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Policies and Infrastructural Facilities for Technology Transfer to SMEs in Globalized Economy

INDIAN PERSPECTIVE

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1. Globalization and its Impact on SMEs

GLOBALIZATION in a way has not only affected the competitiveness of Small and Medium Enterprises (SMEs) but has also threatened the very survival of some of the weaker ones. It has forced them to re-think their manufacturing and marketing strategies. Small and large sized companies have realized that to compete globally they need to work more closely with each other than ever before. Large enterprises can have the economy of scale, benefits of knowledge, research, marketing, branding and in some cases even financing. Small enterprises can be the low cost engines of production and generate jobs. This could be an ideal combination for Indian industry to remain globally competitive.

Globalization has in effect thrown many challenges as well as opportunities for the SMEs. The challenges include:

(a) *Internationalization of domestic markets*: With many foreign companies establishing joint ventures and wholly owned subsidiaries and setting up manufacturing facilities in India the domestic market is experiencing a large number of products which are manufactured by these outfits. Such products are posing stiff competition for the products manufactured by domestic companies.

(b) *Availability of imported products at cheaper price than local products*: Landed prices of imported products have become cheaper than the price of products manufactured domestically. This is due to revision of tariffs and duty structure, as demanded by the WTO. As a result of this, many companies have been forced to shut down their manufacturing operations and take up trading instead.

(c) *Brakes on reverse engineering*: Due to alignment of IPR laws with the TRIPs agreement of the WTO, product patent regime has been introduced in the country, replacing the process patent regime. This in turn started affecting the fortunes of many companies which were thriving on the basis of reverse engineering.

(d) *New trade barriers imposed by TBT and SPS agreements of WTO*: The Technical Barriers to Trade (TBT) notifications issued by many countries have resulted in rejection of many export consignments, affecting the exports of various companies. Sanitary and Phyto-Sanitary (SPS) measures stipulated in the SPS agreement have forced companies to assess the sanitary and hygienic conditions prevailing in their factories and accordingly has suggested to make investments to improve the same.

The opportunities that globalization has unfolded include:

(a) *Increased flow of foreign investment and technology*: The globalization process has attracted more and more foreign companies to bring in investments and technology into the country and establish joint ventures. This has provided an opportunity to the local SMEs to build up their capabilities and capacities.

(b) *Outsourcing or re-location of pieces of supply chain*: The globalization process has opened up many

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opportunities for design outsourcing and contract manufacturing for the local SMEs.

(c) *Access to foreign markets*: The globalization process has enabled the local SMEs to look beyond the national boundaries and access foreign markets for their products and services.

(d) *Mergers and acquisitions*: The globalization process has promoted mergers and acquisitions among companies resulting in enhancement of economies of scale, quality, delivery schedules, etc. of the local SMEs.

(e) *New areas of business*: The process of globalization has resulted in opening up new areas of business for local SMEs such as business process outsourcing, medical transcriptions, clinical research trials, etc. It has also encouraged some of the SMEs to look at emerging technologies such as biotechnology, nanotechnology, etc.

Some of the forward looking and dynamic SMEs have seen these opportunities and integrated themselves with the global supply chains.

Globalization has also given rise to a number of Preferential Trade Agreements (PTAs) or Free Trade Agreements (FTAs) between nations which also present opportunities as well as threats.

2. The Need for a Pro-SME Policy and Technology Transfer to SMEs

It has been observed that a thriving SME sector is characteristic of flourishing economies. SMEs are the powerhouses of industries. Worldwide, they account for a massive 99.7 per cent of all enterprises. Since SMEs contribute substantially to the economic and industrial development in most countries, it becomes necessary to put in place a policy mechanism that will facilitate their growth.

It is becoming amply clear that only those SMEs which are competitive would be able to survive in the globalized economy. Now what does competitiveness imply? Being competitive means having the ability to produce high quality goods and services at market determined prices or even at prices lower than that and supplying them as per committed delivery schedules. It also means supplying products with innovative features that conform to international standards, supplying products that are rugged, user-friendly as well as having a customer appeal. Many of these competitiveness parameters hinge upon application of modern state-of-the-art technology. For example, use of advanced process technology usually results in a better product quality and durability, technology usually helps in reducing cost by effecting savings in material, energy or through replacement of conventional materials with cheaper alternative materials and technology can make a product rugged such as scratch-proof, unbreakable etc. Therefore, technology transfer to SMEs must be facilitated to enable them to become competitive and contribute effectively in country's economic and industrial development. Also, SMEs must build capacities to attract technology from outside and then absorb and adapt it for newer applications. The excellent performance of high technology users in sectors like auto components and pharmaceuticals only underlines the need for technology transfer to SMEs in India.

