The Manufacturing Plan

Strategies for Accelerating Growth of Manufacturing in India in the 12th Five Year Plan and Beyond
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1 Executive Summary

1.1 Introduction

India has become one of the fastest growing economies in the world over the last two decades, undoubtedly aided in this performance by economic reforms. The striking aspect of India’s recent growth has been the dynamism of the service sector, while, in contrast, manufacturing has been less robust. The Manufacturing sector’s contribution to the GDP has stagnated at 16%, raising questions about India’s development model, including its sustainability, especially for generating adequate employment.

Currently, India’s manufacturing sector contributes about 16% to the GDP, and India’s share in world manufacturing is only 1.8%. This is in stark contrast to China; where manufacturing contributes 34% to the GDP and is 13.7% of world manufacturing – up from 2.9% in 1991. India’s growth has been on the back of a booming services sector which contributes 62.5% of the GDP. These statistics clearly indicate that while manufacturing has not been the engine of growth for the Indian economy, it now needs to grow at a much faster rate. With changing global realities, the manufacturing sector will need to be the bulwark of employment creation over the next decade, in contrast to current employment of only 9% of India’s working population. India’s long touted demographic dividend can only then be sufficiently exploited through the systematic growth of this sector.

The lacklustre growth of manufacturing can also be traced to the low technological depth of the Indian manufacturing sector. In India R&D has not been sufficiently exploited and needs an overhaul in terms of its focus and its organization. Most Indian manufacturing firms appear to be stuck at the basic or intermediate level of technological capabilities. Creating conducive environments to increase business expenditure on R&D complemented by institutional measures around skill development, regulation and standardisation need to be key areas of emphasis.
However, it is imperative that manufacturing growth must not be at the expense of unsustainable degradation of the environment. Therefore environmental sustainability will need to be factored into India’s manufacturing growth plans.

Comparison of the performance of countries shows that those countries that managed to catch up with the earlier industrialised, high-income countries were the ones whose governments proactively promoted structural change. Therefore Industrial Policy, and with a focus on manufacturing, is back on the national agendas of many countries. The critical question now is not whether there should be an industrial policy (in which ‘manufacturing’ is invariable the dominant element), but what should be the paradigm and architecture of the industrial policy. Successful industrial policies have generally not been an outcome of centrally planned economies but ones that have had the involvement of private enterprises and other non-governmental stakeholders. Successful strategies evolve from on-going productive interactions between government and producers. Therefore the government must improve the process of interaction, collaboration, and learning amongst producers and itself. This is very different from the paradigm of Indian industrial policy prior to India’s economic reforms commencing in the 1980s. In that era, industrial planning was a top-down control activity with Government determining who should produce what, where and how much of it. The paradigm shift required towards collaboration and learning has been attempted while formulating the manufacturing roadmap during the Twelfth Plan and beyond.

1.2 Paradigm shift in approach to the Manufacturing Plan

The Steering Committee analyzed reasons for India’s poor performance in Manufacturing and has identified the root causes for this (detailed in Box 2). There are several aspects in which the approach of this plan is different from that of earlier plans.
Box 1: ROOT CAUSES: POOR PLANNING, INADEQUATE CONSENSUS

Poor implementation is a root cause for India’s poor performance in Manufacturing. In China, and Japan and Germany—countries that have developed very competitive manufacturing sectors—things get done. In contrast, things do not get done as certainly in India. Policies, even well conceived ones, are often not implemented. Projects, albeit well intended, do not get completed on time. The Steering Committee for preparing the Manufacturing Plan for India concentrated on finding the root causes for poor implementation of projects that are not completed in time and policies that do not get implemented in the country. Only if solutions address these root causes will the Plan produce its intended results.

Two root causes for poor implementation are: inadequate consensus amongst stakeholders for policy changes, and very poor coordination amongst agencies in execution. Going deeper, there are two root causes for poor coordination. One is poor planning. The other is lack of alignment amongst agencies regarding the purpose of policies and objectives of projects—which cycles back to inadequate consensus. Thus the root cause analysis reveals that the two primary causes for poor implementation are (1) poor planning and (2) inability to obtain adequate consensus amongst stakeholders. Therefore, we have recommended a ‘back-bone’ organization to support implementation of the Manufacturing Plan, with requisite resources to support good planning and systematic consensus formation. (The ‘back-bone’ organization is described in the chapter on Way Forward in this Plan.)

Good Planning

The essence of good planning is to specify, very clearly, the order and the time in which various tasks must be done to achieve the intended outcomes. Equally important, the execution of the tasks must be monitored systematically, and likely slippages must be anticipated and corrective actions taken in time. Reflecting on various project and policy failures, several failures of planning in the country were noted. A good plan was not made before announcing action. Or, a plan was made but it was not understood by, and sometimes not even known to, the various agencies involved. And, often, even when the plan was known, there was no monitoring and follow-up. Allocation of adequate resources required for tasks and assignment of clear responsibilities for their performance are essential for good planning. But this is not sufficient for a good plan. Attention to time, and timeliness are of the essence in a plan designed to get things done.

The time dimension in planning and execution of policies and projects will be most critical for achieving India’s ambitious goals for its Manufacturing Policy and Plan. Manufactured
goods are tradable. And countries compete for investments in manufacturing. Therefore the speed with which the Indian manufacturing eco-system improves, compared with the speeds at which other countries’ eco-systems improve the competitiveness of their eco-systems, will determine the success of India’s policies and plans. Much of the action to implement the Plan will be in the States. Therefore whatever ‘steering’ organizations the country tasks, at the Center and in the States, to ensure that its Manufacturing Plan produces the required outcomes, must be supported by planning cells that ensure that good plans are made for execution and that these are followed up in a timely manner by the steering organizations. This has not been the case so far.

**Systematic Consensus**

The other root cause is inadequate consensus to support implementation of policies and projects. A root cause for this is poor understanding amongst policy-makers of what consensus means and how it can be systematically obtained. Consensus is not unanimity. And while consultation is necessary for consensus, consultation is only a means for consensus, not the required end. Consensus requires agreement by those who are most affected by a policy or project, both positively and negatively, that the option developed will meet desired ends without causing unacceptable harm to any of those affected. The conversion of this theory to practice requires professional skills and tools to design and manage consultation and consensus-building processes. Such resources are becoming increasingly available in India and elsewhere too as the need for stakeholder support is becoming imperative in all democratic societies. Such resources must be applied systematically wherever necessary in the implementation of various aspects of the country’s Manufacturing Plan. It is recommended that this capability must be part of the ‘back-bone’ organization for Implementation.

Moreover, wide-spread consensus-building processes must become part of the Indian manufacturing system. For this, institutions for representation, such as employee unions, employer associations, and civil society organizations, must become more professional, more democratic, and more competent in arriving at agreements that ensure fairness to all stakeholders. It is worth noting that the strength of such organizations of representation and the processes of consultation amongst them can explain the continuing competitive strengths of the German and Japanese manufacturing eco-systems, even though wages in these countries are amongst the highest in the world, and their currencies are very strong too. In other words, low wages and cheap currencies need not be the only sources of competitive advantage in manufacturing. The ability of people to work together is a more sustainable, and a more satisfying, source of national competitive advantage.
1.2.1 Setting up clear and comprehensive objectives

In order to create a paradigm shift in the manufacturing sector, it is essential to consider the objectives over a longer timeframe, such as 15 years. The National Manufacturing Policy, which was introduced in 2011, states these objectives and these are the underlying objectives that the Plan aims to achieve as well. These objectives are:

I. Increase manufacturing sector growth to 12-14% over the medium term to make it the engine of growth for the economy. The 2 to 4 % differential over the medium term growth rate of the overall economy will enable manufacturing to contribute at least 25% of the National GDP by 2025.

II. Increase the rate of job creation in manufacturing to create 100 million additional jobs by 2025. Emphasis should be given to creation of appropriate skill sets among the rural migrant and urban poor to make growth inclusive.

III. Increase ‘depth’ in manufacturing, with focus on the level of domestic value addition, to address the national strategic requirements.

IV. Enhance global competitiveness of Indian manufacturing through appropriate policy support.

V. Ensure sustainability of growth, particularly with regard to the environment.

1.2.2 Collaborative approach towards formulation of the Plan

In line with the new paradigm, a widely consultative and inclusive approach was adopted to prepare the manufacturing industry roadmap under the Twelfth Plan. Twenty six working groups were set up to analyse opportunities and constraints and develop recommendations both on sector-specific issues and cross-sectoral issues. A Steering Committee was constituted to provide overall guidance and strategic direction to the process of development of the plan and oversee the functioning of the working groups.

All the working groups and the steering committee had representatives from Government (Central and State), industry, industry associations, academia and NGOs to ensure that all the
stakeholders were constructively involved in the process. A stakeholder conclave was conducted during the Plan preparation to ensure that other stakeholders, who may not have been a part of the working groups, could also be productively included in the development of the plan. The Planning Commission team played the role of the orchestrator of this systematic and collaborative process.

1.2.3 **Focus on Cross-Sectoral issues alongside sector specific strategy formulation**

It was recognized that there are a number of issues that affect the growth of manufacturing in the country as a whole that are not specific to any one industry. Technology & Depth, Human Resources Development, Business Regulatory Framework and Environmental Sustainability are some areas that affect the entire manufacturing industry. Eleven such issues were identified and working groups were set up for developing suitable Plans for these.

The Plan also addresses the strategies required to achieve above average growth in 18 industrial sectors. The sectors were selected on the basis of their strategic importance to the country, employment potential, competitive advantage and growth potential.

1.2.4 **Dedicated focus on Implementation**

In addition to articulating the strategy, the steering group concentrated on the overall process for implementation. Processes by which other countries have successfully implemented industrial policy were examined. Successes and failures within India in achieving alignment amongst stakeholders were also studied. Based on these insights, institutions and processes required to implement the Plan have been detailed.

The engine of manufacturing growth will move along three rails. One is the rail of action: to follow-up and do the tasks in the Plan. The second is the rail of systematic involvement of stakeholders for involving the right people at the right time to build support for some difficult decisions that must be taken. The third is the rail of learning. There will be mistakes in action
and successes too. These must be examined periodically to proactively distil insights from them and put the learning into practice.

1.3  **Key Strategies: Cross-Sectoral Themes**

1.3.1  **Technology and Depth**

Developing technology and depth has been identified as an absolute imperative for Indian manufacturing. Technological capabilities for most manufacturing firms appear to be stuck at a basic or intermediate level and there is an absence of organized technology led development initiatives. At present, R&D expenditure in the country is only about 0.9 percent of GDP, of which about three fourth is in the public sector and only one-fourth is in the private sector which is stark contrast to funding trends in countries such as US and China. India needs focus on strategic investments in national technological capabilities alongside development of institutional frameworks to ensure sustainability.

One such key requirement is enhancement of human capital. Recommended strategies include investment in skill development through strengthening of industry government linkages, establishing centres of excellence and providing platforms for continuous interaction between various stakeholders.

Besides correcting for tax anomalies and introducing tax incentives, business investment in technology needs to be promoted by optimizing on already established R&D infrastructure and developing clusters. New technologies must be introduced through better FDI policies, especially those involving technology transfers, JV's with international firms and introduction of PPP projects.

Deployment of technology related funds that focus on development and up gradation, complemented by incentives such as tax benefits and subsidy on interest costs for R&D
projects, will provide the requisite risk mitigation for businesses. Ensuring availability of raw materials and other inputs and, where necessary, policies that encourage local value addition rather than exports of raw materials will also facilitate the innovation climate in India.

Technology growth and adoption through development of technical regulations, enhanced capability of regulators, and strengthening of standards setting and conformity assessment institutions will provide the required foundations. Regulatory frameworks must be strengthened especially in the area of IP, supplemented with increasing awareness about IP and improvements in the process of award of IP.

Demand for India-made products should be stimulated through interventions such as judicious preferences in government procurement and channelization of offset investments into areas that improve technological depth in Indian manufacturing are also required.

1.3.2 **Human Resources Development**

India’s demographic profile ensures an abundance of human resources, though there are serious concerns about its employability, especially in the manufacturing sector. A significant shortfall in the present level of skill development is likely to result in a demand supply gap in the near future. This human capability challenge along with archaic labour laws and high costs of compliance are likely to retard on-going investments in the manufacturing sector. While overall skill development has acquired national importance, other constraints on growth of employment specific to the manufacturing sector must also be addressed. Foremost is simplification of labour laws that allow for greater flexibility on employment related issues without compromising on the social security of the workforce.

Several strategies are required to strengthen skills in manufacturing. Skill enhancement through creation of sector specific skill councils and coordination of skilling initiatives between ministries will be essential. Improvement of on-the-job training schemes along with changes to
the apprenticeship model is required. ITIs must be upgraded. Development of a comprehensive human resource market information system is necessary. The quality of supervisors / managers in the manufacturing system also needs improvement. Also, manufacturing should be made as an attractive career option for India’s youth. Improvement of skill levels and business literacy of workers in the informal sector will also be critical as this sector accounts for 33% of the manufacturing output.

Social security concerns of the workforce should be assuaged through measures such as the creation of ‘sump’ institutions for workers in transitional phases before and between employments. This has to be supported with strengthening of the social security framework.

Enabling quick registration of Unions and developing accountability measures for Union leadership along with an introduction of a Voluntary Code of Conduct (VCC) regarding labour practices to all Corporates is also recommended.

1.3.3 Business Regulatory Framework (BRF)

Business regulatory frameworks are indispensable in creation and promotion of successful business environments in countries. The BRF should ideally aim to simplify the regulatory system, ensure fair competition among players and reduce the cost of compliance of doing business in the country.

In India, businesses growth is hampered by myriad ambiguous and vast business regulations as well as poor enforcement. Neither is a repository of all these regulations available nor a proper stakeholder consultation mechanism for improvements in them.

A national policy on Business Development and Regulation and better institutional arrangements to implement business regulations are necessary. Further, administrative and
regulatory reform measures recommended before, that are awaiting implementation, must be implemented expeditiously, as must the National Competition Policy.

Business regulatory governance must be systematized by setting up and operationalizing common minimum standards across the country for Single Window Clearance (SWC) mechanisms. Regulatory Impact Assessment of new regulations must be mandated and review of existing regulations must be made more effective with compulsory stakeholder consultation.

A ‘National Business Facilitation Grid’ must be set up consisting of all the business regulations and procedures across the country along with a Business Regulatory Governance Catalogue to choose appropriate regulatory alternatives. This will serve as a one stop shop for much needed information for both policy makers and businesses.

Business responsibility should be strengthened, at the same time, by mandating disclosures in accordance with the ‘National Voluntary Guidelines on Social, Environmental and Economic Responsibilities on Business’ (NVG) principles. Business associations should become responsible for the compliance of their members to such rules of corporate conduct.

1.3.4 **Environmental Sustainability**

Growth of the manufacturing sector has to be environmentally sustainable. ‘Being green’ must become a primary focus of businesses and not be considered as an imposition on manufacturers. This is especially challenging for MSMEs who are often handicapped by obsolete and inefficient technologies and therefore imposition of standards on them must be accompanied by institutional support. Regulations should encourage disclosure by firms of their environmental sustainability performance.

New technologies leading to cleaner processes and operations are not being developed at a fast enough pace to address the urgent need for environmental protection. The current industrial
and financial ecosystem does not encourage the mainstreaming and scaling up of new technologies for widespread use mainly due to a lack of financial support, resources and government assistance.

A National Waste Management and Recycling Programme must be developed with a suitable framework and guidelines for promotion of Green products. Government should promote the PPP model for waste management and recycling.

Creation of a Green Technology Fund for usage in areas such as technology up-gradation, promotion of green entrepreneurs, and funding for R&D is recommended. Overall strengthening of regulatory institutions together with institutional reforms is required. Specifically, reforming existing environmental clearance processes, establishing an integrated chemical management policy & regulatory regime and developing Market Based Instruments and Emission Trading are recommended. Green public procurement through price incentives on government tenders should be encouraged and special incentives need to be introduced for export of green products.

1.3.5 **Water**

With an increasing population, India is moving towards perennial water shortages, with rising demand and falling per-capita water availability. Despite the high amount of rainfall, the utilizable water resources are limited in the country. Developing appropriate strategies and institutional frameworks will be fundamental towards addressing this issue.

Sustainable water use is hampered by a governance deficit and a fragmented institutional framework for water management. Establishment of a National Water Regulator and transfer of water to the concurrent list are recommended. An overarching ‘Water Act’ to cover all parts of the water management value chain may also be necessary. These could be supplemented with creation of River Basin Organisations mandated and empowered for Integrated Water
Resource Management, establishment of a Bureau of Water Efficiency along with National Water Registry and Information System.

Water management can be improved also through equity and efficiency based water pricing for industries, making ‘Water Returns’ mandatory for major water using industries and promoting rain water harvesting in industry through incentives and regulations.

1.3.6  Land

Currently Indian industry utilizes only about 2-4% of land in India. India has sufficient availability of land and even at heightened industrial activity in the future shortage of land is not expected. However, there are some critical issues that pose challenges to obtaining land for industrial development. These include small land holdings, inaccurate, outdated land records and restrictions on usage of land that.

Development of a National Land Use policy to take care of the growing needs of the industrial and urban sector, while protecting land for agriculture is recommended. This policy should cover Land Mapping, Land Zoning and Digitisation of Land Records. State Governments should then formulate appropriate Land Use Policy in alignment with the National Land Use Policy.

Expediting the establishment of an independent regulator which can lay down guidelines, monitor the functioning of the land market and provide oversight is recommended. This should be complemented by the establishment of an institutional framework for land acquisition and development of guidelines that would cover issues such as valuation of land, timeframe for acquisition and method of compensation. Legislation regarding the latter is under formulation. Whereas industry supports the intent, it is very concerned about the very large increase in land prices that is baked into the proposed legislation.
1.3.7 **Clustering and aggregation**

Industrial clusters are increasingly recognized as an effective means of industrial development and promotion of small and medium-sized enterprises. With various ministries such as MSME, Textiles, Chemicals, Commerce and Industry using the cluster approach to improve the growth of sectors under their purview, there is an opportunity to improve cluster management by discovering and applying best practices across sectors.

However, with various administrative ministries managing their own schemes, insights from each other’s experiences have not been effectively used so far. Cluster aggregators, mainly Cluster Associations, play a significant role in connecting the cluster participants and the government and this link has often been found to be weak.

With a view to improve the effectiveness of Cluster as a tool for promoting industrial growth, it is recommended to set up a Central Cluster Cell (CCC) at an apex level to monitor the performance of clusters and share best practices across clusters. The CCC can also develop ‘Cluster Manuals’ to facilitate State Governments in creating new clusters and cluster development.

A roadmap is needed to implement different types of clusters—big zones, local clusters for MSMEs, knowledge parks, etc. Also, the scope of soft interventions should be expanded to include capacity building of cluster associations, initiatives aimed at improving market linkages, improving product quality, improving access to credit, encouraging innovation, skill development, etc.

1.3.8 **Promoting Micro Small & Medium sized Enterprises (MSME)**

The Micro, Small and Medium Enterprises (MSME) sector has emerged as a vibrant and dynamic sector of the Indian economy over the last five decades. Besides playing a crucial role
in providing large employment opportunities at a comparatively lower capital cost, MSMEs contribute nearly 45% of manufacturing output and 40% of exports.

However, there are inherent challenges faced by MSMEs. These relate to availability of credit, technology, skill development, inadequate industrial infrastructure and issues around marketing and procurement.

Issues around credit and finance should be solved through measures such as, but not limited to, scaling up of operations of SME exchanges and enhancement of credit guarantee schemes. The scope of the Credit Linked Capital Subsidy Scheme for supporting technology acquisition and upgradation of production facilities should be enhanced. A more effective procurement policy for goods/services from MSEs by Government Departments and Central PSUs and better management of Defence Offset Policies for MSMEs will strengthen the sector too.

Measures should be taken to increase penetration of Information Technology in MSMEs. This will substantially improve the productivity of MSMEs and also enable them to get more effectively linked into marketing, procurement, business facilitation and learning networks.

Clusters of Excellence in different segments should be promoted and a B2B International portal of National Small Industries Corporation should be launched. Other requirements are revamping of the Skill Development & Capacity Building Program and installation of an Electronic Tracking System for the Prime Minister Employment Generation Programme.

1.3.9 **Boost Manufacturing Exports**

An increase in exports of India manufactured products is imperative to achieve the desired growth rate in manufacturing. Share of manufacturing in India's total merchandise exports has remained largely stagnant and was 61.5% in 2010-11.
The challenges in increasing exports are the relatively slower rate of growth of manufacturing production, the low share of high tech exports, poor transport infrastructure and insufficient information with manufacturing about procedures and regulations of various countries affecting Indian exporters.

Provision of world class infrastructure at Indian ports and airports is an absolute must to reduce transport costs for manufacturers and ensure reliability of delivery for facilitating manufacturing exports.

Consultation with stakeholders must be improved while preparing FTAs and reforms. Market strategies must be improved to capture unexplored markets and also facilitate a move towards "high-tech" exports from current low tech exports. Simultaneously, the Brand Promotion Strategy must coalesce and project the brand values of the Indian manufacturing sector onto the world stage.

1.3.10 Reforming the role and management of PSEs

Post-Independence, public sector enterprises were set up with an objective to promote rapid economic development through creation and expansion of infrastructure. Subsequently, their role changed as active participants in various production sectors. However, in today’s economic environment, with the successful role played by the private sector in driving industrial growth, the role of PSE’s needs to be redefined.

PSEs can potentially be investors in areas which are important for the country but which, due to heavy investment requirements and/or high risks, are not attractive for the private sector. Such capabilities are required in the process of industrial growth to provide foundations and spin-offs that the private sector could benefit from. A few examples of these types of capabilities with large spinoffs are: wafer fabs and modern aircraft production capacities.
A radical suggestion to ensure flexibility for entry and exit of public investment in the process of industrial growth is that new PSEs in such areas may be promoted through a Single Holding Structure (SHS). The model would combine features of a sovereign wealth fund and the Government acting as a venture capitalist into a single holding structure. Thus portfolio management can be professionalized and separated from the management of the enterprises themselves.

Regardless of such radical institutional change, there is a need to set up a strategy and business development committee for every CPSE to direct acquisitions, joint ventures and new business activities. A system of strategic evaluation for every CPSE should also be introduced and its MOU must be lined to key performance parameters.

Governance of CPSEs will be improve by transparency in appointment of CMDs and whole time directors and reengineering of the vigilance function in CPSEs. Other recommendations to improve on existing deficiencies of CPSEs include autonomy in recruitment and compensation policy.

1.3.11 National Investment and Manufacturing Zones (NIMZ)

NIMZ is a concept introduced in the National Manufacturing Policy of DIPP, which has the in-principle approval of the Cabinet. The NIMZ offers a policy solution for a number of challenges discussed, and is a policy tool that can be applied to select zones designated for promoting manufacturing. Areas would be specifically delineated for the establishment of manufacturing facilities for domestic and export led production, along with the associated services and infrastructure with the objective of promoting investments in manufacturing and ease of development of such units.

The NIMZs would be a combination of production units, public utilities, logistics, environmental protection mechanisms, residential areas and administrative services. They would have
processing areas where the manufacturing facilities, along with associated logistics and other services and required infrastructure will be located, as well as non-processing areas for residential, commercial and other social and institutional infrastructure.

Each NIMZ would have a governing body, which would be in the form of a Special Purpose Vehicle (SPV) formed with the constituents of that specific NIMZ. The key feature of the NIMZs is that they would have more efficient and business friendly procedures and approval systems along with superior physical infrastructure.

1.4 Recommendations by Sector

The objectives of the Plan will be met by the performance of enterprises in select sectors. The selection of the sectors that are included in the Plan has been on a “bottom-up-cum-top-down” process. India’s New Manufacturing Plan is not made on a blank slate. Manufacturing enterprises are operating in the country in a large variety of sectors. They are competing with one another and with enterprises from abroad too. Therefore they understand the constraints in India on their competitiveness and growth, as well as opportunities before them. Therefore associations of enterprises in various sectors were encouraged to prepare plans for their sector’s growth, along with the central government ministry/department responsible for the sector. They have indicated what the enterprises (and their associations) will themselves be responsible for and the support required from Government. These proposed plans were scrutinised and aligned with the national priorities. These sectors can be classified into four categories according to their principal contributions to the objectives.

