

**Policies and Programmes for Industrial Development  
and Technological Innovation in India**

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## **1. Introduction**

The progress of industrialisation over the last six decades after independence, particularly in the post-liberalisation period has been a striking feature of India's economic development. In pursuance of a conscious and deliberate policy of industrialisation, a large investment has been made to build up capability over a wide spectrum of industry. Industrial production has made rapid strides in terms of variety, quality and quantity. Impressive indigenous capability has now been developed to the point of self-sufficiency in sectors like chemicals, construction, information and communication, mining, power, transport, etc. Concomitantly, a large Science & Technology (S&T) base and Research & Development (R&D) capability have been created in the country with excellent facilities for indigenous development of technologies and support provided to promote the transfer of technologies to industry. With the help of proactive policies and liberal fiscal incentives, knowledge-based industries in biotechnology, chemicals, drugs and pharmaceuticals, food processing, information and communication technology, renewable energy etc. have brought a revolution in the economy of the country. India today operates the largest programme for the development of small industry in any developing country. The government of India has taken a number of steps for the promotion, protection and development of micro, small and medium enterprises.

This paper makes a review of the evolution of industrial policy over the last six decades since the independence and the complementary efforts made by various arms of the Government for modernization, transfer of technology and the promotion of technological innovation in the Indian industry.

## **2. The Evolution of Industrial Policy**

The goals and objectives set out for the nation by the first Prime Minister Pandit Jawahar Lal Nehru on the eve of Independence were rapid agricultural and industrial development, rapid expansion of opportunities for gainful employment, progressive reduction of social and economic disparities, removal

of poverty, and attainment of self-reliance. These objectives formed the basis for the nation's approach to industrial growth and development, an approach that emphasized the importance of continuous increase in production and ensuring its equitable distribution to achieve a sustained economic growth. A major step that the Government of India took towards these objectives was to establish a National Planning Commission to identify priorities and formulate and oversee the implementation of various development programmes. The concerned Ministries of the Government in consultation with the Planning Commission formulated industrial policies from time to time, and concomitantly took several initiatives on indigenous development and transfer of industrial technologies and adoption and adaptation of imported technologies wherever required, in order to improve the technological competitiveness of the Indian industry.

## **2.1 Industrial Policy Resolution, 1948**

The first Industrial Policy Resolution was declared by the Government in April 1948 that primarily laid down a broad outline of the strategy for industrial development in the country. A clear demarcation was made among various sectors to be kept under the domain of the public sector, private sector and the joint sector. It laid down that the State would be exclusively owning and controlling industry on arms and ammunition, atomic energy, railway transport, and the establishment of new undertakings in six basic industries except where, in the national interest, the State itself found it necessary to secure the cooperation of private enterprises. The rest of the industries was left open to private enterprises though it was made clear that the State would also progressively participate in such industries. Further, a distinctly co-operative bias to the cottage and small scale industries was given in the Resolution.

Consequent upon the adoption of the Resolution of 1948, the Industrial (Department and Regulation) Act (IDR Act) was enacted in 1951 in order to empower the Government to regulate the process of industrial development through licensing.

## **2.2 Industrial Policy Resolution, 1956**

With the enactment of the Constitution of India, the country accepted the socialistic pattern of society as the objective of social and economic policy. Towards the end of the First Five Year Plan (1951-56), a need was felt to formulate a fresh industrial policy. Thus IPR 1956 was adopted based on the 'Mahalanobis Model', which emphasised on the role of heavy industries for a long term higher economic growth. Since capital was scarce and the entrepreneurial base was not strong enough, the IPR 1956 gave prime importance to the role of the State to assume a predominant and direct responsibility for industrial development and therefore, the scope of the public sector was expanded in order to boost the process of industrialization as an important means to achieve a socialistic pattern of society.

It was decided that all industries of basic and strategic importance, and in the nature of public utility services should be in the public sector. Industries requiring large investment e.g. heavy machinery, steel, fertilizers, locomotives, petrochemicals, oil and gas exploration and refining, etc. were also reserved for public sector. Accordingly, the industries were classified into three categories, based on the proposed state intervention and ownership in each of them. The first category that comprised 17 industries including railways, air transport, arms and ammunition, iron and steel and atomic energy was under exclusive domain of the State. The second category consisted 12 industries, which were to be progressively State-owned, but in which private enterprise was also welcome to supplement the effort of the State. The third category comprised the rest of the industries, which was, in general, left to the private sector.

Further, the role of cottage, village and small scale industries in the development of national economy was reemphasized in the Resolution. It was also stressed that disparities in levels of development among different regions should be progressively reduced.

## **2.3 Industrial Policy Measures in 1960s and 1970s**

**2.3.1** The policy directions during this period were restrictive to control monopolies, foreign investment and imports of technology. In compliance with the IPR 1956, the Monopolies and Restrictive Trade Practices (MRTP) Act was introduced in 1969 to enable the Government to effectively control concentration of economic power with a few individuals and groups. The new Industrial Licensing Policy (ILP) was passed in 1970 that classified industries into four categories, viz. 'Core Sector', 'Heavy Investment Sector', the 'Middle Sector', and the 'De-licensed Sector'. The ILP of 1970 restricted the role of large business houses and foreign companies to the core, heavy and export oriented sectors. A Patent Law was enacted in the same year to safeguard the rights for process technologies but it restricted product patenting. Technology import policy was made more restrictive and selective.

**2.3.2 Industrial Policy Statement 1973:** With a view to preventing excessive concentration of industrial activity in the large industrial houses, this Statement gave preference to small and medium entrepreneurs over the large houses and foreign companies in setting up of new capacity particularly in the production of mass consumption goods. Further, new undertakings of up to Rs.10 million by way of fixed assets were exempted from licensing requirements for substantial expansion of assets.

**2.3.3 Industrial Policy Statement, 1977:** IPS 1977 laid emphasis on decentralisation and on the role of small scale, tiny and cottage industries, widely dispersed in rural areas and small towns, and reinforcing interaction of the agricultural and industrial sectors for generation of employment for the rural population. For this, a number of measures were proposed to provide support and services to small scale industries (SSI), and tiny and cottage industries, such as; expansion of the list of industries exclusively reserved for the SSI sector, special legislation to promote self-employment ventures, setting up of District

Industries Centres, effective financial support through development financing institutions, marketing support through purchase preference and reservation for exclusive purchase by government departments and public sector undertakings etc..

