R. and Rao, T.V. (1998) Excellence Through Human Resource.

Pareek, U. and Rao T.V. (1999) Designing and Managing Human Resource System, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.

Porter M.E. (2001) Competitive Strategy Free Press, New York.

Rao, P.L. (1997) changed Functional Ambience Personnel today April-June 1997.

Sarangi S.K. (2002) Strategic Management Everest Publishing House, Pune.

Sarangi S. K. (2003) Economics, Business and Industrial Management Himalaya Publishing House, Bangalore.

[11] Chun, J. (1997), "Theory of Creativity,' *Entrepreneur,* October