Manufacturing Industry in India
Technology and
Depth Value Addition

October 2011

Report on Strategies for Technology Development
by
the Group – I

Content

Annexure

Executive Summary

1. **Background**: Planning Commission, Government of India constituted a Working Group on "Technology and Depth Value Addition" towards preparation of the 12th Five Year Plans. 3 groups were formed under this Working Group. One of them is on "Strategies for Technology Development" headed by the Joint Secretary , Department of Heavy Industry. The composition of the group is annexed. The group went into the subject in detail and took into account the Mid term appraisal on the XIth FYP as well as held consultations with stake holders. Based on this exercise , the following recommendations are being made:-
2. **Recommendations**: The recommendations have been arranged ToR -wise as below:-

2.1 Suggested Measures to Enhance Technology and Depth Value Addition through Partnership between Industries and Govt Labs.

1. ***R & D Infrastructure*** – Public funded R&D Institutions have state-of-the-art R&D infrastructure but often found not fully utilized, Common research facilities in high-risk research and Research infrastructure in Industry are not adequate.

- Simple mechanism for use of public funded R&D infrastructure by industry or group of industries (devote 50% of time utilization by industry).
- Where costs are very high, create state-of-the-art common Research facilities in select sectors inside industry to be used by them.
- Create hassle-free mechanisms for industry oriented research facilities in the universities on PPP mode.

2. ***PPP Research & Development*** - India is facing several challenges in the areas like climate change, water, energy, food, healthcare, transport and environment, Public f unded research and industrial research are happening in isolation with appropriate and affordable technological solutions in large scale yet to be seen and while a few technologies are developed / available but scalability and business models are the issues.

- Launch 10 technology missions in these areas
- Create consortia of industry and institutions with time-bound research and development goals
- Provide all-round support in terms of fund and infrastructure
- Industry(s) to lead such PPP projects through its large scale deployments on commercial basis.

3. ***Quality of Human Resource*** – Due to poor collaborations, both excellence in higher education & research and industry's capacity / performance in research are affected , Mutual Trust deficit is the major issue, Neither university nor industry are incentivized and recognized for collaborations, Industry partnership in university's governance, infrastructure, course curriculum, technology usage, faculty/students development, research is absent and Industry's benefit from university in terms of quality HR and knowledge services are not significant.

- Incentivize both university and industry for successful partnerships in university's governance, infrastructure, course curriculum, technology usage in education delivery and expansion of outreach, faculty/students development and research
- Specially Incentivize universities those are benefiting industry by providing high quality HR and knowledge services and earning more than 50% of their research budgets, based on industry ratings

4. ***Frame National Technology Strategy/Policy*** in close association with industry. Refine it every five year or earlier.

5. C***reate Centers of Excellence in the strategic/priority areas*** in partnerships with universities, Industries and Global R&D institutions. managed by private sector. Incentivise these Centers of Excellence. Industry commercializing technologies f rom these COE's also to get incentives.

6. Place in position ***Government policy for procurement*** of Indian industry' R & D outputs (Supported by R & D Institutions) to trigger Industrial R & D, products having larger share of value addition in India to get preference.

7. Establish viable and holistic '***Product Development Competence***' at the national level, seed and enable the growth of a robust 'innovation eco system' for the capital goods sector as a whole.
8. To encourage domestic R&D efforts, CPSEs needs to be empowered to decide R&D partners
9. Opportunity to developers to carry out field trials on no cost no commitment basis
10. To encourage indigenous development with adequate risk mitigation
11. Higher Super IT deduction
12. Carryover of unabsorbed R&D losses for extended period of time
13. Development activities be taken up in areas like High Temperature Material, Machine Tool Technology, Solar Power, Nano Technology.
14. Up-gradation of domestic testing laboratories to obviate testing abroad
15. Funding R&D in capital goods sector and other critical areas of strategic importance from the cess levied on import of technology
16. Creating exclusive interfaces for collaborative/ consultancy projects with institutes of excellence (such as IIT Madras Research Park)
17. Hiring retired experts and young talents to support R&D for a specified time
18. CSIR/DSIR laboratories to extend services for establishment of Pilot Plants/facilities for up-scaling of models/processes
19. Strengthening R&D infrastructure specially for type testing of prototypes. For prototype manufacture and field trials, road map could be as under:
    - 1st to 3rd Year – for conceptualization, development at Laboratory Level
    - 4th to 6th Year – evaluation and demonstration at pilot plant facility
    - 7th to 10th Year – commercialization by industries

2.2 Recommendations: Intellectual property regime to another more collaborative and indigenous innovation

1. ***National IP think Tank*** :To nurture a conducive environment for creation, protection and extraction of value of IP which drive and lead's IP demand of today .
2. ***Strengthening Industry-University Linkages***: Right framework in the form of incentives to research and university is needed
3. **Better IPR Regime enforcement mechanism**: Fast Track mechanism for expeditious resolution of pending cases & Stringent policies on infringement of IP and proper enforcement of IP
4. ***Encouraging IP education and Training*:** Training for all disciplines, all sectors and all level of Industry and Academic Institutions on latest happenings, Issues and specialized IP requirements across the country
5. ***IP management & Research Centers:*** Management- oriented education and IP research Centres to be created.
6. ***Government Policy on procurement of Indigenous IP***: There is a need to create a market for IP Products developed by domestic Innovators, a policy in this regard will go a long way in promoting innovation.
1. ***Award & Recognition:*** To recognize and reward people those who have contributed in harnessing the country's intellectual capital and creating an eco-system that boosts creativity and innovation

2.3 Recommendations: Policies for Promoting Joint Ventures between Foreign Companies and Indian Partners

1. Fiscal Measures: While encouraging the transfer of technology to Indian companies by foreign partners, the taxation set off of licence fees/royalty may be given, so that it does not add to the cost of the product.

a. Direct Tax

- Taxability in the hands of foreign investor of the technology fee should be clarified.
- The deduction in case of profits earned by a company from R & D is currently available only to those companies which have been approved prior to April 1, 2007.

b. Indirect Tax

- The R & D Cess of 5% may be made creditable towards any output taxes .
- Technical know-how could be one of the major cost for some industries say, pharmaceutical industry. But some states provide for a value cap on the quantum of investment on technical know-how for the purpose of reckoning investments. For example, in Maharashtra, the value cap for intangibles (which includes technical know-how, pre-operative expenditures, interest capitalized etc) in reckoning gross fixed capital investment for determining the incentive is capped at 10% of total project cost. The states may re-visit the subject in light of the above.

2. Non Fiscal Measures

- In the purchase tender terms, **weightage can be given to foreign suppliers offering technology transfer** to Indian company.
- A strategy adopted by many foreign companies, while agreeing to technology transfer/collaboration or JV, is to transfer technology for the end product, while withholding technology of critical parts / sub-systems for which the Indian company will continue to depend on them for supplies. The regulations governing the formation of JVs may guard against such practices by insisting on a total ToT. This could be done by quickly reducing import content through a PMP, as was the practice earlier.
- Assist MSMEs which are willing to enter into collaboration for latest technology, design etc. through establishing Technology Acquisition Fund which will promote Joint Ventures both in India and abroad.

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CHAPTER 1 : INDIAN MANUFACTURING SECTOR – TECHNOLOGY PROFILE

1.1 **Manufacturing In India**: The industrial revolution in different parts of the world can be visualized as waves, as first proposed by Nikolai Kondratieff, a Russian economist in 1920s. The first wave started in 18th century England with inventions related to the textile industry, steam engine and printing. The second wave started in 19th century America and comprised of rapid developments related to automobile, railroad and telephones. The third wave in 20th century was led by Japan, which focused on electronics and automation.

1.2 **Modern manufacturing in India** was brought by Britishers during Second World War for defence production. Though the earliest evidence of manufacturing activities in Indian subcontinent is found in the remains of the Harappan civilization (4000- 3000 BC). Accurate weights and measures were in use. Kilns for smelting copper ingots and casting tools were in existence. Metal tools included circular saws, pierced needles and bronze drills with twisted grooves. Technologies for lifting, loading and transportation of construction materials, building construction ramps, scaffolding, and related tools were used for creating monumental architecture. Ports such as Lothal in Gujarat were developed as export centers of early manufactured products from smelted copper and bronze. Before Independence, Indian private sector, English companies and a number of American companies had already led foundation of modern Indian manufacturing. Nehruvian era saw building of big public enterprises such as steel plants, dams, power hoses and like. Indira Gandhi regime consolidated Public Enterprises approach in all aspects of Indian economy. In 1991 a complete turnover took place and the manufacturing focus shifted from Public Sector to private sector. All policies were liberlaized in favour of private enterprises.

1.3 **Indian Manufacturing Today:** Industry accounts for 28% of the GDP and employ 14% of the total workforce. In absolute terms, India is 12th in the world in terms of nominal factory output. The manufacturing accounts for 15% of the GDP. Today India makes most of the articles, simple technology articles like pins to high tech products like missile and satellites. Tough, **India leads the market** in offshored back-office services, but as a manufacturing center it lags behind China, Thailand, and the rest of Asia. The reasons are erratic electricity supplies, poor roads, and gridlocked seaports and airports, governance issues, labour polices, etc. One of the main reason has been that MNCs aas well as Indian companies always foucsed on Indian demands and never considered India as a base for global supplies. Meanwhile technology advancements led to consolidation of global capacities in many many manufacturing sectors. Indian manufacturing capacities remained stagnant at local levels. Their capabilities to change to global levels also diminished. In sectors led by high the and competitive prices, India legged behind.

1.4 Government of India recognized the **importance of technology led in depth value addition** to the Indian economy. XI Plan itself, the following strategies were suggested to overcome the situation:-

I. The government's own purchases, where these are large, could be used as a lever to encourage domestic manufacture and transfer of technology as a condition. The intention should not be to simply prefer domestic manufacture irrespective of cost or technology but to use leverage to create a modern and competitive industry.
II. Standards of products and services that may be sold in the country could be specified in a manner that would encourage domestic production building to scale within these standards.
III. Wherever the government subsidizes the purchase and use of new technology for example, for the promotion of environment friendly products) it specifies standards or technologies as well as domestic production requirements.
IV. Tax benefits (and/or) interest subventions for selected industries along with conditions for local content (with no discrimination between domestic and foreign companies).
V. Subsidies for local manufacture, or local R&D, in selected industries (with no discrimination between domestic and foreign companies).
VI. Provision of special infrastructure, for example, privileged and well equipped areas, R&D funds and marketing funds the users of which are required to meet specified conditions.

1.5 **Policy regime for Manufacturing:** There is licensing requirement for manufacturing except for some items reserved for MSME and Public sector. FDI, International Technology Transfer, Imports and Exports are also free. DST – TDB and Technology Upgradation Fund for Textile and Jute Industry, DBT, DSIR and Indo US s & T Foundation operate technology upgradation funds. National Manufacturing Competitiveness Council was set up in 2004 to give policy inputs. NMCC wrote National Strategy for Manufacturing in 2006. NMCC has suggested a comprehensive approach for MSME sector with following funding:-

Funding requirement for the NMCP for MSME:

Sl. No.	Name of the Sub-Scheme	Amount Rs crore
1	National Programme on Application of Lean Manufacturing	300.00
2	Promotion of ICT in Indian Manufacturing Sector	160.25
3	Mini-Tool Rooms to be set up (by Ministry of SSI)	135.00
4	Technology And Quality Upgradation Support for SMEs	93.50
5	Support for Entrepreneurial and Managerial Development of SMEs	66.50
6	Design Clinic scheme to bring design expertise to the Manufacturing Sector	50.00
7	Enabling manufacturing sector to be competitive through quality management standards and quality technology tools	50.00
8	National campaign for investment in Intellectual Property	50.00
9	Market assistance/SMEs and technology upgradation activities (Ministry of SSI in co-operation with TIFAC/CSIR)	26.50
10	Marketing Support/Assistance to SMEs	24.25
	TOTAL	956.00

During the XIIth FYP a concentrated strategy to increase the depth in manufacturing through infusion of Technology is proposed. Indian Manufacturing Policy is likely to be finalized soon, giving boost to Indian manufacturing.