While restricting foreign investment and technology imports, the IPS 1977 recognized the role of technology for industrial development, and sought to exploit the S&T capability available in the country. The development and application of appropriate technology, development and widespread application of small and simple machines and devices for improving the productivity and earning capacity of workers in small and village industries were emphasised, and recommended utilisation of indigenous technology as far as possible for future development of industries. However, in order to promote technological self-reliance, it recognised the necessity for the import of technology in sophisticated and high priority areas where Indian skills and technology were not adequately developed, but with suitable R&D efforts by the importers, for adaptation and assimilation of such imported technologies.

#### **2.4 Industrial Policy Statement, 1980**

The IPS of 1980 focused attention to the need for promoting competition in the domestic market, technological upgradation and modernisation. Some of the socio-economic objectives spelt out in the Statement were i) optimum utilisation of installed capacity, ii) higher productivity, iii) higher employment levels, iv) removal of regional disparities, v) strengthening of agricultural base, vi) promotion of export oriented industries vi) consumer protection against high prices and poor quality and vii) revival and improving efficiency of public sector undertakings (PSUs). Further, a strategy to provide support and encouragement to small scale industries and a policy of 'Economic Federalism and Ancillarisation' were advocated. Several policy measures were taken to boost the development of small scale industries and to ensure their rapid growth.

Transfer of technology was given due importance in the policy and a number of measures were proposed for technological and managerial modernization to improve productivity and quality, and to reduce cost of production. Substantial resources for R&D were proposed to be allocated to constantly up-date technologies. Companies with in-house R&D establishments, and capability to absorb, adapt and disseminate modern technology were permitted to import such technology to increase their efficiency and cost-effectiveness. "Modernisation packages" were proposed to be evolved to suit the requirements of each industry sector

With a view to promoting industrialization of backward areas, the Government of India announced in June, 1988 the Growth Centre Scheme under which 71 Growth Centers were proposed to be set up with basic infrastructure facilities such as power, water, telecommunications and banking to enable them to attract industries.

## **2.5 Industrial policy, 1990**

This Policy was primarily meant for providing support for the promotion of small scale and agro-based industries (ref. section-3.1.1). Further, under this policy, several measures were also proposed for simplification of procedures for industrial approvals, and delicensing, relaxation on import of raw materials and components, foreign investment, foreign collaboration and import of technology.

## **2.6 Statement of Industrial Policy, 1991**

It was suggested in the Seventh Five Year Plan (1985-90) that there was a need to consolidate on the strengths gathered so far and to take fresh initiatives to enable Indian industry to respond effectively to the emerging challenges. A number of policy and procedural changes were introduced during the Plan period aimed at reducing costs, and technological and managerial modernisation of industry for increasing productivity and quality and improving competitiveness in the international market. The Industrial Policy reforms started

during the 1980s gradually reduced the industrial licensing requirements, removed restrictions on investment and expansion, and facilitated easy access to foreign technology and foreign direct investment. The public sector was freed from a number of constraints and given a great degree of autonomy.

The IPS of 1991 proposed to pursue a sound policy framework with the objectives of encouraging entrepreneurship, development of indigenous technology through investment in R&D, transfer of new technologies, dismantling of the regulatory system, development of the capital markets and increased competitiveness for the benefit of common man. The objective of the 1991 Policy was to maintain sustained growth in productivity, enhance gainful employment and achieve optimal utilization of human resources, to attain international competitiveness, and to transform India into a major partner and player in the global arena. Several reforms were proposed under the IPS of 1991 that include:

- 1) Abolition of industrial licensing requirement for most industries, excepting a few sectors related to security and strategic concerns, social and environmental issues.
- 2) Improving productivity and efficiency to avail emerging domestic and global opportunities.
- 3) Liberalizing norms for setting up industries in cities.
- 4) Encouraging Foreign Direct Investment (FDI).
- 5) Automatic approval for Foreign Technological Agreements (FTAs) related to high priority industries and eased procedures for hiring of foreign technical expertise in order to introduce technological dynamism in the industry.
- 6) Amending the MRTP Act to discontinue the practice of pre-entry scrutiny of investment decisions by MRTP companies under the Act.

- 7) Restructuring of public sector units (PSUs) to tackle the problems of low productivity, over staffing, technological backwardness and low rate of return, and dilution of equity/disinvestment of PSUs to raise resources and ensure wider private participation in PSUs.
- 8) Development and utilisation of indigenous capabilities in technology through investment in R&D as well as its upgradation to world standards.
- 9) The spread of industrialisation to backward areas of the country through appropriate incentives, institutions and infrastructure investments.
- 10) Enhanced support to the small-scale sector for its economic efficiency and continuous technological upgradation.

2.7 India has been one of the members of the General Agreement on Tariffs and Trade (GATT) since 1948. After the Marrakesh Agreement, India joined WTO since its inception in 1995. The commitments under the TRIPS Agreement compelled the country to liberalize its patent regime and an amendment to the Patent Act 1970 was carried out in January 2005. The patent amendment covers the food, pharmaceutical and agro sectors and can be expanded over time to other sectors. Product-patents were granted under the regime that will remain in force for twenty years, when the patent-holder will have exclusive rights over the manufacture and sale of a product (drug).

## **2.7 Growth of Industrial Production**

The trend of growth of industrial production over about last ten years can be noticed from Table-1.

### 3. Policies and Programmes for Development of Micro, Small & Medium Enterprises (MSME)

#### 3.1 MSME Policies

As evidenced from the successive policy decisions of the Government as illustrated above, one common feature of the industrial policy has been to encourage, promote and support small scale industry (SSI), and village and cottage industries.

**Table-1: Annual Growth Rates of Industrial Production**

<i>Period</i>	<b>Index of Industrial Production (IIP) (BASE: 1993-94)</b>	<b>Annual Growth Rate (%)</b>
1998-99	145.2	4.1
1999-00	154.9	6.7
2000-01	162.6	5.0
2001-02	167.0	2.7
2002-03	176.6	5.7
2003-04	189.0	7.0
2004-05	204.8	8.4
2005-06	221.5	8.2
2006-07	247.0	11.5

*Source: Central Statistical Organisation*

##### 3.1.1 Industrial Policy 1990

This Policy was almost entirely devoted to the promotion of SSI and agro-based industries which recommended several measures that include, inter-alia, increase in investment ceiling in plant and machinery for SSI and tiny units, expansion of the list of items reserved for exclusive manufacture in the sector, Central investment subsidy exclusively for the sector in rural and backward areas; modernisation and upgradation of technology for improving the

competitiveness of products; setting up of technology centres, tool rooms, process and product development centres, testing centres; setting up of an apex bank, Small Industries Development Bank of India (SIDBI) to ensure adequate and timely flow of credit; training of women and youth under the Entrepreneurial Development Programme; according high priority to the agro processing industry in credit allocation from the Financial Institutions etc.