3. SMEs in India

SMEs in India today include small scale industries, small scale enterprises, tiny enterprises and SSSBE (Small Scale Service Business Enterprises) and

medium-size enterprises. The focus is mainly on the sectors relating to manufacturing such as textile, auto ancillary and engineering industries. The definition used by the Indian authorities is based on the level of investment in plant, machinery or other fixed assets whether held on an ownership, lease or hire purchase basis. Currently, this limit is up to Rs 10 million. In order to enhance the competitiveness of the small scale sector, in the changing scenario of economic liberalization and globalization, the investment limit in respect of certain hi-tech and export oriented items was enhanced to Rs 50 million to enable them to undertake technological upgradation. Till last year, the number of items, which had investment ceiling of Rs 50 million in plant and machinery was 71. The SSI ministry's efforts to raise the investment limit for 69 more products in the small and medium enterprises (SME) sector from Rs 10 to Rs 50 million is likely to come into force shortly. Items included in the list for which investment limit is going to be raised vary from the auto component to food processing and pharmaceuticals sector. Once this comes through, the total number of products in the SME sector with an investment limit of Rs 50 million will go up to 140.

The following are the figures that reflect the significance of Indian SMEs to the national economy:

- Estimated number of enterprises: 11.86 million
- Estimated employment: 28.29 million
- 91 per cent of total industrial units
- 39.42 per cent of total industrial production
- 34 per cent of total exports
- 6.81 per cent of GDP
- Growth rate of about 8 per cent per year over last 10 years, *vis-a-vis* about 5 per cent for whole industrial sector
- Wide range (over 7,500) of products manufactured - from traditional to hi-tech
- Over 21,400 ISO-9000/14001 certified units

Reforms in the SME sector in India have kept pace with those for other aspects of the economy, with results there for everyone to see. As a result of policy reforms, the Indian SME sector is in a better position to take on competition from the globalized world than ever before. This can be attributed to not only policy changes, but also to a new found confidence amongst entrepreneurs who are taking a more global view of their businesses just like SMEs from many other countries including Italy, South Korea, Taiwan and China, to name a few.

Small and Medium Enterprises Development (SMED) 2005 Bill

The bill clarifies what it defines as small and medium enterprises.

(a) in the case of the enterprises engaged in the manufacture or production of goods pertaining to any industry specified in the First Schedule to the Industries (Development and Regulation) Act, 1951 as –

  (i) a small enterprise, where the investment in plant and machinery does not exceed Rs 50 million; or

  (ii) a medium enterprise, where the investment in plant and machinery is more than Rs 50 million but does not exceed Rs 100 million.

(b) in the case of the enterprises engaged in providing or rendering of services in relation to any industry specified in the First Schedule to the Industries (Development and Regulation) Act, 1951, as:

  (i) a small enterprise, where the investment in equipment does not exceed Rs 20 million; or

  (ii) a medium enterprise, where the investment in equipment is more than Rs 20 million but does not exceed Rs 50 million.

4. Policies for Technology Transfer to SMEs in India

India's S&T Policy 2003 states –

A strong base of science and engineering research provides a crucial foundation for a vibrant programme of technology development. Priority will be placed on the development of technologies which address the basic needs of the population; make Indian industries - small, medium or large - globally competitive; make the country economically strong; and address the security concerns of the nation. Special emphasis will be placed on equity in development so that the benefits of technological growth reach the majority of the population, particularly the disadvantaged sections, leading to an improved quality of life for every citizen of the country. These aspects require technological foresight which involves not only forecasting and assessment of technologies but also their social, economic and environmental consequences.

Thus, emphasis is on development and transfer of innovative technologies and making Indian industry, in particular SMEs globally competitive. While the corporate sector is more or less well equipped to meet its technology demands, it is the SME sector that needs hand holding for technology development and transfer. Government has formulated a number of schemes that facilitate this. Some of them are described as follows:

4.1 Technology Development and Demonstration Programme (erstwhile PATSER)

The Technology Development and Demonstration Programme (TDDP) of DSIR aims at catalyzing and supporting activities relating to technology absorption, adaptation and demonstration including capital goods development by involving industry and R&D organizations.

Under the programme, innovative technologies are up-scaled from the *'proof of concept stage'* to *'pilot plant/ pre-commercial stage'* by the *industry*. The projects involve research, design, development and engineering and are executed by industry, overseen by experts from university/laboratory.

DSIR has supported over 165 projects so far since inception of the scheme in 1992, when it was called PATSER. More than 100 projects have been completed and 45 projects have gone into commercial production, which are paying lump sum premia/royalty. So far, more than Rs 50 million royalty/premia have been received. About 20 patents have been filed based on projects supported under the scheme. The scheme has synergized around 85 private sector companies (mainly SSI), 30 public sector companies and 25 R&D laboratories. It is estimated that more than 30 per cent of budget earmarked for Technology Development and Demonstration Programme benefits the SME sector.

4.2 Technology Development Board (TDB)

To accelerate the development and commercialization of indigenous technology or adapting imported technology for wider domestic application in a dynamic economic environment, the Government of India enabled the placing of the proceeds of an existent cess on the import of technology into a fund called the Fund for Technology Development and Application. To administer the fund, the Technology Development Board (TDB) was set up by Government of India on 1st September 1996 and the operation of fund was assigned to Department of Science & Technology, Government of India. The Board provides financial assistance in the form of equity, soft loans or grants. TDB's participation in a project generally does not exceed 50 per cent of the project cost. The projects funded by the Board include sectors such as medicine and health, engineering, chemicals, agriculture and transport. Till 31st March 2005, the TDB had handled 141 projects valued at a total cost of Rs 20,438.9 million. Of the TDB's commitment of Rs 6,629.4 million towards these projects, it has already released Rs 5,264.1 million. Of these projects, at least one third relate to the SME sector. TDB also gives an annual award to an SME for successful commercialization of technology.