1.6 **Draft National Manufacturing Policy:** A high level committee chaired by Prime Minister Dr. Manmohan Singh has approved in principle the draft National Manufacturing Policy. The salient features of the policy are:

- To increase the share of manufacturing in the GDP from the current 16 percent to 25 percent by2025 and in the process create an additional 100 million jobs.
- To create National Investment and Manufacturing Zones (NIMZs) with world class infrastructure facilities. The proposed zones will enjoy special policy regime, tax concessions, less stringent labour and environment laws, and flexible compliance norms.
- To set up a Manufacturing Industry Promotion Board (MIPB) at the level of Union Minister of Commerce and Industry to ensure coordination amongst Central Ministries and State Government and to ensure effective implementation of the policy.
- **To set up a Technology Acquisition and Development Fund to promote acquisition and development of appropriate (primarily green technologies) technologies.**
- To introduce policy measures to facilitate the expeditious redeployment of assets belonging to non-viable units, while giving full protection to the interests of employees. This will be done through appropriate Insurance Instrument and/or Sinking Fund

1.7 **NMCC Position Paper on Technology Development and value addition:** salient features are:-

- Keep Value Chain indigenous
- Control upstream value chain in some industries to safeguard growth in downstream segments
- Greater base for CG manufacturing for value chain and impact on GDP
- Growing import of CG for manufacturing competitiveness
- Low value addition in Domestic Industry to be checked with technology infusion.

- Technology Development is the key. FDI and FTA Policies impinge technology development of CG sector
- Manufacturing Value chain needs to be harmonious
- IPR ownership transfer by labs to MNCs to be checked.
- Public Funded Institutions not to become source of cheap knowledge to MNCs.
- Sophisticated WTO compatible policies needed to ensure access to foreign technologies as well as more development within India.
- Better Fiscal and exchange policies to be leveraged for encourage domestic technology development.

1.8 Technology Profile of Major Indian Manufacturing Sectors:-

Following slides inform the gaps in technologies for important Indian manufacturing sectors:-

1.8.1 Machine Tools : Technologies targeted

A) **Metal cutting machine tools**:
- Multi-axes, Multi-tasking machines
- High precision machines
- Large machines (boring-milling, turning)
- Gear cutting and finishing machines
- Grinding technology and machines
- Electrical and micro-machining

B) **Metal forming machines**:
- Higher press automation and transfer systems,
- Servo presses,
- Sheet working machines (including laser, waterjet)
- Hydroforming
- Fine blanking
- Forging machines
- Flow forming

C) **Special technologies**:
- Explosive forming,
- Electro- magnetic forming etc.
- Cutting tool technologies
- Robotics and automation
- Alternative materials (epoxy granite etc.)
- Thermally stable welded structures
- Hydrostatic spindles, guideways
- Motorised and high frequency spindles
- Smart machines with embedded sensors

D) **Critical components development**:
- Anti-friction linear guideways
- Ball screws
- Precision spindle and ball screw support bearings
- CNC controls
- Spindle and axes servo motors with drive controllers
- Feedback measurement systems

1.8.2 Textile Machinery: Technologies Targeted

- Auto coner

- Rotor spinning machine
- Processing machinery with continuous scouring, bleaching, mercerising, washing, dyeing plants, preshrinking ranges
- High-tech garment making machinery and knitting machinery
- Non-woven and Technical Textiles machinery
- High end compact spinning
  - High speed OE
  - High speed winders
  - High speed woolen / worsted frames
  - Air Jet technology
  - Extruders
  - Spinning beams
  - Godets
  - Winders
  - Opening, Cleaning, Blending
  - Spinning
  - Filament yarn testing (on / offline)
  - Shuttleless looms (rapier >400 rpm; air jet > 800 rpm; water jet > 800 rpm)
  - High speed circular knitting machinery (Microprocessors)
  - Warp knitting
  - Environmentally sustainable processing
  - High speed wide width processing
  - Special purpose processing and finishing machinery (e.g. plasma-finishing)
- Hi-tech industrial stitching/sewing machinery (lockstitch, overlock, coverstitch, bar tacking, pocket set, button holes, etc)

1.8.3 Heavy Electrical Equipments: Technologies targeted

- Super critical technology
- Turbines of 1000MW and more
- Raw materials : CRGO Steel
- High Voltage Testing Facilities
- Ultra high voltage transmission equipments & systems.
- Energy efficient technologies like IGCC, UGCC , Concentrated Solar Thermal Project

1.8.4 Earth Moving and Mining Machinery : technologies targeted

- High capacity Electric Dump Trucks ~ 190 ton – 240 ton
- High capacity Rope shovels ~ 42 Cum
- Walking Draglines ~ 72 m - 33 Cum; 150m - 50 Cum
- Hybrid Drive Loaders of high capacity ~ 10 cum bucket
- Electronically Controlled Emission Compliant engine ~ 2500 HP
- Fully Automatic Electronically Modulated Transmission ~ 1500HP
- Long Wall Mining systems and Continuous miners for underground mines
- Axial piston pumps and motors
- Cutter Suction Dredgers and Trailer Suction Hopper Dredgers

1.8.5 Metallurgical Equipments

- Beneficiation/Utilization (Pelletization) of slimes
  - Beneficiation of low grade iron ore (Fe: 30~40%)
  - Development of technology for palletization of hematite/ geothetic ore
  - Recovery of ultra fine iron mineral from slime
  - Coal gasification
  - Developments of smelters e.g. COREX, FINEX etc.
  - Use of energy saving technologies e.g. CDQ (coke dry quenching), TRT(top gas recovery turbine) , HEC (high efficiency combustion) regenerative burners etc.
  - Chemical absorption of CO_2 and storing it underground
  - Development of microbial treatment for effluent treatment
  - Level-3 automation
  - Extensive use of Process/ Supervisory Models

- Blast Furnace equipment
  - Mud Gun1.8.6 Process Plant Equpments
  - Slag granulation plant
  - Tap hole Drilling Machine
  - Top Charging equipment
  - Tuyeres, Tuyere coolers
  - Copper stave coolers & SG iron stave coolers
- Coke Oven Machines with pollution control measures
- Steel Melting
  - Torpedo Ladles
  - Convertors
  - Secondary refining units (LF, RH Degasser, VAD, VOD)
- Continuous Caster
  - Caster Segments & segment cooling equipment
  - Electromagnetic devices (EMS/EMBR)
  - Moulds & mould cooling equipment
  - Mould Oscillator
  - Tundish equipment
- Raw Material Handling Plants
  - Stackers & Reclaimers
  - Wagon Tipplers
  - Higher capacity Wagon Pushers
- Bucket Wheel Excavators
- Rolling Mill Equipment
- Large Mill Stands for plate mills & hot strip mills (around 350t single or 500t 3-piece design)
- Heavy duty Hydraulic dividing Shears
- Heavy duty hydraulic plate leveller
- Straightening Machines for long products
- CNC Roll grinding machines
- Large reducers for plate mill & hot strip mill main drives
- Large back-up rolls (up to ~300t) and work rolls (up to ~75t)
- Equipment for sorting, stacking and bundling of long products
- Ultra fast plate cooling equipment (up to ~25/300 C/sec)
- Large size roll bearings

➢ Some of the steel plant components / spares still imported into the country include:

Area	Typical components
Mineral beneficiation	Pneumatic jigs, wet high intensity magnetic separators
Coke oven complex	Anchorage springs
Pellet / DR plant	Induration / briquetting machines, disc pelletizer components
Sinter plant	Mixing & nodulising drum, circular sinter cooler
Blast furnace	Coal dust injection system, bell-less top
Steel melt shop	Oxygen lance system, gunniting equipment, slag arrestor system
Cont. casting plant	Mould assembly, automatic mould level controller, EMS (electromagnetic stirring) equipment
Rolling mills	Special rolls, roll grinding m/c, AGC (Automatic Gauge Control) cylinder, universal mill stand, large Mill Stands for Hot Strip Mills / Plate Mills
Processing lines	Flash butt welders, jet finishing equipment for hot dip coatings, tension levelers, special spray nozzles, rotating hydraulic cylinders, laser welders, zinc coating pots with inductors
Material handling	Ship loaders / un-loaders
Oxygen plant	Compressors & cryogenic pumps
Gas holders	Fabric seals

Area	Typical components
Furnaces	Furnace burners, Furnaces for roasting, melting, heating & heat-treatment
Metal Foundries & Metallurgical industry	Moulding machines & Moulds, Die casting machines and other miscellaneous machines used in metal foundries & metallurgical industry.

1.8.6 Process Plant Equipments- Technologies targeted

- T Embedded Technologies
- Sub Sea Equipment namely Oil well drilling and Process gas Boilers for Ethylene and Gas Crackers
- High technology process plant equipments.

1.8.7 Electronics and Telecom Hardware: technologies Targeted

- R & D , Design, and manufacturing Technologies – whole spectrum
- 3G and 4G in Telecom,
- Embedded Technologies,
- Electronics components.
- Chips Design and Manufacturing,
- Consumer Electronics
- Power Electronics,
- Nano Electronics.
- Defense and aero space technologies.

The same exercise can be extended to other important sectors of manufacturing technologies like chemicals and petrochemicals, organic and in organics, drugs, pharmaceuticals and bio technologies, food processing and agro technologies with similar results. The Technology mapping of the country is complete with the two statements that India lags behind other emerging economies in R & D spending, Patents registration, high tech manufacturing high tech products exports, and technology exports. India depends on technology imports and is yet to become a knowledge cluster. Advent of National Manufacturing Technology is a step in right time and in right direction to retain strategic value chain and employment in India. .

CHAPTER 2 : PARTNERSHIP BETWEEN GOVERNMENT LABS AND INDUSTRY

2.1 **Indian R & D System:** The Indian R&D system can be grouped by way of a variety of performers and funding sources. The performers include the national laboratories , universities, in-house R&D laboratories and non-profit organisations. The funding sources include the Central Government, State Governments and the industry. In the Central Government, scientific research is carried out under both these groups. R&D performing bodies inter-alia included Department of Atomic Energy (DAE) , Department of Spa c e (DOS) , De f enc e Research & Development Organisation (DRDO), Council of Scientific and Industrial Research (CSIR), Indian Council of Agricultural Research (ICAR). In the R&D funding group fall the Department of Science & Technology (DST), Department of Bio-Technology (DBT), Ministry of Earth Sciences (MES) among others.

2.2 **Government Laboratories.** There are 200 national laboratories and an equal number of R&D institutes in the Central Sector and about 1300 R&D units in the industrial sector. Some prominent Departments are :-

- 40 R & D institutions under The Council of Scientific and Industrial Research (CSIR),
- 12 R & D institutions under Department of Atomic Energy
- 15 R & D institutions under Department of Space

2.2 State Governments also have some R & D institutions. DRDO, NRDC and ICAR are the technology licensing arms of the Govt laboratories. The Central Government is the chief patron of scientific and industrial research. Its share was 74% of the India's total R&D expenditure estimated around Rs. 57 billion during 1993-94.