### **3.1.2 Separate Policy Statement of 1991 for Small, Tiny and Rural Industries**

The IPS 1991 was accompanied by a separate Policy Statement for the promotion and strengthening of small, tiny and rural industries which had the following features:-

- i) Deregulation and debureaucratising the procedure to impart greater vitality and growth to the sector.
- ii) Modifications in all statements, regulations and procedures to ensure they do not go against the interest for small and village enterprises.
- iii) Separate package for promoting tiny units and recognition of all industry-related service and business enterprises except for specified target groups to ensure adequate flow of credit on normative basis.
- iv) To provide access to capital markets by allowing 24 per cent equity participation by other industrial undertakings
- v) Legislation to ensure prompt payment of bills and legislation for Limited Partnership Act.
- vi) Introduction of a new scheme of integrated infrastructural development to promote industrialisation in rural and backward areas.

- vii) Stress on technology upgradation by setting up a technology development cell and strengthening the facilities available with Small Industry Development Organisation (SIDO), and enforcement of quality control.
- viii) Promotion of exports by setting up Export Development Centre.
- ix) Change in definition of women's enterprises and support to women entrepreneurs.
- x) Significant expansion in programmes for entrepreneurship.

### **3.1.3 Administrative Restructuring**

The government of India's encouragement to the MSME sector is reflected in the fact that a separate Ministry of Small Scale Industries and Agro and Rural Industries (SSI & ARI) was established in October 1999 as the nodal Ministry for policy formulation and implementation and coordination of schemes and programmes on promotion and development of these industries. This Ministry was bifurcated into two separate identities viz. Ministry of SSI and Ministry of A&RI in September 2002. Later, all the activities were again brought under a single Ministry of Micro, Small & Medium Enterprises (MSME) in May 2007. The Office of the Development Commissioner, MSME (earlier DCSSI) functioning within the Ministry of MSME is entrusted with the responsibilities of providing techno-economic and managerial consultancy, common facilities and extension services, and providing facilities for technology upgradation, modernization, quality improvement and infrastructural support to MSMEs. The Micro, Small & Medium Enterprises Development (MSMED) Act, 2006 was adopted in October, 2006.

### **3.2 Role of MSMEs in Indian Economy**

The MSMEs, particularly the small scale industries (SSI) have played a vital role in the economic progress of India. It has been estimated that a million

Rupees of investment in fixed assets in the small-scale sector produces INRs. 4.62 million worth of goods or services with an approximate value addition of 10 per cent. The important features of the MSME sector in India are highlighted below:

- The MSME sector has grown rapidly over the years with overall growth in terms of the Index of Industrial Production (IIP) (base: 100 in 2001-02) as 10.88 per cent in 2004-05 and 12.32 per cent in 2005-06.
- The annual growth in the number of units has been ~4 per cent.
- The units produce an amazing variety and type of products. About 8000 products are manufactured in this sector in more than 20 major industry groups, particularly in consumer and household products.
- The total annual production in the sector accounts for almost 40 per cent of the gross industrial value added and contributes about 5.8 per cent of GDP.
- The cumulative employment provided in the sector is about 29.5 million (in 2005-06), which is second only to the Agriculture sector and is about 35 per cent of total employment in manufacturing and services in the country. The average increase in employment in the sector is 4.37 per cent per annum.
- The Sector plays a major role in India's export performance. Direct exports from the Sector account for nearly 35 per cent of total exports. Further, SSI units contribute around 15 per cent to exports indirectly. The product groups, in which the sector dominates in exports, are sports goods, readymade garments, woolen garments and knitwear, plastic products, processed food and leather products. Non-traditional products account for more than 95 per cent of the SSI exports.

The pace of growth in number of units and other economic parameters in the MSME sector as per the Third All India Census conducted with reference year 2001-02 can be seen from the year-wise data in Table- 2.

No reliable data for Medium industries is available but based on informal sources there are 10,000 to 15,000 medium units with their production accounting for 5 per cent of total industrial output, 2 per cent of GDP and with contribution of 10 per cent to total exports of the country.

**Table- 2: Growth and Economic Contribution of MSMEs in India**

Year	No. of units (millions)	Production	Employment	Export
		(at current prices) (Rs. billion)	Nos. (million)	(at current prices) (Rs. billion)
1990-91	6.787	788.02	15.834	96.64
1991-92	7.063	806.15	16.599	138.83
1992-93	7.351	844.13	17.434	177.84
1993-94	7.649	987.96	18.264	253.07
1994-95	7.960	1221.54	19.141	290.68
1995-96	8.284	1477.12	19.793	364.70
1996-97	8.621	1678.05	20.586	392.48
1997-98	8.971	1872.17	21.316	444.42
1998-99	9.336	2104.54	22.055	489.29
1999-00	9.715	2337.60	22.910	542.00
2000-01	10.110	2612.97	23.873	697.97
2001-02	10.521	2822.70	24.933	712.44
2002-03	10.949	3148.50	26.021	860.13
2003-04	11.395	3645.47	27.142	976.44
2004-05	11.859	4297.96	28.257	1244.17
2005-06	12.342	4978.42	29.491	NA

**Source: Ministry of MSME**

### **3.3 Programmes on Technological Innovation in MSMEs**

In order to tackle the problems faced by the Micro, Small and Medium Enterprise (MSME) sector, and improve its technological competitiveness, several promotional measures have been taken by the Government for helping the industrial units in introducing new technologies in their products and processes. The Development Commissioner, MSME and Small Industries Development Organization (SIDO) under the Ministry operate a large no. of schemes and programmes, brief details of which are given below:

#### **3.3.1 Micro & Small Enterprises Cluster Development Programme (MSECDP/SICDP)**

It is the flagship scheme of the Ministry of MSME for the development of clusters for capacity building, technology upgradation of the enterprises, skill development, marketing and export support, improved credit delivery, setting up of common facility centres (CFCs), etc. The government assistance under the scheme was enhanced up to INRs. 80 million to support soft as well as hard intervention including setting up of CFCs for assisting technology improvements, quality standardization and testing. Till October 2007, 400 micro, village and small enterprise clusters have been developed by the Ministry of MSME, and other Ministries have also promoted 800 more clusters.