1.4.1 Sectors of strategic importance

It is essential for the country to develop domestic manufacturing capabilities in certain sectors for ensuring national security and self-reliance. Industries in following sectors require greater focus to increase indigenization in production

- Defence Equipment,
- Aerospace,
- Capital Goods, and
- Ship Building & Ship Repair

1.4.2 **Sectors for basic inputs**

Availability of high quality raw material and production inputs is essential for ensuring sustained growth of the manufacturing sector. Significant impetus is required towards developing production capacities in the following sectors:

- Steel
- Cement
- Fertilizers
- Exploration and development of minerals

1.4.3 **Sectors for depth & value addition**

These are knowledge and technology intensive industries with high growth potential. Developing competitive advantage in them through increasing depth and value addition in domestic manufacturing will contribute to long-term sustained economic growth. While India has developed good technological capabilities in certain sectors in this category (e.g. Automobiles), it lags behind significantly in others (e.g. Electronics). The sectors in this category include

- Automobiles,
- Drug, Pharmaceuticals and medical devices,
- Petrochemicals,
- Electronics,
- Chemical, and
- Paper
1.4.4 **Sectors for employment generation**

Maximum growth in employment is likely to come from industries which are more labour absorptive and less capital intensive and hence their success is imperative for the country to achieve its job creation goals. These include:

- Textiles
- Food processing industry
- Leather & Leather goods
- Gems & Jewellery

1.5 **Summary of Strategies**

While there are certain common challenges and underlying solutions across sectors, each sector also has its unique constraints that need to be addressed. The Plan describes detailed strategies for each sector in Chapter 6.
Box 2: Strategies for highest overall impact

Policy and process interventions

- Align stakeholders in the process of development and implementation of industrial policies.
- Simplify processes for doing business in India by mandating a ‘Regulatory Impact Assessment’ and operationalizing single window clearance across the country.
- Create a level-playing field for Indian manufacturers through fiscal measures by correcting anomalies in duty structures.
- Boost demand for domestic manufacturing, regardless of ownership of enterprises, through public procurement backed by minimum threshold quality parameters.
- Bring down the cost of finance.

Technology upgradation measures

- Improve Government-industry and industry-academic collaboration.
- Encourage technology transfers through FDI / JVs.
- Improve technical standards and voluntary compliance, across the industry.
- Encourage adoption of ‘Green technology’
- Modernize MSMEs through technology adoption and adequate access to finance.

Infrastructure creation

- Improve transport and power infrastructure.
- Set up NIMZs (National Investment and Manufacturing Zones)
- Make industrial clusters more effective by creating both, the ‘hard’ physical infrastructure as well as the ‘soft’ infrastructure for knowledge creation and sharing.
- Design an effective land acquisition process for industrial development.

Human Capital formation

- Modernize labour regulations and institutions.
- Improve skill availability through Skill Councils.
- Ensure social protection to all employees in the manufacturing sector by creating ‘Sump institutions’ for workers in transitory phase and develop innovative insurance systems for the informal sector.
- Improve ‘Industrial Relations’ through streamlining of consultative processes and representative institutions.
- Improve the quality of manufacturing managers/supervisors.
1.6 Way Forward

A good manufacturing plan focuses on accelerating learning within a country’s industrial ecosystem that enables enterprises within it to improve their competitiveness faster than enterprises in other countries. The implementation system for such a plan needs to focus on building broad-based capabilities across industries. The manufacturing plan for the Twelfth Plan and beyond makes many recommendations developed through a managed, participative process with structured involvement of a diverse set of stakeholders.

Recommendations that have emerged require the involvement of multiple stakeholders/owners. Previous experiences of implementation in India have shown that the inability of various stakeholders to work together has been a root cause of failure of policies. Conventional structures with a hierarchical chain of command to improve coordination have not met with much success in the past and are likely to be untenable in the future as well due to the multiplicity of stakeholders involved.

Thereby, drawing from international and domestic learnings, the recommended approach for policy implementation is based on three principles of Local action, Creation of Lateral connections and Focus on Learning.

Local actions and Lateral connections will require a process of implementation that will coordinate multiple entities in a consultative manner. Learning will establish a process that systematically distils lessons from experience to improve the on-going evolution of policies and their implementation.

Therefore, a two track implementation and learning approach has been recommended. The first track delineates the steps required to convert the recommendations of the plan to implementation. The second track concentrates on the systemic changes that need to be
undertaken to strengthen the process of consultation, policy making and on-going implementation.

The ‘third rail’ that provides the power to accelerate learning and institutional capacity improvement is an on-going process of evaluation and learning, which must be proactively facilitated through the creation of a ‘backbone’ organisation and other means.

**Track One: Develop an implementation process for the Manufacturing Plan**

The Plan has recommended several actions for each of the cross cutting issues and sectoral areas. The recommendations are varied in nature – policy changes, institutional improvements, reviewing and revamping the existing institutional structures, fiscal measures, new schemes, etc. While some of the recommendations can be implemented in the form of schemes by respective ministries / departments, many of the recommendations do not lend themselves to such an approach. These recommendations have to be handled through a broader project approach with a well-defined implementation system. The implementation system requires: steering, governing, stakeholder consultation facilitation, program management and project execution. Setting up of this system will be critical, and program management and stakeholder facilitation functions will be vital for ensuring success of the entire structure.

For sectoral areas, involvement of line ministries of governance and administration of programs will be imperative. Secretaries of sectoral line ministries should also be involved in the overall steering function to provide linkages for the sectors on cross-cutting issues.

Government should further clarify allocation of roles in the performance of the oversight and steering functions amongst DIPP, NMCC and Planning Commission and furthermore ensure that these agencies are fully equipped to perform their respective roles.
**Track Two: Make systemic reforms**

In the course of developing the Plan for Manufacturing, through intensive discussions with stakeholders, ‘root causes’ were located for present problems in the country with implementation of such ambitious and complex programs. These root causes require broad institutional changes. Efforts are being made by Government to address these. Implementation of these changes by Government will accelerate the implementation of the many actions required to achieve the country’s ambitious goals for its manufacturing sector.

Foremost is an improvement in the architecture of government programs and schemes. This requires a Government ministry to change its role from micro-manager to scheme designer and facilitator. The ministry’s role should be to act as a knowledge partner and enabler to the project implementers (which will typically be in the states). In order to be able to play this role effectively, the ministry will need to develop capabilities which are focused not only on scheme design and strategic alignment of schemes to tactical outcomes, but also create strong evaluation and feedback systems and networks from which the states and other local implementers can learn.

Second, expeditious implementation of the recommendations of the 2nd Administrative Reforms Commission is required. These will substantially improve the performance of the Government generally and its effectiveness in growing the country’s manufacturing sector.

Third, is to ensure enforcement of accountability. As Government is subject to ‘extensive accountability’ management of public programs requires more attention to the definition and measurement of this accountability. In a recent proactive reform initiative, the Performance Management Division in the Cabinet Secretariat has introduced the Results Framework Document (RFD), which provides a summary of the most important results that various departments and ministries expect to achieve in a year. While the RFD has been expanded, beyond basic financial and physical targets, to include stakeholder consultation and feedback, it
needs to be further extended to include results that require collaborative action among ministries.

Often desired outcomes are not in the exclusive ambit of a single ministry and therefore collaboration is required among several departments and ministries. The roles of departments and ministries to achieve these outcomes requires a systemic analysis of the issues from which the actions required of the various departments/ministries can be determined and their goals developed. Overall this critical system’s input to the RFD process can be provided by the Planning Commission. The ‘Steering Function’ proposed for implementing the Manufacturing Plan can also provide this input with respect to responsibilities, and hence performance measures, of various ministries with respect to the Manufacturing Plan.

Fourth, is the need for an effective stakeholder consultation process. International experience shows that successful industrial strategies evolve from an on-going productive interaction between Government and producers. Further, in a federal structure, such as India’s, State Governments have a strong role too. Considering the variety of issues that impinge on manufacturing growth, civil society organisations must be involved too. Therefore, to understand issues and to arrive at consensus, consultation is required amongst many stakeholders.

Mandating consultations, improving consultation processes, and providing dedicated resources to improve the quality of stakeholder consultations are a few ways by which the overall process can be strengthened. Further, role of Industry associations can be expanded to arrange for such consultations as these associations have already had a vital role to play in the evolution of the manufacturing plan. Commercial banks that actively engage with manufacturing enterprises for provision of finance and thus have insights into the performance and constraints of industries should also be involved more systematically in the process of policy evaluation.
Effective dissemination of information by the government is vital both during the stage of formulation and after. Stakeholders, who are likely to be affected by new government policies, realize its implications generally after the policies have been announced. With the ubiquity of electronic communications and the advent of social media, Government’s communication processes must be modernized, to be made more pro-active and effective.

**Immediate Action Points for Implementation**

**Take the Plan to the States**: Much of the implementation of the Manufacturing Plan will be in the states. Therefore, state Governments, and stakeholders in the states must be engaged.

**Put the implementation system in place**: The implementation system described in the Plan will need to be instituted through the collaboration of various national and state agencies as well industry associations. The DIPP, NMCC and the Planning Commission will need to collaborate to delineate their roles in the implementation process.

**Ensure sectoral schemes align with overall strategy**: The financial outlay of the Plan should be aligned with the strategies identified in the Plan. Rather than following the process where budgets are determined as variances to previous year’s outlays, allocations should be designed and reviewed in accordance to the strategies identified.

**Communicate the Plan to a broader audience**: Communication is critical to the successful implementation of any major change program. Communications must be designed to suit the audiences for which they are intended. Some can be delivered in the form of documents or presentations. Others should be delivered through interactive discussions where clarifications can be given and even suggestions obtained. Industry Associations can play a very important role in these. The Planning Commission, DIPP and NMCC would have to provide leadership and play a major role in the Communications outreach.
2 Introduction to the Manufacturing Plan

2.1 Why do we need focus on manufacturing?

The Eleventh Plan has targeted growth in manufacturing at 10-11 percent but actual performance will be only about 7.7 percent. It is a matter of concern that the manufacturing sector has not shared in the dynamism of the economy, not just in the XIth Plan, but even in preceding Plan periods. As a result, the share of the manufacturing sector in the country’s GDP has remained stagnant at ~15% (excluding mining) for the last ~30 years (Figure 1).

This share is very low, especially when compared with 34 percent in China and 40 percent in Thailand (Figure 2). The slow pace of growth of the manufacturing sector at this stage of India’s development is not an acceptable outcome, and we must ensure that manufacturing becomes the driver for GDP growth. This can be accomplished by the manufacturing sector growing at a faster rate than GDP. Only then will manufacturing be able to attain a significant share of the GDP.
In order to attain a ~25% share of the GDP by 2025, manufacturing would need to grow at a rate of ~2-4% higher than the GDP (Figure 3). This will ensure that manufacturing becomes the engine of growth for the economy.
In addition, manufacturing must provide a large portion of the additional employment opportunities required for India’s increasing number of youth. Agriculture cannot be expected to provide more jobs. On the contrary, it should be releasing labour which has very low productivity in agriculture to be absorbed in other sectors. While the services sector has been growing fast, it alone cannot absorb the 250 million additional income-seekers that are expected to join the workforce in the next 15 years. Currently, manufacturing in India provides only ~12% of jobs, and this share is significantly less than that of other countries (Figure 4). Unless manufacturing becomes an engine of growth, providing at least 100 million additional decent jobs, it will be difficult for India’s growth to be inclusive.

India’s trade balance must also be improved, and this necessitates a larger volume of exports of manufactured goods. In order to increase exports as well as provide its internal market with domestically produced manufactured goods that compete with imports, India must manufacture a much larger volume of products at competitive costs and quality.
A strong focus on improving the "depth" in Indian manufacturing is essential. "Depth" can be defined as the capability and expertise in all aspects of a product value chain. Achieving a greater depth in manufacturing entails ensuring a higher level of value addition within the country. This requires focus on a few key areas like the heavily import-skewed capital goods sector, technological advancements in nearly all manufacturing sectors, and a focus on improved domestic research and development.

The shape of global manufacturing supply chains has changed dramatically with the advent of computers and telecommunications. Manufacturing has been ‘deconstructed’. Therefore, the ability to engineer products quickly and at low cost is becoming an increasing source of competitive advantage. In today’s open-trade world, it is essential that Indian industry develop global competitiveness. While scale remains an advantage in industry, the deconstructed value chain of manufacturing ensures that this scale and competitiveness can be achieved through growth of networks of manufacturing enterprises.

While industrial growth is the need of the hour, we must also ensure that this growth happens in a sustainable manner, especially with regard to the environment. Industrial growth is a leading factor in the degradation of the environment. With the high rates of growth targeted by the manufacturing sector, it must be ensured that this growth happens in a sustainable manner and with minimal cost to the environment.

2.2 What are the objectives of the Plan?

Given the requirements of the Manufacturing sector, following are the 5 major objectives of the Manufacturing Plan:

1. Increase manufacturing sector growth to ~2-4% more than GDP growth to make it the engine of growth for the economy and increase share to ~25% of overall GDP by 2025

2. Increase the rate of job creation in manufacturing to create ~100M additional jobs by 2025
3. Increase "depth" in manufacturing, with focus on the level of domestic value addition

4. Enhance global competitiveness of Indian manufacturing through appropriate policy support

5. Ensure sustainability of growth, particularly with regard to the environment.
3 Nature of Industrial Policy

3.1 The question of ‘Industrial Policy’

The Government of India needs a strategy to accelerate the growth of its manufacturing and industrial sectors to meet the goals and obtain the outcomes mentioned. The concept of ‘industrial policy’ became controversial in the 1980s, with its principal thrust to disband the system of licenses and quotas for industrial production, resulting in the economy being liberalized in 1991. The theory-in-use thereafter has been to leave the growth of industry to market forces, which was consistent with the broader movement for open, market-based economies around the world. However, as pointed out earlier, this approach has not produced the growth of India’s manufacturing sector that was necessary to create employment and depth in India’s industry. Therefore a strategic departure from this approach has become imperative now.

Indeed, it is observed that even the US Government, which has been a staunch opponent of the concept of an industrial policy and champion of the ‘leave-it-to-the-market’ approach is also considering what strategies it should now adopt because, like India, it needs its manufacturing sector to grow faster to create more jobs and assist in the balancing of its trade.

Recent analysis (by economists such as Ricardo Hausmann, Director of the Centre for International Development at Harvard University; Dani Rodrik, Professor of International Political Economy, Kennedy School of Government, Harvard University, and Justin Lin, Chief Economist, The World Bank) of the processes by which various countries (e.g. Japan, Korea, Taiwan, China and Thailand) have built up large and competitive manufacturing sectors provides insights into the shape of strategies that induce such growth. These insights are supported by the continuing competitive strength of German industry in the face of new competitors from the East, as well as by the failures of other countries who adopted other approaches.
A macro-economic observation (Hausmann) is that complexity, in terms of the variety of the components (sectors, technologies, sizes of firms) of the manufacturing eco-system, is a necessary condition for the competitiveness and further growth of the manufacturing sector. Therefore the creation of adequate variety within the manufacturing eco-system of the country has to be an objective of the national industrial / manufacturing strategy. The macro analysis reveals that a national industrial eco-system grows and becomes more complex (and competitive), by moving into adjacent sectors rather than by big leaps into unconnected areas.

This observation leads to the question about how firms on the ground successfully move into new areas, and what the Government should do to enable them to do this. Rodrik’s analysis is that the process of collaboration between Government and producer firms is the key to this process of discovery and growth rather than the specific policies that were adopted. Specific policies must fit the context of each country, in terms of both its capability and resource endowments, as well the stage of development of its industries in relation to those in competing countries. In other words, there cannot be a single policy formula.

Successful strategies will evolve from an on-going productive interaction between Government and producers. Therefore the Government must concentrate on improving the process of interaction, collaboration, and learning amongst producers and the Government.

The conclusion is that the process of industrialization must be viewed as a process of learning and of developing increasingly complex capabilities. Therefore the development of Government’s strategy to accelerate growth of the manufacturing sector must be derived from a model of the essential features of this learning eco-system, followed by an analysis of the processes by which the eco-system learns. Government’s interventions must be targeted to catalyze and support the learning and capability building process.

### 3.2 Essential features of a Manufacturing Eco-system that Learns

A dynamic manufacturing eco-system has three features that enable it to learn and grow.
i. Firstly, it must have depth (value addition) in manufacturing processes. A manufacturing sector, no matter how large, that is composed mostly of low value addition assembly industries, cannot create new technological capabilities.

It may compete on low costs on account of scale and low labour costs, but it can easily lose these advantages to other countries which have even lower labour costs. Also, merely having R&D capabilities, without the wherewithal around them to convert ideas into manufactured products will not enable the growth of manufacturing industries.

ii. The second essential characteristic of a manufacturing system that enables rapid learning is the combination of four capabilities: human skills, embodied technology in hardware, knowledge (intellectual property), and a large and demanding customer base. All four components grow together to create a productive and competitive industry.

iii. The third requirement of a learning system is the range of different sized firms, especially small and medium sized ones. Small firms provide the first stages for skill development. They take up larger numbers of people into the industrial workforce with less capital investment, and they provide nurseries for experimentation too.

From these small firms, some can grow into specialized, internationally competitive, medium sized firms. Such firms are the backbone of the German industry, and also the strength of India’s internationally recognized automotive component, pharmaceutical, and IT sectors.

3.3 Processes that enable the Manufacturing Eco-system to Learn

Five processes must be noted.

- Firstly, learning is accelerated through the interaction of the diverse components of the system: R&D with producers, both with customers, producers with institutes for skill development; and interactions amongst adjacent sectors and technologies that spur new combinations and innovations. Thus complexity breeds further technological development and growth. This
requirement translates into the strategies for building clusters, and linking research and development institutes with producers.

- Second is the process of Innovation. Innovation can be spurred by several enablers that create ‘safe-failing’ spaces for experimentation. These enablers include early stage risk capital, incubators, and quick exit / bankruptcy laws. Analysis reveals that the Indian industrial eco-system has inadequate support systems for experimentation and innovation.

- Third is a regime of Standards. Standards are an embodied learning of the eco-system. They enable firms, small ones in particular, with a base of knowledge, and also act as means to reduce transaction costs with their customers and suppliers.

- Fourth is an IP regime. Like Standards, a good IP regime provides a base of knowledge for researchers and producers to develop upon further without having to re-invent the wheel. An IP regime also provides incentives for taking risks by assuring rewards.

- The fifth category of processes that enable system-wide learning and continuing improvement are a class of processes such as Total Quality Management, Total Productive Maintenance, Business Excellence, etc. In fact, such processes have been the foundations for the rapid, country-wide growth of productivity and competitiveness of the Japanese and Korean industry. The power of such processes has been realized by sectors of Indian industry too, such as the auto industry, and by business groups in India such as the Tatas.

3.4 The architecture of a Strategy to accelerate growth of Manufacturing

This analysis of the process by which Manufacturing grows explains the architecture of an effective Government strategy to accelerate growth of the Manufacturing sector.

Since Manufacturing enterprises, unlike IT and financial services enterprises, involve the production and movement of material goods, they require a good physical infrastructure — transportation, power, land to build — to be competitive. Moreover, the materiality of manufacturing activities also results in more regulations — of safety, pollution, factory inspections, labour conditions — and hence
a more complex administration structure too. The quality and efficiency of the physical and administrative infrastructure is a basic requirement for productive manufacturing enterprises. This is India’s chronic weakness.

Manufacturing enterprises that succeed in India succeed in spite of a woefully insufficient and unsupportive infrastructure compared with other countries. Hence the thrust in Government’s New Manufacturing Policy (2011) to create good infrastructure for manufacturing enterprises along transportation corridors is overdue.

Good physical infrastructure and smoothly functioning administrative infrastructure are threshold requirements for 21st century manufacturing enterprises to compete in the international arena. However these will not be sufficient. Competitive manufacturing, as the analysis has shown, requires the development of complex capabilities — technologies, skills, and management abilities to coordinate diverse interactions and processes of learning. Such capabilities can be learned and improved. Continuous improvement in these capabilities is the key to sustainable competitive advantage, even absent advantages from raw materials required for manufacturing, as Japan and Korea have demonstrated. Therefore the thrust of Government strategy must be on the enrichment of the composition of these capabilities in the country’s manufacturing eco-system.

The strategy the Government of India had followed until the 1980s to build the required composition of these capabilities was not successful. The strategy was to determine, top down, the capacities that were required in various sectors and allocate resources to them along with licenses to produce and sell designated quantities. It limited the ability of enterprises to create innovations, and combinations of enterprises and technologies, which are essential for the growth of a dynamic, self-adapting manufacturing sector.

However, as the US has realized, a strategy of ‘leaving it to the market’ without an effective Government strategy to strengthen the eco-system for learning and capability building is not effective in a competitive world where other Governments are constantly improving their country’s ecosystems with appropriate processes and interventions. The US has good physical and administrative infrastructure to support manufacturing enterprises. Yet it has been slipping behind other countries
such as Germany, Japan, Korea, Taiwan, and China, where processes of building capabilities have received deliberate attention.

There is an erroneous view that Industrial Policy is about ‘picking winners’—investing large amounts of public resources in particular technologies and particular companies. The criticism of this approach to industrial policy is that Government can get it very wrong, and has no business to risk public resources in such bets. On the other hand, Governments have sometimes succeeded hugely with such bets — witness the success of POSCO in Korea for example. Also, there is no assurance that the private sector will always get it right either: a large number of private sector companies go bust too.

The thrust of industrial policy must be not on picking a few winners but on creating an eco-system in which more winners emerge and, as they emerge, are enabled by the eco-system to become stronger. This is the opposite of what India’s industrial licensing system did. It put curbs on the growth of good Indian enterprises, for example by limiting Tata Motors (then known as Tata Engineering & Locomotive Company) to its licensed range of trucks above 6 ton GVW even though the company had developed the capability to move into adjacent arenas of lighter trucks.

The paradigm for India’s 21st century manufacturing strategy will not be a return to licensing and controls. Neither will it be Government leaving it entirely to the market and hoping for the best. Nor will it be Government picking a few winners. The paradigm will be to build an eco-system for rapid learning and capability building. It will encourage entrepreneurship and support innovation. It will provide the system-wide processes to support collaboration and build stronger value chains with depth.

While being responsive to international requirements (and its own need too) for an open international trade system, it will also be mindful of the process of capability building required within the country to grow a much larger number of competitive enterprises that create more value within India and employ larger numbers of people in decent jobs. Such enterprises can be Indian-owned or foreign owned, so long as they fulfil our national aspirations for a much larger and internationally competitive manufacturing sector in India.
3.5 Three components of India’s Manufacturing Strategy and Plan

The architecture of India’s Manufacturing Plan is built around three components. The first are capabilities and processes that go across many, if not all sectors of manufacturing, and that build into the eco-system the processes for rapid learning and building of capabilities.

The second component has to be the plans to strengthen the performance of selected sectors. The selection of these sectors is done by a combination of top-down and bottom-up analysis. From the top, certain sectors appear more important to meet the goals of the Plan for more employment, for example, or to produce goods that India needs for its strategic security. On the other hand, the capabilities created by Indian entrepreneurs in some sectors provide potential for more growth, and they should be supported. For example, the pharmaceutical and auto parts sectors. Thus the Plan, at present, has identified 18 such sectors.

India’s sectoral strategy has to be broad-based, covering many sectors, to achieve the large-scale growth that India needs in manufacturing. India cannot achieve its goals by ‘picking winners’. In each of these sectors, a sector strategy is required to grow capabilities and relieve constraints. Such sector strategies should be formulated jointly by the associations of producers in the sector (and other principal stakeholders too) and the relevant Government department. They should describe the opportunity for the sector and the actions required from the producers themselves, along with support from Government policies.

The preparation, implementation, monitoring, and adjustment of these plans has to be an on-going exercise, not limited to the present exercise of preparing the 12th Five Year Plan, nor limited only to activities within this Five Year period. A longer term vision and strategy must guide the planning. The development of this longer term vision and strategy is essential for plans to produce ambitious results.