4.3 Pharmaceuticals Research and Development Support Fund (PRDSF)

The Department of Science and Technology (DST) launched a Drug Development Programme during 1994-95 for promoting collaborative R&D in drugs & pharmaceuticals sector involving industries and institutions. 50 projects have been supported under the Programme involving 22 institutions and R&D establishments and 23 industries, a significant percentage of which are SMEs. These projects were about development of new chemical entities, new vaccines, assay systems, drug delivery systems and herbal drugs. These projects have resulted in filing of 4 product patents and 12 process patents. The Programme has also led to setting up of eight National Facilities for R&D.

The Government established a Pharmaceuticals Research and Development Support Fund (PRDSF) with an allocation of Rs 1,500 million (US$35 million) for the year 2005-06. The programme supports pharma R&D projects by extending soft loan with an interest rate of 3 per cent.

4.4 New Millennium India Technology Leadership Initiative (NMITLI)

The Government of India has recognized the power of innovation and had launched a new initiative during 2000 to enable the Indian industry to attain a global leadership position in a few selected niche areas by leveraging innovation-centric scientific and technological developments in different disciplines. The programme is backed by the national determination to turn sound technology ideas into realities by symbiotically promoting and fostering private-public partnership in a Team India spirit. Only companies that are registered in India and having more than 50 per cent shareholding by Indians or Non-Resident Indians can participate. The R&D centre of the applicant company must be recognized by the DSIR (or recognition must be obtained within 12 months). The financial support is provided as a grant to public institutions and as a loan with an interest rate of 3 per cent to private sector companies.

In a very short span, NMITLI has crafted more than 37 path setting technology projects involving over 65 industry partners, a significant percentage of which are SMEs and 175 public funded R&D institutions with an outlay of Rs 2,500 million.

4.5 Foreign Direct Investment (FDI) and Foreign Technology Transfer

Although foreign direct investment is allowed on the automatic route in most sectors, there exists a limit on foreign direct investment in SMEs. According to the rules

in force, a small scale unit cannot have more that 24 per cent equity in its paid up capital from any industrial undertaking, either foreign or domestic. Cumulative FDI inflows in the country till September 2005 were US$ 35.52 billion with around US$4 billion annually in the last 4-5 years. The total number of foreign collaborations approved during August 1991 to August 2004 were 26,117 out of which foreign technical collaborations (that involve foreign technology transfer) were 7,635. The percentage share of foreign technical collaborations in total number of foreign collaborations has been dropped in the recent years indicating that technology transfer is taking place along with equity participation. Seeing this trend, the Government has communicated its consent to the enhancement of equity investment limit in SMEs from 24 to 49 per cent. This should ease the investment choking that many SMEs felt and would attract technology to India.

5. Infrastructural Facilities for Technology Transfer to SMEs in India

The government has set up an impressive S&T infrastructure in the country that is engaged in technology development and transfer. Some of the components of this infrastructure are described below:

5.1 National R&D Laboratories

There are 12 major scientific agencies in the country, viz. Defence Research Development Organization (DRDO) with over 50 laboratories, Department of Space (DOS) with around 8 laboratories, Indian Council of Agricultural Research (ICAR) with over 70 laboratories, Department of Atomic Energy (DAE) with around 15 laboratories, Department of Scientific & Industrial Research including Council of Scientific & Industrial Research (CSIR) with 39 laboratories, Ministry of Environment & Forests, Department of Science and Technology (DST) with around 20 scientific institutions, Department of Biotechnology (DBT) with around 6 laboratories, Indian Council of Medical Research (ICMR) with over 25 laboratories, Department of Ocean Development (DOD), Department of Information Technology and Ministry of Non-conventional Energy Sources (MNES). In addition to the R&D laboratories and establishments, there exists a vast network of universities, technical institutions and colleges in the country. There are around 250 universities/deemed universities, including 11 institutions of national importance and around 12,000 colleges.

With R&D being viewed as a business worldwide, it becomes imperative that new ideas and technologies identified in the R&D laboratories are carried forward by technological innovation and piloted into commercial production. While many of the national laboratories have set up their own business development groups for technology transfer to industry, including SMEs, certain specialized agencies have also been set up by the government to facilitate technology transfer and commercialization to industry. One such agency is National Research Development Corporation (NRDC), a public sector enterprise, which is described below:

5.2 NRDC Transforming Innovative Research into Profitable Technology

NRDC is India's premier service enterprise whose business is to be the identifier, the carrier and the pilot of technology transfer. For over forty years, NRDC has played a key role in speeding the commercial applications of research and effecting the transfer of technology from laboratory to enterprise. NRDC guides and assists the entrepreneur in executing his technological business plans. NRDC's extensive network of national and international contacts in scientific bodies, technology transfer agencies, industrial and engineering concerns, and venture-capital providers, has enabled it to act as an effective catalyst translating innovative research into marketable industrial products, processes and services. NRDC works in close conjunction with over 200 national R&D laboratories and has licensed over 2,000 technologies for commercial exploitation, of which nearly 1,000 are in production with a current annual turnover of about Rs 12,000 million (Rs 12 billion). Technologies licensed by NRDC cover areas such as chemicals, drugs & pharmaceuticals, food, agro-processing, bio-technology, metallurgy, electronics, instrumentation, building materials, manufacturing techniques and utility processes including pollution control.