#### **3.3.2 Credit Linked Capital Subsidy Scheme (CLCSS) for Technology Upgradation**

The scheme aims at facilitating technology upgradation by providing upfront capital subsidy to SSI units, including tiny, khadi, village and coir industrial units, on institutional finance availed of by them to promote new and appropriate technology for MSMEs, assessing present level of technology and their forecasting, setting up technology information centres/data banks and IT portal for information dissemination, carrying out detailed technology audit, modernisation of production equipment and techniques. The subsidy is up to 15

per cent with a ceiling of INRs. 10 million loan amount for availing the benefit under this scheme. So far, 2620 units have been assisted with a total amount of INRs. 743 million.

### 3.3.3 Support for ISO-9000/14001 Certification Fee Reimbursement

Reimbursement of fees is made to the extent of 75 per cent or Rs.75,000 whichever is lower in order to encourage technology upgradation, quality improvement and better environment management. So far, 13,433 units have been supported with an amount of Rs. 709 million.

### 3.3.4 Infrastructural and Support Facilities

Ministry of MSME has following activities to provide infrastructural services to MSME sector as given in Table-3.

**Table-3: Infrastructural and support facilities for MSMEs**

Programme	Objectives	No. Established
Technology Resource Centres (TRCs) & Small Industry Service Institutes (SISIs)	To help SSIs to upgrade and modernise technology, and provide information on latest technologies, machinery and raw material suppliers, quality standards, etc	30 TRCs/ SISIs. 28 branch SISIs
Product-cum-Process Development Centres (PPDCs)	For R&D, product design and innovation, product and process improvement and development of improved packaging techniques, common facility centre and manpower development and training.	6 PPDCs
Regional Testing Centres (RTCs)	To provide testing facilities to enable SSIs to produce stores conforming to specifications, and also, one time capital grant to industry associations up to 50% or Rs.5 mill, whichever is less for international level testing centres.	4RTCs
Field Testing Stations (FTSs)		7 FTSs
Mini Tool Rooms	Assistance up to 90%/Rs.90 mill, whichever is less, for setting up new mini tool rooms, or upgradation of existing tool rooms.	-

**Source: Ministry of MSME**

### **3.3.5 National Manufacturing Competitiveness Programme**

As one of the Policy initiatives, the Government of India has set up the National Manufacturing Competitive Council (NMCC), under which a National Manufacturing Competitive Programme (NMCP) has been announced particularly to support the SME sector in their endeavor to become competitive. A ten component scheme was approved under the programme that include, application of lean manufacturing, design clinic, promotion of ICT in manufacturing sector, setting up mini tool rooms, technology and quality management support to SMEs, etc. A package for various services e.g. legislative back-up, credit support, fiscal measures; support for cluster based development, technological and quality upgradation, marketing, entrepreneurial and managerial development and empowerment of women owned enterprises; strengthening of Prime Minister's Rozgar (*employment*) Yozana (*scheme*) and strengthening of database for MSME sector.

### **3.3.6 Programmes of National Small Industries Corporation (NSIC)**

Include five technology service centres and three technology service extension centres for technology sourcing and dissemination of information, institutional linkages with R&D institutions; one Technology Business Incubator; two Software Technology Parks etc.

### **3.3.7 Promotion of Rural Industries**

- i) Product Development, Design Intervention and Packaging (PRODIP) scheme - for improving the quality of khadi products and also to diversify into new products. So far, 198 projects have been established by 2005-06.
- ii) Government has recently launched the Scheme of Fund for Regeneration of Traditional Industries (SFURTI) for comprehensive development of 100 traditional industry clusters of khadi, village industry

and coir products. The KVIC and the Coir Board are the nodal agencies for the Scheme.

- iii) Another scheme on “Rejuvenation, modernisation and technology upgradation of the coir industry’ has also been launched.
- iv) Khadi & Village Industries Commission (KVIC) implements programmes for the development of khadi and village industries. It operates through 30 State/UT KVI Boards, 4969 registered institutions and 30,129 cooperatives, 188 departmental units and 15,441 sales outlets. KVIC undertakes R&D projects with the help of national level institutes such as IITs and National Institutes of Technology; and has set up Mahatma Gandhi Institute for Rural Industrialisation (MGIRI) and in-house testing laboratory for the promotion and technology support for rural industry.

#### **4. Science & Technology Policies and Programmes on Technological Innovation in Industry**

##### **4.1 Science & Technology Policies**

**4.1.1 S&T Policies:** The country’s commitment to science, technology and innovation was first evidenced with the adoption of the Scientific Policy Resolution (SPR) in 1958. In pursuance of the SPR, a large number of higher education and research institutions were set up in India. Later, the Technology Policy Statement (TPS) was announced in 1983 TPS 1983 specifically called for development of internationally competitive technologies with export potential, energy saving technologies and environment friendly technologies. For acquisition of technology, though a selective role for import of technology and foreign investment was preferred, it specifically stressed the need for absorption, adaptation and subsequent development of imported know-how through adequate investment in research and development to which importers were expected to contribute. Keeping in view the need of the liberalized economy in the country started early 1990s, a comprehensive S&T policy was adopted in 2003 that proposed to

encourage research and innovation in areas of relevance to the economy and society, particularly by promoting close and productive interaction between public funded S&T institutions and industry and strengthening enabling mechanisms that relate to technology development, evaluation, absorption and upgradation from the conceptual stage to utilization, encourage participation of private industries in R&D by providing fiscal and other benefits, increase S&T manpower, and generate and manage Intellectual Property Rights (IPR).

**4.1.2 Policies on ICT:** As a part of the reforms agenda, the Indian Government has taken major steps to promote ICT, with a focus on software development for export; telecommunications policy reform, privatisation of the national long-distance and mobile phone markets; and development of a more comprehensive approach to ICT. Some of the policy initiatives on the Information and communication Technology industry are:

- Policy on electronics components - 1981.
- Industrial and licensing policy for color television receiver - 1983.
- Measures to accelerate the rapid development of electronics - 1983.
- New Computer policy – 1984 and 1988.
- Integrated policy measures in electronics - 1985.
- New Software Policy - 1986.
- World Market Policy – 1988
- New Telecom Policy – 1999

Further, to attract foreign direct investment, the government permitted foreign equity of up to 100 percent and duty free import of all inputs.