2.3 The commitment of Indian Government to promote socio-economic growth of the country through the use of S&T has shown remarkable success in a short span of four decades.

2.4 India today ranks among the few developing countries which have achieved self-sufficiency in food production. The country has endeavoured to fulfill the basic needs of healthcare and housing for a large section of its people.

2.5 In the field of basic research, the country has done notably and has established major research groups with world-class capabilities in various emerging and frontline areas of Science & Technology. Some examples are the areas of Molecular Biophysics, Molecular Biology, Neuro-biology, Liquid Crystals, Biomedical Devices, Superconductivity, Condensed Matter Physics, Astronomy and Astrophysics, Powder Processing and Advanced Materials, Organic Chemistry, Solid Sate and Surface Chemistry, Numerical Weather Prediction, Parallel Processing and Atmospheric Sciences.

2.6 India occupies a unique position in the world having formulated its own nuclear programme and cultivated self-reliance in areas of reactor technology and its entire associated fuel cycle. The country designs, constructs and operates nuclear reactors, fabricates the required fuel -- reprocesses it, and treats the waste generated in the entire fuel cycle in a comprehensive manner by a totally indigenous effort.

2.7 Similarly, in the high-tech area of space research India can now design, build and operate state-of-the-art communication and remote sensing satellites as well as launch 1000 kg class remote sensing satellites into polar sunsynchronous orbit. Many of the technologies developed for the nuclear and space research programmes are now finding their way into the market and being used in other sectors. Indian industry is striving to keep pace with these developments.

2.8 Yet another achievement which speaks of the high level of S&T capability of India is the development of supercomputers -- only a few advanced countries have this capability today. In the field of Aeronautics, the country has developed and successfully flown an all-composite trainer aircraft. Projects are in hand for the development of Light Transport Aircraft and Light Combat Aircraft.

2.9 A large number of technologies have been developed and commercialized for various chemicals, including petrochemicals and agrochemicals; industrial catalysts; drugs and pharmaceuticals; biomedical devices; food processing; leather processing and products; engineering materials and equipment; electronic equipment and construction materials, to cite a few. Many of these technologies have also been marketed abroad, an indication of their global competitiveness.

2.10 Special mention may be made of the technologies developed for industrial catalysts, such as Encilites, for producing important petrochemicals like p-xylene, ethylbenzene and olefins, and for drugs such as AZT (anti-AIDS), Etoposide (anti-cancer) and Centchroman (non-steroidal oral contraceptive).

2.11 Micropropagation of several trees and crops by the plant tissue culture technique, development of ELISA and PCR techniques and DNA probes for detecting enteric pathogens in drinking water, development of toxinogenic oral vaccine for cholera and conversion of molasses to ethanol using a special yeast strain are a few examples of achievements made in the field of Biotechnology.

2.12 The major programmes being pursued in the field of marine sciences include exploration and exploitation of living and non-living marine resources, study of air-sea interactions, coastal zone management and scientific expeditions to Antarctica. India has established its reputation for carrying out oceanographic surveys. A major assignment completed was the comprehensive survey of the Caribbean waters under the CORE project. India's success in exploration and survey of deep sea polymetallic nodules has earned here the distinction of being registered as a Pioneer Investor under the UN Convention on the Law of the Sea which has recently come into force. An area of 150,000 sq.km has been allotted in the Central Indian Ocean to India for survey, exploration, and ultimate retention of 75,000 sq.km. of high abundance area.

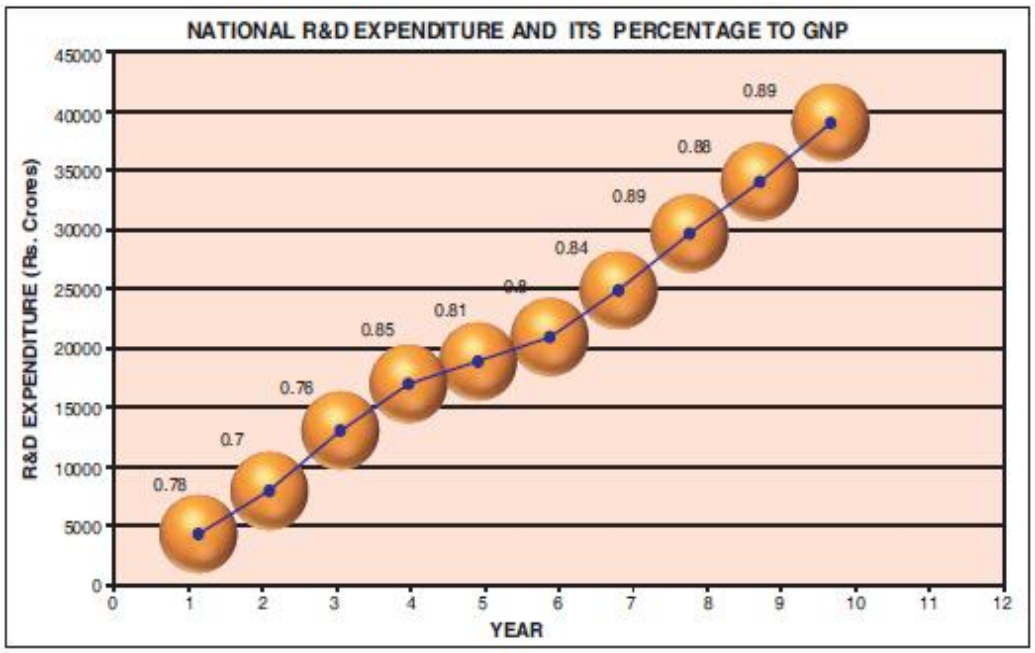
2.13 CSIR tops the list in India in generating knowledge:-

PCT Top Applicants (Publication Year = 2010)

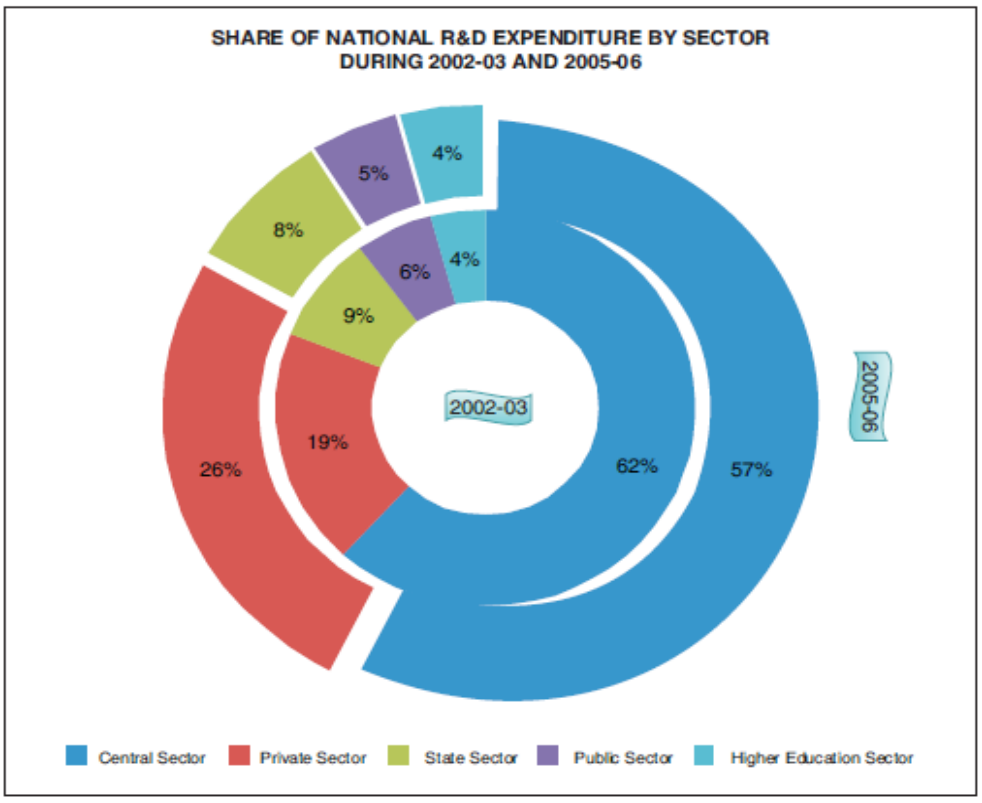
Applicant	Publication	*Rank*
COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH	***56***	***306***
DR. REDDY'S LABORATORIES LTD.	26	*660*
RANBAXY LABORATORIES LIMITED	22	*785*
HETERO RESEARCH FOUNDATION	20	*851*
LUPIN LIMITED	19	*893*
MATRIX LABORATORIES LTD	18	*933*
ALEMBIC LIMITED	15	*1100*
CADILA HEALTHCARE LIMITED	15	*1100*
PANACEA BIOTEC LTD.	14	*1175*
TATA STEEL LIMITED	14	*1175*

Tata remains the lone entry in the top for non- bio tech manufacturing sector.

2.14 The National expenditure on Research and Development (R&D) has increased from Rs. 18088.16 Crore in 2002-03 to Rs. 20086.34 Crore in 2003-04. It further increased to Rs.24117.24 Crore and to Rs. 28776.65 Crore for the years 2004-05 and 2005-06 respectively. By applying the appropriate rates of growth for different sectors as observed from 2001-02 to 2005-06, the projected National R&D expenditure would attain a level of Rs. 32941.64 Crore in 2006-07 and Rs. 37777.90 Crore in 2007-08



In the total R&D expenditure for the year 2005-06, the Central Government including Public Sector industries contributed 62.0%, Private Sector 25.9%, State Governments 7.7% and Higher Education Sector 4.4%. If one considers Industrial Sector as a whole comprising both Public and Private Sector, the share of Industrial Sector in the total National R&D expenditure increased from 25.3% in 2002-03 to 30.4% in 2005-06.



2.15 Some of the C**SIR laboratories having the core strengths** in the manufacturing, and continuing for prospective collaborative activities are:

- Advanced Materials and Process Research Institute (AMPRI), Bhopal
- National Chemical Laboratory, Pune

- Central Glass and Ceramic Research Institute (CGCRI), Kolkata
- National Aerospace Laboratories (NAL), Bangalore
- Central Mechanical Engineering Research Institute, Durgapur
- Central Electrochemical Research Institute, Karaikudi
- Central Scientific Instruments Organization, Chandigarh
- Central Road Research Institute, New Delhi
- National Metallurgical Laboratory, Jamshedpur
- Central Institute of Mining and Fuel Research, Dhanbad
- Central Electronics Engineering Research Institute, Pilani
- Indian Institute of Petroleum, Dehradun
- Indian Institute of Chemical Technology, Hyderabad
- Indian Institute of Chemical Biology, Kolkata

2.16 Recommendations:

It is recommended that **development activities** in the following areas should be taken up:

· High Temperature Materials – development, characterization.
· Processes for containment/ conversion of CO_2.
· Containment of pollutants like NO_X, SO_X generated during combustion of Indian/ Imported Coal.
· Coal Gasification.
· Generation, storage and application of Hydrogen in large scale with a vision for Hydrogen Economy.
· Absorption, storage and conversion of Solar Thermal Energy for utilization in electric power generation and other utilities.
· Semiconductor physics for higher efficiency photovoltaic cells for conversion of Solar Energy.
· Hydro power and Water energy-tidal waves.
· Wind Energy.
· Transmission of power.
· Transportation (Rapid/Maglev).
· Advanced C&I.
· advanced machine tool technology,
· advanced welding technology
· Photosynthesis/ biochemical processes for effective utilization of Solar Energy.
· Nano Technology – development of materials and processes for industrial scale production of the materials for application in Metallurgy, Insulation, Wear/ Corrosion resistant coatings, Photovoltaic etc.