5.3 Small Industry Development Organization (SIDO)

Small Industry Development Organization headed by the Development Commissioner of Small Scale Industries, is an apex body for formulating, coordinating, implementing and monitoring policies and programmes for the promotion and development of the small scale industries in the country. It provides a comprehensive range of facilities and services to small scale units through a network of 30 Small Industries Service Institutes (SISIs), 28 Branch SISIs, 7 Field Testing Stations, 4 Regional Testing Centres, 2 Small Entrepreneur Promotion and Training Institutes (SEPTI) and 1 Hand Tool Design Development and Training Centre. For the benefit of small scale industries seeking information about the latest technologies available all over the world, Technology Resource Centres (TRCs) have been set up in all 30 SISIs.

5.4 Infrastructural Facilities of National Small Industries Corporation (NSIC)

NSIC - Technical Services Centres/Extension Centres provide valuable technology and common facility support to SSIs. This support is in the form of conventional and hi-tech machining facilities, specialized testing facilities and other quality upgradation services. Services in the area of energy/ environment audit, consultancy for ISO 9000 and preparation of project exports for SSIs are also provided. NSIC-TSCs at New Delhi, Howrah, Rajkot, Chennai and Hyderabad enjoy the status of 'In House R&D Centres' of Department of Scientific and Industrial Research (Ministry of Science & Technology). In order to cater to the needs of SSIs to face the challenges arising due to recent economic and policy changes like lifting of quantity restrictions and globalization, the Technical Centres have taken the challenge head on and started several hi-tech training programmes in the area of CAD/ CAM, hydraulic and pneumatic controls, etc.

Software Technology Parks: Recognizing the importance of information technology in the globalized economy, NSIC has established two Software Technology Parks (STP) – one at New Delhi in 1995 and second at Chennai in 2001. These two parks are established under the Software Technology Parks of India (STPI) Scheme of the Ministry of Information Technology. The STPs provide infrastructural facilities and create conducive business environment for the software exporters.

Technology Transfer Centre: Technology Transfer Centre at Okhla in Delhi disseminates technological information relevant to the needs of SSIs, facilitates enterprise-to-enterprise relationships, assists in upgradation of technology and encourages industry-institutional linkages.

5.5 Science & Technology Entrepreneurs Parks (STEPs)

The Science & Technology Entrepreneurs Park (STEP) programme was initiated by Department of Science and Technology (DST) to provide a re-orientation in the approach to innovation and entrepreneurship involving education, training, research, finance, management and the government. A STEP creates the necessary climate for innovation, information exchange, sharing of experience and facilities and opening new avenues for students, teachers, researchers and industrial managers to grow in a trans-disciplinary culture, each understanding and depending on the other's inputs for starting a successful economic venture. STEPs are hardware intensive with emphasis on common facilities, services and relevant equipments.

The DST has so far catalyzed 15 STEPs in different parts of the country which have promoted nearly 788 units generating annual turnover of around Rs 130 crore and employment for 5,000 persons. More than 100 new products and technologies have been developed by the STEPs / STEP promoted entrepreneurs. In addition, over 11,000 persons have been trained through various skill development programmes conducted by STEPs.

5.6 Technology Business Incubators (TBIs)

The need for instruments such as TBI has been recognized world over for initiating technology led and knowledge driven enterprises. Studies also show that such mechanisms help not only in the growth of technology based new enterprises but also in improving their survival rate substantially (from 30 to over 70%). TBIs also facilitate speedy commercialization of research outputs. The essential feature of a TBI is that the tenant companies leave the incubator space in 2-3 years.

5.7 Venture Capital Financing

Small Industries Development Bank of India has launched SME Growth Fund, a new venture capital fund with a large corpus of Rs 5,000 million, dedicated to the SME sector. The 8-year life Fund is being established with an objective to meet the long-term risk capital requirement of innovative and technology oriented units in this sector.

Venture Funds are recognized globally as the most suitable form of providing risk capital for the growth of innovative and high technology businesses. Innovative SME units are expected to play a catalytic role in the post liberalized economic environment in the country. Keeping in view the level of dispensation of venture finance to the SME thus far, the new Fund with its size of Rs 5,000 million is a significant milestone. It is a unique initiative sponsored by SIDBI jointly with major public sector banks. Besides formal commitment of Rs 2,250 million so far from SIDBI, Punjab National Bank and Union Bank of India, several other major nationalized banks were expected to participate in the Fund.

Duly registered with SEBI as a venture capital fund, the Fund shall invest in domestic SME units having superior growth potential, rapid scalability, a strong committed team and enjoying unique and sustainable long term competitive advantage. The Fund will identify unlisted SME entities in various growing sectors such as life sciences, retailing, light engineering, food processing, information technology, infrastructure related to services such as health care, logistics and distribution, etc.

6. Conclusions and Recommendations

(a) SMEs will have to integrate with global supply chains. They will have to identify their core areas of strength and concentrate solely on them. For business components falling outside their core areas, they must establish forward and backward linkages to stay competitive.

(b) SMEs will have to adopt a technology strategy which is well integrated with the business strategy to stay competitive in the globalized economy.