The third, vital, component of the Strategy is the institutional ability for effective consultation and collaboration between producers and public policy makers & implementers and the systemic reform of existing systems and processes within the Government. The strength of this process has been
found to be the common factor in the success stories of all countries that have built large, competitive manufacturing sectors. Their specific strategies have differed, suiting their circumstances. However, the success of their strategies was determined by the close collaboration between the various stakeholders in the evolution and implementation of the strategies.

The structure of the processes of collaboration between the government and producers has also differed, fitting the political economy of the country. In China, the state has substantial control over the production sector, thus ensuring tight collaboration. In Korea, large businesses, combined with the government chose sectors and developed them together. In Germany, and Japan, business associations, government ministries, and stakeholders (especially labour unions) work together in institutionalized processes of consultation.

Lack of coordination amongst government ministries, and the relatively poor quality of interaction between business associations and government - which is constrained by the competition amongst associations, and the orientation, by and large, towards lobbying and financial sops - prevents improvement in the process of collaborative learning and capability building that India needs to grow its Manufacturing sector.

In a world in which other countries are already ahead of India by having stronger processes for continuing collaboration and improvement, this becomes all the more essential to address. Therefore, it is imperative that India build institutional arrangements quickly for policy evolution and implementation. Such arrangements will be the essence of 21st century ‘Industrial Policy’.
4 Approach for development of the Manufacturing Plan

The persistent failure of India’s manufacturing sector to meet expectations suggests that a radical change in the policy approach towards it is needed. We cannot continue the way we have been. The ‘coordination’ challenge in growing the manufacturing sector is complex.

The range of inputs required for manufacturing enterprises is larger than for enterprises in other sectors. The linkages within the manufacturing sector are many too: between raw material producers, capital goods’ producers, component producers, and assemblers - policies that favour one segment may harm another.

4.1 Collaborative process of development

As has been noted earlier, one of the key common factors seen across countries with successful growth in manufacturing is that they had a very good process for consultation between producers and policy-makers, and coordination amongst the policy-makers.

Therefore the paradigm of planning in manufacturing must shift from ‘planning as allocations’ to ‘planning as learning’, and from budgets and controls towards improving processes for consultation and coordination. In India we have rightly given up the paradigm of allocations and quotas to plan industry. However, not having mastered the other paradigm yet, we have not been able to grow our manufacturing sector as fast as we should.

The design of processes of consultation, coordination, and learning, must fit a country’s political and economic structures. The development of a good architecture for a consultative policy making process, and facilitation of its conduct, is what ‘planning’ for manufacturing growth has to be about. Cohesion can be brought about through more effective coordination amongst agencies, and more effective consultation amongst stakeholders.

Therefore, the approach to the development of a Manufacturing Plan has been explicitly focussed on the incorporation of a collaborative process of shaping manufacturing policies while creating the content of the Plan.
The team constituted to develop the Manufacturing Plan constituted of a diverse set of stakeholders forming the Steering Committee and the various Working Groups (Figure 5).

4.2 Issue identification and sector coverage

The focus has specifically been on transforming the approach to align the varied stakeholders to a common national goal, instead of having silo-limited views on individual sectors and individual goals (Figure 6). In order to achieve this coordination between the various sectors, and to identify the underlying causes of the slow progress of manufacturing, a set of thematic "cross-cutting" issues were identified in addition to the major sectors of manufacturing. Working Groups were constituted to identify strategies for each of these key horizontal "cross-cutting" issues, as well as key vertical sectors (Figure 7). The "cross-cutting" issues identified deal with a set of causes which have impeded the growth of manufacturing across sectors. They directly link with relieving infrastructural challenges, both physical and administrative, by looking at the shortcomings in the space of land & water management, cluster and zone development, business regulations, etc. They also try to address the weak development of human resources, of which a vast quantum is essential to achieve our goals. Another key feature essential to all sectors is depth of technology in the sector’s supply-chain within the country. These cross-cutting issues have been identified in the National Manufacturing Policy.
recently approved by the Cabinet. This Plan describes the actions to be taken in all these areas and a process for their implementation and monitoring.

**Figure 6 - Coordinated aligned approach**

**Figure 7 - Focus on sectors as well as cross-cutting issues**
Select sectors were also identified as being critical in achieving the overall manufacturing goals. The key characteristics of these sectors are:

- Employment intensity – select sectors like textiles, leather, food processing, paper, gems & jewellery create large-scale employment

- Strategic security – select sectors like defence & aerospace, shipping are essential to develop from a perspective of security. Also, the fertilizer sector is essential to secure in order to ensure food security. Mineral exploration and development is a critical space to develop to exploit India's resource endowment and ensure raw material security

- Technology capabilities – select sectors like capital goods, steel, electronics systems design and manufacturing form the base for other industries and need to be developed to create capabilities to deepen manufacturing

- Competitive advantage – select sectors like automotive and pharmaceuticals are well developed in India from a competitiveness viewpoint, and need focus to ensure continued advantage and growth
- Other significant sectors – like chemicals & petrochemicals, cement, which require focus for development

The strategies suggested in this document have been formulated based on the recommendations provided by the various Working Groups. It should be noted that the XIth plan document and other earlier discussions have been considered by the Working Groups in developing their recommendations. The recommendations have been reviewed and harmonized into a coherent national strategy for Manufacturing.

4.3 Building an evolving tree of policies

It is essential to transform the approach of policy development to ensure that the correct level of maturity of various policy areas is identified and appropriate strategies developed to address them
(Figure 8). This approach was taken by the various Working Groups to ensure that their recommendations deal with either alignment on policy issues, creation of institutions to build a base for action, or actions built on existing institutions.

What is critical to note here is that based on the level of maturity of a policy area the action required is very different.

- **Planting the roots**: In case of a policy area in its nascent stages, it is necessary to align the viewpoints of different stakeholders and get consensus on the "why?" of the issue.
- **Building the trunk**: In case of a policy area which has basic alignment and consensus, it is essential to ensure the development of an appropriate mechanism for enforcing that policy, including the institutional architecture. This forms the "how?" and the "who?" of the policy.
- **Growing the leaves**: In case of a policy area with deeper level of maturity and existing consensus and institutions, it is necessary to provide the necessary actions which bear fruit, by focussing on the "what?" of the policy.

This framework of strategy developed has been considered by the Working Groups to ensure that the recommendations are building the right portion of the tree for the different policy areas.
5 Strategies to address the various cross-cutting issues

5.1 Technology and depth

5.1.1 Introduction

A principal objective of this Plan is to increase ‘depth’ in manufacturing, to increase domestic value addition, and meet national strategic requirements. The technological depth of the country’s manufacturing sector goes up when it becomes an active player in more parts of the manufacturing value chain (research, development and production).

Depth in technology is extremely important for a country to sustain its competitive advantage in a global economy. It is not only important from the point of view of greater value addition, but it is also required to attract new industries, and maintain competitive advantage of current industries.

Technological depth ensures self-reliance in strategically important sectors and ensures a healthy trade balance. The ‘Dutch Disease’, which has plagued many natural resource intensive economies, can be attributed to their lack of manufacturing depth.

5.1.2 Key objectives

The key requirements for improving Technology and Depth are to:

- Provide an enabling environment for domestic enterprises to invest in technology creation, technology absorption and achieve higher value addition

- Ensure availability of demand for products developed and / or manufactured indigenously

- Provide enabling environment for foreign enterprises to invest in manufacturing and research activities in the country, in the areas in which the country needs foreign technology

- Mitigate the risks of MSMEs investing in technology development and technology up gradation
5.1.3 **Status and Key Challenges**

Lack of depth in technology is one of the foremost issues affecting the growth of manufacturing sector in the country. India’s R&D spend is 0.9% of GDP, whereas China, UK and Israel spent about 1.2%, 1.7% and 4.3% respectively. At present, about three fourth of the R&D expenditure India is in the public sector and only one-fourth is in the private sector. This is in stark contrast to trends seen in China where private sector finances 70% of total R&D spending. Further, 65% of total R&D spending in the United States and approximately 75% of total R&D spending in Korea and Japan is also sponsored by the private sector.

Empirical data further suggests that though developed nations are more heavily invested into R&D than emerging economies, with evolving industrial structures in the latter, India’s counterparts have accelerated investment in R&D. This evidenced by facts such as India’s R&D spend to GDP ratio being only 2/3rd’s of China and India having only a 0.4% share of patents filed worldwide in contrast to 5.8% for China and 21.8% for US. While patent applications in India witnessed a growth rate of 22% per year between 2002 and 2005, most were filed by foreign companies.

Most Indian manufacturing firms appear to be stuck at a basic or intermediate level of technological capabilities and there is a clear absence of organized technology led development initiatives.

India’s net imports have also been going up in some key sectors like Industrial Machinery & Equipment and Telecommunication equipment which indicates a lack of depth in these industries. Furthermore, share of Capital goods in Manufacturing, which is an indicator of the overall depth of technology and value addition in the Manufacturing sector, is relatively low in India.

The key challenges faced by Indian Industries are:

- The Indian Industry has not given sufficient importance to the documentation of knowledge and creation of IP. As a result, not only were opportunities lost to create IP, but we lost IPs to other countries such as in traditional agricultural products. Our regulatory framework, speed of award of IPs and the enforcement of IP regulations needs improvement.

- Though there is an improvement in the industry-academia collaboration in creating patents / technologies, still there is a large scope for improvement.
• While FTAs signed with other countries are favourable for some products, they often create a distortion in the market in terms of inverted duty structure for other products.

• Many segments of the industry, especially MSMEs, have limited information and access to risk capital for sourcing / developing and internalising new technologies.

• The weak attention to standards not only invites dumping of sub-standard products by other countries, but also makes it difficult for the industry participants to benefit from each other’s learning and improve their technology depth.

• Absence of National agenda and policy framework to support innovation

5.1.4 A System’s Improvement Framework

It is essential to set the context before moving to the recommendations. Government support is essential to enable a country’s industrial ecosystem to gain depth because technological learning takes a long time, requires large investments, and is risky. Support to the enterprises should be in such a way that it motivates and enables enterprises to learn and develop complex capabilities and not become complacent and inefficient, which was the outcome of the industrial policy adopted by India until the 1980s.

Chapter-3 defined the process of industrialization as a process of learning and developing increasingly complex capabilities. It identified five processes and three components of infrastructure of the manufacturing ecosystem that are required to enable enterprises to learn and develop capabilities in a competitive environment.

The Working Group on Technology and Depth looked at these elements in the Indian industrial ecosystem. Meanwhile the sectoral working groups examined their sectors’ specific requirements. From these two sets of analysis the policy levers for India at this time were distilled.
Table 5.1 and Table 5.2 capture the generic policy levers that should be moved for faster growth of manufacturing over the next five years. The specific policy interventions must be tailored to fit the requirements of sectors by a process of industry – government consultation which, as has been emphasised before, will be the key to ‘get it right’. MSMEs and large enterprises will require different kind of interventions from Government.

### TABLE 5.1: PROCESSES THAT ENABLE LEARNING

<table>
<thead>
<tr>
<th>Process that enables learning</th>
<th>Policy levers</th>
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</table>
| 1. Interaction between diverse components of the system – R&D, Producers, Customers, Government, Institutes of Skill Development, etc. | • Cluster development  
• FDI and JVs  
• Industry / Research Institute / Academia partnership  
• Higher education in the country |
| 2. Creating ‘Safe-failing’ spaces for experimentation by firms | • Access to risk capital, technology funds  
• Subsidy on interest costs  
• PPP model of funding |
| 3. Creating a regime of ‘Standards’ | • Setting up a system of National Standards benchmarked to International Standards |
| 4. IP regime, which helps firms to build on each other’s innovation | • Effective ‘IP’ regime  
• Improving awareness of IP |
| 5. System-wide improvement: Processes such as ‘Total Quality Management’ | • Mainly the firm’s role to adopt such tools and increase organizational learning  
• Nation-wide, and State-wide campaigns to improve ‘Total Quality’ in all enterprises, including MSMEs, should be sponsored by Government through institutions such as Quality Council of India |

### TABLE 5.2: MANUFACTURING ECOSYSTEM INFRASTRUCTURE

<table>
<thead>
<tr>
<th>Ecosystem Infrastructure</th>
<th>Policy levers</th>
</tr>
</thead>
</table>
| 1. Physical infrastructure | • Cluster development  
• Special manufacturing zones (NIMZ) |
| 2. Improving capabilities | • Skill development  
• Total quality management  
• JV, Technology transfer, FDI |
MSMEs play a critical role in innovation thanks to their nimbleness and their ability to experiment with new technologies on small scales.

However, they often suffer from lack of funds, inability to take risks associated with technology developments and the difficulty of attracting skilled manpower. Policy interventions for MSMEs must be tailored to their conditions. The MSME Ministry has been created to ensure that this is done.

Government policies for MSMEs to help them improve their technological capabilities should focus on:

- Providing access to risk capital
- Setting up of standards for the industry
- Improving Industry / research institute / academia interaction, mostly in clusters
- Stimulating demand / providing scale through preferential treatment in government purchases

On the other hand, large enterprises handle complex technologies and manufacture globally competitive products for domestic as well as global customers. They compete with global manufacturers in local as well as in global markets. The Government policies for large enterprises can focus on:

- Improving IP regime
- Ensuring human resource availability by establishing institutions for technology education and research, educational institutions, etc.,
- Ensuring access to critical raw materials
5.1.5 Strategies for change

Some high impact strategies for India at this time to accelerate the development of technological depth in the manufacturing sector have been analysed. These should receive special attention in policymaking and implementation.

Create coherence amongst existing institutional agencies towards developing national priorities for indigenous technology development

Several countries like China and Singapore have followed a comprehensive approach to identify critical technologies to be developed indigenously and have formulated mechanisms to ensure that these technologies were funded and incubated.

In India, we have various agencies like the Department of Science and Technology, NMCC and the Planning Commission working in this area. To make this process more robust and comprehensive (including funding and incubating projects), the present process / institutional arrangements should be reviewed and fine-tuned / restructured. The Industry, as key stakeholders, should be involved and consulted in the design of new arrangements.

Create ‘Safe-failing’ spaces for companies to engage in innovation

Government participation in funding of research through a ‘Technology Fund’ or ‘Technology Upgradation Fund’ is an important instrument for reducing the risk for firms in investment in research. The structure of the ‘Technology Fund / Technology Upgradation Fund’ has to evolve over a period of time. While there may be one Central Technology Fund focusing on developing on indigenous technologies of National Priority, each industrial ministry can develop their own version of Technology Fund. However, the Central Technology Fund can be the knowledge custodian of all the Technology Funds in the country and work towards capturing and sharing insights from these various Technology Funds.

The ways in which the Government could provide / redesign fiscal incentives for R&D activities are:
• **Tax credit instead of tax incentives**: With the imposition of Minimum Alternate Tax (MAT) of 20%, companies are unable to avail full benefit of weighted deduction. Equivalent benefits of weighted deduction on R&D spend should be treated as tax credit and be allowed to be set off against Tax and/or MAT Payable.

• **Broadening of R&D incentives**: Credit on input services / capital goods whether R&D is done within factory or outside should be allowed. Accelerated Tax Benefits should be extended beyond the DSIR approved R&D institutions as long as the R&D spend is audited by reputed audit firms.

• **Extension of tax benefits**: Certain tax benefits restricted to firms registered before a certain period. Also, certain R&D incentives are applicable only until 2012. Such schemes, which have successfully encouraged R&D / technology development in manufacturing, should be extended.

• **Activity specific incentives**: Certain tax incentives in India are location specific. Tax benefit should be made activity specific, that is, extended to manufacturing of specified articles irrespective of the location.

**Improve knowledge sharing between knowledge and financial sector**

There are several programs like Small Industry Business Research Initiatives (SIBRI), Technology Development Board (TBD), Biotechnology Industry Partnership Programme (BIPP), and Biotechnology Industry Research Assistance Programme (BIRAP) which promote early stage innovations and PPPs. These institutes can work with financial institutes to leverage their understanding of technology in improving the ecosystem for technology development.

**Strengthen the IP regime and systems to leverage IP**

A strong Intellectual Property regime is a pre-requisite for creation of global IP from India. It has also become a requirement under WTO. While the importance of IP for creation of Innovations in the industry is well understood, the question is whether developing countries will get penalized given that
they are starting with a low base compared to developed countries. One way to manage this is to introduce the ‘utility’ model of patents (as China has) which can help generation and protection of incremental innovations in Indian manufacturing.

Given the need for a strong IP regime from a long-term point of view, the following steps need to be taken:

- Improve IP enforcement mechanisms
- Develop global information database on IPs accorded
- Accelerate the process of Patent Examination and according patents

Also, in order to leverage the benefits of IP:

- Build awareness about IP through education and training
- Create National IP mission to continually evolve the IP strategy of the nation
- Encourage joint IP filings by industry / academia / research institutes
- Encourage the formation of companies specializing in IPs (through tax incentives)
- Exempt income tax for the income generated from domestic IPs

**Strengthen partnership between Industry and academia / other research institutes to create IPs domestically**

Industry-academia partnerships are relatively weak in India compared to many other countries. In the last few years, efforts have been made by various stakeholders including the Government, leadership of central / state research institutions, Industry and the Academia to develop stronger partnerships. However, we still have a long way to go. Some of the policy measures that Government can use to accelerate the development of Industry-Academia partnership are:

- Joint ownership of IP arising out of these collaborations

- Align the goals and annual planning processes of central research institutions with that of industries through industry associations
• Incentivise Central / State Research institutes to create joint IPs with Industry
  o Tying up a certain percentage of their budget to the number of collaborative IPs created

• Incentivise University and industry for forging successful partnerships in University’s governance, infrastructure, course curriculum design, faculty / students development and research

• Create Cluster Innovation Centres at Universities with the aim to foster a favourable ecosystem and enforce industry-academia linkage

• Consider passing a legislation which will provide a legal framework for active interface between funding agencies, academia and industry

**Clusters (and NIMZ) can provide enabling infrastructure to improve technological depth**

Clusters play a critical role in propagating technological depth by facilitating technological learning and manufacturing through the presence of the entire eco-system in the same geographical location. The NIMZ policy, which was cleared by the Cabinet in October 2011, ensures that business is provided with the eco-system required for growth, not only in manufacturing, but also for investments in research and development. The attractiveness of NIMZs will be even higher for new high-technology industries, which will benefit from the localised presence of the entire value chain participants. Also, the benefits of Industrial Clusters to MSME participants are also well understood, and the MSME Ministry is using the Cluster Approach to drive the growth and depth of MSME industries.

**Improve Technical Standards, Voluntary Compliance and Conformity Assessment**

Standardization plays an important role in upgrading products and in the sustenance of quality and technological advancement in manufacturing, which are the core constituents of ‘depth in manufacturing’.

Standards are a form of embodied technical knowledge accessible to all types of business that enables more effective product and process development. They promote and enable the diffusion of technology in a form that is readily assimilated by firms with the complementary capabilities to take
up and use the new methods. Standards therefore constitute one of the important foundations for the technological depth in manufacturing, and are accorded high importance by the policy planners in the developed world.

Standards in use are either enforced by law for mandatory compliance (technical regulations) or driven by market demand (voluntary compliance). In India, the Bureau of Indian Standards (BIS) is responsible for developing technical standards. While India may be over regulated in many areas, it has a technical regulation deficit in sectors like telecom, electronics and IT products and chemicals.

Apart from Government led technical regulations, there are several global voluntary initiatives like Worldwide Responsible Apparel Production (WRAP) certification, Energy management sustainability, Green buildings/products, pa/c chemicals and Social Accountability (SA 8000). While these help define technology standards and regulations, we do not have a mechanism in India to work with such private initiatives. It is important for us to participate in setting such voluntary standards to suit the Indian industry. There is a provision for participation of various countries in shaping these regulations however we have not been able to do so because of a lack of institutional structures.

During the 12th Five Year Plan, the focus on Technical Regulations should be on:

- Developing a policy on technical regulations
- Capacity building of regulators (BIS)
- Review of technical regulations to identify the gap vis-à-vis national standards
- Sensitizing the industry regarding the need to provide scientific data to regulators to formulate effective technical regulations
- Setting up of helpdesks in industry bodies and export promotion councils for information dissemination

In addition, for Voluntary Compliance initiatives must be strengthened:

- Promoting and funding a ‘Standards Cell’ in industry associations and Standards Developing Organisations (SDO)
- Capacity building of SDOs
• Capacity building programs for the training of technical staff in the industry for writing company and industry level standards.

Government should also create a database / software based system to track the changes in technical standards / voluntary compliances globally and alert Indian manufacturers of development.

While the Standard setting process sets the standards to be followed, conformity to the standards is assessed by Conformity Assessment agencies. While many conformity assessment agencies have sprung up in the last few years, it is important that these conformity assessment agencies are of world class and their certificates are acceptable across the world.

To achieve these, the following steps are envisaged during the 12th Five year plan period:
• Promoting the acceptance of Indian conformity assessment globally
• Capacity building for inspection bodies / certification bodies
• Developing regulation on Conformity Assessment

Quality Council of India, set up jointly by the Government of India and the top industry associations – CII, FICCI and ASSOCHAM, has been working to
• Establish and maintain an accreditation structure in the country
• Help representing India’s interest in International forums
• Spread the quality movement through the country

The 12th Plan will focus on strengthening the capabilities and role of the QCI.

Removing anomalies in duty structure

• Inverted duty structure vis-à-vis imports: In almost all promotional schemes where import duties are reduced (Nil Duty Project Imports, certain Defence purchases, SAD exemption under ITA
Agreement for IT products etc.), imports get the benefit of reduced duties / nil duty. However, for same schemes, domestic manufacturers are not given equivalent exemptions. This creates a systemic disadvantage for local manufacturers. It is therefore recommended that import of finished goods under special schemes be either discontinued, or domestic manufacturers be given equivalent exemptions in order to create a level playing field.

- **Higher duty on intermediate products vs. final products:** For specified purposes, presently there is higher duty on intermediate goods (used by the domestic manufacturer for assembly/manufacture of goods), as compared to duty on finished goods. This in turn leads to higher input cost for the domestic manufacturer. It is therefore recommended that duty on intermediate goods be brought in line or set lower than applicable for final products.

- **CST / VAT Retention:** Inter-state movement of goods by domestic manufacturers carries added cost in the form of central sales tax (on inter-state sales) / retention of input VAT credits (on inter-state stock transfers). This is can be avoided in case of imports by executing sales in the course of import or through directly consigning the goods to the customer’s state. This creates disadvantage to domestic manufacturers. Therefore, CST on inter-state sales and provisions of with respect to retention of input VAT on inter-state stock transfers should be abolished.

- **VAT Vs. SAD:** VAT rates have been increased from 4% to 5%, however there has been no consequential increase in the rate of SAD on imported products which is levied in lieu of VAT. Therefore SAD should be increased to 5% to reflect the pan-India based trend of revision of the VAT/CST rate bracket of 4% to 5%.

While some of these issues can be solved through GST implementation, some issues will remain outside the gambit of GST and will have to be addressed.
Encouraging FDI and Joint Ventures

FDI (investments by foreign companies in Indian ventures) and Joint Ventures of Indian companies with foreign partners can provide access to technology in areas in which domestic expertise is inadequate. The Government must identify the areas, in consultation with the industry, in which FDI and Joint Ventures can help to bring technology. Several problems that are impeding FDI/ JVs need to be addressed. Some these are:

- The ambiguity in the nature of income arising to foreign investor on transfer of technology

- Procedural complexities for foreign companies while claiming credit for taxes withheld by Indian companies

- The R&D cess paid by the importer cannot be adjusted against any output taxes paid by the importer, resulting in additional cost of 5% for the technology importer

- Service tax paid on import of technology cannot be adjusted against taxes paid on output, if the manufacturing is outsourced

- Limitation on technology cost as percentage of total investment available for state tax exemptions

Preference for Domestic products in Government Procurement

The cost of any manufacturing activity (excluding raw-materials and utilities) depends on the maturity of manufacturing technology used and the magnitude of the demand. For a matured technology, the cost of manufacturing will be relatively low, due to the learning curve effects. Similarly, due to scale effects, the unit cost of manufacturing goes down with the increasing demand. Therefore, a domestic enterprise using new indigenous technology will have a cost disadvantage compared to a global enterprise that has the benefits of matured technology. Unless there is some incentive provided to domestic enterprises to offset this handicap, developing indigenous technology will be difficult.
Therefore governments in many countries, developing as well as developed, provide preference in Government procurement to domestic enterprises. However, to ensure that this policy measure does not lead to development of sub-standard quality products or create inefficiencies in the domestic enterprises, the preference in procurement can be made applicable with minimum quality standards; a cap on the permissible price differential between domestic and imported products, and also a sunset clause.