2.16 Empowerment: CPSUs and other Govt. Industries should be adequately empowered to drive R&D in their sector. For this, the following issues need to be addressed at policy level:

2.16.1 Encouraging domestic R&D efforts:

It is well recognized that domestic R&D is an important ingredient in self sustenance effort of the country. However, efforts being made in this regard require to be further strengthened. National Level Policy changes are needed to encourage indigenous development of technologies with focus on the following specific aspects:

· R&D projects in India should be supported by GOI but adequate empowerment should be given to the CPSUs and other Govt. Industries to decide their R&D partners which can be from Indian/Foreign Private or Public sector/organisations.
· In the context of Power Sector, for indigenously developed products/systems especially those involving substantial developmental investment, the
qualification requirements pertaining to equipment performance over a minimum period specified by customers like Electricity Boards, NTPC, PGCIL etc. should be modified suitably to accommodate/encourage indigenous developments. This would enable domestic companies pursue products/systems, development, testing and marketing of indigenously developed products & systems as well as real time evaluation in the field. At the same time user's interests can be safeguarded by the product developers by way of recourse to deferred payments, extended guarantees or insurance cover to indemnify them against the risk of failure. Further, development of indigenous products must be encouraged by providing an opportunity to the developers to carryout field trials on no cost no commitment basis.
· To support commercialization of indigenously developed products, an acceptable mechanism/ enabling provision is needed for risk mitigation. This could be in the form of insurance scheme to cover any potential risk

over and above the normal warrantees and guarantees offered by the product developer and funded through the aegis of a R&D cess.

· As per the Research & Development Act, 1986, as amended in 1995, a cess of 5% is being levied by Government on all payments made towards import of technology, etc. The Government should encourage R&D in capital goods sector and other critical areas of strategic importance by providing funding from this cess. Further, additional R&D funds can be created by imposing a nominal cess on the turnover of every company, on the lines of the cess on petrol and diesel for developing national highways.

· In certain specific areas identified for attracting FDI, policy changes are necessary to include transfer of technology to an Indian company as a mandatory condition to allow access to our huge domestic market.

· The GOI should work on mechanism to give special treatment to developing countries for transfer of clean coal technology on reasonable terms and conditions and in a manner that contributes to the long-term developmental prospects of the host developing country. This must be vigorously pursued.

· Enunciate a clear policy to provide incentives for the commercialization of products developed through indigenous R&D efforts. The incentive could be among others, in the form of excise duty exemption at least for a period of five years from the date of commercialization.

· Rationalization/acceptability of new materials by statutory authorities like IBR for boiler applications must be permitted. If alternate materials for usage not codified by ASME are available, the same should be permitted provided these alternate materials have been codified by any other international specification formulating agency or certified by reputed national laboratories that are approved by IBR.

· Huge investments are needed in R&D, skill base development and new technologies to foster innovation. For example, research in the field of combustion process, gasification process, nano technology, high temperature steels, etc. find application in a variety of sectors like energy, automotive, ship building, etc. Such inter-sectorial innovations can be effectively steered at Government level for bringing out the synergy. Policy framework must support such research involving various sectors of industry with appropriate funding mechanism.

· Identify and support certain high cost domestic R&D efforts of Indian companies through government funding by way of grants and soft loans with the purpose of establishing references for technologies/ products thus developed. For demonstration projects, a collaborative approach involving the developer, the user and the Government with appropriate equity participation could be considered. For example, BHEL has made a beginning in terms of a tie-up with APGENCO for 182 MW IGCC project. There is a need for financial support from the Government for such projects. It should also be extended to other areas like development of 765 kV transmission equipment, Advance Ultra Super Critical Technology, etc. It may be pertinent to mention here that U.S government has already extended 50% funding on such demonstration projects.

· Consider appropriate delegation of powers to Maharatna, Navaratna and Min-Ratna CPSEs boards for out sourcing of expert knowledge/ technology in niche areas for carrying out R&D from international experts/ institutions on exclusive basis giving consideration to quality and capability rather than price determination on L-1 basis.

2.16.2 Strengthening R&D Infrastructure:

R&D Infrastructure at National Level needs strengthening in terms of facilities especially for type testing of prototypes with a view to minimize development/commercialization cycle. The areas to be considered for strengthening are:

· Prototype and material development in case of special castings and forgings used in power generating equipment requires infrastructure supplementation at national level to improve their development pace.

· Testing Laboratories in India are to be upgraded to address capacity & availability issues obviating the need for sending the equipments abroad for type testing.

· Promote Joint endeavors of Indian companies with IGCAR, MIDHANI etc. to develop and commercialize production of prototypes.

2.16.3 Intellectual Property Rights:

It has been found that Indian brain working on new technologies for multi-nationals in India are made to file patents on behalf of MNCs in India and in their country of origin and products designed, engineered and manufactured on the basis of these patents are commercialized at premium prices in our own country. A mechanism should be developed to take care of this aspect while framing the policies so as to empower the technology base of the country.

2.16.4 Encouraging partnership between experts/industry and academic institutions:

Most of the institutions in India are still continuing with old pattern of consultancy projects of smaller number, smaller values and having small impacts which are generally handled by individual Professors who are

well known in the industries. Some of the steps that can be taken to encourage partnership between industry and academic institutions are :

· Institutes should be encouraged to create exclusive interfaces for effective management of collaborative/ consultancy projects as done in some of the reputed institutions like IIT Madras Research Park, IISc Bangalore SID etc.
· Adaptation to a well structured industry- academic interface, with a separate mechanism for facilitation of work, communication, monitoring progress of work, promoting implementation will be fruitful in matching the needs of the industries with the resources available at Academic institutions – both in terms of intellect and lab facilities.
· The experienced expert personnel retiring from organizations of repute and professors and experts available to support R&D should be possible to be hired under defined Govt. policies, not going by tendering route but based on direct recruitment for a specified time up to duration on project.

2.16.5 Proposal for Govt. Laboratories:

CSIR/DSIR labs have developed several products/ processes, many of which have been successfully utilized in areas like agriculture, pharmaceuticals, chemical sciences etc. but developments in the areas of engineering and manufacturing are not that significant when compared with the other areas. In order to meet the immediate and upcoming requirements of the nation and medium to large scale industries, especially in industries devoted to power sector following are the recommendations:

· CSIR/ DSIR laboratories should extend their services for establishment of pilot plants/ facilities for up-scaling of laboratory models/ processes for evaluation and acceptance by industries, leading to large scale commercial utilization.

· CSIR/ DSIR laboratories can consider a long term tie up with industries, supporting end-to-end development in following steps :

Ø 1st to 3rd year – for conceptualization, development at Laboratory level
Ø 4th to 6th year – evaluation and demonstration at pilot plant/ facility
Ø 7th to 10th year – commercialization by industries.

· CSIR/ DSIR labs shall be autonomous and shall participate in industrial research/ development on a competitive basis.

· The model of Department of Energy (DOE, USA)/ European Union (EU) may be considered for industry oriented developments. It may be pertinent to mention here that U.S. government extends support by funding to many demonstration projects also for example Development of High Voltage transmission equipment, Advance Ultra Super Critical Technology etc.

· Govt. R&D agencies should take projects for the development of technologies for CRNGO (Cold-Rolled Non-Grain Oriented Silicon Steel), Special insulating material and large size castings & forgings which are being used extensively in power sector.

· Emphasis should be given for wider coverage of basic and applied research at CSIR/ DSIR labs to be oriented in meeting the requirements of the domestic industries, in order to reduce the cost of buying/borrowing technology and processes from abroad

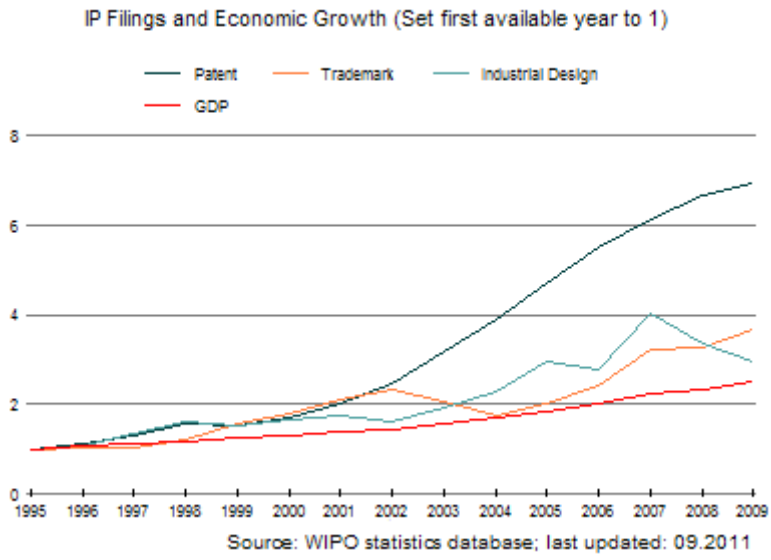
· Proposal for Government laboratories product development & Research Centres to be set up for material technology, CNC system, drives and control technology, tooling technology, CIM and simulation technology, measurement technology, automation and robotics and bearing & tribology technology required for exclusive development of machine tool technology.

CHAPTER 3 : IPR REGIME AND INNOVATIONS

3.1 **Indian IPR Regime:** India is a signatory of global IPR Regime and it has thus aligned its IPR Policies through a set of new acts namely the Patents Act 1970, the Trade Mark Act 1999 , Geographical Indications of Goods Act, 1999 and Designs Act, 2000 . India has developed institutional mechanism for IPR regime implementation. Structurally , the mechanism is at par with the international practices. The IPR system in India is developing. Enforcement is also improving slowly.

3.2 The **IPR performance indicators** are as hereunder:-

IP Filings (Resident + Abroad, Including Regional) and Economy				
Year	**Patent**	**Trademark**	**Industrial Design**	**GDP (Constant 2009 US$)**
1995	1,710	38,876	1,629	510.77
1996	1,960	39,581	1,787	548.54
1997	2,249	39,491	2,203	573.10
1998	2,658	46,610	2,637	607.42
1999	2,645	61,637	2,507	650.72
2000	2,919	69,142	2,738	676.95
2001	3,473	81,495	2,841	712.26
2002	4,204	90,746	2,618	739.09
2003	5,425	79,515	3,154	800.96
2004	6,708	67,455	3,740	867.41
2005	8,022	77,907	4,817	948.10
2006	9,444	93,649	4,500	1037.56
2007	10,534	124,871	6,592	1137.52
2008	11,413	127,991	5,489	1195.75
2009	11,846	143,362	4,828	1287.29



3.3 **Innovations in India:** The ability of a nation to use and create knowledge capital determines its capacity to empower and enable its citizens by increasing human capabilities. In the next few decades, India will have the largest set of young people in the world. Following a knowledge-oriented paradigm of development would enable India to leverage this demographic advantage. In the words of our Prime Minister, "The time has come to

create a second wave of institution building and of excellence in the field of education, research and capability building so that we are better prepared for the 21st century."