**4.1.3 R&D Infrastructure:** Various scientific Ministries and departments and S&T agencies have established a large number of R&D institutions. The Higher Educational Institutions, State Governments, public sector undertakings and private sector industrial houses have also set up need based R&D institutions. The number of R&D institutions under various sectors in the country is shown in Table-4

**Table-4: No. of R&D institutions under various sectors**

<b>Sector</b>	<b>No. of R&amp;D Institutions</b>
Major S&T agencies of Central Government	462
Central Government Ministries/Departments	245
Public Sector in-house R&D institutes under Ministries/departments	115
Total under Central Government	822
State Governments (Institutes, Research Stations, Joint Sector Companies)	834
Universities	182
Deemed Universities	89
Institutes of National Importance	13
Total Higher Academic Institutions	284
Private Sector in-house R&D institutions	2020
<b>GRAND TOTAL</b>	<b>3960</b>

*Source: Department of Science & Technology*

## 4.2 Public Expenditure on R&D

The Gross Expenditure on Research & Development (GERD) of India has been around 0.8 per cent of GDP during the last 2-3 years which is much less as compared with the developed countries. This investment is proposed to be raised

to 2 per cent by the end of the Eleventh Plan (2007-12) as recommended in the S&T Policy 2003. The progressive increase of R&D expenditure incurred by the twelve scientific departments and agencies of the Central Government over the last three decades is shown in Table-5.

**Table 5: Expenditure on Research & Development by Major Scientific Departments and Agencies under Central Government**

Agency / Year	R&D Expenditure (Rs.* Million)			
	1970-01	1980-81	1990-91	2002-03
Council of Scientific & Industrial Research	215.57	690.00	2491.88	9512.50
Defence Research & Development Organisation	175.54	797.00	6810.00	30794.90
Department of Atomic Energy	287.16	734.70	2755.40	12346.70
Department of Biotechnology	-	-	413.67	1678.04
Ministry of Information Tech	-	54.06	330.30	1010.90
Ministry of Non-Conventional Energy Sources	-	40.04	160.20	123.90
Department of Ocean Development	-	-	278.04	1396.00
Department of Science & Technology	8.42	406.37	1198.25	5095.20
Department of Space	-	560.16	3862.22	21654.30
Indian Council of Agricultural Research	183.70	974.47	2762.51	13710.00
Indian Council of Medical Research	21.76	90.01	445.40	1575.00
Ministry of Environment & Forests	-	37.40	1620.93	2652.26
<b>Total</b>	<b>892.15</b>	<b>4384.28</b>	<b>23128.70</b>	<b>101549.70</b>

*Source: Department of Science & Technology*

\* 1 US\$= ~ Rs. 50

#### **4.2 Technological Innovation Programmes of the Science & Technology Ministries and agencies**

In pursuance of the S&T and industrial policy objectives, the S&T Ministries and departments and their agencies have taken several initiatives for

the development and transfer of technologies to industries and promotion of knowledge-based industries.

#### 4.2.1 National Science & Technology Entrepreneurship Development Board (NSTEDB), DST

NSTEDB was created in the Department of Science & Technology (DST) in 1982 as an institutional mechanism to help establish knowledge driven and technology intensive enterprises and facilitate S&T entrepreneurship development and generation of self-employment opportunities for S&T persons. The important programmes and achievements of the Board are shown in Table-6.

**Table – 6: Programmes of NSTEDB**

Activity	Objectives	Performance
Science & Technology Entrepreneurs Parks (STEPs)	To forge academic research industry linkages and promote innovative enterprises through S&T entrepreneurs	15 STEP.. 788 units set up with annual turnover of Rs. 1.30 bill. Employing 5000 persons
Technology Business Incubators (TBIs)	To provide infrastructural & support facilities to start-up enterprises	30 TBIs
Entrepreneurship Development Cells (EDCs)	To create an entrepreneurial culture in S&T academic institutions and to foster techno-entrepreneurship	35 EDCs
S&T Entrepreneurship Development (STED) scheme	To create micro-enterprises in rural areas by utilizing local resources	STED in 43 districts. 13 more proposed. 2600 micro-enterprises, 7000 employed
Technology based Entrepreneurship Dev. Prog. (TEDPs)	To train S&T qualified persons in setting up of industry	70 TEDPs organized. ~2000 trained
Skill Development programmes.	Training rural people in S&T skills for setting up self-employment	11000 trained. 100 new products and technologies developed

**Source: NSTEDB Website**

The technology areas chosen for transfer to the potential entrepreneurs under the NSTEDB programmes include bio-fertilisers, solar energy, herbal medicines, computer hardware and networking technology, PCB design and

manufacturing, fashion technology, plastics products, biotechnology, food processing, footwear design and development etc.

#### **4.2.3 Technology Development Board (TDB), DST**

The Government of India created a Fund for Technology Development and Application out of the proceeds of the Research and Development Cess levied (@5%) on the imports of technology. To administer the Fund, a Technology Development Board (TDB) was set up on 1<sup>st</sup> September, 1996, under the provisions of the Technology Development Board Act, 1995, as a statutory body to promote development and commercialization of indigenous technology and adaptation of imported technology for wider application. The Board provides financial assistance in the form of equity soft loans to industrial concerns at a simple interest rate of 5% per annum, or grants to research and development institutions. Up to 2005-06, the Board has supported 156 projects with financial assistance of Rs. 5.60 billion. A few notable success stories are the projects of Shantha Biotechnics Pvt. Ltd., Hyderabad for the development of recombinant DNA based Hepatitis-B vaccine using innovative technology; Bharat Biotech International Ltd., Hyderabad for production of recombinant Hepatitis-B vaccine; and Eicher Motors Limited, Pithampur for the introduction of a four cylinder E483 engine with innovative design and concepts.

#### **4.2.4 Technology Information, Forecasting & Assessment Council (TIFAC)**

The Technology Information, Forecasting and Assessment Council (TIFAC) was established in 1987 to examine and evaluate the existing state-of-the-art technology and projections for technological developments in the future in various sectors. TIFAC has carried out more than 200 Technology Forecasting/Assessment and Techno-market Survey studies, and a major long-term technology forecasting and assessment exercise - Technology Vision: 2020 report has been prepared on a national level.

In order to bring together the industry and R&D institutions, collaborative technology development projects were implemented under Mission Mode on i) Advanced Composites, ii) Sugar Technology, iii) Fly ash disposal and utilisation, and iv) Leather industry, in collaboration with the respective industries and user Ministries. A single window Patent Facilitating Centre has been established by the Department of Science and Technology at TIFAC for providing patenting facilities and advice to scientists and technologists and creating awareness and understanding of patents among the scientific community.

Under its Home Grown Technology (HGT) Programme SME-led technology efforts are supported for encouraging them to carry out innovations at pilot production level. So far, 75 projects have been supported, 15 technologies commercialised and 10 Patents filed.