Some ways in which the preference for indigenous products can be provided in Government purchases are:

- In sectors of strategic importance, procurement should be done only from those vendors, who have locally established manufacturing base
- A multi-tier tax structure can be introduced, which offers concessional tax rates for products with higher local value addition
- A certain percentage of government procurement to be reserved for enterprises using domestic manufacturing / domestic IP; and a certain percentage of can be reserved for firms in MSME sector.

However, as a pre-requisite to implementing this procurement strategy, streamlining of procurement functions is essential. Public procurement organizations must be clear about how national policy goals should be translated into procurement practices without compromising quality. ‘Least cost’ is not always the right strategy and needs to be balanced by other guidelines. When public procurement is to be used as a means for developing domestic production capabilities, it is necessary that public procurement professionals have expertise in the industries with which they are concerned.

**Aligning investment obligations under ‘Offset Policy’**

The obligations of investments of foreign companies under ‘Offset Policy’ should be targeted towards investment in industries in which the country needs to improve technological depth. Here too,
officials who administer offset policies must have knowledge of the industries and technologies involved to be able to stretch offset requirements to create significant transfers of technologies in practice.

**Encouragement of local value addition in critical natural resources**

Some natural resources like good quality coal and iron ore are becoming in short-supply in the global economy with growing demand from developing economies especially China and now India. Domestic availability of some of these raw materials provides us a competitive advantage which we should leverage to build domestic industries that add value to these resources, thus creating additional jobs and improving our trade balance. Going further up the value change government policies and duty structure should be designed in a way to incentivise value addition of Steel rather than exporting Steel in raw material form.

In general the trade-off between export of inputs which are in demand elsewhere in the world, and use of those inputs for improving the competitive position of domestic user industries is a tricky one, while promoting entrepreneurial freedom and free trade. These trade-offs must be understood and sensitively managed to ensure competitive and sustainable growth of domestic manufacturing. Examples of vulnerabilities that have developed for Indian industries, when longer term consequences of policies have not been foreseen, are the virtual disappearance of production of intermediaries for generic drugs which China is now dominating, and also the dwindling of Indian capital goods industries, where too Chinese industry is becoming a bog international supplier. Chinese industrial policy has evidently done far better than India’s in building depth in China’s industries.

5.2 Human resource development

5.2.1 Introduction

To exploit its demographic dividend, India must generate jobs to satisfy nearly 250 million additional income seekers that are expected to join the workforce in the next 15 years. A significant portion of these jobs will need to come from the manufacturing sector. In order to ensure that these jobs also lead to the targeted growth of the sector’s contribution to GDP, human resource productivity will
need to increase as well. Therefore, issues related to job creation and productivity of human resources are extremely important in the larger context of the manufacturing sector and the economic growth of the country.

One of the primary objectives of the plan is to increase the competitiveness of Indian manufacturing. Human resources are of critical importance for the growth of knowledge and technology, value addition, and improvement of competitiveness in manufacturing through processes of continuous improvement. In fact, the human resource is the only ‘appreciating resource’ in a manufacturing system. It is the only resource that has the motivation and ability to increase its value if suitable conditions are provided, whereas all other resources—machines, building, materials, etc.—depreciate in value with time. The best enterprises view their people as their prime asset and the source of their competitive advantage.

In this forward thinking approach, people are not considered as merely labour—an input like other inputs to be switched on and off in sync with production demand. Nations that have achieved sustainable competitiveness in manufacturing even when they do not have raw materials required, such as Germany, Japan and South Korea, have created systems for the continuous improvement of the capabilities of their human resources.

India must invest in and build its human resource capabilities to catch up with other countries that have moved ahead and thereafter sustain competitive advantages in manufacturing. Indeed the contentious debate of ‘labour’ versus ‘capital’ in the enterprise, as well as disputes between the institutions that represent the people working in the enterprise and owners of the capital, could be reframed if employees were seen as assets, with value that can appreciate, rather than as labour costs.

The issues related to ‘labour’ have been considered in various forums and by different groups during the past few decades. The first and the second National Commission on Labour, the Prime Minister’s Council on Trade and Industry, the National Strategy for Manufacturing by NMCC, the National Manufacturing Policy, etc. all enumerate the challenges faced by the manufacturing sector related to labour and have also recommended solutions.
The purpose of this section is not to re-tread the same ground, but to propose a set of holistic changes in key areas that require close involvement and buy-in from various stakeholders. Consensus about these holistic changes is more likely to be achieved if, as mentioned before, the primary challenge was reframed as the development of human assets to build India’s manufacturing ecosystem and strengthen India’s manufacturing enterprises, rather than merely management of costs of labour.

The latter, narrow and short-term perspective would suggest that a primary requirement to improve the competitiveness of Indian manufacturing is to provide capital providers with ‘the flexibility to hire and fire’ labour. Whereas the perspective that will grow the strength of India’s human resources along with continuous improvement in the competitiveness of its manufacturing sector would give primacy at the national as well as enterprise level to:

- good industrial relations
- systems for continuous skill upgradation
- retention of talent and skills

All these would help foster collaboration, rather than disruptive contention, between managers and employees (and their representative unions) to improve productivity of employees and enterprises.

5.2.2 **Key objectives**

The key objectives for the manufacturing workforce in India are:

- Creating 100 Million additional good quality jobs by 2025
- Developing skilled workers to meet the requirements of these jobs
- Ensuring social protection for low income workforce

5.2.3 **Status and key challenges**
In India, the manufacturing sector employed approximately ~58 million people or just about ~12% of the workforce in 2008\(^1\). This share is low compared not only to other developing countries, but even with more developed economies where there is a higher demand for services.

By 2025, an additional ~100 million people are expected to join the workforce if the manufacturing GDP grows at the desired 12-13%. A large proportion of these employees should have access to social security benefits and they should be equipped for and incentivized to be more productive than the current workforce.

The high degree of informality in the workforce is a matter of great concern as well. Registered companies (also known as ‘formal’ sector) employ both formal and informal workers. According to the NCEUS, the formal sector had 8.76 Million formal workers and 16.71 Million informal workers in 2009. The rest, approximately 32 Million workers, belonged to unregistered units.

Given the current status of employment, skill development and social protection, it is clear that significant changes are necessary to meet the ambitious objectives. Currently, when most firms see the low cost of human resources as a source of competitive advantage (albeit transitory), they understandably focus on minimizing labour costs rather than adding value to their human assets. If firms continue to look at reducing the cost of their workforce, they are less likely to invest significantly in training and skill-building. This is one reason why employment has not grown even as firms have become more competitive. Also, given the current state of labour laws, ‘informalization’ and ‘casualization’ of the workforce may continue.

Challenges in meeting the objectives lie broadly in three areas:

- From a skill development perspective, there is a significant gap between the existing training capacity and people entering the workforce. A very small proportion of total manufacturing workforce is currently skilled. Moreover, less than 25% of the total number of graduates are estimated to be employable\(^2\) in manufacturing. The total training capacity in the country is about

\[^1\text{CSO Data}\]
\[^2\text{According to NASSCOM –f or all graduates (not only related to manufacturing)}\]
4.3 million for all sectors including manufacturing. The Apprentice Training Scheme (ATS), which is supposed to provide a bridge from education to employment, has very low penetration and is suffering from significant administrative issues.

- For entrepreneurs and other employers, the perceived (or real) lack of flexibility of changing the size and nature of the workforce can act as a retardant in making investments that could lead to greater employment opportunities. Also, the complexity of labour laws and the administrative mechanism of the laws make it harder to do business in the country.

- By 2025, an additional 8 million management workers (supervisors and above) are estimated to be required. Well trained management/supervisory staff are critical for improving the productivity and industrial relations in large as well as small manufacturing enterprises. Due to poor quality of educational institutes, brain drain and the relative unattractiveness of manufacturing for potential managerial workers, only a small portion of the graduates from engineering and management institutes are joining the manufacturing sector. Therefore there will be a significant gap between demand and supply of management staff for manufacturing.

5.2.4 **Strategy and key recommendations**

For the manufacturing sector to meet its objectives of competitiveness along with employment growth, strategies of firm must change. Human resources should be managed as a source of sustainable competitive advantage. Government policy changes should induce and support such firm level strategies. Currently only a small percentage of the total workforce is in the formal sector. However, as a larger proportion of the workforce formalizes, as they must if we want to meet our objectives of social protection, unions will become an even more important stakeholder.

Therefore the key stakeholders who will need to work together to make the necessary changes to the system in key areas mentioned above are: Government (at the Centre and State level), Industrial organizations and the unions.

The strategies for meeting the objectives are in the following categories:

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3 Aon Hewitt Survey
• Inducing job creation by reducing the cost of generating employment
• Developing a supply of qualified human resources to meet the demand from additional job creation
• Enhancing skill levels of current workforce to improve productivity
• Improving the state of manufacturing management in the country
• Providing social protection to low income workforce
• Improving Industry-workforce relationships

5.2.4.1 Inducing job creation by reducing the cost of generating employment

There are two major barriers to employment generation: limited flexibility in managing the workforce and cost of complying with labour regulations. Both these barriers must be removed in order for jobs to be created at a much faster rate.

i. Limited flexibility in managing the workforce: Flexibility to manage the number of jobs in the enterprise is regulated by the Industrial Disputes Act which defines when and how employers can retrench employees while employee benefits are regulated by the Minimum Wage Act which defines the lowest wage that can be paid for various services. Management of flexibility is impacted by collective bargaining institutions as well, as it should be.

The recommendations to increase the level of flexibility while ensuring fairness are:

• Companies should be allowed to retrench employees (except categories such as ‘protected workmen’, etc.) as long as a fair severance benefit is paid to retrenched employees. This severance benefit should be higher than what is currently mandated – this is to make sure that the policy is fair to retrenched employees and that retrenchment is not a knee-jerk response from employers – and the value should be arrived at through tripartite dialogue between government, employers’ associations and employees’ associations.

• In order to ensure that there is sufficient liquidity to pay the severance benefit to the retrenched employees, a mandatory loss-of-job insurance program could be put in place. This will especially
be useful in situations where the retrenchment is due to bankruptcy or exit of the employer and will reduce the justification for requiring prior permission to shut down businesses.

• The threshold level of employment for the Chapter VB of the Industrial Disputes Act and the threshold for applicability of the Factories Act should be reconsidered.

• The process of engaging contract labour should be reformed – employers should be allowed freer use of contract labour while ensuring that the rights of contract workers are protected, which is not the case at present.

ii. Cost of complying with labour regulations: The traditional enforcement approach which is based on inspection-prosecution-conviction creates incentives for rent-seeking behaviour, especially if the laws are complex or have provisions that are contradictory. The complexity of compliance impacts smaller enterprises much more. They cannot bear the high administrative costs.

Recommendations to improve compliance and also contain the cost of complying with labour regulations are:

• Simplification of labour laws: The implications of labour laws should be detailed through a series of ready reckoners that are easily available and regularly updated so that inspectors and employers have a common set of rules to look at.

• Improvement of administration: Higher investment should be made in the training of inspectors to ensure that they are able to efficiently identify incidences of actual non-compliance rather than harass employers.

• Facilitating easier filing: Filing of reports should be made a once a year activity with an online option. As far as possible, the interface between enterprises and government should be computerized to increase transparency and efficiency and remove scope for rent seeking.
- Developing a self-certification model: While ensuring that regulations governing labour welfare must be complied with, a self certification model should be developed where appropriate.

- Additionally, fiscal incentives to encourage permanent job creation should also be considered, after evaluating their implications and potential impact.

5.2.4.2 Developing a supply of qualified human resources to meet demand from additional job creation

As the manufacturing sector GDP grows and disincentives for job creation are removed, demand for human resources will increase significantly and therefore shortages of employable human resources will be exacerbated. The manufacturing sector may need more than 90 Million people by 2022. This is an opportunity to ensure that a higher number of people are qualified to join the organized sector rather than being compelled to remain as unorganized workforce. However, the current capacity for skill development is ill-equipped to meet this demand. The capacity of the country’s skill development infrastructure must be substantially increased and the quality of existing institutions involved in skill development has to significantly improve.

Role of industry: To ensure that the right kinds of skills are developed, industry must be involved in defining what is required. To enable the industry to play its role in defining the requirement of manpower both in terms of quality and quantity, Sector Skills Councils envisaged in the National Skills Policy are being set up. These councils will identify skill development needs in their sector, evaluate the gaps, create plans for skill development, and improve the quality of the training system. The councils are also expected to establish sector specific Labour Market Information Systems (LMIS) to assist in planning and delivery of training.

Private sector participation in skill development: For the private sector to play a role in augmenting the skill-development capacity in the country, effective PPP models are needed. Existing ITIs should be clustered together in projects with total training capacity of at least 100,000 each to allow private sector service providers to leverage scale benefits leading to long term financial sustainability. For inducing the private sector to participate in creation of additional capacity, scalable and sustainable
business models with direct linkages to employment should be deployed. The NSDC has created such models. They should be implemented across 20-30 projects specific to Manufacturing in partnership with industry associations and from funding through NSDF.

**Improving ITIs:** The quality of the existing ITIs is seen as inadequate for the needs of industry. In addition to inducing private sector involvement in upgrading the quality of infrastructure in existing ITIs, the Department of Industrial Training should regularly monitor the performance of ITIs and their students either directly or through a monitoring agency. The faculty and staff as well as curriculum and content should be improved with industry involvement through sector skills councils.

**Attracting students:** In addition to improving the quality and the quantity of the skill development ecosystem in the country, it is also important to induce students to use this ecosystem to develop vocational skills. An unsecured loan scheme should be created for those who aspire to undertake vocational training. As a long term strategy, it is important to make acquisition and improvement of skills an aspiration for people, especially youth. This could be achieved by recognising high skill persons at the national and state levels along with recognition of other worthy citizens. Large enterprises could also provide special incentives and recognition for acquisition of high skills.

**Overall coordination:** A number of initiatives have already been taken by various Government ministries to tackle issues related to skill development both at the central and the state level. Coordination between these initiatives should be improved. The role and performance of the National Skill Development Coordination Board should be assessed. To ensure that skill development activities are aimed towards areas of maximum impact, it is important to put in place an information system that provides data on availability and requirement of skilled resources.

**5.2.4.3 Enhancing skill levels of current workforce to improve productivity**

Training and skill-building of the existing workforce is an important element of the strategy for increasing productivity of manufacturing in India. Training of employees can be incentivized by allowing tax deductions for expenditure incurred on training. Currently, skill building is predominantly
achieved by in-house training of workers by each enterprise. However, clusters and NIMZs provide opportunities for shared infrastructure to provide training for skilled and semi-skilled workers.

A number of existing initiatives are focused on setting up tool rooms which are necessary for SMEs. These tool rooms can be made more effective by periodic performance audits by independent agencies and also by operating them on a PPP model in collaboration with Industry Associations. Just as tax incentives are provided for investments in critically required infrastructure assets, fiscal measures including tax benefits on training expenditure may also be considered for investment in critical human assets.

Apprenticeships can be an effective way of ensuring that entry level workers have the skills required to join the formal workforce. However, the current apprenticeship model needs to be reformed:

- Simplifying workflow for engagement of apprentices by employers, inclusion of new trades, and recording compliance through e-filing
- Removing NOC requirement for out-of-region candidates
- Revising current levels of stipend
- Equating stipend reimbursement regime with MHRD
- Allow apprenticeship capacity flexibility to a maximum of 1:1 ratio between apprentices and full time employees
- Make all graduates eligible for apprenticeships
- Reduce minimum course duration to 3 months and converge with MES
- Review penal provisions of imprisonment
- Allow outsourcing of classroom training
- Set up information and matching infrastructure for employers and candidates
- Introduce recognition programs for employers
- Allow for 150% income tax deduction of Apprentices stipend paid by employers
- Revamp outdated curriculum; Converge with MES

These changes will require changes in the Apprenticeship Act and may take time. In the mean time, a new model of in-company training should be deployed. In this model, companies should be allowed
to take trainees for a period of up to 6 months. Such traineeships should not be covered under the Apprenticeship Act and neither should the trainees be deemed workmen. The sector skill councils should lay down the guidelines for such programs and ensure that they are not misused by employers. Such models can ensure that new entrants develop the skills required to be a productive part of the manufacturing workforce.

5.2.4.4 Improving the state of manufacturing management in the country

There were a total of approximately 5 million managers in the manufacturing sector in 2008. If the manufacturing sector grows at the targeted 12-13%, 8 Million more managers will be needed by 2025. Well trained managers are extremely important for improving the productivity of manufacturing enterprises and maintaining harmonious industrial relations. They form the backbone and provide the glue in a manufacturing enterprise.

Currently, only a very small portion of graduates from engineering and management institutes take up careers in manufacturing. Consequently there is a significant gap between supply and demand. Recommendations to improve the quantity and the quality of management in the manufacturing sector are:

- Increase collaboration between manufacturing companies and engineering/management institutes for joint projects in which staff and students of the institutes can get some hands-on experience
- Encourage enterprises (especially larger ones) to run good graduate engineering programs which can be a source of management talent for themselves as well as the manufacturing sector generally.
- Scale up programs such as Visionary Leadership for Manufacturing (VLFM) at the national level. The VLFM program is currently being implemented under an agreement signed by the Prime Ministers of India and Japan in December 2006 through a partnership between NMCC, Ministry of Human Resources Development, CII, Japan International Co-operation Agency, IITs Kanpur and Madras and IIM Calcutta.
• Set up centres of excellence for manufacturing management through MoUs between institutes, government bodies and industry partners. Business schools that focus only on manufacturing management should also be encouraged.
• Create a PPP model for engineering and management colleges with partnership with industry associations and employers with focus on manufacturing management
• Launch a campaign focused on attracting management talent to the manufacturing sector
• A large source of potential managerial/supervisory staff is the current workforce. Support should be provided to enable deserving members of the workforce to be promoted to management positions.

Recent reviews with many sectors of industry reveal a crying need for better supervisors and foremen—the first and second levels of supervision—who are the backbone of productive and harmonious manufacturing enterprises. Development of supervisors and foremen, through suitable programs, collaboratively designed and managed by industry and educational and training institutions must be ensured along with the emphasis on development of skilled workmen and good managers.

5.2.4.5 Providing social protection to low income workforce

Formal sector workers can leverage collective bargaining to obtain social security; however the informal workforce is dependent on government actions to improve social protection for them. A number of social security schemes have been launched in the recent past. However the existing coverage represents a very low percentage of the total number of workers in the manufacturing sector. For example, the New Pension Scheme (NPS) that was launched in May 2009 to increase pension coverage, particularly to the informal sector, has less than 200,000 voluntary subscribers – this is far less than the total intended coverage for such a scheme. Limited access to social security is exacerbated for those with low or uncertain incomes.

**Unemployment benefits:** Low income workers in transitional phases of unemployment are particularly vulnerable as they are unlikely to have significant savings. To help overcome the problems associated with social protection for temporarily unemployed workers, which include contract workers at the end of their contracts, a solution could be for these workers to be part of a ‘sump’ as
permanent employees of contract agencies that are provided with government support to ensure skill upgradation of these workers. The focus should be on creating a pool of workers who can be available to employers and ensuring that those that are unemployed have avenues for training as well as financial assistance. For example, the Automotive Mission Plan has recommended the formation of a Supplementary Unemployment Benefits fund to be created by automotive companies for providing compensation to laid-off workers. Such funds in other sectors too can be utilized to finance the creations and sustenance of the ‘sumps’ that could be the ‘win-win’ solution out of the ‘fairness-flexibility’ dilemma.

**Increasing penetration of existing schemes:** To ensure that existing schemes reach the entire workforce, it is important to increase awareness of these schemes through communication programs. The distribution channels for these schemes should be evaluated and measured regularly and private sector participation should be encouraged too. Financial literacy of the workers in the informal sector should also be improved so that they make better informed decisions about participating in social security schemes.

5.2.4.6 **Improving Industry Workforce Relationships**

Strong and effective industry relations can enable managements of enterprises and their workers to collaborate in increasing the productivity and competitiveness of the manufacturing sector. Collective bargaining is a cornerstone of the relationship between enterprise owners and managers and the majority of human resources of enterprises. The legal set up in India provides strong protection to collective bargaining. Unions have a critical role to play in ensuring inclusive growth of the manufacturing sector especially by working towards social protection for the workforce. They can also play valuable roles in other areas such as skill development. The National Skill Development Policy has recommended that trade unions contribute in areas such as developing competency standards, course design, improving awareness of and promoting participation in skill development among the workforce. To ensure that unions can play a broader and more effective role, it is important to invest in capacity development of unions through training of their leadership.
The multiplicity of unions in the same enterprise for the same type of workers can lead to inter union rivalries and can weaken collective bargaining. Therefore legislation that enables one union per enterprise is strongly recommended. The union leadership should also be held accountable for any illegal behaviour by union members during negotiations. The practice of withholding recognition of unions should be discouraged. Strong gain-sharing systems can help to improve productivity.

The government has a crucial role in enabling good industrial relations by providing platforms for the industry and the workforce to participate in policy development and implementation. The government’s role in such platforms should be that of an impartial facilitator focused on creating consensus amongst employers and employees around solutions. In especially contentious areas such as changes in labour laws, the government should enable the development of consensus positions between the various interested parties. The ‘backbone organization’ described in the Way Forward chapter should have the capabilities to effectively assist in such a process of consensus creation.

5.3 Business regulatory framework

5.3.1 Introduction

Business plays an important role in the economic growth and development of any country. It deploys capital, engages labour, produces goods and generates profit that is re-invested for further expansion at domestic and international fronts. Across the world, the inter-linkages among business regulations, business procedures, market returns, growth and development have been well established. The countries that have performed better than the others in terms of thriving business have, to a great extent, done so on account of the quality of business regulatory environment that they have been able to maintain.

5.3.2 Key objectives

Considering the importance of a supportive business regulatory framework, the key objectives of streamlining the regulatory framework in country are:

- Reducing compliance cost for businesses in India
- Simplifying the existing regulatory system
5.3.3 **Status and key challenges**

- **Weak institutional architecture for business regulations in the country**
  - Despite that high priority of the business regulatory reform agenda in the country, there is no dedicated authority that can guide the whole process of reform in a structured, planned, cogent and systematic manner, which could mandate the respective departments of the Union, State and Local governments to comply in a timely, result oriented and predictable way.

- **Ambiguous nature and vast scope of business regulations**
  - There are vast numbers of business regulations at different levels of government are in existence in the country.
  - There are instances of contradictory as well as overlapping business regulations on account of these being administered by the different tiers as well as layers of government.

- **Absence of national repository of business regulations**
  - Despite the advancements in Information and Communication Technology (ICT) and its ever-growing applications and usage, there is no dedicated online repository to track all the business regulations and procedures.

- **Lack of coherence in business regulatory governance across country**
  - Business facilitation is very much in the agenda at the national as well as state levels. But there is lack of coherence in all such efforts. There are wide variations in government-business transactions taking place in different locations of the country. It has also been found that there is a lack of predictability and standardization in terms of timelines as well as process adopted by different state governments when it comes to facilitating business.

- **Lack of defined mechanism for consultation between government and industry**
- The interface between government and the industry is also not well defined. There are definitely periodic consultations among various industry collectives and specific government departments located at different levels, but such consultations are not structured enough to be guided by a well-defined and outcome-oriented process.