(c) Though a number of policy measures and infrastructure facilities for technology transfer have been put in place by the Indian Government and its associate agencies, apparently only a small percentage of the 11 million odd SMEs in the country are able to take advantage of them. In order to increase the percentage of beneficiaries, there should be a widespread publicity of the available technology transfer schemes and the norms for availing the benefits of technology transfer schemes should be further simplified.

(d) Participation of SMEs in international exhibitions, business delegations and buyer-seller meets must be facilitated to assist them in accessing foreign technology for their production requirements.

(e) FDI limit of 24 per cent equity participation in SMEs need to be liberalized to enable them to attract foreign technology.

(f) Though technology transfer mechanisms exist, technologies do not get transferred at times because they are not packaged properly. Usually, the technologies that are available with the laboratories are not completely ripe for commercialization or the imported technology needs modifications, prior to its implementation. Thus, there is a need to set up specialized agencies that acquire technologies from labs and foreign suppliers, add value to them and then offer a complete technology package to the SMEs.

(g) Innovative mechanisms need to be put in place to promote technology transfer from institutions and R&D establishments.

(h) The SMEs will have to establish intense linkages with R&D institutions to bring about adaptations in acquired technology and carry out technology upgradation in the long term to keep pace with rapid technological obsolescence in the globalized economy.

(i) SMEs must not lose sight of patenting the value additions that they bring about in acquired technology and build a patent portfolio in the long run. This would enhance their long term competitiveness and also, build their brand image. •

INDIA'S EMERGING STATUS IN GLOBAL TRADE AND R&D

India 29th Leading Global Trader in Merchandise and 11th Largest Services Exporter

INDIA has crawled up one step to reach the 29th position among the leading merchandise exporters in 2005, which saw a slowdown of real merchandise growth to 6 per cent from 9.5 per cent in 2004.

As per the latest World Trade Organization (WTO) statistics, the country's total merchandise exports were $95.1 billion, a 25.8 per cent rise from the previous year's $75.6 billion.

Germany was ranked number one in the same list with $970 billion, closely followed by the US with $904 billion. China came third with $762 billion. Even countries like Norway, Chinese Taipei, Austria, Ireland, Thailand were ranked above India.

But, India's total merchandise imports were $134.8 billion in 2005, up 39 per cent from $97.3 billion in the previous year.

In the merchandise imports list India was placed 17th, while the US topped with $1,732.4 billion. China was third with $660 billion. Germany came second with $773.8 billion.

Despite exports showing a decent double-digit growth, India's share in world trade is still not impressive. If it is just a miniscule 0.9 per cent in the total merchandise good exports, the country contributes to just 1.3 per cent in imports of goods.

Though real merchandise exports slowed down, it continued to rise significantly faster than global merchandise output. The report said, "largely due to price developments (increase in fuel and mineral prices), merchandise trade expanded faster than commercial services trade for the third year in a row."

The report added, "The further rise in prices of fuels and mining products contrasted with the deceleration in export prices for agricultural products and manufactured goods. Prices of all manufactured goods were held down by the price decline in electronic goods." World exports of fuels grew 41 per cent to $1.4 trillion, which is 13.8 per cent of the total merchandise exports. This is the highest showing by fuel sector in two decades.

In another interesting observation, the report said, "among the world's 50 leading merchandise exporters, the

major fuels and mining products supplying nations increased their merchandise exports in dollar terms by at least one third."

"Among the major traders exporting manufactured goods, China stands out with an increase of its merchandise exports of 28 per cent in 2005," the report said.

Riding on a high given by IT and ITES exports, India has climbed five spots to grow into the world's 11th leading commercial services exporter in 2005, as per the latest statistics released by the WTO.

The WTO, in its International Trade Statistics for 2005, report said, "Among the leading commercial services traders, the most dynamic exporters with a value increase of 15 per cent or more in 2005 include China, India, Luxembourg, the Russian Federation, Poland, Mexico, Brazil and Hungary."

The top five leading exporters and importers in world trade in commercial services in 2005 include Germany, the UK, Japan and France.

While US tops the services exporters chart with $354 billion, India's services were worth $56.1 billion (2.3% of the total). China was ninth in the list with $73.9 billion (3.1% share).

But India also figured 13th in the list of world's largest commercial services importers $52.5 billion (2.2% share). This is a jump of two spots from last year. The US came first even in the importers list with $281.2 billion (12% share). China was 7th with $83.2 billion (3.5% share).

The WTO defines commercial services as services minus government services, and further divides them into transport, travel and other commercial services.

In the list of exporters of other commercial services – comprising communications, construction, insurance, financial computer and information services, royalties and licence fees and recreational services – India was 8th with $43.8 billion, much above China, which came 14th with $29.2 billion. The US topped that list too with $188.8 billion.

India also figured in the list of importers in this category by coming 13th with $26.6 billion. However, India did not find a place in the list of the first 15 leading exporters and importers of travel services including an assortment of goods and services consumed by travellers.

But India came 9th amongst the 15 leading importers of transportation services including carriage of passengers, movement of goods and rentals or charters. It did not figure in the exports list in the same category. The services sector worth $56.1 billion makes up about 53 per cent of India's GDP last fiscal. This is a 41.6 per cent growth from the previous year's $39.6 billion. Of India's total services exports, software exports contributed to around $23 billion. The slightly higher growth in services exports has resulted in a small trade surplus as the services imports during the same period were around $38 billion.