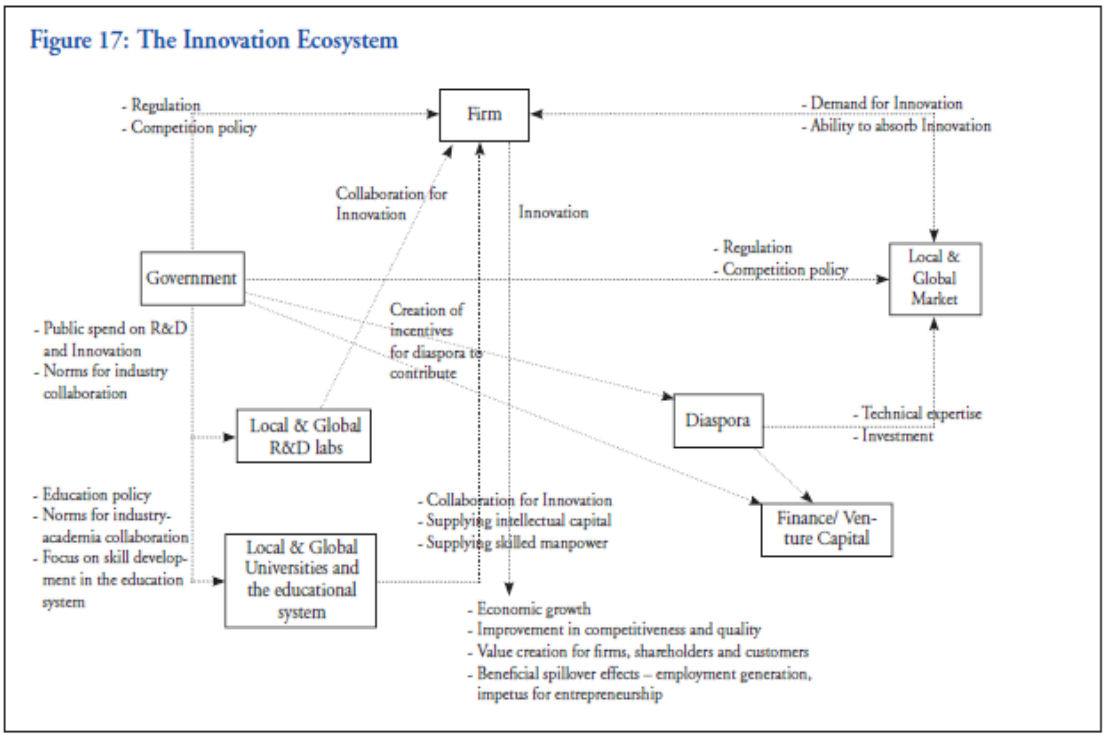
3.4 With this broad task in mind, the **National Knowledge Commission** (NKC) was constituted on 13th June 2005 with a time-frame of three years, from 2nd October 2005 to 2nd October 2008. As a high-level advisory body to the Prime Minister of India, the National Knowledge Commission has been given a mandate to guide policy and direct reforms, focusing on certain key areas such as education, science and technology, agriculture, industry, e-governance etc. Easy access to knowledge, creation and preservation of knowledge systems, dissemination of knowledge and better knowledge services are core concerns of the commission.

3.5 National Knowledge Commission has submitted around 300 recommendations on 27 focus areas during its three and a half year term. While the term of the NKC has come to an end, the implementation of NKC's recommendations is currently underway at the Central and State levels.

3.6 A **survey by the NKC confirmed the rising Innovation activity and awareness** in India as well as the need to continuously and publicly encourage this trend as a key enabler in India's economic growth and competitiveness. It reinforces the fact that Innovation is growing in the Indian economy significantly. However, there is need for further effort along a range of parameters in order to fully realize India's Innovation potential. The spread and impact of Innovation depends on several factors which must relate to each other in order to achieve optimal results.

3.7 **IPR and Innovation**: IPR , when commercialized creates values for the industry and for the country. IPR comes out of an eco-sytem fostering innovations. Innovation is an effort that requires the synergistic use of cumulative energies of the industry, the government, the educational system, the R&D environment and the consumer. The Innovation Ecosystem, as seen from Figure below, is a complex environment that requires the

Figure 17: The Innovation Ecosystem



coordinated functioning of a number of diverse factors in order to function effectively.

Source: NKC Reports.

Innovation also needs to become as wide spread as possible, spreading across the entire economy, from the grassroots to the large firm level. As already noted above, crucial to the goal of increasing Innovation led growth is the need to bring about reforms in the education system, especially in respect of higher education and skill based marketable vocational education. Therefore, policy and direct reforms to allow India to effectively use and create knowledge capital, is critical and extremely relevant to furthering the cause of Innovation and entrepreneurship in the Indian economy. It is felt that a comprehensive effort to address these issues would act as a critical enabling factor for India to be amongst the global leaders in Innovation.

3.8 **Innovation Foundation**: DST have established few institutions to support innovations being commercialized for the greater benefit of the society. The Department of Science and Technology (DST) India helped establish the National Innovation Foundation (NIF) - India, on Feb 28th 2000, with the main goal of providing institutional support in scouting, spawning, sustaining and scaling up grassroots green innovations and helping their transition to self supporting activities.

3.9 For the last twenty years the **Honeybee Network** and Society for Research and Initiatives for Sustainable Technologies and Institutions (**SRISTI**) have been scouting innovations by farmers, artisans, women, etc. at the grassroots level.

3.10 Grassroots Innovations Augmentation Network (**GIAN**) scales up innovations, from the Honey Bee database of innovations, through value additions in innovations to sustain creativity and ethics of experimentation. GIAN was conceived at the International Conference on Creativity and Innovation at Grassroots (ICCIG), jointly organized by IIM Ahmedabad and SRISTI.

3.11 **The Honey Bee** database of 10,000 innovations, collected and documented by SRISTI, would be part of the National Register of Innovations to be managed and supported by NIF.

3.12 DST has proposed an **National Innovation Act, 2008.** The salient features of the Act are:-

- National Annual Integrated Science and Technology Plan
- Special measures for low cost technologies
- Incentives for Angel Investors
- Facilitating Measures
- PPP:Exchange or market place for trading in Innovation
- CONFIDENTIALITY AND CONFIDENTIAL INFORMATION AND REMEDIES AND OFFENCES
- Indirect and Direct tax Incentives:n Innovation Park or in a Special Innovation Zone

Act when passed will significantly improve the eco-system for innovations.

3.13. **Recommendations on IP regime to enable more collaborative and indigenous Innovation.**

a. National IP Think Tank: The country needs to be equipped with properly weighed Institutionalized mechanisms which drive and lead today's demand. It is equally important and need of the hour to nurture a conducive environment for creation, protection and extraction of value of IP. A properly weighed Institutionalized mechanism would drive this change to Provide leadership, Vision and direction to develop a robust Intellectual Property ecosystem which supports the Nation's Pursuit to harness Intellectual Capital in the"Decade of Innovation".

b. Strengthening Industry-University Linkages: IP Regime should look at bringing in a policy for both the Industry and University to work together. This has been a huge challenge and one of the main reasons behind not getting Indigenous and collaborative Innovations. **Special subsidies and IP funding Schemes should be launched to encourage joint IP Filings.** Research institutes should balance invention with innovation through increased collaboration with industry. The universities and research labs have diverse resources and are the best partners for industry for collaborative work.

Preferably institutions and private corporations that develop patentable innovations should be allowed to jointly own patents. A lot of Industries have the talent pool but due to lack of proper infrastructure and facilities are not able to churn out the innovations. Here the IP Regime should play a vital role by allowing the Industry to work with world class Institutions on collaborative and jointly own IPR's. Drafting legislation requiring all **government agencies issuing research grants to motivate universities, research institutes, and their individual researchers to seek and exploit patents and to engage in technology transfer and market linkage programs with industrial concerns.** This will bring in confidence among the Industry-Academacia and give them the spark to innovate and work together and come out with Indigenous innovations.

India should look at considering enacting a **Bayh–Dole type of legislation in** India which will give more opportunities for collaborations between the Indian Universities and Industry. It provides a legal framework for active interface between funding agencies, academia and industry, which has so far been lacking. The new system if implemented will be expected not only to improve the flow of innovation

from laboratory to marketplace, but also to help institutes to collaborate and work on Indigenous Innovations.

c. Enforcement Mechanism: The IP Regime should look to revive the IP Enforcement system. If IP generated is not protected then it will not encourage innovators and Industry to come forward to innovate and work on collaborative projects. There should be stringent policies on infringement of IP and proper training for enforcement bodies.

d. Enhancing IP Education and Training: Educating local communities, businesses and the public on the potential benefits of the intellectual property system; providing assistance to innovators/producers/ creators on how to use intellectual property protection to their commercial advantage and supporting efforts of stakeholder organizations in this area. Further there need to be a structured preferably on PPP model, training programmes for the enforcement bodies.

e. IP Management & Research Centres: The Government should seriously look to adopt the launch of **management-oriented education and IP research facilities**. This facility's curriculum should focus on issues related to **patent protection, exploitation—licensing, negotiating and litigating—to convert patents into revenue streams**. Once this model is well established this will enable the Industry to innovate and collaborate in IP Projects. Currently due to the non-understanding of various IP issues, Industry and Academic institutes don't see value in IPR'S. There is a need to bridge this gap and have such kind of initiatives in the IP regime to bring in awareness and sensitize the Industry to make them see value out of IPR'S.

f. IP Information System: Information plays a key role for Technology development. The government should adopt in its IP regime the increasingly use of information technology for IP Information Management, and Indian Patent Office (IPO) should have an information system with all global databases which can be accessible to industries and R&D institutions .Currently the information which is available is in pockets and also not that easily accessible on time to Industry. The IPO should look to streamline its IP database through intranet, establish patent/IP search facilities at zonal levels and develop a workbook, or catalog of illustrations, drawn from a variety of disciplines, taken from foreign experiences with guidelines. This information and knowledge sharing will enable the Indian Industry to understand the technology gaps and trigger the Industry and academic sector to develop indigenous Innovations. **This management of Information system and developing a common Global IP Information Management platform** is the key to an Innovation ecosystem and will make a whole lot of differences to be more collaborative and develop in-house technologies. The government should look at a Launch a prior art database and interconnect these databases and search engines with as many foreign patent offices as possible.

g. IP Policy initiative: National IP Policy for India and a centralized IP system to be operated by a single nodal agency handling all aspects of IP's and IP issues, presently different categories of IP is handled by different Ministries in India.

h. Government Policy on procurement of Indigenous IP: Our innovators don't find any domestic market and do not get favorable response for their innovations in India. 1. Government should come forward and create a market for IP products developed by domestic innovators. Policy should look at enabling Government agencies to go in for procuring more domestic IP innovations. Government to buy the technology/Technology transfers at a decent royalty and use the innovations to encourage more collaborative and Indigenous Innovations. 2. The government should look at promoting local standardization, allocating additional R&D budget to domestic technology and Development and aiming at growing quantity of IP– Tax / financial incentives.3.Government should encourage Local universities and research centers – for R&D and have a policy to encourage local companies – to take up Commercialization.

I In manufacturing sector, **IP infringement** is rare in India. Nevertheless, the tendency of foreign persons to patent insignificant, minute or incremental improvements poses a roadblock to Indian innovation. So the ip regime in India may look at granting patents only to substantial improvements/innovations/inventions in engineering products.