• Inherent limitations of regulatory system in country
  - Lack of periodic review clauses in regulations
  - Lack of Regulatory Impact Analysis (RIA)
  - Lack of sunset clause in regulations

• There have been recommendations for regulatory reforms earlier as well, but due to absence of any one dedicated agency accountable for the reforms, they could not be implemented.

These are some of the key challenges that have contributed towards India's low ranking in terms of ease of doing business in country.

5.3.4 Strategy and key recommendations

Follow-up over previous administrative and regulatory reform endeavours

Lack of implementation of earlier recommendations on regulatory reforms has contributed to the current situation of business regulatory framework in country. All these recommendations need to be reviewed and a repository of all these documents needs to be created. After this an enquiry can be taken up to check the extent to which these recommendations have been implemented or are pending by the public authority or department.

There is a need for a process for responding to the existing recommendations. In such a system once a certain expert group or commission of enquiry has submitted its report, the respective departments are required to prepare a response. That response is put up in the public domain along with the original recommendations. It makes easier for various stakeholders to understand the extent to which the recommendations have been accepted along with the reasons for non-acceptance, if any.
Establishing enabling institutional architecture

• Formulating national policy on business development and regulation
  - The policy should also provide the principles of optimal business regulatory governance. It is
    recognised that there will be a special role of the Prime Minister and Chief Ministers in the
    aforementioned policy making process because in the final analysis, the actual adoption of
    the policy will entirely be dependent on the political leadership.

• Drafting and enacting "National Business Development and Regulation Bill"

• Building institutional architecture for looking after the business regulatory reforms in the country
  - A dedicated institution can be set up for this purpose. The institution should be set up at the
    national level as well as at state level.

• Enabling institutional architecture for ensuring competitiveness in manufacturing. The same is
  required in both, central as well as state level.
  - At the central level the National Manufacturing Competitiveness Council (NMCC) has been
    entrusted with this responsibility
  - Similar institutions may be set up at state level; to be called State Council on Manufacturing
    Competitiveness and Competition Reforms

• In June 2011, the Ministry of Corporate Affairs has set up a Committee to draft National
  Competition Policy (NCP). Once this policy is formulated, further steps are required:
  - Building consensus on the policy
  - Creating institutional framework for operationalising the policy
  - Creating incentive and disincentive mechanisms for States to implement NCP

• Operationalisation of National Manufacturing Policy and development of state manufacturing
  plans in line with National Manufacturing Plan.
Systematization of business regulatory governance

- Mapping and classification of all existing business regulations and procedures and providing an online one stop shop – "National Business Facilitation Grid" for all information related to business regulations and procedures in India. Design principles of this online portal can be finalized through a consultative process.

- Setting up and operationalization of single window system across country. Common Minimum Standards should be prescribed that all SWS should adhere to. These common minimum standards again can be established through a consultative process.

Adopting Regulatory Impact Assessment (RIA)

- Tool of RIA should be developed for Indian context through a consultative process and due research reflecting upon global experiences with its adoption and usage
  - Following eight elements should necessarily be a part of RIA tool for Indian context: policy coherence; cost of doing business; competition; innovation; SMEs; consumers; labour; environment and commons.

- Process of doing RIA should involve a wide stakeholder consultation.

- RIA has to be mandated in the country in ex ante as well as ex post manner

- Union Ministry of Finance and State Ministries of Finance can possibly take the responsibility for developing these tools for RIA.

Improving administration at central and state level

- Recognizing the wide variations with business procedures at the country level, it is recommended to benchmark the execution timelines and processes that are undertaken by different government entities to facilitate business requirements.
• Business Facilitation Officers (BFO) can be designated as focal points for the businesses in particular departments
  - BFOs will be held accountable for the cases of defaults and deviations that are making transactions burdensome, thereby causing inconvenience to businesses

**Making businesses more responsible towards society**

• Considering the importance of the subject, "Business Responsibility" should be included as a separate subject under the Government of India (Allocation of Business) Rules 1961, and Ministry of Corporate Affairs can be entrusted with the responsibility of carrying out these activities.

• Redefining the contract of business and society and developing new rules of the game for corporate conduct
  - Needs to be done through a widespread consultative process

• Stronger role of business associations in responsible business
  - Business associations should be strengthened to develop and impose rules of conduct on their own members
  - Business Associations should be entrusted with the responsibility of overseeing the compliance to rules of corporate conduct
  - Such associations should provide their members a process for debating and agreeing on voluntary imposed norms, assistance to members to develop capabilities to conform to these norms and, very necessarily for such associations to be trusted as effective institutions for self-governance, internal governance that disciplines errant members.

• Disclosures on the adoption of ‘National Voluntary Guidelines on Social, Environmental and Economic Responsibilities on Business’ (NVG) principles should be made mandatory for businesses. The guidelines would continue to remain voluntary and businesses would have the freedom to adopt them at their own pace. The disclosure framework should be freely up-loadable on the MCA portal (simple, electronically enabled form on the MCA-21). All such reports should furthermore, be available in the public domain.
• Adoption of NVG principles can be made mandatory for all Public Private Partnership projects. This will help in mainstreaming these principles.

• Establishing the required institutional architecture for facilitating adoption of NVG principles.

**Developing an ongoing process of stakeholder consultation**

For achieving the objectives of a stakeholder consultation, it is imperative to have capacity building both ends: at the government side as well as at the industries. A process of productive consultations, and the roles of representative institutions of employers and unions in these consultations, in improving the productivity of the country’s manufacturing eco-system, and its sustainable competitiveness, cannot be over-emphasised. The competitiveness of German and Japanese manufacturing industries, in spite of high wage costs and expensive currencies, in contrast to the relative decline of US and UK manufacturing industries, is attributed to the better collaborative processes in the former countries. The following actions must be taken to achieve this objective:

• Passing a legislation mandating stakeholder consultation and also defining the process that needs to be followed.

• Measures to strengthen Industry Associations and their structure to enable them to convey the view of industry in a constructive manner.

• Similar capacity building for stakeholders, such as labour unions.

**Developing a Business Regulatory Governance Catalogue** to choose appropriate regulatory alternatives among Self-Regulation, Co-Regulation and Public Regulation

• Currently no structured modality of exploring various alternatives for achieving regulatory objectives.
Detailed analysis should be undertaken to determine which alternatives to regulations are feasible as well as beneficial for Indian context.

Such catalogue will serve as a ready reference One-Stop-Shop for the policy makers as well as the business community while arriving at the choice of appropriate mode of regulation.

**Capacity building for carrying out regulatory reforms**

Since carrying out the aforementioned regulatory reforms requires a tremendous effort, capacity needs to be built in order to implement them. The capacity building framework needs to incorporate the following:

- Developing resources such as modules, guidelines, methodologies, reference manuals, checklists, case studies etc. as reference material for regulators
  - These resources should also be available through an online knowledge portal
- Training programmes for regulators need to be arranged.

5.4 **Ensuring environmental sustainability with industrial growth**

5.4.1 **Introduction**

The rise in growth in the resource intensive Manufacturing sector is enabled and facilitated by an ever-increasing rate of material use leading to manifold impacts to the environment.. The contribution of the manufacturing sector to environmental degradation primarily occurs during the following stages (Figure 11):

- Procurement and use of natural resources
- Industrial processes and activities
- Product use and disposal

The air, water and land are affected through the environmental impacts created through the operations of manufacturing units.
5.4.2 **Key objectives**

Rapid Ecologically Sustainable Industrial Growth with focus on

- Mainstreaming and promoting green business: An environment has to be created wherein being Green is not viewed as just an obligatory expectation of a company, but as an area of primary focus for the company to develop further and be recognised as a leader.

- Protecting natural resources: natural resources have to be prolonged to their fullest use to maintain the aim for continual economic growth and lessen environmental impacts.

- Addressing funding issues: which act as a constraint for movement towards a more sustainable industrial model

![Diagram: Contribution of various stages of manufacturing to environmental degradation](image)

*Figure 11 - Environmental impact of manufacturing*

5.4.3 **Status and key challenges**

The Central Pollution Control Board has identified 17 highly polluting industries, the majority of which are manufacturing industries. MSMEs, in particular, can have a significant impact on the environment
as they are generally liable to be equipped with obsolete, inefficient and polluting technologies and processes. 70% of the total industrial pollution load of India is attributed to MSMEs. New technologies leading to cleaner processes and operations are not being developed at a fast enough pace to address the urgent need for environmental protection.

The current ecosystem does not encourage and facilitate the mainstreaming and scaling up of new technologies for widespread use mainly due to a lack of financial support, resources and government assistance.

The waste management and recycling industry in India is currently vast but largely unorganized. In this space, it is necessary to mainstream the industry and ensure that the livelihoods of all people dependant on this industry are supported and upgraded.

5.4.4 **Strategy and key recommendations**

**Organized waste management and recycling**

- Development of a National Waste Management and Recycling programme
  - This is an overarching framework to create and mainstream the organized waste management and recycling industry
  - Structured frameworks and guidelines for recycling industry to be developed to integrate it with the existing waste management rules & guidelines
  - Development of industry and sector specific recycling standards

- Promotion of PPP model for waste management and recycling
  - Establish facilities for reuse, recycling and reprocessing of wastes from various sectors should be encouraged by providing incentives and ensuring the process for setting up PPP facilities

- R&D funding
  - Promoting new technologies and processes for waste management and recycling
  - This should be aligned with the overall Technology Fund as discussed earlier
• Building institutional capacity
  - Local institutional bodies must have their capacity built on recycling and waste management

Creation of a Green technology fund

• For usage in 3 key areas: technology up-gradation, promotion of green entrepreneurs, and funding for R&D

• This could be disbursed in the form of concessional loans, grants, etc

• This fund should be a part of the overall technology fund proposed for improving depth in manufacturing, and must ensure focus on commercialization of new technology areas

Promotion of green products

• Development of a framework & guidelines for promotion of Green products
  - Definition of the specifications
  - Creation of / assignment of a new / existing entity to perform this task on a regular basis
  - Identification of top 100 green products (based on assessment of maximum environmental impact) and setting of standards for the same

• Promoting green public procurement through price incentives on government tenders
• Encourage and develop voluntary rating programmes

• Creation of centres of excellence to promote green products and processes

• Incentive programmes for creation of Life Cycle Inventories

• Incentives for export of green products
Environmental Regulatory Reforms and Market Based Instruments

- Strengthening regulatory institutions together with bringing institutional reforms
  - Moving towards load based standards from concentration based regime
  - Implementing polluters-pay principle, with specific pollution loads beyond a defined benchmark should be priced and paid for by industry

- Reforming the existing environmental clearance process
  - Institutionalize the concept of cumulative impact assessment of the region
  - Introducing technology assessment while appraising new projects
  - Process for administering the clearances needs to be streamlined – should include considerations of decentralization, requirements and tenure of clearances

- Establishing integrated chemical management policy and regulatory regime
  - Set up a regulatory process to assess all chemicals, register and phase-out toxic chemical products and replace them with non-toxic/less-toxic substitutes

- Market Based Instruments and Emission Trading
  - Initial pilot Emissions Trading System to limit particulate matter emissions

Scale up the emissions market to address additional pollution problems at the state and national levels

Monitoring technology for all types of pollutants be made as affordable as possible for industry; waiving of applicable taxes and excise duties, as well as direct subsidies to monitoring technology wherever their installation is mandated by the state pollution boards

Sustainable Environment Management in MSMEs

- Reconstitution of Regulatory Bodies
  - Inclusion of stakeholders / associations
- Sector wise product sub-groups need to be formed as part of PCBs
- Grievance Redressal Mechanism should be established at each PCB

- Creation of common infrastructure for MSMEs in clusters
  - Central Grant Scheme for soft infrastructure, unit level technology up-gradation assistance, portion of project cost for Common Effluent Treatment Plants
  - State Grant Scheme with provision for arranging land for CETPs, time bound speedy legal clearances, provision for equity participation in SPVs by SPCBs/ State agencies

Disclosure on Performance

- Short term action to increase voluntary disclosure of environmental sustainability performance
  - Development of reporting standard based on several existing sustainability reporting initiatives
  - Incentives for voluntary disclosure

- Long term steps to compare environmental sustainability performance of organizations with industry specific benchmarks
  - Development of Environment Sustainability Benchmark Index, esp. for identified highly polluting sectors

5.5 Water issues

5.5.1 Introduction

While India has abundant natural precipitation of ~4000 BCM (Billion Cubic Meter), the utilizable water resources of the country have been assessed at ~1123 BCM, of which 690 BCM is from surface water and 433 BCM from ground water sources. With its increasing population, India is moving towards perennial water shortages. The current per-capita water availability is estimated at around 1720.29 m3 per capita according to data from the Central Water Commission.
Water demand is projected to increase by ~22% by 2025 to ~833 BCM, with ~11% of this demand coming from Industry.

5.5.2 Key objectives

- Improve the governance and management of water in order to ensure availability of water for all purposes

- Improve the management of water by industry, in particular in terms of utilization and pollution

5.5.3 Status and key challenges

- Inadequate storage capacity
  - Despite the high amount of rainfall, the utilizable water resources are limited. This is due to natural factors like lower storage in river basins, coupled with temporally concentrated water availability.
  - Per-capita storage in the country is only ~210 m³ which is much behind other countries

- Governance deficit and fragmented institutional framework
  - Water is a state subject with the union coming in only for inter-state river waters
  - Need to pursue integrated water resource planning with an emphasis on convergence of the various water programs
  - Multiple information portals run by various agencies of government that focus on different aspects of water resources
  - Weak water pricing regime

- Inadequate water management by and for industry
  - Current water utilization by Industry is ~40 BCM (~10 BCM as process water & ~30 BCM as cooling water)
- Water intensity high as compared to global benchmarks – to the extent of ~30-50%
- Recycling water in industry is not common and its proliferating is not happening in a substantial scale as required in the present scenario

5.5.4 **Strategy and key recommendations**

Strategy for water based on improving the overall water management, as well as specific measures to ensure availability and efficient utilization of water by industry.

**Managing overall water resources**

- **Transfer of water into concurrent list**
  - While ensuring that this does not lead to centralization
  - The union should also exercise the existing legislative powers under Union list and River Boards Act

- **Creation of an overarching "Water Act"**
  - Different parts of the water value chain handled by different Acts
  - Common framework would lead to greater clarity on water rights, regulation, protection of water resources, better dispute resolution, etc

- **Establish National Water regulator**
  - To lay down rules and methods for State regulators
  - To create overarching legal and regulatory framework for water management
  - Build collaborative framework / platform for river basin management, etc

- **Creation of River Basin Organisation (RBOs) mandated and empowered for Integrated Water Resource Management**
  - Currently RBOs have limited participation of stakeholders

- **Establish National Water Registry and Information System**
  - Integrate various existing information systems
  - Offer a platform for interactive and participatory management
  - Transactional layer for implementation of policies by member organizations
  - Aggregator and integrator of information available with various agencies of the government. This would play a major role in strategic planning of IWRM, and offer a robust implementation vehicle for policies at multiple (National, State and Local) levels
• Establish Bureau of Water Efficiency
  - Review interventions for reducing water intensity in agriculture, industry and domestic segments
  - Identify the water usage across industry, agriculture, domestic and municipality and develop tools to optimize the same in a time bound manner

**Water management in Industry**

• Create Equity and Efficiency based Water Pricing Regime for Industries
  - Overcome lack of a clear policy framework based on cost recovery principles
    • Current pricing regime is undervalued for all users
    • This would overcome wide variations in tariff structure due to current determination by various States
    • All Indian cities currently operate a mix of measured/metered or unmeasured / unmetered tariffs
  - Potentially 2 different pricing regimes in 2-tier tariff system / IBT tariff system

• Enforce "Water returns"
  - Annual return to be filed by water users on similar lines of tax returns – should include key measures like water utilization per unit produce, effluent discharge details, rain water harvested, water reuse details, fresh water consumption, etc
  - Mandatory for major water using industries and businesses

• Promote Reuse and Recycle of Wastewater in Industry
  - Regulations and incentives through National Water Regulator and the National Bureau for Water Efficiency and a system of water returns
    • Industry specific standards introduced through National Bureau for Water Efficiency
  - Promoting rain water harvesting in industry both within and beyond the fence through incentives and regulation
5.6 Land issues

5.6.1 Introduction

Among all the traditional factors of production for any economic activity, land being natural, immovable & non-renewable, is a distinct resource. It needs to be looked at from Industry's perspective as a tangible resource with supply and demand issues and the linkage in the form of land acquisition for industrial demand.

Land in India has a special significance because it carries a huge tangible and emotional value for owners and also for those whose livelihoods depend on it. This makes it very important to consider the land acquisition process in a critical manner.

5.6.2 Key objectives

The key objectives with regard to solving the various issues and challenges related to land pertain to:

- Improving the management of land as an asset in India
- Setting up a more transparent, fair and efficient process of land acquisition for industry development

By achieving these key objectives, we would be able to ensure a more productive utilization of land, and in particular, be able to spur industrial development, which has in many instances been hindered as a result of poor land management and land acquisition processes.

5.6.3 Status and key challenges

India has sufficient land for all uses – agriculture, industry, human dwelling, infrastructure and other uses – as long as it is used with prudence and productivity. Currently industry utilizes only about 2-4% of all land in India. Even at heightened industrial activity in the future, it is expected that there would be sufficient land for all users, including industry. However, there are some critical issues that need
resolution in order for land to become a well-managed resource, especially from the point of view of Industry.

Land is inherently an imperfect market, because land is an immobile asset. Hence, no two pieces of land are alike, and can be differentiated. This gives rise to a monopolistic power with the landowners. Furthermore, the value of a piece of land effectively changes when we change its usage and due to development of surrounding areas. In addition, the owner is often emotionally attached to his land. In India, land is considered a very important asset from an emotional perspective.

A major characteristic of land ownership in India is that the land holdings are typically small. Typical industrial usage requires development of large tracts of land. Consequently, industrial development has as a prerequisite need to acquire land from a large number of owners in order to develop a contiguous piece of land for industrial use.

Another problem in the land market is the incomplete, outdated, and inaccurate land records, which give rise to disputes and litigation. Since industrial projects require large amounts of land and land holding in India is fragmented, industrialists have to deal with a large number of landowners and consequently face substantial risk of litigation.

In addition, there are some restrictions on usage of agricultural land for non-agricultural purposes. Non-Agricultural Use Clearance (NAC) from the local / state government is necessary before agricultural land can be considered for other uses.

5.6.4 **Strategy and key recommendations**

A three-pronged approach should be undertaken for tackling the land issues. This includes the development of an institutional framework to support the various actions, a drive to create Land Use Policies to manage land better, and a reformed process of land acquisition (Figure 12).
A National Land Use Policy should be developed to take care of the growing requirements of land for sectors other than agriculture. State Governments should formulate appropriate Land Use Policy in alignment with the National Land Use Policy. The main features of this policy should be Land Mapping (record of types & quanta of land available), Land zoning and Digitization of Land Records. The Land Use Policy should also look at measures to optimize utilization of land by benchmarking current utilization efficiency with global benchmarks, and setting standards & incentives for more efficient utilization.

There is a need to establish an independent and autonomous regulator which can lay down guidelines, monitor the functioning of the sector and provide oversight. The Regulator should

- Encourage state and local governments to define zoning of land, ear-marking them for different uses, and encourage digital land records
- Define guidelines for valuing various types of land for different uses
- Establish norms for setting-up and operating Land Development Corporations (LDCs) and monitor adherence to the norms by these institutions
- Lay down the guidelines for acquiring land by a corporate body
- Establish norms for process of land acquisition, compensation and relocation & rehabilitation of various stakeholders for different project characteristics

- **Value of land** can be determined, as per the guidelines laid down by the Regulator, in the following ways:
  - **Open-offer price**: Land owners will be asked to submit their application for sale of land in a reverse-auction process.
  - **Multiple of historical price**: The Regulator can set a price based on a multiple of the historical land prices, as mentioned in the land records of the government.

- The acquiring agent for land should be an **independent commercial entity – Land Development Corporation** – that has been licensed by the Regulator to acquire land. The role of LDC would be to acquire and develop the land on behalf of its clients (end users) in exchange of the process and maintenance fee. A state can have multiple LDCs and each LDC will execute projects through SPVs. The operations of the LDC will be under the purview of the Regulator.

- The **process of land acquisition** will be guided by the Regulatory framework applicable for the project characteristics as defined by the LDC in its SPV. The role of local/state government authorities in supporting the acquisition process should be laid out clearly by the regulator based on project characteristics. The acquisition process may vary depending upon
  - minimum % that the SPV needs to acquire from individual land holders before regulation mandates compulsory acquisition of land from other owners
  - nature of consent required from different stakeholders

- **Compensation for land** needs to factor the following:
  - Upfront payment
  - Annuity income stream
  - Participation in the future appreciation due to growth as a result of land development.

  In addition to the above factors, the land owner needs to have the flexibility to choose a compensation package
- An owner can choose to take the full-value in upfront compensation or take a part of it as annuity payouts (determined by prevailing financial indicators of the time).
- However, every land owner will necessarily have the component of "Participation in future appreciation" as part of the compensation.

- The LDC has to operate a rehabilitation and resettlement program with combination of different elements which have been defined by the regulator based on the project characteristics; these include elements like:
  - Alternative dwelling, if displaced
  - Skill development
  - Assistance in employment / income-generating opportunities
  - Community development

- The Industry must be responsible for payment of cost of land acquisition, including market price, share of the appreciating value, and cost of the comprehensive R&R.

- There should be a timeframe defined for land acquisition, and the LDCs must interface appropriately not only with the local self-governance bodies, but also other grass-root level organizations in order to build awareness about the land acquisition process.

A description of the process of land acquisition, the role of the institutional framework and the other modalities related to land acquisition is provided in Figure 13.

![Figure 13 - Description of land acquisition process](image-url)
5.7 Clustering and aggregation

5.7.1 Introduction

Industrial clusters are increasingly recognized as an effective means of industrial development and promotion of small and medium-sized enterprises. Cluster is a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities (external economies). The concept has gained immense popularity among the policy makers as a very important tool of intervention. Enterprises can better improve their competitiveness due to the presence of specialized suppliers of raw materials, parts and components, machinery, skills and technology as well as other supporting services. The research on clusters clearly reflects the advantages of focusing on clusters with positive inter relationships among their stakeholders. Developing clusters is not only a means to improve the competitiveness of Industry but also an instrument for alleviation of poverty, generation of sustainable employment, fostering innovation, enabling better credit flow more effectively and sustainably.

5.7.2 Key objectives

- Kick starting growth in new industries where ecosystems need to be developed
- Providing aggregation benefits – economies of scale and economies of scope to the cluster participants
- To improve the competitiveness of the cluster participants
- Organising the unorganised industrial sector

5.7.3 Status and key challenges

- For MSME participants, Cluster plays an important role in their inclusiveness, technology absorption, efficiency improvement and availability of common resources. Ministries dealing with MSME enterprises have been using Cluster program as one of the key policy tools in administering Industrial Policy. There are around 7,000 clusters in traditional handloom, handicrafts and modern SME industry segments.
• The Ministry of Micro, Small and Medium Enterprises (MSMEs) adopted the cluster approach as a key strategy for enhancing the productivity and competitiveness as well as capacity building of small enterprises (including small scale industries and small scale service and business entities) and their collectives in the country. The Ministries have been administering Hard and Soft interventions to help the cluster participants. While hard interventions will include investments in infrastructure like common facilities, common testing centres, roads, the soft intervention will include training, capacity building, skill improvement, marketing inputs, product design & development, etc.

• In order to assess the level of intervention required, MSME ministry has carried out a diagnostic study of about 471 clusters. However, the follow-up on these studies have been weak.

• Today, the cluster programs are administered by various ministries (Textiles, Leather, Food, MSME, Heavy Industry (Auto)) under various names with different terms and conditions. This apart from putting the cluster participants through procedural hurdles also makes it very tough to learn from each other and improve the efficiency of these schemes.

• Though many of the cluster schemes make it mandatory to have an SPV, a Project Management Agency and Cluster Associations, the capacity of these aggregators needs urgent improvement. These cluster aggregators provide the crucial link between the Ministry and the Cluster participants. The Cluster Aggregators also need to have soft skills required to impart a vision to cluster participants, and see beyond their immediate requirement.