(*The Financial Express*, 14 November 2006)

India Now Draws 25 per cent of Global R&D Spend

INDIA's Inc's innovation basket is all set to swell, as it continues to be one of the hottest R&D destinations for companies large and small. The country is drawing 25 per cent of fresh global investments in R&D centres. And, many of these centres set up by multinationals are among their largest R&D units outside the US or Europe.

In the past few years, over 200 global companies across IT, telecom, biotechnology, chemicals, automobiles, consumer goods and pharmaceuticals have set up their R&D hubs in India. For many companies, such as Oracle, Intel, Adobe, ST Microelectronics (STM), SAP and others, the India R&D centre is their largest facility outside the US or Europe. Others, including IBM, Texas Instruments, Delphi, HP, Microsoft, GE, Philips, Motorola, Google, Cisco, Eli Lilly, Bayer AG, Siemens and LG Electronics, have been tapping Indian talent for conducting cutting-edge research over the last decade.

However, the growth is not without problems. There is an acute manpower shortage when it comes to cutting-edge research. "Even as the private sector is on a hiring spree, not enough people are opting for PhD and Masters degrees, as a plethora of job opportunities are coming up at the graduate level. Also, we need more PhDs in the hi-tech field," says Shri T.V. Mohandas Pai, Director (HR), Infosys Technologies. Shri Pai estimates that there is a demand-supply gap of 25-30 per cent for R&D professionals.

Adds Shri Naresh Chand Gupta, Managing Director, Adobe Systems India, "The demand-supply gap in R&D space is not just a challenge for India but even globally, given the fact that companies need to constantly innovate products and services."

However, the good news is that the shortage is not acting as a dampener for shifting R&D work to India. "India has a rich talent base. As a result, a lot is going on in the Indian context which forms the basis for R&D work," says Daniel Dias, Director, IBM India Research Lab. IBM has a research lab (one of the few among its labs worldwide) and development centres in multiple locations within India.

The value of R&D work done in India is also set to get a boost with new centres being set up in the country. According to Evalueserve, the value of R&D work done in India will touch $27.5 billion by 2010 (against $8.5bn in 2005), throwing up an additional manpower requirement of 2.94 lakh researchers between 2006–2010 and another 3 lakh professionals between 2011–2015.

Commenting on the manpower problems, Ms. Swati Piramal, Director-Strategical Alliances and Communication, Nicholas Piramal, told *ET*, "Universities are not equipped with high-tech infrastructure for training researchers."

It is the industry which trains them and then loses them to competitors, Ms. Piramal adds. Shri Pai, on the other hand, emphasizes on the creation of a National Science Foundation to fund research in educational institutions and arouse scientific temper in schools and colleges.

That kind of effort will only help boost R&D in India. Meanwhile, the companies that are already here are betting big on India. For instance, SAP Labs India is the largest development facility outside Germany. Similarly, the GE's R&D centre in Bangalore is its second largest centre. Philips' second campus in India is its largest research centre outside Eindhoven. Adobe Systems has 900 people in its India R&D operations – the highest number outside the US chipmaker Intel has 3,000 staff in India, the majority in its R&D unit. Some of Intel India R&D's recent contributions include complete design of the Centrino mobile chip called Napa. STM has built a state-of-the-art design campus in Greater Noida, which once fully developed will have 5,000 engineers. The company has earmarked $30m in investments over the next two years.

(*The Economic Times*, 2 November 2006)

The Indian Investment in Burrup

AS you look out the window of the Qantas Boeing 737-800 preparing to land at the small north-west Australian industrial town of Karratha, a couple of large domes and a few reactor columns in a fenced compound stand out in what is otherwise a bleak, brown landscape appearing bereft of civilization. This industrial complex, producing liquid ammonia from natural gas, represents the biggest Indian investment in Australia.

The A$630-million plant of Burrup Fertilisers Pty Ltd., promoted by the Oswals, is one of those rare investments–in fact, it is the first–in secondary processing of gas in Western Australia, which is rich with resources such as natural gas, iron ore and gold. Named after the Burrup Peninsula where it is located, Burrup Fertilisers sent out its first ammonia shipment in June this year and has since shipped 10 more consignments totalling 2.50 lakh tonnes to buyers in China, Korea, India and even far off Alaska.

Why did the Oswals choose this remote region of Australia to locate an ammonia complex? "Simple", says Mr Wolfgang Jovanovich, Director (Corporate), "There is abundant natural gas in this region at economical prices; it is located in proximity to the Asian market where our buyers are, we have a good deep-water port that can handle large vessels and finally, you are allowed to have a 100 per cent owned company in Australia," he adds.

As you walk around the complex hosting the 7.6-lakh tonnes per annum ammonia plant and utilities including a captive power plant along with Shri Hemant Deshmukh, General Manager, who heads the plant, you notice that a lot of the equipment and machinery there bear Indian brand names. "L&T fabricated a large part of the plant while others such as Godrej have supplied some of the equipment here," says Shri Deshmukh. He explaines that fabrication expertise is better and cheaper in India.