J Collaborative R&D may be encouraged by totally exempting from tax the income arising from patents and other forms of IP generated in India through a collaborative venture between foreign and Indian entities.

K Similarly, i**ncome arising out of IP** held by individuals may be exempt from tax. This will encourage indigenous innovation to a great extent.

L Academicians generate valuable IP in the course of their academic/R&D work. Such IP may be allowed to be exploited by them through s**ale, licencing or by setting up technology incubation firms while still in service.** Even though such ip may be held jointly by the individual and the academic institution (or assigned to it), it may be treated as owned by the individual, allowing him/her to keep say 90% of the income from such ip for at least 10 years, tax-free. This will encourage both development of innovations and their commercialization.

M A **competitive challenge for innovating in nationally important issues** may be initiated, by which individuals/companies/R&D labs can collectively come up with innovative solutions/products/processes. Prize money should be substantial: say Rs.10 crore tax-free, PLUS reimbursement of all R&D costs incurred. (Projects like the Nano would ideally fit into such a competition scheme in manufacturing field).

N It has been found that Indian brain working on new technologies for multinationals in India are made to file **patents on behalf of MNCs in India and in their country of origin** and products designed, engineered and manufactured on the basis of these patents are commercialized at premium prices in our own country. A mechanism should be developed to take care of this aspect while framing the policies so as to empower the technology base of the country

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CHAPTER 4 : JOINT VENTURES AND TECHNOLOGY TRANSFER

4.1 **Joint Venture Policy:** India follows one of the most liberal FDI policy. In manufacturing Indian FDI policy allows 100% foreign equity under automatic route. With no conditions attached. While China and some other emerging economies have used Joint Venture route to bring in strategic technologies.

4.2 **Performance**: The following tables shows that Manufacturing is at the bottom of the table , when compared to services in attractive FDI. In another word FDI has not been a vehicle of transfer of technology for manufacturing.

STATEMENT ON FINANCIAL YEAR WISE FDI EQUITY INFLOWS

FROM APRIL 2006 TO MARCH 2011

Sl No	Sector	2006-07 Apr-Mar FDI	2007-08 Apr-Mar FDI	2008-09 Apr-Mar FDI	2009-10 Apr-Mar FDI	2010-11 Apr-Mar FDI	Total FDI
1.		in Rs crore	in Rs crore	in Rs crore	in Rs crore	in Rs crore	in Rs crore
2.	COIR	0.18	0.06	0	1.19	0.46	1.89
3.	MATHEMATICAL,SURVEHING AND DRAWING INSTRUMENTS	0	5.02	0	0.01	0	5.03
4.	GLUE AND GELATIN	0	9	0	1.26	0.04	10.3
5.	SCIENTIFIC INSTRUMENTS	0.34	0.01	3.56	0.01	11.16	15.08
6.	**BOILERS AND STEAM GENERATING PLANTS**	15.24	6.09	0	18.48	2.87	42.68
7.	COAL PRODUCTION	5.77	55.44	1.07	0	0	62.28
8.	DYE-STUFFS	0	22.24	5.62	19.53	24.25	71.63
9.	TIMBER PRODUCTS	0.01	1.54	55.75	30.62	7.19	95.12
10.	SUGAR	43.95	41.09	22.68	0.48	0.79	108.99
11.	LEATHER,LEATHER GOODS AND PICKERS	37.6	29.78	15.56	23.71	42.1	148.75
12.	**AGRICULTRUAL MACHINERY**	114.52	26.54	22.43	8.7	2.21	174.41
13.	GLASS	6.42	44.25	103.86	13.28	35.48	203.3
14.	PHOTOGRAPHIC RAW FILM AND PAPER	12.99	217.28	4.44	0.01	3.6	238.33
15.	**INDUSTRIAL INSTRUMENTS**	0	8.81	83.65	36.85	115.55	244.86
16.	RETAIL TRADING (SINGLE BRAND)	0	0	20.45	97.5	180.09	298.04
17.	TEA AND COFFEE (PROCESSING & WAREHOUSING COFFEE & RUBBER)	28.34	74.95	175	37.6	14.4	330.29
18.	**EARTH-MOVING MACHINERY**	4.58	268.58	10.8	75.69	8.12	367.77
19.	COMMERCIAL, OFFICE & HOUSEHOLD EQUIPMENTS	24.5	39.08	54.55	372.82	115.14	606.09
20.	RAILWAY RELATED COMPONENTS	118.39	49.37	77.41	160.27	318.5	723.94
21.	SOAPS, COSMETICS & TOILET PREPARATIONS	26.64	25.16	105.94	117.27	463.98	739
22.	RUBBER GOODS	86.66	60.97	400.71	114.62	78.71	741.67
23.	FERTILIZERS	22.82	7.92	623.96	38.46	83.77	776.94

24.	VEGETABLE OILS AND VANASPATI	72.01	6.12	196.13	338.09	267.35	879.69
25.	PRINTING OF BOOKS (INCLUDING LITHO PRINTING INDUSTRY)	91.45	141.93	141.12	337.65	168.42	880.57
26.	DIAMOND,GOLD ORNAMENTS	283.89	235.96	388.46	145.59	89.36	1,143.26
27.	**MACHINE TOOLS**	170.26	225.67	206.45	640.06	53.01	1,295.44
28.	**MEDICAL AND SURGICAL APPLIANCES**	59.45	52.24	352.03	789.71	146.66	1,400.09
29.	PAPER AND PULP (INCLUDING PAPER PRODUCTS)	23.08	123.73	1,181.59	76.39	30.15	1,434.95
30.	**PRIME MOVER (OTHER THAN ELECTRICAL GENERATORS)**	114.48	164.79	341.51	182.99	758.13	1,561.90
31.	AIR TRANSPORT (INCLUDING AIR FREIGHT)	281.11	408.32	281.79	111.47	620.83	1,703.52
32.	EDUCATION	187.73	177.56	1,033.36	300.5	173.24	1,872.39
33.	ELECTRONICS	188.41	543.1	659.25	246.73	274.75	1,912.24
34.	CERAMICS	548.33	462.62	850.44	33.6	54.06	1,949.05
35.	FERMENTATION INDUSTRIES	122.65	1,075.92	628.42	536.7	262.28	2,625.97
36.	**MISCELLANEOUS MECHANICAL & ENGINEERING INDUSTRIES**	382.07	859.85	635.43	725.18	493.96	3,096.49
37.	MINING	29.53	1,762.08	161.09	829.92	357.42	3,140.05
38.	**FOOD PROCESSING INDUSTRIES**	457.28	279.01	455.59	1,314.23	858.03	3,364.15
39.	TEXTILES (INCLUDING DYED,PRINTED)	567.95	747.89	756.52	715.21	588.95	3,376.53
40.	SEA TRANSPORT	326.01	524.51	231.35	1,343.58	1,370.27	3,795.72
41.	HOSPITAL & DIAGNOSTIC CENTRES	174.78	965.48	1,019.96	623.13	1,177.33	3,960.68
42.	NON-CONVENTIONAL ENERGY	11.01	235.95	602.87	2,872.41	977.71	4,699.95
43.	**INDUSTRIAL MACHINERY**	117.3	481.87	514.31	1,594.94	2,109.07	4,817.48
44.	**DRUGS & PHARMACEUTICALS**	1,012.84	1,351.68	810.12	1,006.29	961.09	5,142.02
45.	CONSULTANCY SERVICES	525.95	926.38	1,211.46	1,623.57	1,245.91	5,533.27
46.	PORTS	0.01	3,666.57	2,019.87	304.61	49.84	6,040.90
47.	AGRICULTURE SERVICES	55.74	236.18	23.92	5,922.29	202.6	6,440.73
48.	C**EMENT AND GYPSUM PRODUCTS**	1,097.04	68.71	3,143.53	159.07	2,911.03	7,379.39
49.	**CHEMICALS (OTHER THAN FERTILIZERS)**	629.56	938.66	2,950.68	1,726.24	1,811.53	8,056.67
50.	INFORMATION & BROADCASTING (INCLUDING PRINT MEDIA)	348.31	1,157.44	3,378.28	2,340.55	1,887.17	9,111.74
51.	**ELECTRICAL EQUIPMENTS**	353.4	2,705.56	1,931.46	3,484.32	698.85	9,173.59
52.	HOTEL & TOURISM	882.13	1,693.96	2,093.04	3,576.16	1,405.15	9,650.44
53.	TRADING	521.22	2,505.48	2,765.33	3,487.19	2,201.36	11,480.58

54.	PETROLEUM & NATURAL GAS	393.86	5,643.15	1,633.36	1,296.90	2,543.14	11,510.41
55.	METALLURGICAL INDUSTRIES	773.63	4,681.34	4,152.56	1,999.30	5,023.34	16,630.18
56.	POWER	711.79	3,956.68	4,033.47	6,138.32	5,796.22	20,636.48
57.	**AUTOMOBILE INDUSTRY**	1,188.11	2,618.87	5,218.03	5,892.61	5,864.18	20,781.79
58.	MISCELLANEOUS INDUSTRIES	1,390.81	2,131.65	6,691.56	5,403.13	6,853.73	22,470.87
59.	COMPUTER SOFTWARE & HARDWARE	11,780.19	5,515.24	6,740.41	4,126.76	3,551.24	31,713.84
60.	CONSTRUCTION ACTIVITIES	4,438.93	4,934.82	8,666.57	13,468.52	4,978.75	36,487.58
61.	TELECOMMUNICATIONS	2,149.58	5,099.56	11,684.81	12,269.66	7,542.04	38,745.66
62.	HOUSING & REAL ESTATE (INCLUDING CINEPLEX,MULTIPLEX,INTEGRATED TOWNSHIPS & COMMERCIAL COMPLEXES ETC.)	2,126.60	11,391.95	12,758.91	14,027.29	5,600.31	45,905.06
63.	SERVICES SECTOR	21,252.75	26950.4	28,692.37	19,940.44	15,052.48	111,888.45
	Grand Total	56,390.22	98,642.09	123,024.88	123,119.65	88,519.37	489,696.21

4.3 **Global Scenario:** _Most countries have used policies to influence technology transfer by transnational corporations (TNCs). The measures span a wide range, from those affecting technology transfer through FDI to broader policies on enterprise development, vendor development, skill creation, inter-firm linkages and the promotion of innovation. In the past, many newly Industrialized countries had introduced mandatory requirements which include:

· Mandatory Joint Ventures- evidence of deep linkage with local economy is mixed (some studies concluded that even voluntary joint ventures are not more likely to strike linkages than wholly owned affiliates)

· Minimum local Content requirements either mandatory or with incentives which is one of the most important tools.

4.4 China has practiced mandatory requirements for technology transfer in automotive and other sectors, but these may be phased out as part of its commitments in WTO.

4.5 **Controls on inward FDI** (used, among other things, to regulate technology transfer) have declined in recent years. But Governments use other policy tools more actively to promote technology transfer and development by TNCs. These include targeting technology-intensive activities and functions by promotion agencies seeking to attract new FDI, incentives for existing foreign affiliates to upgrade technologies and undertake more R&D and the encouragement of greater local content and stronger local linkages by TNC's.

4.6 **The development and refinement of investment promotion tools** – this can cover both the attraction of new investments and the upgrading of existing ones – is perhaps the cutting edge of FDI policies for technology transfer. Mature industrial countries use them as actively as developing countries. Ireland and Singapore are cases in point, showing how this is done and how it needs to be combined with improvement in local capabilities.