• The current amount allocated for soft interventions is grossly inadequate.

• The current cluster initiatives are mainly focused towards MSME sector. Other industries can also benefit from Cluster programs as demonstrated by the Automotive industry Clusters.

• There is a deficit of trust between the various participants in Clusters today, which needs to be addressed
5.7.4 **Strategy and key recommendations**

- It may be desirable to set up a Central Cluster Cell (CCC) at apex level (to be located in DIPP or Planning Commission) to monitor the performance of Clusters and share best practices across them. The CCC should also develop a Cluster manual which may define Clusters, development strategies adopted across the Clusters, share best practices and develop a communication channel. The constitution of a CCC will considerably reduce the coordination problems across the Clusters and within Clusters across different sectors. The CCC should:
  - Maintain information about all the Clusters along with the Cluster participant profile, employment generated, etc.
  - Evaluate the performance of these Clusters on pre-determined range of various performance parameters
  - Identify best-practices and ensure sharing best practices across Clusters, in areas like
    - Building trust among participants
    - Cluster Branding
    - Building innovation at Cluster level
    - Suggesting fiscal incentives to provide to Clusters
    - Increasing competitiveness of Cluster players
    - Effectively leveraging the common facilities
    - Identify gaps and assist the relevant ministries in bridging these gaps

Today there are several agencies playing critical roles in developing and supporting Clusters. Some of these agencies are:

- Implementing ministries like MSME, Textiles, Leather, Food Processing and Heavy Industries
- State Governments
- Department of Science and Technology and National Innovation Council in the areas of technology upgradation and Innovation
- These agencies are being continuously strengthened to make them more effective. The CCC is envisaged as knowledge partner to these agencies. The roles of CCC will complete a crucial missing link in the cluster support ecosystem.

- Provide assistance to State Governments in the cluster formation through strengthened DICs at district level besides NGOs and reputed institutions that have capacity to undertake this type of work.

- Develop strategies for growing different types of clusters (e.g. hub-and-spoke, MSME, high tech, etc) for the different sectors
  - The CCC should undertake this exercise and include details on the approach to be employed for each type of cluster and sector

- The scope of soft interventions should be expanded to include capacity building of Cluster associations, initiatives aimed at improving market linkages, improving product quality, improving access to credit, encouraging innovation, skill development, etc
  - The allocation of funds for soft interventions should be increased accordingly

5.8 Promoting MSMEs

5.8.1 Introduction

The Micro, Small and Medium Enterprises (MSME) sector has emerged as a highly vibrant and dynamic sector of the Indian economy over the last few decades. MSMEs not only play crucial role in providing large employment opportunities at a comparatively lower capital cost, they also contribute significantly in manufacturing output. Since they are widely spread in rural & backward areas, they help in reducing the migration of workforce in urban areas. MSMEs are complementary to large industries as ancillary units and provide various items & consumables and support services to sustain in the competitive market. It is estimated that this sector contributes about 45% of manufacturing output and 40% of total exports of the country and employs about 69 million persons in over 29 million units throughout the country. There are over 6000 products ranging from traditional to hi-tech
items manufactured by the MSMEs. The sector also covers the enterprises established in Khadi & Village industries and Coir sector.

Recognizing the contribution and potential of the sector, the definitions and coverage of MSE Sector have been broadened significantly under Micro Small and Medium Enterprises Development (MSMED) Act, 2006. Service sector, an important emerging sector has also been included under this Act, depending on its category into Micro Small and Medium enterprises. The criteria of investment limit in plant & machinery is the only parameter, used to categorise the enterprises in the sector in the country.

**Progress in the 11th Plan**

During the first 4 years of the XIth Plan, MSME Sector exhibited a growth rate of 13% on an average, which is substantially higher than other sectors, but is suffering from quite a few impediments. These need to be addressed immediately to make Indian MSMEs a global hub of entrepreneurship and also a global supplier of competitive and innovative products, complying with international standards set by the buyers. Various initiatives were made to strengthen the sector by implementing Plan Schemes like Credit Linked Capital Subsidy Scheme (CLCSS), Credit Guarantee Scheme (CGS), Establishment of Technical Institutes, Tool rooms to create facility for Skill Development. Rejuvenation, Modernization and Technology Up-gradation of Coir Industry (RMOT), Scheme of Funding for Re-generation of Traditional Industries (SFURTI) etc. have also been implemented to facilitate growth of traditional industries.

Micro Small and Enterprises Cluster Development Programme (MSE-CDP) an important Scheme was re-framed subsuming Industry Infrastructure Development Component to build capacity and provide support for Infrastructure Development. In addition, National Manufacturing and Competitiveness Programme (NMCP) was initiated to streamline the manufacturing process. The Prime Minister’s Employment Generation Programme (PMEGP) a flagship Scheme was initiated in the 11th Plan to create employment opportunities in rural & backward areas and thus to reduce regional imbalance and socio-economic development.
The initiatives made by the Union Government have made a good impact on this sector, as this sector could stand well even in the global crisis. However, it is proposed to continue the initiatives in the 12th plan by bringing a reform in the implementation process to achieve tangible results. It is recommended to focus on these following areas

(i) Continuation of the Skilled Development Programme in a wider form to impart training to 42lakh persons during the 12th Plan period.

(ii) Appropriate support in technology sourcing and adoption to produce high value added products in various sectors

(iii) Broad basing Cluster based interventions to reach more clusters in the rural and backward areas to keep alive Indian craftsmanship, manufacturing of traditional products

(iv) Identifying new avenues for marketing of MSME products through a National brand building concept and assured share in Government Purchase Programme from MSMEs including service

(v) Re-structuring of institutional set-up and other establishments is vital to provide requisite support to MSME sector for further improvement and to enable a global foot print for MSMEs.

5.8.2 Key objectives

The objectives for the MSME sector are:

- Promoting competitiveness and productivity in the MSME space
- Making the MSME sector innovative, improving technology and depth
- Enabling environment for promotion and development of MSMEs
- Strong presence in exports
- Improved managerial processes in MSMEs
5.8.3 Status and key challenges

MSME sector has been consistently registering a higher growth rate than the overall growth of the industrial sector. There are some inherent challenges faced by the sector which have a strong impact on its growth. These relate to (i) availability of Credit and Institutional Finance (ii) Outdated Technology & Innovation, (iii) Need for Skill Development & Training, (iv) Inadequate Industrial Infrastructure, (v) Marketing & Procurement.

The Working Group decided to deliberate various aspects of MSME sector, relating to the growth of the sector. These may be classified under six important verticals to provide theme based focus, while devising any strategy for the sector.

These are i) Finance & Credit ii) Technology iii) Infrastructure iv) Marketing & Procurement v) Skill Development & Training vi) Institutional Structure However, keeping in view of the unique status of the Khadi & Village industries and Coir sector in the Indian economy, it was decided that there will be separate recommendations for these sectors. Similarly, concerns of un-organised sector and special areas & groups would be given due consideration while formulating any programme/schemes under the aforementioned six major verticals.

5.8.4 Strategy and key recommendations

Credit & Finance

Credit is a crucial input for promoting growth of MSME sector, particularly the MSE sector, in view of its limited access to alternative sources of finance. Access to information, simplification of loan procedures and interest subvention for micro enterprises are enabling features for timely and affordable credit to MSMEs. The plan should provision resources for promoting e-platforms for information flow and simplification of procedures. To address the risk perception of banks, particularly for lending to MSEs, the Credit Guarantee scheme needs to be strengthened. There should be substantial increase in the number of MSEs covered under the Performance and Credit Rating scheme which is a facilitating factor for easy access to credit with liberal terms.
The reach of the MSEs to the banking net work has to be substantially enhanced through setting up of branches near clusters. In fact, a cluster centric approach is the best bet for addressing the credit needs of the MSME sector, because of reasons of operational convenience and trust building.

Access to finance needs to be enlarged through alternative sources of capital such as private equity, venture capital and angel funds. This is crucial for facilitating the growth of knowledge based enterprises which have high potential in the Indian context. Further, prospective enterprises in emerging areas such as Nano-technology, Bio-technology, Aero-space and Defence-applications would also require such alternative sources of finance since traditional channels are unable to meet their needs.

There has to be aggressive market intervention, such as promoting companies for market making and ensuring scaling up of operations of SME exchange. The plan has to provide resources for such market interventions.

**Technology Up gradation & Support for Emerging Sectors**

Technology will be the foremost factor for enhancing the global competitiveness of Indian MSME Sector. The Prime Minister’s Task Force on MSMEs has identified low technology, generally used by the MSME sector, as a major cause for poor competitiveness of the sector.

The immediate challenge is developing appropriate technologies for various manufacturing processes which will lead to substantial reduction in cost of manufacturing by enhancing labour productivity, reducing material wastage and minimising energy consumption.

The issue may be addressed by developing collaborations or Public/Private R&D institutions. The focus must be on key areas of manufacturing, with clearly defined objectives, deliverables, timelines and project budgets. Globally competitive manufacturing technologies are available in the international market for various industries. To facilitate absorption of such globally competitive technologies, it may be necessary to subsidise the industry. An important suggestion in this regard is setting up of a Technology Acquisition and Support Fund with adequate allocation to assist both
development of indigenous technology and acquisition of global technology by the Indian MSMEs. Setting up of such a fund has already been recommended by the Prime Minister’s Task Force on MSME sector. Separate schemes of the Ministry for installation of plants and equipment’s with advanced technologies, viz., CLCSS & NMCP components may be merged into one scheme.

Adoption of renewable energy based technologies may also be provided adequate incentive to overcome higher transaction cost for adoption of such technologies by the MSMEs. It is suggested that technology oriented initiatives under NMCP may be clubbed as the modified NMCP Scheme and offered to MSME Clusters/Mini-Clusters as a package on a Cafeteria mode and they can develop their own projects as per the requirements.

To provide support to the start-ups in the Hi-tech and Emerging Sectors, it would be desirable to have in place:

a) Modular industrial estates/laboratories near premier technical institutions with the required plug & play facilities.

b) Linkage to angel/venture capital for sourcing the initial capital requirement.

Skill Development & Capacity Building:

Lack of skilled manpower and information as well as lack of reach to modern technology are affecting the growth of the MSME sector. Among its major recommendations, the Prime Minister’s Task Force has identified lack of skilled manpower as a road block for the growth of the MSME Sector. The Ministry of MSME has been mandated to provide skill to 42 lakh persons during the 12th Plan period.

The main challenges before the Ministry is to upscale the training capacities from the present capacity of training 4 lakh persons per year to train at least 12 lakh persons per year by the year 2017. Upscaling of the training capacity of the Ministry through the public private partnership mode is strongly recommended. To ensure quality of training programmes conducted and transparency in the entire process of selection-registration-administration-handholding of the trainees, it is recommended that a web-based management information system may be launched. To coordinate the entire process of
conducting skill development programmes setting up of a virtual SME training school can be considered. The proposed institution will standardise the training curricula, certify the trainers and certify the trainees on completion of the programme.

For ensuring sustainability of programmes, it is proposed that programmes may be gradually taken to self-financing level, which will also ensure quality as demonstrated by training programmes conducted by Tool Rooms on self-sustainable basis. To ensure a high success rate of trainees, involvement of industry associations in training programmes is recommended for identification of the skill gap, developing appropriate training curricula and handholding of trainees in self/wage employment.

**Infrastructure development**

Cluster based intervention has been acknowledged as one of the key strategies for comprehensive development of Indian industries, particularly the Micro and Small Enterprises (MSEs). The Ministry of MSME has adopted the cluster approach as a key strategy for enhancing the technical and physical infrastructure as well as capacity building of micro & small enterprises and their collectives in the country. Since 1994, Ministry had also been supporting creation and upgradation of industrial infrastructure in the States under Integrated Infrastructural Development (IID) Scheme, which was subsumed under MSE-CDP in October 2007.

Land and infrastructure constraints are a major problem, particularly in metros and bigger cities. As production processes of majority of MSEs can be accomplished in Flatted Factories, Flatted Factory Complexes may be encouraged by providing financial support likewise. Accommodation problem of industrial workers may be addressed to a great extent by supporting dormitories (in or around industrial estates/ areas). SPVs may run the dormitories on sustainable basis.

Maintenance of Industrial Estates (mainly maintenance of roads, drainage, sewage, power distribution and captive power generation, water supply, dormitories for workers, common effluent treatment plants, common facilities, security, etc.) is a critical component for successful functioning of the industrial enterprises in any industrial estate/industrial area. It would be appropriate to handover
maintenance of Industrial Estates to the Industry Associations, local bodies, state government agencies, SPVs on self-sustaining basis. World over hi tech and innovative enterprises start in Modular Industrial Estates. To encourage such ventures, Modular Industrial Estates are proposed to be set up near Centres of Excellence like IITs.

The Cluster Development Programme of the Ministry of MSME (MSE-CDP) may be continued in the 12th Plan period with streamlining of interventions and also ensuring the sustainability of Clusters developed. The Programme should also address the requirements of the large unorganized manufacturing sector.

**Marketing & Procurement**

Marketing & Procurement are the other areas where MSMEs face more challenges than opportunities. The challenges range from procurement of raw materials to lack of market information. MSMEs face several constraints in the marketing & procurement front due to their limited manoeuvrability in such wide ranging activities either on account of lack of finance or on account of lack of awareness. While marketing of products of MSMEs mostly depends upon the market forces and individual efforts of the enterprises, Government and its organizations can play the role of a facilitator to help MSME sector in these endeavours.

There are multiplicity of market development assistance programmes to support MSMEs, like participation in domestic and international trade fairs, bar coding, packaging and standardization within the Ministry. There is a need for rationalization and consolidation of such programmes under different broad heads.

However, schemes especially in areas of use of ICT for creating cluster-level, state-level and national level B2B portals with connectivity to international markets and marketing infrastructure may be required in the 12th Plan such as setting up of testing facilities and establishment of information dissemination centres and display-cum exhibition centres.
The plan allocation for such schemes can be made under the Infrastructure vertical and Technology vertical (ICT Scheme) respectively. The vacant land available in the premises of MSME DIs and DICs can be put to use for construction of display cum exhibition centres and establishment of information dissemination centres.

Setting up of marketing organizations in clusters in PPP mode through formation of SPVs, which would form the focal point at the cluster level for all marketing related activities such as e-marketing, branding, advertising, barcoding etc. could be considered in the 12th Plan.

National Small Industries Corporation (NSIC), the autonomous outfit of Ministry of MSME may be the Apex Organisation to co-ordinate market development activities under different schemes.

The Government has recently introduced a Public Procurement Policy for the MSME sector. Further, there is also need for inclusion of private sector in the procurement policy for the MSME sector. An offset under defence purchases has vast potential for MSME sector. There is need for setting up a mechanism in the Mof Defence to ensure that the offsets under defence purchases are suitably focused to support SMEs in upgrading their capacities.

All new and existing Schemes should be merged into one Scheme, namely Marketing Development Assistance Scheme.

**Institutional Structure**

The Institutional and legal framework for promotion and development of Micro, Small & Medium Enterprise (MSME) Sector of India is spread both at the National & State level. The primary responsibility for the development of MSMEs lies with the State Governments and Government of India supplements their efforts through a range of initiatives. The Prime Minister’s Task Force in its report have made significant recommendations on liberalising the policy regime for the MSME sector,
viz., introduction of insolvency act, liberalisation of labour laws, liberalisation of apprenticeship act, strengthening of district industry centre etc.

The following issues need to be immediately addressed to unshackle the growth of the MSME sector –

(i) Environmental issues, (ii) Labour issues, (iii) Exit policy, (iv) Amendment of MSMED Act (v) Restructuring of the DICs and MSME-DIs.

On the environmental issues, it is recommended that policies be made uniform pan India with appropriate relaxation of the controls for the MSMEs. Regarding the Labour issues the immediate need is to consolidate the plethora of labour laws and acts into one user friendly law. The enactment of Micro, Small and Medium Enterprises Development (MSMED) Act, 2006 is a harbinger for the growth of the MSME Sector. However, there is an urgent need to strengthen the various provisions of the Act along with enactment of the rules under the various sections. For e.g. Introduction of filing of Entrepreneurs Memorandum (EM) under the MSMED Act was an important initiative towards liberalisation of the MSME sector

However, the implementation of the process of filing of Entrepreneurs Memorandum is still very tardy. Application of e-governance for streamlining of the procedures and for that purpose setting up of an information and data base network among the DICs, MSME-DIs and the Ministry may be considered.

The provision regarding the delayed payment under the MSMED Act was another facilitator for ensuring regular cash flow to the Micro & Small Enterprises against the supplies made. The Micro & Small Enterprises Facilitation Councils (MSEFC) stipulated under the Act to be set up at the State level where foreseen as facilitators to the MSEs.

However, most of these MSEFCs are not operating efficiently. In fact, in some states they are yet to be constituted. The Group recommends immediate action for up scaling the activities of these
MSEFCs and introduction of an information and communication network for operation and monitoring of these MSEFCs. A budget of Rs.100 Crore may be allotted for ICT enabled up scaling of the EM filing and MSEFC operations.

**Khadi & Village Industries**

The broad targets for development of Khadi and Village industries sector during the 12th Plan period are to achieve at least 11% growth in Khadi sector and 13% growth in Village Industries. The strategy for achieving targets are to develop product-wise clusters of Khadi & Village Industries products and develop their domestic as well as export market, introduce innovations in design & technology, creation of entrepreneurship and growth in manufacturing in rural non-farm sector to prevent migration by enhanced allocation for PMEGP. The Khadi Reform Programme has been taken up in the 11th Plan for up scaling marketing of Khadi Products and improving earning of Khadi artisans. The reform also includes introduction of Khadi mark, strengthening Khadi Institutions, market promotion of Khadi products and participation of private party in the form of partnership in the existing establishment of Central Silver plants. The process has been slow and needs to be sped up in the 12th Plan and outcomes need to be clearly defined.

Although the PMEGP is the flagship Programme under KVIC, it is yet to be evaluated in terms of its efficacy. A quick evaluation is warranted before any major up-scaling as suggested by the Working Group. Likewise an evaluation of the cluster based initiative by the name of SFURTI is also necessary to evaluate how shortcomings can be overcome while taking up the proposed expansion and introduction of Heritage Clusters. Since the Textile Ministry has been implementing such clusters in Handloom and Handicrafts sectors it would be desirable to ensure convergence whenever possible and avoid duplication.

**Coir Industry**

Coir Industry is mostly confined in Southern states namely, Kerala, Tamil Nadu and Karnataka. Enterprises in this sector are usually in Micro and Small sector. At present, products manufactured in the Coir Sector are for limited uses. R&D initiatives have been made by the Central Coir Research
Institute in Kalavoor and the Central Institute of Technology in Bangalore to develop innovative products for diverse uses. However, it could not be very successful in absence of favourable costing and these technologies have not also reached the grass root level.

Under the Prime Minister’s Gram Sadak Yojana (Bharat Nirman), it has already been decided to use Coir geotextiles for construction of rural roads in 9 States. In future, the project is likely to be extended to all the 28 States of the country. The coir industry will be facing problems in catering to the huge requirements. Hence it will be appropriate to infuse appropriate technology to improve quality & up scaling manufacturing capacity in the 12th Plan to meet the requirements.

**The Unorganised Sector**

The Prime Minister’s Task Force on MSMEs have stated that no discussion on MSME can be completed without a full treatment of the unorganized sector. More than 94% of MSMEs are unregistered with most of them being in the informal/unorganized Sector. The Task Force has commented that ‘ in addition to the growth potential of the sector and its critical role in the manufacturing and value chains, the heterogeneity and the unorganized nature of the Indian MSMEs are important aspects that need to be factored into policy making and programme implementation.

The Promotion and programmes of the Micro & Small Enterprises in the unorganized sector would need to address their survival strategies and should be in the direction of providing livelihood alternatives such as social security, skill formation and credit. On the other hand, policies/programmes for the larger sized MSMEs need to address issues relating to growth, marketing, access to raw material, credit, development and technology upgradation. The

Government policy must focus its attention to ensure support to the MSMEs to prosper as also to provide an enabling atmosphere for the MSMEs in the unorganized sector to flourish and progressively integrate with the organized sector. The Government must also take effective steps for the welfare of the workers in this sector. The future strategy ought to focus on providing social security to the unorganized workers in the MSME sector in terms of the mandate under Unorganised Workers Social Security Act,(UWSSA) (Para 1.16 &1.18 PM’s Task Force on MSME)
While agreeing to this, the Steering Committee advised that policies for the MSME sector would have to be devised especially in the areas of skill formation and credit & technology upgradation, keeping this duality in perspective. Instead of consigning these responsibilities to other Departments, the Ministry of MSME will have to actively provide an enabling environment for the unorganized sector to flourish and integrate with the organized sector. Towards this, it is suggested that separate approaches/schemes for the unorganized sector be built into the broad verticals-credit, technology, skill formation etc. For e.g. Some of the important suggestions of the Working Group on Unorganised Sector such as Skill Development and Business Resource Centre can be incorporated into the flagship MSE-CDP Scheme as these can be done on a cluster basis. Apart from this, the Ministry may work out the modalities of how enterprises in the Sector can be registered.

5.9 Boosting manufacturing exports

5.9.1 Introduction and current status

In order to achieve the desired growth rate for the manufacturing sector, it is necessary to have a high growth rate for the country's exports as well. Considering this, the Department of Commerce has come up with a strategy paper on doubling India’s exports.

In between 2011-2016 growth in the advance economies is projected to average at ~3.7%, while emerging economies are projected at ~8.9%. Further, share of emerging markets GDP as a proportion of world GDP is expected to increase by ~6% at the cost of developed nations. Share of manufacturing in India's total merchandise exports has been largely the same and was 61.5% in 2010-11. Rate of growth of manufacturing exports was 16.2% in the first four years of XIth plan.

5.9.2 Key objectives

- Accelerating the rate of growth of manufacturing exports and reaching a level of USD 534Bn by 2016-17, from current level of USD 151.15Bn
- Building a brand image for Indian products
- Increasing technology intensity of products being exported from India
5.9.3 **Status and key challenges**

- **Low level of production**
  - Output is the most important determinant of exports. Therefore, quantum, quality and competitiveness of domestic manufacturing is very important for export performance of the manufacturing sector. Unfortunately, India's manufacturing is growing at a very low rate as compared to other developing countries.

- **Very low share of high tech exports**
  - High tech products have better terms of trade due to high income elasticity. However, India’s share in the global trade of high tech products is very low, and has been between 5%-8% during 2003-09.

- **Non-tariff barriers being placed by countries**
  - There is a lack of information and clarity on procedural norms and regulations of various countries regarding specification as well as methods of sampling, inspection and testing. Several conformity assessment issues also have the effect of restricting trade.

5.9.4 **Strategy and key recommendations**

For achieving the above mentioned objectives a stable and comprehensive policy for promotion of exports is required. Following specific action points can be considered for achieving the above mentioned objectives:

**Accelerating rate of growth of Indian exports**

- **Providing world class infrastructure at ports and airports.**
  
  For promoting exports, adequate infrastructure at all major ports and air ports is required. Further, deepening of draughts at berths, anytime working in ports, deployment of shore mobile cranes for cargo, LPG and CNG connection through pipes and making them available in every town are also required.