#### **4.2.5 Department of Scientific & Industrial Research (DSIR)**

The primary aim of DSIR is to promote R&D by industries, support a larger cross section of small and medium industrial units to develop state-of-the art globally competitive technologies, catalyze faster commercialization of lab-scale R&D, and strengthen technology management capabilities. DSIR is operating several schemes for technology development, demonstration, innovation and management and provide several fiscal benefits to encourage private R&D as shown in Table-7.

#### **4.2.6 Council of Scientific & Industrial Research (CSIR)**

The CSIR was established in 1942 as a multidisciplinary R&D organization, presently with 39 constituent research laboratories and 80 field centres spread across the country which carry out basic and industrial research in different fields of S&T, such as building materials and road research, chemicals, drugs and pharmaceuticals, food processing, leather, pesticides, petroleum and petrochemicals, etc. So far, 3000 technologies have been developed, out of which 1500 have been transferred to industries. CSIR is

operating the New Millennium Indian Technology Leadership Initiative (NMITLI) scheme, the largest Public-Private Partnership effort to catalyse innovation oriented technological development in selected niche areas by synergising the competencies of publicly funded R&D institutions, academia and industry. The programme has evolved 42 projects involving 287 partners with an estimated outlay of Rs 3 billion. The projects are setting new global paradigms in the areas such as nano-material catalysis, biotechnology, bio-informatics, industrial chemicals, gene-based new targets for advanced drug delivery systems, low cost office computers, improved liquid crystal devices and others.

**Table-7: Programmes of DSIR**

<b>Programme</b>	<b>Objectives</b>	<b>Achievements</b>
Technology Development & Demonstration Programme (TDDP)	To catalyse and support activities on technology absorption, adaptation and demonstration.	Till 2005, 166 projects supported, 30 technologies commercialized/prototypes developed.
Technopreneur Promotion Programme (TePP) (in association with DST and TIFAC)	To support and encourage innovators to become technology based entrepreneurs by converting original ideas into working models, prototypes, etc.	Till 2005, 122 projects supported.
Technology Management Programme (TMP)	To facilitate industry and consultancy organisations, S&T institutions in developing and learning tools and techniques to effectively combat technology change and pressure in the constantly evolving and highly competitive business climate.	-
Fiscal incentives	Duty free imports, weighted tax deductions, tax holiday, income tax exemption etc. for industrial R&D provided to the companies.	-

*Source: Department of Scientific & Industrial Research*

#### **4.2.7 National Research Development Corporation (NRDC)**

NRDC provides support for commercialisation of laboratory know-how, licensing indigenous technologies, technology development loans for setting up

pilot plants to prove/scale-up laboratory processes, development and promotion of rural technology, etc. It works in close conjunction with over 200 national R & D laboratories and has licensed over 2000 technologies for commercial exploitation, of which nearly 1000 are in production with a current annual turnover of about Rs 12 billion.

Technologies licensed by NRDC cover areas such as chemicals, drugs and pharmaceuticals, food, agro-processing, bio-technology, metallurgy, electronics, instrumentation, building materials, manufacturing techniques and utility processes including pollution control. NRDC has also set up 52 rural technology demonstration cum training centres in various parts of the country to give hands-on training and demonstrations to artisans and technicians living in rural areas

#### **4.2.8 Department of Biotechnology**

The DBT was set up in 1986 to give a new impetus to the development of modern biology and biotechnology in India. The department has made significant achievements in the growth and application of biotechnology in the broad areas of agriculture, health care, animal sciences, environment and industry.

DBT has launched Small Business Innovation Research Initiative (SBIRI) to provide financial support to biotechnology entrepreneurs for early phase of product development. More than 50 technologies have been transferred from R&D institutions to industry under DBT support. Further, DBT has established two Biotechnology Parks/ Biotech Incubation Centers which provide support for the promotion of Biotech startup companies and the promotion of Public-Private Partnerships. Three other such projects are at various stages of development. Biotech Consortium India Ltd. (BCIL) under the department is engaged in the promotion and development of biotech industry.

#### **4.2.9 Ministry of Information and Communication Technology (ICT)**

The Department of Information Technology (DIT) has set up a Technology Development Council (TDC) to facilitate R&D in IT, promote free and open source software and to promote applications of IT for indigenous, efficient and cost effective solutions for product and process development in the industrial sectors including Bioinformatics. Under the scheme on innovation promotion in IT the department provides support to specified institutions to promote start up companies. A National Mission on Power Electronics Technology (NaMPET) has been set up. The DIT also supports R&D in convergence communication and broadband technologies, and for development of telemedicine technology.

Software Technology Parks (STPs) were set up for providing infrastructure, buildings, electricity and telecommunications facilities and high speed satellite links. The department has set up 35 STPs including 19 international gateways to boost software exports using high speed data communication links. DIT also has programmes on Standards, Testing & Quality Control (STQC), DOEACC etc. to provide facilities to ICT industry for quality control and manpower development.

#### **4.2.10 Department of Space**

The Department under its technology transfer and industrial consultancy programme, has transferred about 270 technologies developed by various constituents of Indian Space Research Organisation (ISRO), to industries.

### **5. Policies and Technological Innovation Programmes for selected Industry Sectors**

#### **5.1 Food Processing Industry**

Food processing and agro industries have been accorded high priority with a number of important relieves and incentives on regulation and control, fiscal policy and taxation; export promotion etc. As a result of several policy initiatives undertaken since liberalisation in 1991, the industry has witnessed fast

growth in most of the segments. As per a recent study on the food processing sector, the turnover of the total food market is approximately Rs.250,000 crores (US \$50 billion) out of which value-added food products comprise Rs.80,000 crores (US \$16 billion). Ministry of Food Processing industries has launched a mega Food Parks Scheme in order to provide infrastructure facilities for the food processing industries along with value chain from the farms to the market, with the provision for one time capital grant for the approved project cost. Several other promotional measures are being taken by the Ministry for technological upgradation, quality improvement, standards and safety etc.

## **5.2 Textiles industry**

The Government adopted the National Textile Policy in 2000 which had the major thrust on Technological upgradation, enhancement of productivity, quality consciousness, strengthening of the raw material base, product diversification, increase in exports and innovative marketing strategies, financing arrangements, maximising employment opportunities and integrated human resource development. Ministry of Textiles is implenting Technology Upgradation Funds Scheme (TUFS), Technology Mission for Cotton (TMC), Jute Technology Mission (JTM), Powerloom Schemes, Jute Manufacturers Development Council (JMDC), Integrated Textiles Parks etc.