Burrup has a 25-year gas supply contract signed up at rates significantly lower than the prevailing one for natural gas. Power is expensive in Western Australia but the complex has its own 44-MW captive power plant. Burrup also has the sales side well sewn up through a 20-year offtake agreement with Norway's Yara International, the world's largest producer and distributor of ammonia and nitrate fertilisers. Yara has also taken a 30 per cent equity stake in Burrup Fertilisers where the Oswals hold 55 per cent and 15 per cent rests with other private investors.

Operations at the plant are directed from the top by a group of Indian managers – there are 17 Indian employees in a total of 68 at the plant – with expertise in the fertiliser sector in India. Given that there are not too many fertiliser units in Australia, Shri Deshmukh says that they do face a problem in getting experienced local manpower but they manage by on-the-job training of the local workers.

The experience with the commissioning and operation of the ammonia complex has been so good that Burrup Fertilisers is now weighing plans to expand into the production of urea and ammonium nitrate.

(*The Hindu Business Line*, 16 November 2006)

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KALEIDOSCOPE OF INDIA'S OVERSEAS BUSINESS

PHARMACEUTICALS

Gain with Pain

Troikaa Pharma Going Global with Painless Diclofenac Injection

NICHE pharma products company Troikaa Pharmaceuticals is going global with the world's only "painless diclofenac injection". After having created a Rs 12-crore brand for this product in India, Troikaa is going to outlicense the technology to global players to market it in France, Malaysia and China. In a couple of years, Troikaa has made this product a Rs 8-crore brand through its own "Dynapar AQ". A further Rs 4 crore is contributed by the sales of Nicholas Piramal's "Zobid" brand, for which the technology has been outlicensed by Troikaa.

"As we are not big enough to market this new product on our own, we have licensed the technology to an Indian pharma major to sell it in Malaysia and China. We are also finalizing a technology transfer deal with a French company which will market it in France," says Shri Ketan Patel, Managing Director, Troikaa Pharma. The company has got an Indian patent for this new technology and it will now get it patented in another 30 plus countries.

The Rs 75 crore pharma company is targeting a turnover of over Rs 100 crore this year. Exports are going to double this year to Rs 30 crore as the company has registered more products in over 35 countries. After commissioning its new Rs 20 crore plant in Dehradun recently, Troikaa will invest an additional Rs 12 crore to set up a small volume parenterals unit there. A major expansion at its Ahmedabad facility is also being finalized. "Over the next three years we plan to invest about Rs 50 crore," says Shri Patel.

Troika has started marketing "AccuFlow", a smart infusion system which was developed by Shri Sandeep Gokhale who won an award for it from IIM-A's "Anvesha" initiative. While existing instruments for monitoring infusions cost a minimum of Rs 45,000, this new product is being sold to hospitals for just Rs 2,800. "It will not only reduce greatly the burden on nurses, the product will also identify any inferior quality infusion bottles," says Shri Patel.

To tap the emerging contract research outsourcing arena, Troikaa has started working on the first such project from an US-based company.

(*The Economic Times*, 21 December 2006)

AUTOMOBILE

Ashok Leyland to Set Up Bus Assembly Unit in UAE

ASHOK LEYLAND, the Hinduja Group company, has entered into an agreement with the Ras Al Khaimah Investment Authority (Rakia) to set up a bus assembly unit at Ras Al Khaimah, the UAE.

It will be set up with an initial investment of $5 million (Rs 23 crore) with a capacity to build 1,000 buses of international styling, manufacture and quality. The unit to be managed and operated by Ashok Leyland is expected to start production in a year's time.

The bus assembly unit will eventually be upgraded to a vehicle assembly plant for trucks and buses in the second phase. The unit will use Ashok Leyland chassis and bus body CKD units from India, including Irizar TVS. The facility will include a modern paint shop for bus bodies and employ 450 workers.

The agreement was signed by R. Seshasayee, Managing Director, Ashok Leyland, and Dr Khater Massaad, CEO, Rakia, a public body established by the Government of Ras Al Khaimah.

The unit will have an industrial licence that will enable duty-free import of vehicle kits and duty-free export of finished vehicles to the GCC and the West Asia. Ashok Leyland has a 60 per cent share in Dubai's standard bus market with exports to the region expected to be in excess of 1,500 vehicles a year.

(*The Hindu Business Line*, 6 October 2006)

RECENT POLICY INITIATIVES

Global Innovation & Technology Alliance (GITA)

THE Department of Science & Technology (DST) under the Ministry of Science & Technology and Confederation of Indian Industry (CII) signed a Memorandum of Understanding on Global Innovation & Technology Alliance (GITA). The MoU was signed by Secretary, DST, Dr. T. Ramasami and CII President R. Seshasayee in the presence of Union Minister for Science & Technology and Earth Sciences, Shri Kapil Sibal. Welcoming the development the Minister said there is a greater global exploitation of technology as exemplified by export flows of high-tech products across nations and technological collaboration for generic technologies. Therefore, we can no longer afford to go ahead on our own and, have to develop technology in partnership with entities, nationally or internationally. GITA is one such example of public-private partnership, he said.

The broad objective of GITA project is to promote and facilitate technology partnership between overseas and Indian industry/institutes with the aim of enhancing technology competitiveness of Indian organizations. The technology partnerships can take place through various modes under the framework of national/international laws.