4.7 Singapore recognized the connection between foreign investment and internationalization, and viewed TNCs as being powerful agents for the transference of modern technologies to developing countries. TNCs are at the forefront of innovation; their presence can provide a way of keeping up with technical progress. In addition to these technological advantages, TNCs also possess internationally established brand names, global marketing presence and superior knowledge of market channels, and access to international flows of information. However,

· one important weakness in Singapore's approach is the question of technological innovation, considered at the last stage of technological transfer. For a variety of reasons, state-of-the-art R&D by TNCs is nearly always concentrated in a few developed countries and high technology tends not to be developed outside the TNC's home base.

· Another important weakness is that the very presence of strong TNCs can inhibit local companies from deepening their technological capabilities, preferring to import foreign technologies that are proven and ready-to-use, rather than invest in their own R&D.

But policies directed only at foreign investors are unlikely to work if the environment is not conducive to more advanced technological activity. Direct controls on technology transfer and FDI did not fully succeed largely

because they did not address two issues: in information and administrative requirements of technology regulation, and the absorption and upgrading of imported technology.

· It is difficult for any Government to dictate effectively to private enterprises the best technology to buy, the most economical terms for procuring it and the optimal structure of transfers over time. On the FDI front, it is similarly difficult for Governments to dictate which technologies to transfer or how much to restrict entry to encourage infant local enterprises. The difficulties are far greater in developing countries, where information and skills are more scarce, institutional structures more rigid and local enterprises and institutions less developed.

· The second issue was that regulations focused on the cost of the transfer, not on the conditions needed for the effective absorption and upgrading of imported technology. Many countries sought to encourage technology absorption by stipulating foreign equity shareholding or insisting on minority joint ventures. The presumption was that greater local ownership would lead to better absorption and diffusion of technology.

But the strategy worked in countries that had strong local firms, a large skills base and an export-oriented environment. It also worked in some large developing countries. For instance, in India, joint ventures – stipulated by domestic equity ownership requirements – were found to have generated substantial local learning and transfers of technology.

4.8 Indian context:

FDI provides access to new technology, capital, R&D facilities and management know how for the host region which in turn increases economic development. One of the most important reasons why India is trying to attract more FDI is to achieve technology advantage from foreign to host country firms. As per a discussion paper by Manoj Pant and Sangeeta Mondal, technology transfer is more likely to be achieved by the presence of foreign firms rather than by simple purchase of foreign technology. It is also seen that technology transfer is dependent on the absorptive capacity of firms and the competitive nature of the industry. It also states that institutional factors like the degree of competition positively impact the effects of traditional factors like absorptive capacity in determining technology transfer.

According to IUP Journal by Sahoo, Foreign Direct Investment (FDI) has contributed in a big way in improving export competitiveness and volume of exports particularly technology intensive manufacturing exports in China and Singapore. India has also made earnest efforts in recent years to market itself as an attractive destination for FDI not only to acquire advanced technology but also to enhance its export potential and export competitiveness with emphasis on technology intensive exports. The note highlights the fact that by emulating the policies followed by China and Singapore and also with the right mix of domestic policies for FDI by the Government, India can substantially enhance its export competitiveness in the international market.

4.9 Automatic Route for FDI in Technology inputs/brands (DIPP perspective):

It is stated that with the issue of Press Note 8 (2009 series) dated 16th Dec., 2009, the Government had liberalized payment of royalty, lump sum free for transfer of technology and payments of use of trademark/brand-name. These payments were brought under the automatic route, i.e., without any requirement for approval of the Government of India, subject to Foreign Management (current account transaction), Rules 2000 as amended from time to time. However, till 31st March, 2011, Government approval was still required for such payments, if the foreign collaborator had any existing tie up, in the 'same field', on or prior to 12th January, 2005. Subsequently, this condition has also since been dispensed with after issue of 'circular 1 of 2011-Consolidated FDI Policy' dated 31st March 2011. Therefore, all payments of royalty, lump sum fee for transfer of technology and payments of use of trademark/brand-name are now under the "Automatic Route".

4.10 Recommendations:

I. Fiscal Measures

Fiscal incentives provide financial relief to firms undertaking R&D by reducing its tax obligations and/or by reducing costs (through subsidies or by allowing higher depreciation rates to machinery) of plant expansion and thereby helping them to reap any possible economies of scale.

While encouraging the transfer of technology to Indian companies by foreign partners, the taxation of licence fees/royalty need to be streamlined so that any cess/taxes/duties paid on acquiring technology does not add to the cost of the product when manufactured in India. Such taxes should be set off against output taxes and duties on the goods produced, so that there is incentive for acquiring technology from abroad and for JVs to form. **All technology acquisition costs should be structured to become cost neutral on the end product.**

Following are some of the key issues that hamper investments or transactions relating to technology acquisition and development which needs to be addressed to boost technology diffusion through joint ventures.

a. Direct Tax

· The characterization of the income arising to the foreign investor on transfer of technology is a vexed issue from a direct tax perspective. This leads to uncertainty as regards its taxability in the hands of foreign investor thereby discouraging the flow of technology from outside India.

· The foreign investor is required to obtain PAN to enable the payer to withhold taxes at appropriate rates. Also, the foreign investor is required to file its annual return of income before the tax authorities in India for the purpose of claiming credit in respect of the taxes withheld by the payer in India. Such additional compliances

could become quite cumbersome for the foreign investor in India especially where the foreign investor does not have any operations in India.

· The deduction in case of profits earned by a company from the business of scientific research and development is currently available only to those companies which have been approved prior to April 1, 2007. However, the benefit does not extend to newly incorporated companies which intend to undertake scientific research and development. On a separate note, the benefit of tax deduction / weighted deduction, as the case may be, gets partially offset by the levy of MAT. Therefore, such a deduction/ weighted deduction is not sufficient to provide the required thrust to this sector.

b. Indirect Tax

· The R & D Cess is payable by an importer of the technology at the rate of 5% of the cost incurred towards import of technology. However, R&D Cess paid by an importer is not creditable towards any output taxes payable by the importer (either towards excise duty, service tax or VAT). Hence, the amount of R&D Cess paid becomes a cost to the importer of technology as it is not one of the specified taxes on which credit can be availed under the Cenvat Rules or VAT regulations. This effectively results in an additional 5% cost to the expenditure incurred on acquisition of technology from an overseas party.

· Service tax paid on imported technology is not creditable if manufacturing process is outsourced - in cases where the importer licenses the technology, but may not possess manufacturing capabilities (due to various business drivers) and may outsource the manufacturing process to the third party, the importer needs to allow the imported technology to be used by this third party for the manufacturing process.

· Since the importer does not undertake manufacturing the importer would not have any output central excise duty liability and hence would not be entitled to take credit of the service tax paid on the import of technology under the Cenvat Rules. On the other hand the manufacturer of goods cannot take credit of the service tax paid by the importer as such party has neither received any service nor paid for it. Consequently, the service tax paid on import of technology becomes a cost for the importer of technology and increases the cost of production.

· The fiscal incentives provided by the states for industrialization are typically based on the quantum of investments made for setting up or expanding a particular unit. Thus, the amount of investment typically determines the tax quantum of exemption. The investments which qualify for the incentive include the expenditure incurred for land, building, plant & machinery, pre-operative expenses, technical know-how etc.

· In the modern era, technical know-how could be one of the major cost for some industries say, pharmaceutical industry. But some states provide for a value cap on the quantum of investment on technical know-how for the purpose of reckoning investments. For example, in Maharashtra, the value cap for intangibles (which includes technical know-how, pre-operative expenditures, interest capitalized etc) in reckoning gross fixed capital investment for determining the incentive is capped at 10% of total project cost. Such a low ceiling on the amount of cost for technical know-how becomes a deterrent for industries which involve high level of technical costs as investments and is therefore arbitrary and artificial; this could be seen as impediment to parties keen to acquire new or upgrade existing technology.

II. Non Fiscal Measures

· **Technology Transfer requirement in conjunction with the provision of a tax incentive**; to induce technology transfer not only to joint venture but also to local firms that are sub-contractors. For instance, in Brazil fiscal incentives were given to information technology firms that invested at least 5% of local sales in R&D. As a result, 46% of expenditure was on projects developed jointly with local universities or research centres. Motorola established centre of semi-conductor component development as a result of these incentives in Brazil.

· **Contractual Arrangements**- Such arrangements with foreign investors can offer host Government an opportunity to encourage the formation of local linkages by including them in the award procedures. For instance, under the Umbrella Subcontracting Scheme of Malaysia, the Government granted procurement contracts without competitive tendering to a foreign company in exchange for its marketing the products of medium sized local companies

· **Partnerships with foreign Affiliates**- Government can use foreign affiliates as partners in technology upgrading programmes by providing financial support. For instance, Singapore's Local Industry Upgrading Programme gives responsibility to managers seconded by foreign affiliates to identify potential suppliers and evaluate their capabilities and design programmes to remedy their weaknesses. Foreign affiliates participating in the programme then transfer technology and skills to upgrade the capabilities of the latter.

· In the purchase tender terms, **weightage can be given to foreign suppliers offering technology transfer** to Indian company.

· A strategy adopted by many foreign companies, while agreeing to technology transfer/collaboration or JV, is to transfer technology for the end product, while withholding technology of critical parts / sub-systems for which the Indian company will continue to depend on them for supplies. The regulations governing the formation

of JVs may guard against such practices by insisting on a total ToT. This could be done by quickly reducing import content through a PMP, as was the practice earlier.

· Assist MSMEs which are willing to enter into collaboration for latest technology, design etc. through establishing Technology Acquisition Fund which will promote Joint Ventures both in India and abroad.

· Insist on local value addition on substantial imports (the threshold value could be as low as Rs.10 cr). This could be part of the Offset Policy: **offset content may be split** into two parts: **50%** mandatory through local value addition **on the items imported**; balance **50%** through other offset trade. This will force foreign companies to seek Indian partners to meet the local value addition component on the products exported by them.

· The foreign investor can be provided the following services:

a. Targeted promotional activities

b. Identifying the skill needs of the investor and supporting it in developing them.

c. Identify specialized infrastructure needs of the investor and provide package

d. Provide risk funding

e. Public–funded/Venture Capitals; commercially driven; governed by competent 'non-risk-averse' boards; and run by professionals

f. Form Technology Acquisition Fund

g. Strengthening the existing infrastructure of product-specific technology development centres.

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CHAPTER 5 : PUBLIC PROCURREMENT

5.1 Public Procurement: India is working on a draft Public Procurement Law with the objective of transparency. The draft law proposes 5% price preference for PSEs. Some purchase preference to MSME is also provided in the MSME Act.

5.2 WTO has enunciated a plurilateral **Agreement on Government Procurement (GPA)** , which has been signed by 15 WTO members. India is an observer. India is working towards introducing Public procurement law bringing further transparency in the procurements.

5.3 More than 100 countries of the World have specific public procurement laws. Which establish standard policies, procedures and transparencies. Almost all laws favour global competition, however may of them have caveats for domestic supplies. One of the recent example is by China in 2002 . The relevant article is :-

> **Article 10** The government shall procure domestic goods, construction and services, except in one of the following situations:
>
> (1) where the goods, construction or services needed are not available within the territory of the People's Republic of China or, though available, cannot be acquired on reasonable commercial terms;
>
> (2) where the items to be procured are for use abroad; and
>
> (3) where otherwise provided for by other laws and administrative regulations.
>
> The definitions for the domestic goods, construction or services mentioned in the preceding paragraph shall be applied in accordance with the relevant regulations of the State Council.