## **5.3 Drugs & Pharmaceuticals**

The Pharmaceuticals policy 2002 gives high priority to abundant availability of good quality essential pharmaceuticals at reasonable price; strengthening indigenous capability for production and exports; strengthening the system of quality control and distribution; encouraging R&D with particular focus on diseases endemic or relevant to India and channelising higher investment into R&D, and creating an incentive framework to promote new investment and encourage introduction of new technologies and new drugs.

The Drugs & Pharmaceuticals R&D programme was started by DST in 1994-95 for promoting collaborative R&D in drugs and pharmaceuticals sector with the objectives of synergising the strengths of publicly funded R&D institutions and Indian pharmaceutical industry; to create an enabling infrastructure, mechanisms and linkages to facilitate new drug development., and to enhance self-reliance in drugs and pharmaceuticals especially in areas critical to national health requirements. In 2004, the Government established Drug Development Promotion Board (DDPB) under the administrative control of DST for supporting R&D projects jointly proposed by industry and scientists. So far, under this programme, 70 projects have been supported, 6 products developed and 13 process patents filed.

A major driving force for the progress of the pharmaceuticals industry has been the emphasis given by the firms on R&D. During the past decade, the R&D profile of the major Indian pharmaceutical industry has undergone considerable changes. In 2004, R&D spending of the organized pharmaceuticals industry was nearly US\$340 million, which was an increase of more than 300% over that of 2000. It has been estimated that the current R&D investment by Indian Pharmaceuticals industry alone is about 40 per cent of total R&D investment by industry in the country. Increased R&D investment by Indian firms in the generic drug industry is also reflected in their drive to obtain patents not only in India, but in many developed countries as well.

#### **5.4 Energy and Renewable Energy**

The Government of India announced the Electricity Act in 2003, Electricity Policy in 2005 and Tariff Policy in 2006 in order to create a conducive environment for investments in the power sector. The Integrated Energy Policy of 2008 recognizes the role of renewable energy sources. Ministry of New and Renewable Energy, through The Solar Energy Centre (SEC), Centre for Wind Energy Technology (C-WET), Indian Renewable Energy Development Agency (IREDA) and other R&D organisations supports R&D for renewable energy industry. The establishment of Sardar Swaran Singh National Institute of

Renewable Energy is in its final stages and the Institute is likely to be operationalised during the 11th Plan period.

A package of incentives which includes fiscal concessions such as accelerated depreciation, customs duty concessions, excise duty exemption, and income tax exemption have been provided for projects on renewable energy. Renewable energy technologies, in the last two decades have matured enough to not only supplement conventional power, it also provides viable solutions in the off-grid mode to meet the electricity needs of remote villages in the country. The grid interactive and off-grid renewable power installed capacity as on 30.09.2008 was about 13,451 MW and 279 MW respectively.

#### **5.5 R&D Expenditure by other Economic Ministries and Departments**

While most of the R&D activities including development and application of industrial technologies are supported and implemented by the twelve major S&T departments and their agencies as listed in Table-5, substantial research is also carried out in different sectors of industry power, irrigation, petroleum, steel, telecommunication, railways, etc through the programmes supported by other economic Ministries and departments and research organizations under them. Some of these R&D organisations are: Research Design and Standards Organization (RDSO), Lucknow; Central Power Research Institute (CPRI), Bangalore, Central Water and Power Research Station (CWPRS), Pune, etc. and leading public sector undertakings, Bharat Heavy Electricals Limited (BHEL), Hindustan Machine Tools (HMT) etc. R&D expenditure by some of the selected important Ministries and departments is shown in Table- 8.

**Table-8: Expenditure on Research and Development by Selected Socio-economic Ministries/Departments**

<b>R&amp;D Expenditure (Rs. * Million)</b>						
<b>S. No</b>	<b>Ministry / Department</b>	<b>1998-99</b>	<b>1999-00</b>	<b>2000-01</b>	<b>2001-02</b>	<b>2002-03</b>
1.	Agriculture & cooperation	214.07	241.54	376.78	452.13	550.85
2.	Animal Husbandry & Dairying	210.12	143.59	154.68	156.94	159.24
3.	Chemicals & Petrochemicals	77.13	95.65	99.41	51.98	62.96
4.	Education	471.40	502.54	502.84	513.78	524.96
5.	Fertilizers	200.15	188.74	191.68	189.24	165.44
6.	Food Processing Industries	68.38	74.20	74.03	55.23	75.72
7.	Health & Family Welfare	851.59	878.92	1033.42	1102.07	1175.63
8.	Heavy Industry	704.07	692.11	819.02	992.91	934.47
9.	Industrial Policy & Promotion	314.24	337.63	411.47	430.77	450.98
10.	Mines	1942.27	2009.99	2204.15	2190.42	2120.54
11.	Petroleum & Natural Gas	1700.41	1816.03	1880.52	1931.50	1944.89
12.	Power	198.11	172.68	212.37	223.41	216.41
13.	Railways	547.93	583.9..9	625.50	612.38	626.05
14.	Small Scale Agro Industries	155.32	156.09	124.40	115.84	108.01
15.	Steel	545.42	547.68	628.83	610.10	652.47
16.	Telecommunication	1374.40	1456.30	1577.48	1422.87	1316.01
17.	Textiles	598.19	614.41	730.27	780.47	834.17
18.	Public Sector under Major Scientific Agencies	323.63	377.73	372.67	410.26	420.51
	<b>Total (All Ministries)</b>	<b>14823</b>	<b>15873</b>	<b>17525</b>	<b>18254</b>	<b>19180</b>

Source: Department of Science & Technology **1 US\$ = ~ Rs. 50**

## **6. Other Related Policy Initiatives**

### **6.1 Credit Policy for Small & Medium Enterprises (SMEs):**

Credit is one of the critical inputs for the promotion and development of the SMEs for which the government has taken several policy measures. Ten per cent of the priority sector lending by the commercial banks have been earmarked for the

SME sector and a sound institutional arrangement for financing the sector has been created. The Small Industry Development Bank of India (SIDBI) is the principle financial institution for this purpose with the main functions of refinance assistance, direct lending and development and support services. State level institutions such as State Financial Corporations (SFCs) and State Industrial Development Corporations (SIDCs), commercial banks and development financing institutions e.g. , ICICI, IDBI, NABARD etc., and venture capital companies are playing a pivotal role to ensure adequate flow of credit for the SMEs. At the end of March 2007, the loan outstanding against the MSME sector from scheduled commercial banks is estimated over INRs 1270 billion. In addition, the sector is estimated to have received funds from emerging sources like venture capital and private equity, external commercial borrowings etc. to the tune of INRs. 120 billion.