These partnerships shall be facilitated through following enabling activities:

(a) Providing exposure to the industry/other organizations through organizing summits/seminars/workshops/ missions, etc.

(b) Direct facilitation services by interacting with organization on either side.

Through various mechanisms, it shall be the effort of CII and DST that Indian industry and other organizations get benefited by generation of new technology opportunities.

I. Various promotional and networking forums created by CII and DST.

II. Additional programmes as shall be decided from time to time.

III. Other tools like Information Technology shall also be fully utilized to promote GITA.

IV. Creation of independent entities within /outside CII and under partnership between CII, DST and overseas partner/ partners, from joint technology development/ commercialization projects. The scope and form of these entities shall be decided mutually on case to case basis.

V. Creation of an International Technology Promotion and Facilitation Park for showcasing and commercializing the most promising technologies available through overseas networking.

VI. Any other mechanisms as may be required and deemed appropriate jointly by CII and DST.

Through various mechanisms, it shall be the effort of CII and DST that Indian industry and other organizations get benefited by generation of new technology opportunities.

Research Labs Team up for Carbon Nanotube, Composites Research

A CONSORTIA of Indian academic institutes and industry will be involved in a major national initiative to develop prototypes and technologies from carbon nanotubes and composites, which find a vast range of commercial applications.

Driven by the defence laboratories, the consortia would have the Indian Institutes of Technology, the National Physical Laboratories, the International Centre for Advance Research in Powder Metallurgy and two major private industries.

The Rs 50 crore initiative has begun and would be accelerated during the Eleventh Plan. From the common tennis racquets to aircraft body to medical implants, composites (especially the carbon-carbon composites) are finding increasing use, said Dr. G. Balasubramanyam and Dr. G. Rohini Devi, experts in composite materials and part of the organizing committee of the National Conference on Composites in Hyderabad.

More than a dozen Indian industries are already into fabricating products using the carbon-carbon composites, which have been indigenously developed. In the next five years, a major switchover from metal to composites is expected to happen, throwing up big opportunities for the Indian industry, said Dr. Avinash Chander, Director of the Advanced Systems Laboratory.

The Defence Research and Development Organization is aiming to make an all-composite material missile in the future. Slowly, DRDO wants to emerge as the designer of composites and the industry should produce the materials, he said.

(*The Hindu Business Line*, 25 November 2006)

TECHNOLOGY/PROJECT OFFERS

LIST OF SELECT EXPORTABLE TECHNOLOGIES/PROJECTS FROM SMEs IN WEST BENGAL AND NORTH EAST STATES OF INDIA

Sector		*Technology/Project offered*	*Name of company*	*Value of offer**
Chemical	1.	Ground Water Treatment Plant for Arsenic & Fluoride Removal	Anir Engineers Inc., Kolkata	US$0.4 mn
	2.	Manufacturing of Coal Tar By-Products and Compounds	Techmen's Chemicals Pvt. Ltd., Kolkata	US$0.25 mn
Electronics	3.	Plant for Manufacturing Compact Fluorescent Lamp (CFL) and Ballast	Dhanashree Electronics Ltd., Kolkata	US$0.112 mn
Engineering	4.	Manufacturing of Industrial Use Magnetic Chucks, Lifters and Material Handling System	East Coast Enterprisers Ltd., Kolkata	US$0.65 mn
	5.	Manufacturing of Mechanical Power Transmission Drive and Equipment	Kapsek Engineers Pvt. Ltd., Kolkata	US$1.4 mn
	6.	Plant for Plywood Manufacturing	L.M. Engineering Company, Kolkata	US$0.3 mn
	7.	Manufacturing of Steel Mill Hydraulic System & Cylinder	Static Hydraulic Pvt. Ltd., Kolkata	US$0.215 mn + US$0.03 mn Know-how licensing fee
Food Processing	8.	Technology for Honey Processing Plant	Suan Scientific Instruments & Equipments, Kolkata	US$0.05 mn
Paper	9.	Pulp and Paper Making Plant	Mechano Paper Machines (P) Ltd., Kolkata	US$1.5 mn
Pharmaceutical	10.	Manufacturing of Antibiotic Pharmaceutical Formulation	Pharma Impex Laboratories Pvt. Ltd., Kolkata	US$1.1 mn
Plastic	11.	Manufacturing of Enclosed Frame, Zero Deflection, Tie Rod-Less Injection Moulding Machine	Con-Hyde (India) Pvt. Ltd., Kolkata	US$0.52 mn
	12.	Plant for Mosquito Net Manufacturing	Neptune Plastic & Metal Industries, Kolkata	US$0.5 mn
	13.	Manufacturing of Fire Resistant Rigid PVC Conduit Pipes	Sinha Pipe Industry, Purlia	US$0.103 mn
Textile	14.	Rope and Twine laying Plant of Jute, Sisal, Manila Fibres and other Plastics(PP, HDPE)	Automac Engineers, Howrah	US$0.23 mn

* Value is excluding cost of land & building.

Note: 1. The above list is an extract from the "Report on Profiles of Exportable Technologies from SME's in West Bengal and North Eastern States in India" prepared by WEBCON, Kolkata for DSIR, Government of India, New Delhi.

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