5.4 US Federal Acquisition Regulations also provides for exceptions in global competition for local supplies under circumastances like national interest, emergencies, need for maintaining startaegic industrial facility, small busnesses etc. Exctract of the relevant text is given below:-

> **6.302-3 Industrial mobilization; engineering, developmental, or research capability; or expert services.**
>
> (a) Authority.
>
> (1) Citations: 10 U.S.C. 2304(c)(3) or 41 U.S.C. 253(c)(3).
>
> (2) Full and open competition need not be provided for when it is necessary to award the contract to a particular source or sources in order—
>
> (i) To maintain a facility, producer, manufacturer, or other supplier available for furnishing supplies or services in case of a national emergency or to achieve industrial mobilization;
>
> (ii) To establish or maintain an essential engineering, research, or development capability to be provided by an educational or other nonprofit institution or a federally funded research and development center; or
>
> (iii) To acquire the services of an expert or neutral person for any current or anticipated litigation or dispute.
>
> (b) Application.
>
> (1) Use of the authority in paragraph (a)(2)(i) of this subsection may be appropriate when it is necessary to—
>
> (i) Keep vital facilities or suppliers in business or make them available in the event of a national emergency;
>
> (ii) Train a selected supplier in the furnishing of critical supplies or services; prevent the loss of a supplier’s ability and employees’ skills; or maintain active engineering, research, or development work;
>
> (iii) Maintain properly balanced sources of supply for meeting the requirements of acquisition programs in the interest of industrial mobilization (when the quantity required is substantially larger than the quantity that must be awarded in order to meet the objectives of this authority, that portion not required to meet such objectives will be acquired by providing for full and open competition, as appropriate, under this part);
>
> (iv) Limit competition for current acquisition of selected supplies or services approved for production planning under the Department of Defense Industrial Preparedness Program to planned producers with whom industrial preparedness agreements for those items exist, or limit award to offerors who agree to enter into industrial preparedness agreements;
>
> (v) Create or maintain the required domestic capability for production of critical supplies by limiting competition to items manufactured in—

(A) The United States or its outlying areas; or
(B) The United States, its outlying areas, or Canada.
(vi) Continue in production, contractors that are manufacturing critical items, when there would otherwise be a break in production; or…….

5.5 **Buy American Act:** provides for local purchases except in the following cases:-

25.103 Exceptions.
When one of the following exceptions applies, the contracting officer may acquire a foreign end product without regard to the restrictions of the Buy American Act:
(a) *Public interest.* The head of the agency may make a determination that domestic preference would be inconsistent with the public interest. This exception applies when an agency has an agreement with a foreign government that provides a blanket exception to the Buy American Act.
(b) *Nonavailability*. The Buy American Act does not apply with respect to articles, materials, or supplies if articles, materials, or supplies of the class or kind to be acquired, either as end items or components, are not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities and of a satisfactory quality.
(1) Class determinations.
(i) A nonavailability determination has been made for the articles listed in 25.104. This determination does not necessarily mean that there is no domestic source for the listed items, but that domestic sources can only meet 50 percent or less of total U.S. Government and nongovernment demand.
(ii) Before acquisition of an article on the list, the procuring agency is responsible to conduct market research appropriate to the circumstances, including seeking of domestic sources. This applies to acquisition of an article as—
(A) An end product; or
(B) A significant component (valued at more than 50 percent of the value of all the components).
(iii) The determination in paragraph (b)(1)(i) of this section does not apply if the contracting officer learns at any time before the time designated for receipt of bids in sealed bidding or final offers in negotiation that an article on the list is available domestically in sufficient and reasonably available commercial quantities of a satisfactory quality to meet the requirements of the solicitation. The contracting officer must—
(A) Ensure that the appropriate Buy American Act provision and clause are included in the solicitation (see 22.1101(a), 22.1101(b), or 25.1102);
(B) Specify in the solicitation that the article is available domestically and that offerors and contractors may not treat foreign components of the same class or kind as domestic components; and
(C) Submit a copy of supporting documentation to the appropriate council identified in 1.201-1, in accordance with agency procedures, for possible removal of the article from the list.
(2) Individual determinations.
(i) The head of the contracting activity may make a determination that an article, material, or supply is not mined, produced, or manufactured in the United States in sufficient and reasonably available commercial quantities of a satisfactory quality.
(ii) If the contracting officer considers that the nonavailability of an article is likely to affect future acquisitions, the contracting officer may submit a copy of the determination and supporting documentation to the appropriate council identified in 1.201-1, in accordance with agency procedures, for possible addition to the list in 25.104.
(3) A written determination is not required if all of the following conditions are present:
(i) The acquisition was conducted through use of full and open competition.
(ii) The acquisition was synopsized in accordance with 5.201.
(iii) No offer for a domestic end product was received.
(c) *Unreasonable cost*. The contracting officer may determine that the cost of a domestic end product would be unreasonable, in accordance with 25.105 and Subpart 25.5.
(d) *Resale*. The contracting officer may purchase foreign end products specifically for commissary resale.
(e) *Information technology that is a commercial item*. The restriction on purchasing foreign end products does not apply to the acquisition of information technology that is a

commercial item, when using fiscal year 2004 or subsequent fiscal year funds (Section 535(a) of Division F, Title V, Consolidated Appropriations Act, 2004, and similar sections in subsequent appropriations acts).

5.6 WTO draft on GPA : calls for national treatment to foreign suppliers. However , the draft provides a transitional period local preference policy. The relevant text is:-

Article V Developing Countries
1. In negotiations on accession to, and in the implementation and administration of, this Agreement, the Parties shall give special consideration to the development, financial and trade needs and circumstances of developing countries and least developed countries (collectively referred to hereinafter as "developing countries", unless specifically identified otherwise), recognizing that these may differ significantly from country to country. As provided for in this Article and on request, the Parties shall accord special and differential treatment to:
(a) least developed countries; and
(b) any other developing country, where and to the extent that this special and differential treatment meets its development needs.
2. Upon accession by a developing country to this Agreement, each Party shall provide immediately to the goods, services and suppliers of that country the most favourable coverage that the Party provides under its annexes to Appendix I to any other Party to this Agreement, subject to any terms negotiated between the Party and the developing country in order to maintain an appropriate balance of opportunities under this Agreement.
3. Based on its development needs, and with the agreement of the Parties, a developing country may adopt or maintain one or more of the following transitional measures, during a transition period and in accordance with a schedule, set out in its relevant annexes to Appendix I, and applied in a manner that does not discriminate among the other Parties:
(a) a price preference programme, provided that the programme:
(i) provides a preference only for the part of the tender incorporating goods or services originating in the developing country applying the preference or goods or services originating in other developing countries in respect of which the developing country applying the preference has an obligation to provide national treatment under a preferential agreement, provided that where the other developing country is a Party to this Agreement, such treatment would be subject to any conditions set by the Committee; and
(ii) is transparent, and the preference and its application in the procurement are clearly described in the notice of intended procurement;
(b) an offset, provided that any requirement for, or consideration of, the imposition of the offset is clearly stated in the notice of intended procurement;
(c) the phased-in addition of specific entities or sectors; and
(d) a threshold that is higher than its permanent threshold.
4. In negotiations on accession to this Agreement, the Parties may agree to the delayed application of any specific obligation in this Agreement, other than Article IV:1(b), by the acceding developing country while that country implements the obligation. The implementation period shall be:
(a) for a least developed country, five years after its accession to this Agreement; and
(b) for any other developing country, only the period necessary to implement the specific obligation and not to exceed three years.
5. Any developing country that has negotiated an implementation period for an obligation under paragraph 4 shall list in its Annex 6 to Appendix I the agreed implementation period, the specific obligation subject to the implementation period and any interim obligation with which it has agreed to comply during the implementation period.
6. After this Agreement has entered into force for a developing country, the Committee, on request of the developing country, may:
(a) extend the transition period for a measure adopted or maintained under paragraph 3 or any implementation period negotiated under paragraph 4; or
(b) approve the adoption of a new transitional measure under paragraph 3, in special circumstances that were unforeseen during the accession process.
7. A developing country that has negotiated a transitional measure under paragraph 3 or 6, an implementation period under paragraph 4 or any extension under paragraph 6 shall take

such steps during the transition period or implementation period as may be necessary to ensure that it is in compliance with this Agreement at the end of any such period. The developing country shall promptly notify the Committee of each step.
8. The Parties shall give due consideration to any request by a developing country for technical cooperation and capacity building in relation to that country's accession to, or implementation of, this Agreement.
9. The Committee may develop procedures for the implementation of this Article. Such procedures may include provisions for voting on decisions relating to requests under paragraph 6.
10. The Committee shall review the operation and effectiveness of this Article every five years.

5.7 Recommendations:-

- Preferential tax treatment for companies using equipment manufactured in India for example tax rebate for domestic procurement by EPC companies.
- Place in position ***Government policy for procurement*** of Indian industry' R & D outputs (Supported by R & D Institutions) to trigger Industrial R & D, products having larger share of value addition in India to get preference.
- ***Government Policy on procurement of Indigenous IP***: There is a need to create a market for IP Products developed by domestic Innovators, a policy in this regard will go a long way in promoting innovation.
- Indigenous Innovation and technology diffusion can be promoted through Government procurement by providing preferential treatment in the Government procurement process to indigenous innovative products by creating a dedicated Department of Public Procurement to enable the formulation of an efficient and effective public procurement policy and enforcement.
- Large Government purchasers may adopt the route of "Development Contracts" by which they award contracts to suitable Indian companies to develop their requirement of new machines/technologies/products through a risk-sharing partnership between the purchaser and supplier source 30% of their future requirements with Indian companies especially in high technology sectors like space, atomic energy, electronics, oil & gas, defence, telecom, shipbuilding.
- Made in India (manufactured and IP in India) and Made for India (manufactured in India with at least 40% local content) products could qualify for such preferential purchases in Government contracts
- Indigenous innovation products may enjoy an additional 4-8 percent boost in their technical and price evaluations
- Purchase terms (starting with tender evaluation, payment terms, exchange rate variations, etc.) need to be made same as for imported products
- Physical measures like setting up Integrated Technology Parks with Common Facility Centres and R&D Centres co-located with end-product manufacturers and users.
- To create a dedicated Department of Public Procurement.
- Tax holidays for JVs/ WOS achieving 75% or more local content in first five years of manufacturing.
- Higher depreciation after 1st year at 25% on machinery manufactured with 75% local value addition.
- Regulatory mechanism to stipulate 30% minimum value addition for large imports with technology transfer.

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Annexure I

Composition of the Group I

1. **Shri Hanbhajan Singh, Jt Secretary, D/o Heavy Industry - Convener.**
2. Dr. Ajay Kumar , JS, D/o Information Technology,
3. Shri Alok Kumar, Secretary, D/o Industrial Development, G/o UP,
4. Executive Director, Corporate R & D, BHEL,
5. Shri Anjan Das, Sr Director, CII,
6. Shri P.J. Mohan Ram, Sr Adviser, Technology, IMTMA,
7. Shri Chetan Bijesure, Additional Director, FICCI.

Terms of Reference:

Formulation of appropriate strategies for promoting technological development e.g.

i. Partnership between industries and Government labs,
ii. Preferential purchase by Govt agencies of indigenously developed products,
iii. Intellectual property regime to enable more collaborative and indigenous innovation,
iv. Policies for promoting joint ventures between foreign companies and Indian partners.

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