## **6.2 Assistance for Modernisation and Technology Upgradation of SMEs**

Small Industry Development Bank of India (SIDBI, and other financial institutions and commercial banks have set up several funds to provide support to SMEs for modernisation and technology/quality upgradation. Such initiatives include:

### **6.2.1 Technology Development & Modernisation Fund (TDMF)**

SIDBI jointly with commercial banks are maintaining the fund for direct assistance of small sale industries to modernise their production facilities and adopt improved and updated technology so as to strengthen their export capabilities,

**6.2.2 National Venture Fund for Software and Information Technology (NFSIT):** Being managed by SIDBI Venture Capital Ltd. with INRs. 1000 million.

**6.2.3 Credit Grant Fund Trust for Micro and Small Enterprises (CGTMSE):** Jointly managed by SIDBI and Ministry of MSME for providing support to SMEs

with a corpus of INRs. 13.37 billion and up to December 2006, 61312 proposals amounting to INRs. 15.44 billion sanctioned.

**6.2.4 SME Growth Fund:** Joint fund of SIDBI and commercial banks.

**6.2.5 Microfinance Programme:** Under this joint programme of SIDBI and Ministry of MMSE, a cumulative loan of INRs. 1.02 billion provided benefiting 321,000 persons.

**6.2.6** SIDBI has also set up a Technology Bureau for Small Enterprises (TBSE) in collaboration with UN-APCTT to provide a platform for small enterprises to tap opportunities at the global level for acquisition of technology or establish business collaboration. A company, India SME Technology Services Ltd. (IFTSL) has also been set up by SIDBI and a few public sector commercial banks which provide services such as technology information, match making, finance syndication, business collaboration and support services and has a client base of 615.

### **6.3 Venture Capital Funds (VCF):**

A Technology Development Fund was set up in 1987-88 through levying of a cess on all technology import payments. Later, Technology Development & Information Corporation of India (TDICI) (now ICICI Venture) and Gujarat Venture Finance Ltd. (GVFL) were established. The Securities & Exchange Board of India (SEBI) came out with the guidelines for VCF in 1996 that paved the way for the entry of foreign venture funds into India. Currently, VCFs are concentrating on IT, Biotechnology, telecom, food technology, entertainment, education, new materials etc. At present more than 100 VC companies are operating in India with an investment of more than INRs. 50 billion.

## **7. Conclusions**

India has achieved an impressive success in industrial development during the last six decades after the independence. During this period, the

industrial policy efforts were complemented by several initiatives on development, transfer and adaptation of technologies for industry. It may be noted that over the years, India's industrial policies have evolved broadly in four different phases.

The period up to 1960 was the **formative phase**, when a broad framework of the Industrial Policy was outlined, and the policies were directed to create a reasonable industrial base in the country and to achieve self sufficiency in industrial development. Huge investments were made by the State in heavy industries to have a steadily increasing industrial production. At the same time, the Government of India also identified Science & Technology as a national priority, and in pursuance of the Scientific Policy Resolution (SPR) 1958, a large infrastructure on S&T education and research was created during this period. However, capability for research and development was not up to that level that could cater to the entire needs of the industry, and as such, technologies had to be imported in priority areas and on selective basis.

The period 1960 to 1980 was the **protectionist phase** when the process of industrialization was heavily state controlled and under stiff licensing and regulatory requirements. Restrictions were put on foreign investment and imports of technology. The policies sought to exploit the indigenous S&T capability as far as possible for future development of industries rather than importing technologies liberally. The restrictive policies led many sectors to technological obsolescence and incompetiveness in the market since little attention was paid to efficiency of production, product quality, and undertaking R&D for technological development suitable to industry needs.

The third phase was during 1980 to 1991 that was the **transition to liberalisation**. In the 1980s, Transfer of technology was given due importance and a number of measures were proposed for technological modernization to improve productivity and quality, and companies with in-house R&D establishments, and capability to absorb, adapt and disseminate modern

technology were permitted to import such technology to increase their efficiency and cost-effectiveness. In the Industrial Policy of 1990, several measures were also proposed for simplification of procedures for industrial approvals, and delicensing, relaxation on import of raw materials and components, foreign investment, foreign collaboration and import of technology. Thus a beginning was made towards a more relaxed and friendly policy approach though formally an economic liberalization policy was not adopted by the country till that time. Further, during the period, the Technology Policy Statement (TPS) 1983 was announced, and in order to give greater thrust on new and emerging technologies, separate administrative structures were created in the Government, such as, Department of Biotechnology (DBT), Department of Ocean Development (DOD) (now a part of Ministry Earth Sciences), Department of Non-conventional Energy Sources (DNES) (now Ministry of New & Renewable Energy), Department of Scientific and Industrial Research (DSIR), and several autonomous councils/agencies like NSTEDB and TIFAC. A large number of schemes and programmes were started for the promotion, development and transfer of industrial technologies during the Sixth (1980-85) and Seventh (1985-90) Plans.

The Fourth Phase has been **after the economic liberalisation** in 1991, when the industrial policy of 1991 was announced, under which the distortions of the pre-liberalisation period were corrected by dispensing with industrial licensing and facilitating foreign investment and technology imports, and at the same time taking steps to strengthen indigenous technological capability, human resource development for S&T and innovation, and encouraging private sector R&D in the country. The policy focus in the recent years has been on deregulating the Indian industry, enabling industrial restructuring, allowing the industry freedom and flexibility in responding to market forces and providing a congenial business environment that facilitates and nurtures overall industrial growth. The country also joined the WTO a few years back, and as per the commitments under the TRIPS Agreement, the Patent Act was relaxed to allow product patents, which had positive impact on sectors like pharmaceuticals industry.

The Industrial Policy of India in the post 1990s period fueled rapid increase in various sectors, and Indian Industry registered an impressive growth during last two decades when the number of industries have increased manifold. Striking results were observed in the IT, Telecommunication and Pharmaceutical Industry. The Indian software industry grew from a mere US\$150 million in 1991-1992 to a staggering US\$5.7 billion (including over US\$4 billion worth of software exports) in 1999-2000, representing an annual growth rate of over 50 percent. The Indian Pharmaceuticals industry has also been performing strongly in all fronts after 1990s, and its total production expanded more than four-fold. The global integration of the Indian economy offered a broad window of opportunities for the generic pharmaceuticals industry. This was primarily because most of the companies in this category are more export oriented, some of them exporting more than half of their sales turn over.

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