  - Dedicated export berths for automobile industry at Chennai port and one more port on west coast, equipped with facilities to handle ~5l vehicles by 2010 and space for parking
• Ranipat, Gurgaon and Unmao should be notified as town of export excellence as this would enhance infrastructure development there

• Providing an enabling mechanism for facilitating exports
  • Reduction of transaction cost for exporters
    - Export procedure to be simplified and human interface with exporters to be reduced
  • Addressing Non tariff barriers to ensure fairness to exporters
    - Indian standards need to be in line with international standards and technical regulations
    - Review of our existing standards and their benchmarking with international standards is required
    - More, improved labs with international accreditation
  • Reform of the FTA process to include improved consultative process with stakeholders
    - Include better input taking mechanism from industries and associations
  • Improving fiscal incentives to exporters
  • Attracting FDI in country
    - Linking FDI investment with market access and giving preferential incentives for investment in areas where Indian domestic market is nonexistent
    - Reduction of threshold limit for offset obligation should be considered
  • Ensuring availability of funds to exporters
    - E.g. reduction in ECGC premium, availability of pre and post shipment credit

• Market strategy to capture unexplored markets and products
  • Move to higher value-added products exported to traditional markets
  • Focus on Asian and African countries
    - Market access through quota system should be negotiated with competing countries
    - Conducive trade agreements need to be put in place
  • Focus on Globally Dynamic products
    - Products which are gaining significant share in global trade

**Building a Brand Promotion Strategy to coalesce the brand values of the Indian manufacturing sector**
• Initial survey of existing product promotion strategy and product perception – through IBEF

• Initiate study to benchmark Indian products with competitors in terms of quality and price; all stakeholders should be consulted in this exercise

• A logo and a standard brand kit should be developed

• Focus required on strong PR initiative
  - Participation of government and industry should be ensured at major national and international trade fairs, seminars and exhibitions

**Focus on moving towards "high-tech" exports from current low tech exports**

• Identify the sectors having high technology and high export growth potential
  - Frequent consultations among Export Promotion Councils, Industry Associations, and major technology agencies required
  - CII is already in partnership with many agencies for development of technology. Department of Commerce may partner with these efforts to assist R&D for manufacturing exports

• Need to focus on measures to promote these identified sectors

### 5.10 Reforming the role and management of PSEs

#### 5.10.1 Introduction

Post-Independence, public sector enterprises were set up with an objective to promote rapid economic development through creation and expansion of infrastructure. Since then Public Sector Enterprises have played a key role in growth of manufacturing. With different phases of development, the role of Public Sector Enterprises has also changed and their operations extended to a wide range of activities in manufacturing, engineering, steel, heavy machinery, machine tools, fertilizers, drugs, textiles, pharmaceuticals, petro-chemicals, extraction and refining of crude oil and services such as telecommunication, trading, tourism, warehousing, etc. and a range of consultancy services. While there have been many PSEs like SAIL and BHEL that have performed very well in competition with private sector enterprises, there are also many PSEs that have performed very poorly. In an economic environment that has changed considerably since the early days of India’s post- Independence
development journey, in which the strength of private sector to fulfil the country’s requirement has increased, the need for PSEs as well as the systems for their governance and management should be re-evaluated.

5.10.2 Need for PSEs

The private sector is capable of producing almost all the requirements of the economy, provided investors see an opportunity, which, with the growth of the Indian market, they are seeing in many sectors. Thus, in many areas in which there are PSEs for historical reasons, Government could now disinvest, as it is doing, and invest the resources thus generated for the public exchequer in other public purposes. However, as the Indian economy and its industries evolve, new frontiers are reached, and new capabilities must be provided to the Indian industrial eco-system to enable it to grow further. Often these ventures entail high risk, large investments, and long gestation periods, which private investors are not willing to accept. Nevertheless, such capabilities, if available, would provide foundations and spin-offs that the private sector could use. Examples are: wafer fabs, and modern aircraft production capacities. These high tech ventures would require Government to invest to provide the stimulus necessary. Other socially important areas in which the private sector may not find attractive returns immediately but which are vitally necessary for the country could be industries like drug and vaccine production. Of course the design of publicly owned or publicly-assisted ventures in these areas should take account of the weaknesses observed in the governance and management in present forms of PSEs. The design of these new public owned or public assisted ventures should also aim to leverage private capital and private sector management capabilities appropriately.

The areas in which Government may need to induce the development of capabilities by creating a new ‘PSE’ in an appropriate form could be suggested/vetted by the agency for co-ordinating the technology strategy recommended earlier in para 5.1.4 in the section on Technology and Depth.

5.10.3 Governance and Management of CPSEs

With changing global and domestic market conditions, role of CPSEs has been changed and they have been increasingly told to cut their dependence on the Government. They have been listed on the
stock exchange and few of them have been privatised. The Government has provided CPSEs the necessary flexibility and autonomy to operate effectively in a competitive environment. However, there are a few issues with the operation and management of CPSEs which still persist and need to be resolved. There is a need for thinking of a mechanism on how government can get an efficient Indian presence in the sectors where the private sector investments are not forthcoming. Hence, there is a need to consider new models of governance and management of CPSEs.

5.10.4 Strategy and key recommendations

Considering the various challenges being faced by the CPSEs today, the following steps can be taken to reform the current role of CPSEs in the country:

Change in Corporate governance structure in CPSEs

- Set up a strategy and business development committee for every CPSEs
  - The committee needs to set direction for the company towards diversification, acquisition, joint ventures, new business entry and review of organisational structure etc.
- Introducing a system of annual self evaluation for board of CPSEs
- Changing the board composition to have 50% board members as independent directors
- Role of Government director should be equivalent to Independent directors on matters where government has no views
  - These directors should be paid sitting fees for attending board committee meetings
  - Their evaluation should also be based on their performance as Directors of board of CPSEs
- Reforming the process of selection of Independent Directors to make the process more efficient
  - For this DPE/ PSEB can formulate a panel of approved names, out of which Independent directors can be appointed for CPSEs. Full time CEOs of successful enterprises should also be eligible to be appointed as Independent directors provided there is no conflict of interest
- Present age limit of 65 should be relaxed to 70 years for Independent Directors
- Streamlining the process of appointment of CMDs and whole time directors, in particular the system of obtaining vigilance clearance
• Process of selection of CMDs/ CEOs of Maharatna and Navratna companies to be different from current process
  - A separate body may be constituted within PSEB and the selection criteria should be more focussed on leadership quality, strategic thinking, capability to manage external environment etc. apart from domain/ sectoral expertise
  - Selection of CMD should be made three months before the term of incumbent CMD
  - Vigilance clearance process also needs to be reformed
• Tenure of CMD / Functional director should be minimum made three years irrespective of the age of the person
• Reforming Vigilance function in CPSEs
  - Vigilance in CPSEs should be considered as a managerial function and corruption risk can be managed in the same way as other risks.
  - CPSE officers should be involved in vigilance function at CVO level. A database of executives of CPSEs can be maintained who can be appointed at CVOs.
  - CPSEs should examine disciplinary cases before initiating departmental proceedings against any officer
  - Distinction to be made between cases of conscious and deliberate acts of granting an undue favour versus cases of procedural lapse.
  - A panel of independent personnel of proven integrity and some domain knowledge can be created within CVC, from whom prior advice can be taken on certain matters of commercial/ tender./ contract management decisions.

Change in Human resource strategy for CPSEs

• All CPSEs should undertake a comprehensive manpower planning exercise to identify key skill and talent requirement across all levels within an organisation from a medium term and a long term perspective.
• CPSEs should develop a leadership pipeline for its key positions and a leadership development strategy.
• To fill the immediate gaps at the higher level in CPSEs, an extension of 2 years may be allowed at DGM and above level, subject to certain conditions.
• **Autonomy in recruitment policy**
  - In CPSEs with no budgetary support from government, power of appointment of people at below board level should be delegated to respective CPSE boards
  - CPSEs to prepare their plans for medium to long term recruitment through lateral hiring
  - Executives from one CPSE may be deputed to other for a period of three to five years in the entire career.
  - CPSEs can formulate retention policies for their organisations
  - Multiple access points for CPSEs for meeting their talent requirements
  - Board should be empowered to engage specialists if required

• **Autonomy in compensation policy**
  - Only fixed component should be determined by DPE and the variable component should be left to the CPSE boards to determine. Variable pay should be based on a robust internal evaluation mechanism and should be delinked from the standard calculation formula applicable to all CPSEs.
  - Variable component should be increased to 10% of PBT.

**Review of Memorandum of understanding for CPSEs**

• Current MOU system to be modified and greatly linked to the organisation's approach towards diversification, acquisition, formation of JVs, new/strategic business, usage of ICT, R&D initiative, HR development and organisational changes

• Physical performance parameters, if included in MOU should be benchmarked with industry parameters including those in private sectors. CPSEs should be encouraged to reach to these standards within a defined timeframe.

**Joint Ventures, Public Private Partnership and Procurement**

• CPSE board should be empowered to select the partner for JV and companies for acquisition

• Process of entering into partnership and JVs need to be simplified. Current restriction of minimum ownership of 51% in case of JV to be done away with
Major contract for procurement above a specified threshold may be pre audited through a mechanism within a defined timeframe

At least 30% of the CPSEs should be listed in next three years going up to 50% in five years

Disinvestment in loss making CPSEs may be considered. In case the Government does not intend to disinvest, these CPSEs may be auctioned to other profit making CPSEs

Creation of a Public Sector Land Development Authority for the purpose of developing surplus lands with CPSEs and unlocking their real value

**Technology mapping for CPSEs**

- Every CPSE to have a technology policy, clearly indicating the commitment of the enterprise in using/ sourcing/ developing type of technology as per needs of the organisation
- Every CPSE to have a IT plan.
- A technology committee may be set up in every CPSE to identify the technology needs and finding alternative ways of developing or finding such technology.
- R&D activity to be scaled up.
- Institutional collaboration between CPSEs and CSIR for undertaking R&D.
- A centre for innovation may be set up for assisting CPSEs in developing and implementing strategy to strengthen their technology base.

**Other recommendations**

- C&AG should prepare an annual report about best practices prevailing in diverse fields in different CPSEs and the same should be shared with other CPSEs.
- Audit of C&AG should also cover important cases of indecision and / or delayed decisions cased either due to system lacunae or lack of decision making at individual/ collective level.
- Change in governance model of CPSEs.
As discussed above, there is a need for changing the Government model for CPSEs in sectors where the private sector investments are not forthcoming. The option for the Government to enter or exit from any such future unit should be flexible and fast.

- For this purpose, a Single Holding Structure (SHS) for all new government owned companies can be established.
  - The SHS can be in the form of holding company owning different stakes in different government companies.
  - The management can be a mix of senior incumbent bureaucrats and members chosen for their integrity, expertise and domain knowledge in industry, economic or commerce.
  - The SHS can be self managed like a mutual fund. The board of the SHS would appoint the board of the company it has invested into to the extent of its investment.
  - SHS would earn income through dividends from entities it invested into or through divestiture of its stake.
  - The performance of the SHS entity could be monitored by an empowered group of ministers to whom it would be accountable.

The above mentioned model can be used to fill gaps where there is not enough Indian presence in sectors and which the government considers strategic and vital to India's future.

5.11 National Investment and Manufacturing Zones (NIMZs)

5.11.1 Introduction

We have, in this document, discussed numerous challenges facing manufacturing, and strategies for addressing the same. NIMZ is a concept propounded in the National Manufacturing Policy of DIPP, which has met with in-principle approval of the Cabinet. The NMP is a policy solution for a number of challenges discussed in this document, and is a policy tool to be applied to select zones designated for promoting manufacturing.

5.11.2 Key objectives

Creation of dedicated zones for manufacturing in the nation to
• Promote investments in manufacturing
• Make the country a hub for both domestic and international markets
• Promoting ease of development of manufacturing units

5.11.3 **Issues being addressed**

Specific policy areas have been identified and developed for these dedicated manufacturing zones:

• Availability of land
  - Land procured by the Government
• Procedure for starting of the business
• Labour policies, exit policies
• Encouragement for Green products and practices
• Availability of entire value chain and ecosystem
• Supply of power and other essential utilities
• Customs and sales tax incentives
• Export incentives

Currently, there are no industrial parks or Special Economic Zones (SEZ), which address the aforementioned issues.

5.11.4 **Concept and Strategy**

An area would be specifically delineated for the establishment of manufacturing facilities for domestic and export led production, along with the associated services and infrastructure.

The NIMZs would be a combination of production units, public utilities, logistics solutions, environmental protection mechanisms, residential areas and administrative services. It would have a processing area, where the manufacturing facilities, along with associated logistics and other services and required infrastructure will be located, and a non-processing area, to include residential, commercial and other social and institutional infrastructure. The processing area may include one or more Special Economic Zones, Industrial Parks & Warehousing Zones, Export Oriented Units, DTA
units duly notified under the relevant Central or State legislation or policy. All the benefits available under the relevant legislation or policy will continue to remain available to the said Zones.

The internal infrastructure of the NIMZ will be built and managed by a Developer, or a group of Co-developers. The external linkages will be provided by Government of India and the concerned State government. The users of external as well as internal infrastructure will pay for its use, except to the extent that the government supports the service through budgetary resource.

The NIMZ would have a governing body, which would be in the form of a Special Purpose Vehicle (SPV) formed with the constituents of that specific NIMZ. The SPV would have delegated authority from the State Government, Ministries in the Central Government and other Government Agencies for issuing necessary clearances, as may be necessary for the inception and continuation of business ventures inside the NIMZ. The key feature of the NIMZs would be a more business friendly policy, procedures and approval ecosystem, combined with superior physical infrastructure.

Role of Central Government

- Establishment of NIMZ and coordinating with the central ministries to get the clearance
- Ensuring the availability of external physical infrastructure linkages to the NIMZs including rail, road, ports, airports and telecom
- Viability gap funding
- Helping State Governments in promoting the NIMZs to investors

Role of State Governments

The State Governments would play the lead role in setting up of the NIMZs. In particular, the State Government would be responsible for providing/facilitating the following infrastructure:

- Land
- Power connectivity
- Provision of bulk requirements of water
• Road connectivity (State roads)
• Sewerage and effluent treatment linkages, from edge of NIMZ, to the final disposal sites
• Appropriate infrastructure to address the health, safety and environmental concerns.
• Additional incentives for the development of the NIMZ, including moratorium of all municipal and other local taxes for 10 years - for the NIMZ developers as well as the units which are located in the Zone

Institutional Framework for implementing NIMZs

• The Department of Industry Policy and Promotion (DIPP) will be the nodal department of the Government of India for the NIMZs.

• A High Powered Committee constituted by the Government of India will scrutinize applications for setting up the NIMZ, and subsequently monitor and expedite the progress of implementation.

• The SPV would be constituted for each NIMZ and will be responsible for its development and management. It will also be empowered to issue/expedite approvals and pre approvals.

The major benefits for Units within NIMZ

• Separate exit policy for units in NIMZs, along with Job Loss Policy for labour

• Skill development programs for new employees as well as for the existing employees

• Duty free import/domestic procurement of goods for development, operation and maintenance of SEZ units

• 100% Income Tax exemption on export income for SEZ units under Section 10AA of the Income Tax Act for first 5 years, 50% for next 5 years thereafter and 50% of the ploughed back export profit for next 5 years

• Exemption from Central Sales Tax.

• Exemption from Service Tax.

• Single window clearance for Central and State level approvals.
• Exemption from State sales tax and other levies as extended by the respective State Governments.

**Special Incentives for Green Technologies in NIMZs**

• Low-interest loans for manufacturing to invest in new plans to produce clean /green technology or invest in new plants to produce green products;
• Creation of a central fund for supporting research in the area of green manufacturing;
• Mandatory to get a certain percentage of its electricity mix from renewables;
• Provides grants for workers’ training that will lead to an expanded energy efficiency and renewable energy industry workforce
• Preference to Green units/ Green products during procurement by state/ central government; and ‘Best Green Unit’ awards to encourage, recognize and raise greater awareness.
• If the SPV in a particular NIMZ decides to have an IPP based on renewable Green technology, an investment subsidy to cover the additional interest cost per mega Watt may be considered.
6 Strategies for the various manufacturing sectors

6.1 Introduction

Objectives of the Plan will be met by the performance of enterprises in select sectors. These sectors can be classified into four categories according to their principal contributions to the objectives.

1) Sectors of strategic importance
It is essential for the country to develop domestic manufacturing capabilities in certain sectors for ensuring national security and self-reliance. Industries such as Defence Equipment, Aerospace Capital Goods and Ship Building & Ship Repair are sectors where greater focus is required to increase indigenization in production.

2) Sectors for basic inputs
Availability of high quality raw material and production inputs is essential for ensuring sustained growth of the manufacturing sector. Industries which are engaged in the production of Steel, Cement, Fertilizers, and in the Exploration and development of Minerals, underpin this growth. Significant impetus is required towards developing production capacities in these sectors.

3) Sectors for depth & value addition
These are knowledge and technology intensive industries with high growth potential. Developing competitive advantage in them through increasing depth and value addition in domestic manufacturing will contribute to long-term sustained economic growth. While India has developed good technological capability in certain sectors in this category (Automobiles, Pharmaceuticals and Petrochemicals), it lags behind significantly in others (Electronics, Chemicals and Paper).

4) Sectors for employment generation
Industries such as Textiles, Food processing, Leather Goods and Gems & Jewellery are less capital intensive and more labour absorptive in nature. These are high employment-generating industries that are currently dominated by MSMEs. They lack the deployment of sophisticated technologies in
their manufacturing processes and instead rely heavily on manpower. Maximum growth in employment is likely to come from these industries and hence their success is imperative for the country to achieve its job creation goals.

While there are certain common challenges and underlying solutions across sectors, which have been articulated in the previous chapter, each sector also has its unique constraints that need to be addressed. The following chapter enumerates these and proffers strategies to overcome them.

(A) Sectors of Strategic Importance:

6.2 Defence equipment

6.2.1 Introduction

India has been rapidly enhancing its spending on defence. India has already emerged as the largest arms importer in the world. It is expected that India would become the third largest defence spender after the US and China by 2014. Equipment spending by Ministry of Defence has increased by 15–20 percent over the last five years, and is expected to continue growing at least in the mid–term.

With several large equipment and modernization programs in the pipeline, analysts are projecting an overall spend of USD 80–100 billion in the next five years. This makes India one of the world’s most lucrative markets for military products, and defence suppliers are gearing up to compete.

The Indian defence equipment market can be divided into four large areas:

- Land systems
- Naval Systems
- Electronics Systems
- Aerospace

The recommendations related to Aerospace have been covered in a separate chapter, immediately following this chapter.
6.2.2 **Key objectives**

- Progressive increase share of domestic procurement from 30 to 75 percent in next 10 years
- Ensure that 8–10 largest weapons programs in the country have a targeted large percentage of locally manufactured content
- Build local IP in critical defence areas
- Promote and track civilian applications of technologies and material developed during defence research
- Support local defence manufacturers in building export capabilities
- Enable creation of one million new direct and indirect jobs in the defence manufacturing space
- Monitor implementation of Government’s offset policy in letter and spirit for large contracts

6.2.3 **Status and key challenges**

The turnover of the Defence Public Sector Units (DPSU) and Ordnance Factory Board (OFB) was Rs 38,622 crores (USD 8.46 billion) in 2010-11 and it has been growing at a CAGR of 13% since 2007-08.

The Defence PSUs and Ordnance Factories provide direct employment to around 2 lakh employees, besides providing large-scale indirect employment through ancillaries and Small and Medium Enterprises (SMEs), from which they outsource their various requirements.

**Private sector participation**

- The defence industry is open for Indian private sector participation up to 100% with FDI permissible up to 26%, both subject to licensing
- Thirty licensed companies in the private sector have so far commenced commercial production of the defence items after obtaining industrial licence
- There is a need to increase private sector participation. This needs to be a focus area for this sector.

**Contribution of the various sub-sectors**
• Land Systems account for roughly one-third of combined output of OFB & DPSUs. OFB is the biggest contributor in Land Systems, at Rs 11215 crores and the other contributors are Bharat Dynamics Ltd (BDL) and Bharat Earth Movers Ltd (BEML).
• Defence shipyards in the year 2010-11 had sales of Rs 5000 crores, which is expected to reach Rs 23,000 crores by the end of the 12th plan period.
• Electronics forms an important part of almost all defence systems and the Indian defence electronics industry has shown an uptrend during the 11th plan period. It is projected to grow from Rs 5400 crores in the year 2007-08 to Rs 7948 crores in 2011-12.

Defence Procurement to encourage greater Indian production
• Provisions have been incorporated in Defence Procurement Procedures (DPP) to encourage participation of Indian industries in Defence Production
• The ‘Make’ procedure has been formulated to ensure design, research, development and production of indigenous defence equipment through optimal utilization of the potential of Indian industry
  - The introduction of a new category of acquisition ‘Buy & Make (Indian)’ in Defence Procurement Procedure-2011 will enable Indian industries to acquire technology foreign OEMs and manufacture the product in India

Defence offsets
• Offsets apply to all Capital acquisitions valued at Rs.300 crores or more since July 2005
• Offset Credit Banking has been made operational to facilitate discharge of offsets obligations
• The scope of offset policy guidelines has been expanded, in DPP-2011, to include civil aerospace, internal security and training

These policy interventions will provide a wider range of offset opportunities to vendors and enhance indigenous manufacturing capability. Since the introduction of offsets, contracts worth Rs.14146.22 crores have been concluded so far. Thus, there are now tremendous opportunities available which could spur the growth of the indigenous defence industry, including the private sector, in the next plan period.
Key challenges which face the defence sector

- Restricted technologies: Restricted access to defence technology, particularly in the areas of electronics & communication, missiles and smart ammunition, which are closely guarded by firms and nations. The lack of access to critical technologies, many of which are of dual use, delays projects.
- High R & D cost: Prohibitive cost of R&D for development of cutting edge technologies which is further accentuated by the lack of synergy between the institutions working in this area.
- Low R&D expenditure: Indian industry’s emphasis on R&D has been rather low with most companies spending only about 2% of their sales revenue on R&D.
- Monopsonic defence market: The Defence industry being monopsonic in nature, companies find it difficult to commit adequate funds for R&D in the absence of guaranteed business at the end of the development cycle.
- Fertile playing ground for middlemen, and inability of Government to effectively control or curtail them due to involvement of persons from different nationalities.
- Shipyard Infrastructure and facilities: Infrastructure available in the Defence PSU shipyards is inadequate to cater the futuristic warships and adhere to timelines of force level requirements.
- Low volumes of high technology equipment: Low volumes of high technology equipment are unattractive to qualified vendors. Absence of consortium approach between the designer, manufacturer and the vendor.

6.2.4 Strategy and key recommendations

- Set up a National Defence Manufacturing Council
  - Set up a national defence manufacturing council under the aegis of the Prime Minister’s Office. This body will ensure that domestic manufacturing gets due focus and support from the different Governmental agencies in achieving its goals, as stated in key objectives section of this document.
• Pass an Executive Order with decision to Use Make / Buy and Make (Indian) Mandatory for flagship large programs with appropriate funding
  - Enforce Make or Buy and Make (Indian) classification for all flagship defence contracts and mandate that the prime contractor be an Indian entity. To ensure that technology gaps are overcome, this entity can be a JV between a local entity and relevant global vendors. Eventually more and more projects, even the smaller ones, should also be brought under Make.
  - Decide the right financial model for Indian entities working with the Government on these flagship programs. Both Cost plus and Auction model are viable options.

• Streamline the Defence Procurement Infrastructure
  - Defence procurement processes use a variety of systems and processes. Specifically there is need to streamline at the level of offset implementation, DPSU and OFB procurement, and Ministry of Defence centered capital procurement.
  - Procurement systems and infrastructure for DPSU and OFB should be centralized into a single agency which will manage different aspects of the procurement process. This system will create a centralized list of defence vendors, become a watering hole for all private vendors who wish to participate in the defence procurement process, and provide guidance to new entrant in the system.
  - Additionally, it will provide standardized contractual frameworks and clauses that can be accessed by the multiple contracting agencies. This will help to reduce contract variation and complexity and promote a common understanding of contract requirements across the system.
  - The offset facilitation process should be enhanced through a more professional and specialized approach. Moreover, there is a need for greater role clarity between DoFA, DDP and Ministry of Defence in this area.

• Increase the FDI limit for foreign participation
  - The current upper cap of 26 percent on FDI in defence production needs to be relaxed to 49 percent to ensure adequate participation of interested parties but on case to case basis.
Specific technology transfer should be specified and export to friendly foreign countries should be allowed. Post–contract technology should reside in the JV / country.

• Support for SMEs
  - Support structure for up–gradation of defence manufacturing facilities (SME specific) is a critical need for deeper capability building. Set up an “Innovation Fund” of 1,000 crore for SMEs in Defence sector. Activities should be primarily around helping SMEs achieve manufacturing certifications like ISO, developing IPs and in establishment of licensed defence units
  - Promotion of industry – academia collaboration through schemes to bring educational institutions and the industry together to generate IP

• Create enabling infrastructure for capability building
  - Mechanisms to provide access to critical technologies available with research agencies or obtained through Transfer of Technology (TOT) arrangements are a key lever in enhancing Creating a Vibrant Domestic Defence Manufacturing Sector capabilities of the sector. A royalty / fee model to be developed allowing private sector to commercialize these technologies.
  - A program dedicated to skill up–gradation of defence manufacturing workforce focussing on both short term actions to plug existing skill gaps and long term initiatives is required to ensure projected skill requirements are developed in the eco–system over a period of time. A sector skill council can be formed with the help of NSDC.
  - Creation of a Centre of Excellence for Defence Electronics: To synergize the R&D talent available in private and public sectors as well as in the academia; to be modelled on a PPP model aimed at generation of indigenous IP.

• Vendor development
  - DPSUs should continuously develop vendor base to ensure continuous availability of equipment for timely completion of projects
6.3 Aerospace

6.3.1 Introduction

Aerospace manufacturing is a high technology industry that produces "aircraft, space vehicles, aircraft engines, propulsion units, and related parts". Its value chain is characterized by a long project life cycle spanning R&D, engineering design, manufacturing, assembly, maintenance, repair and overhaul.

The three segments of the Industry are:

- Defence
- Civil aviation
- Space

6.3.2 Key objectives

- Develop greater design and manufacturing capabilities in the defence space
- Become a global player in supplying advanced technology in space sector at a fair price in the global space market
- Drive dedicated technology development for civil aviation, develop greater manufacturing capabilities
- Become the international hub for Maintenance, Repair and Overhaul needs

6.3.3 Status and key challenges

India is one of the fastest-growing aerospace markets.

Defence

- India has embarked on major defence acquisition and development programmes. The industry will witness more than double the number of aircraft and helicopters to be produced during the next decade.

Civil aviation
• Of late, civil aviation requirements are driving dedicated technology development.
• Indian civil aviation industry’s rapid growth is driving modernization of airports, communications, radars and facilities for Maintenance Repair and Overhaul (MRO) of aircraft and sub systems.
• The civil aviation market is expected to register more than 16 per cent CAGR during 2010-2013. As a result, the Indian commercial aerospace market is estimated to absorb about 1,100 commercial jets worth Rs.585, 000 crore over the next 20 years.

Space
• India is ranked sixth globally, in terms of space budget and technological capabilities.
• Indigenous suppliers provide an estimated 70 per cent of the technology content
  - The current major space programmes are PSLV, GSLV, INSAT and IRS

The key challenges faced by the space sector are:

• SME participation
  - SMEs face hurdles due to the high capital cost, low volumes and long gestation period of projects

• International certification
  - Getting certifications for processes and parts is a challenge for India-based suppliers
  - Deterrent for OEMs to outsource some of their components to India, since approvals for parts/components made in India can sometimes take too long and as a result becomes cost inefficient

• Quality issues
  - The aerospace industry has to work on a zero defect target. While quality control in Indian manufacturing has improved significantly, a mature supplier base is still being developed in the country.
• Fragmentation of the sector:
  - Information gap between the defence and non defence sectors
  - DRDO and HAL are confined to the defence sector while NAL and other civilian aerospace companies remain insulated from the developments in the defence sector

Despite these challenges, Indian industry today has the technological capabilities to undertake complex manufacturing required for the sector. In addition, India has a strong base of skilled manpower from its engineering colleges and research institutions which can and should be leveraged to develop this sector.

6.3.4 **Strategy and key recommendations**

• **Strengthening institutional architecture** through a National Aeronautics Commission, if required
  - All the knowledge residing in entities like aeronautics organizations, colleges, labs, etc should be synergistically harnessed
  - Map indigenous capabilities, identify knowledge gaps, direct resources efficiently to address critical technology gaps
  - Formulate a national aeronautics policy to strengthen the aerospace industry

• **Strengthening of certification organisations**
  - CEMILAC is the agency for defence aircraft and DGCA for the civilian aircraft. Given the expected increase in the work in the sector, both organisations must be strengthened, on requirement basis.
  - The government should facilitate certification of SMEs. The process is both complex and expensive. Schemes to create awareness among SMEs and also part finance the process may be started.

• **Promotion of PPP model**
  - PPP model by forming JVs should be encouraged in order to fully exploit the knowledge base of the government and the entrepreneurship of the private sector. This will result in
expansion of aeronautical industrial base in the country and help make the Indian aviation sector competitive and efficient.

- **Earmarking special aerospace economic zones may be considered**
  - Creating clusters to certify and quality test aircraft and system components
  - These enclaves should be set up with the requisite infrastructure like air fields and traffic free air space
  - The growth in offsets could be efficiently utilised in the creation of such SEZs
6.4 Ship-building & ship-repair

6.4.1 Introduction

Nearly 95% of India’s foreign trade in terms of volume and more than 65% in terms of value is through sea routes. Currently, about 10% of our trade is carried by ships with an Indian Flag while the ships manufactured in India carry even less cargo. India’s emergence as a major economic power would mean greater integration in terms of trade with the rest of the world, requiring huge shipping tonnage. To ensure the safety of our vast coast line, the naval requirement of sophisticated and modern vessels is also growing rapidly. Therefore ship building is highly important from a civilian as well as defence perspective.

Shipbuilding essentially involves the assembly, construction and modification of ships in a specialized facility known as shipyards. These shipyards build ships for commercial as well as for defence purposes.

The Shipbuilding Industry has two main sub-sectors: ship building and ship repair. Shipbuilding industry is a significant consumer of raw material and generates substantial employment opportunities. It relies heavily on supplies from key elements of industrial infrastructure such as steel, forging & casting, marine machinery, machine tools, construction equipments, control gears, etc. The supply industry/ ancillaries to the shipyards are extremely important in the whole value chain, and with technological advances, their role has increased significantly.

The development of the shipbuilding industry typically has a positive multiplier effect on the economy by triggering growth in other manufacturing/services sectors. Other countries such as Japan, South Korea and China have all focused on a strong and vibrant shipbuilding industry. Vietnam, Turkey and Malaysia are in the process of building strong capabilities as well.

6.4.2 Key objectives

Medium and long term goals have been set for the Indian ship building and ship repair industry. These are:
• To achieve 5% share of the global shipbuilding market by 2020
• To be self-sufficient in ship repair requirements of the country and to emerge as a dominant ship repair centre displacing Colombo, Dubai, Singapore and Bahrain
• To achieve a share of 10% by 2020 in the global ship repair industry
• To develop a strong ancillary base for shipbuilding / ship repair in the country by 2020
• To generate additional employment for 2.5 million persons (0.5 million direct and 2.0 million indirect) by 2020 in the core shipbuilding as well as the ancillary and supporting industry sector
• To develop strong R&D facilities and design capabilities for commercial shipbuilding

6.4.3 Status and key challenges

• The average annual deliveries over the period of 2010 to 2020 are expected to be in the range of 80-100 million DWT. Hence, Indian shipbuilders would have to achieve delivery capacity of approx. 4-5 million DWT by 2020 in order to achieve the 5% market share by 2020. As against this, current deliveries of the Indian Shipyards stand at 0.25 million DWT.

• The ship repair industry worldwide is estimated to be around USD 12 billion (approx. Rs 55,000 crores) but currently India has less than 1-2% share with revenue of approx. USD 170 million in 2009-10 (Rs 734 cr.)

• India is currently heavily dependent on import of critical ancillaries for its shipbuilding sector. On an average 65% of the value of the ship is derived from ancillaries, of which Indian shipyards import almost two thirds.

• In 2010, Indian shipyards employed approx. 31,800 people with an employment multiplier of over 6.

• India currently lacks design capabilities and most of the concept designs are being sourced from a pool of global designs. Many Indian shipyards have set up their small design centres and some independent design centres have also been established, but broadly, the country is purchasing conceptual design from foreign firms and doing detailed engineering within the country.
6.4.4 **Strategy and key recommendations**

The key policy measures to enable the ship building and ship repair sector to meet its mid and long term goals are:

1. A policy statement in clear terms should be pronounced conveying the commitment of the Government to undertake various priority measures in the sector.

2. In 2002, the Government introduced a Shipbuilding Subsidy Scheme that provided 30% subsidy applicable to ocean going vessels, for shipyards both in public and private sector. The scheme came to end after five years in August, 2007. Some form of adequate financial/fiscal incentive would need to be considered in order to facilitate the industries to achieve critical mass.

3. Infrastructure status to shipbuilding: Granting infrastructure status would assist the indigenous shipbuilding industry to utilize the tax benefits available to the infrastructure sector and also avail credit at comparatively lower rates for investment in the technological development, infrastructural facilities and modernization.

4. Purchase preference for Indian built, Indian flagged vessels and Indian Shipyards in Government/Defence purchase: Globally, countries have aggressively promoted the use of locally build vessels by local shipping companies. NMCC has also recommended facilitating greater carriage of Indian trade by Indian built ships, and consequently developing domestic shipbuilding capabilities.

5. Offset scheme for Government procurement: The ancillary industry in India is neither developed nor matured as compared to other shipbuilding markets in the world primarily because of low volumes of the Indian shipbuilding industry. This has, in turn, severely impacted the cost structure of home-grown companies, rendering them un-competitive in international markets. It should be mandated that during the purchase of any ship from a foreign yard, the foreign yard would have to source a certain amount of marine engineering goods from India. This can create a steady stream of orders for domestic marine engineering companies and help develop capabilities in the sector.
The offset policy in defence sector should insist on systems and sub-systems as units for consideration for meeting offset requirements. Defence procurement from foreign suppliers should be conditional on greater domestic manufacturing content as well as on technology transfer.

6. Need for State Maritime Policies: In order for the efforts to boost Indian shipbuilding to be successful, the industry also needs to get adequate support from the maritime states of the country. It is the states that would have to help implement these policies to support and develop the industry. In this context, development of state maritime policies and state maritime boards is extremely important. Gujarat Maritime Board (GMB) has recently come up with its own shipbuilding policy (Shipbuilding Policy 2010). The policy aims to develop Marine Shipbuilding Parks (MSP) and clusters to create ancillary base for the industry and help reduce costs to the shipbuilders by sharing costs such as common infrastructure, logistics etc. Other states should also be encouraged to have similar enabling policies so as to help develop shipbuilding industry. Such policies would provide clear directions to the shipbuilding industry and confirm the commitment of State Governments on long-term basis.

7. To examine the issue of incidence of taxes that disadvantages the domestic industry.

8. A renewed thrust is required to develop education and training facilities, and R&D infrastructure. This would also include promoting applied R&D to facilitate the development of basic design as well as standardization to encourage series production. For this purpose, Government’s financial support would be required.
6.5  Capital goods & engineering

6.5.1  Introduction

The Prime Minister’s Group constituted under Chairman, National Manufacturing Competitiveness Council in its Report (Prime Minister’s Group Report - PMGR) identified Capital Goods as one of the sectors that is strategic for strengthening national capabilities for the long-term. The PMGR has recommended support for the following subsectors within the Capital Goods sector: (1) Machine tools, (2) Heavy electrical equipments, (3) Heavy transport, earth moving & mining equipments, and (4) High technology equipments like IT, Telecommunications and Electronics hardware. The PMGR has recommended, among other things, the following:

i. A time bound action plan should be prepared in each of these areas for building high class modern capacities with R & D facilities in line with the requirement of meeting the long term strategic demands of the country

ii. The action plan should contain policies and programmes which would encourage growth and development of these sectors in the private sector while strengthening the existing public sector. Competitiveness should be the touchstone for Governmental support.

iii. To protect and promote selected capital goods industries, the government can look at reorienting a few existing policies. e.g. under project import, the customs duty at present is exempt on power equipment and highway construction equipment.

In a separate recommendation on ‘Technology acquisition and development’, PMGR recommended enunciation of a clear policy to provide incentives for acquisition of advanced technologies which are required for strengthening the country’s technological capabilities in the long term.

It also recommended a dedicated fund for acquiring technology for tier-2 suppliers of priority sectors. It recognized ‘offset policy’ as one of the means to ensure that a proportion of the total equipment
imported is manufactured in India. A review of the current FDI policy from the point of view of transfer of technology as well as considerations of National Security was also recommended.

6.5.2 **Key objectives**

The Working Group on Capital Goods and Engineering Sector set up by the Steering Committee on Industry focused on the following sectors: machine tools, earth moving, heavy electrical, metallurgical, textile, process plant, mining, power plant and other industrial machinery and engineering sectors. The key objectives were to make the capital goods sector globally competitive, reduce overseas dependence in strategic sectors, increase depth in manufacturing and enhance production levels, employment, exports and contribution to the national exchequer.

6.5.3 **Status and key challenges**

The main factors that inhibit development and investment in the capital goods sector are as follows:

i. High investment required to create new capacities

ii. Long gestation and payback period

iii. High interest rates in India

iv. The Capital Goods Sector is highly fragmented with a majority of the units being SMEs. The existing collaborations/JVs of Indian companies have ended. There are fewer opportunities for such collaborations in the present policy environment

v. Technology profile of domestic products is from basic to intermediate

vi. Support facilities, technology development institutions and skilled man-power lag behind global standards

vii. Inverted duty structure favours imports
Capital Goods sub-sector production and growth rates projected in the 12th Plan (Rs. Crore)

<table>
<thead>
<tr>
<th>Sub-sector</th>
<th>Market Size 2010-11</th>
<th>Domestic Production 2010-11</th>
<th>Domestic Production CAGR 2004-05 to 2010-11</th>
<th>Projection production 2016-17</th>
<th>Production CAGR 12th Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine Tools</td>
<td>10236</td>
<td>3624</td>
<td>12</td>
<td>13800</td>
<td>25</td>
</tr>
<tr>
<td>Plastic Processing Machinery</td>
<td>3850</td>
<td>2403</td>
<td>28.8</td>
<td>12700</td>
<td>22</td>
</tr>
<tr>
<td>Earth Moving and Mining Equipment</td>
<td>14500</td>
<td>7333</td>
<td>12.5</td>
<td>34900</td>
<td>17.4</td>
</tr>
<tr>
<td>Heavy Electrical and Power Plant Equipments</td>
<td>121000</td>
<td>110000</td>
<td>14.1</td>
<td>257000</td>
<td>15.2</td>
</tr>
<tr>
<td>Textile Machinery</td>
<td>10500</td>
<td>6150</td>
<td>6.9</td>
<td>14300</td>
<td>15.1</td>
</tr>
<tr>
<td>Metallurgical Machinery</td>
<td>4900</td>
<td>1100</td>
<td>12.1</td>
<td>5800</td>
<td>35</td>
</tr>
<tr>
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<td>16300</td>
<td>18000</td>
<td>12.5</td>
<td>35000</td>
<td>12</td>
</tr>
<tr>
<td>Engineering Goods</td>
<td>116000</td>
<td>106000</td>
<td>13.4</td>
<td>277000</td>
<td>17.3</td>
</tr>
</tbody>
</table>

Improvement in competitiveness depends not only on the internal efficiency improvement of enterprises, but also on the accompanying policy framework and the eco system required for developing the sector.

6.5.4 Strategy and key recommendations

I. Investment inducement through clusters: Clusters should include common facilities, for product development, and design and testing facility centers in sector-specific cluster parks. Enterprise management development through a common training centre should be promoted through SPVs. Project proposals should be formulated after conducting detailed surveys in identified sub-sectors of capital goods industry.
II. **Skill development support:** Lack of skilled manpower at all levels to support even the existing level of growth in the industry will strongly impact the machine tools, electrical machinery and earth moving equipment segments. A two-pronged approach is recommended:

- Promote skill development through public agencies
- Promote skill development with the help of private sector on a Public-Private Partnership mode.

The action steps suggested in the different sub-sectors of capital goods include upgradation of selected ITIs, polytechnic institutions and engineering colleges and to establish centre of excellence for executive development.

III. **Fund for Expansion/Modernization of existing units; fund for technology transfer, acquisition of firms abroad; 5% interest subsidy**

The industry is considered high risk and not considered a preferred borrower. Therefore low cost funds are required to stimulate creation of additional capacity and for technology upgradation.

The following specific recommendations for policy initiatives are proposed for the capital goods and engineering sector:

- Support for incentivizing technology development/transfer and value addition in India
  - Modify FDI policy to ensure transfer of technology by giving preference to JVs instead of 100% foreign owned companies
  - Develop indigenous facilities for design, development & testing of equipment
  - Incentivize/mandate foreign players to increase value addition in India
  - Preference in PSE/Government purchases for products having higher local content
  - Inter ministerial coordination through a Central Government body to promote coordination of sub-sectors with user sectors

- Substitute Imports : Calibration of duties and taxes to remove disadvantages for domestic players
  - Regulate/ban import of second hand machinery
- Revisit existing FTAs, PTAs; analyze effects on domestic players before entering into any future agreements
- Address adverse tax structure for local manufacturers in India
- Modify Government tender terms to remove disadvantages to Indian firms against imports

- Promote exports
  - Export line of credit to be extended
  - Support for market/brand development

- Leverage PSEs like BHEL, BEML, HEC, HMT etc. to upgrade domestic technology capabilities.

- Private sector companies in process plant machinery that have a proven track record of technological prowess and ability to export large hi-technology equipment, coupled with large employment generation capability, should be supported.

Though many of the issues constraining the growth of the capital goods sector are common, there are specific sub-sector issues that would require to be addressed with specific measures. The issues specific to machine tool, heavy electrical and power plant equipment, earth moving and mining equipment and associated recommendations are as follows:

**Machine Tools Industry**

India’s share of machine tool production is at present only 0.8% of world production. Over the years Indian industry is increasingly importing machine tools. At present, about 70% of the requirement of machine tools is met through imports. The domestic production is about Rs. 3600 crores. There are 8-10 large companies (turnover above Rs. 100 crores), 10-15 medium companies (50-100 crores) and rest are small. HEC and HMT are two CPSEs in the machine tools sector. New investments have been few, either green field or for modernization. The large industrial houses did not venture in this field but opted out due to low returns on investments.
The machine tool industry has the potential to grow from about 12% per annum to 15-20% and thereby can either retain its share in domestic market at about 33% (realistic scenario) or can increase to somewhere around 50% (ambitious scenario) by 2020 as visualized in the road map for the Machine Tools industry. To achieve a market share of about 50% by 2020, the industry will require around Rs. 15,000 crore to invest in capacity creation. A set of policy, investment and technology development measures have been recommended by the Working Group. If these investments are not made, the domestic industry may lose out entirely to imports, and the domestic market share could drop to 10% or so, and have serious consequences.

The recommended measures, in addition to policy support, include Government support for capacity expansion. The measures include support for technology transfer, common facilities, R&D/incubation centres, business & market development and cluster parks. A roadmap for the Indian Machine Tool Industry (February 2010) by Development Council for Machine Tool (constituted by Department of Heavy Industry) is also under deliberation. Some of the measures that are necessary as identified in the roadmap are as follows:

a. Define a National Mission for Machine Tools (similar to China)
b. Introduce immediate fiscal incentives
c. Mission to indigenize critical mechanical elements and machine tool electronics
d. Measures to attract investment are a priority
e. Creation of modern state of the art capacities
f. Realize full potential of PSU capacities
g. Fillip to R&D and technology development is essential
h. Industry-academia-R&D linkages

The above issues of machine tool industry are included in the Working Group Report.

**Heavy electrical and power plant equipment**

Heavy electrical and power plant equipment constitute the main elements of the capital goods sector. The market size is around Rs. 1,21,000 crore, growing at about 14%. Two distinct segments are power plant equipment (mainly including boilers, turbines, generators - BTG) and electrical equipment for...
power transmission and distribution (power transformer, distribution transformer, switch gears, insulators, capacitors). The major power addition programmes, Restructured Accelerated Power Development and Reforms Programme (R-APDRP) and Rajiv Gandhi Vidyutikaran Yojana (RGGVY), and transmission projects have been major drivers of growth in electricity generation/transmission and the corresponding growth in equipment industry.

With increase in the requirements for meeting the planned additions and a shift towards setting up higher efficiency super critical power plants in the country, the Indian domestic manufacturers have formed joint ventures (JVs) with foreign companies and are focusing on manufacturing higher efficiency equipments. Simultaneous with setting up of joint ventures for manufacturing, a key development has been domestic power developers contracting with Chinese equipment suppliers. The domestic industry has expressed concern about the lack of capacity utilization in BTG segment. Power transmission and distribution equipment industry, though it regained growth in the range of 11-14% in last two years, has a capacity utilization in the range of 70-80%. Capacity utilization is a major issue. The Working Group has made the following sector-specific policy recommendations:

i. Ensuring utilization of domestic capacity
   - The government, through its policies, should create adequate demand potential for heavy electrical & power plant equipment
   - Create appropriate conditions that would enable full capacity utilization of domestic manufacturing entities involved in the Heavy Electrical & Power plant equipment.
   - Create a special vehicle for State Electricity Boards (SEB) that would enable replacement of old and ageing power plants of lower ratings with higher rating (500 MW & above) utilizing the existing land and infrastructure, rather than adopting Renovation and Modernization (R&M) route.
   - Facilitating availability of critical raw materials

ii. Standardization: Different ratings are being specified by different developers/utilities,. Central Electricity Authority (CEA)/Ministry of Power (MoP) may decide on Specific power plant ratings as standard ratings to be adopted for the Indian grid.
iii. Testing facilities: 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 ‘Electrical equipment manufacturing industry’- Industry Report 2010 by IEEMA has listed the industry’s concerns as follows:

i. Limited testing facilities in the country – Lack of high voltage testing facilities (above 400 KV) in the domestic market

ii. Variation in procurement guidelines of state utilities – Standard prequalification criteria be established by a relevant Government body and followed by all the utilities as is the case with UMPP, IPTC etc. This will bring in higher transparency in the equipment bidding space and enhance higher competition among bidders resulting in cost competitiveness to the ultimate buyers.

iii. Gap between Indian and International standards – The Indian standards are not updated frequently by IEC and often fall behind global standards. Absence of updated Indian standards also leads the prospective buyers to customize specifications and prequalification to accommodate for latest International Standards. This, in turn, leads to non-standardization of equipment. It also impacts the global competitiveness of Indian manufacturers.

iv. Threat of escalating imports – The lack of a level playing field in the country inhibits competitiveness against Chinese manufacturers. The price differential between domestic vis-à-vis Chinese manufacturers is mainly due to disadvantages faced by domestic industry as well as subsidies/incentives provided to the Chinese manufacturers by its Government.

v. Taxation related concerns – Inverted duty structure, interest on excise duty for differential prices (supplementary invoice) etc.
vi. Raw material related concerns – Constraint availability of certain critical raw materials, issue concerning mandatory BIS marking for CRGO/CRNGO steel

vii. Lack of preference clause in domestic procurement – The procurement guidelines laid down for funded projects by World Bank and ADB have suitable provisions for allowing preference to domestically manufactured goods/services in the case of procurement through the international competitive bidding (ICB) route. The industry has also urged the central as well as the respective state governments to make it mandatory for government owned enterprises/entities to deploy such preference clauses in cases of domestically funded ICB procurements.

Earth moving and Mining equipment Sector

The earth moving and mining equipment market size was about Rs. 14,000 crore in 2010-11. Production and import are of approximately the same level i.e. Rs. 7000 crore.

The construction equipment industry (CEI) in India enjoys a positive long term outlook. Planned investment in infrastructure (more than US$1 trillion) and growing urbanization will drive the construction industry to grow at 16-17 percent CAGR over the next 10 years. The attractiveness of the Indian market is accelerating the entry/expansion of global OEMs, which will increase the competitive intensity in the market. The growth opportunities are accompanied by increasing competition from equipments from countries like Brazil and China.

The sector has evolved over the years and is at present in an intermediate stage of development. The technology available in the country has the pedigree from the international majors due to technical collaborations in the past. Some products manufactured in India by some of the MNC’s who have set up assembly plants in India are meeting the global standards.

It is estimated that the domestic content is nearly 35% in standard equipment whereas the domestic content is about 78% in high technology equipments. Over the years three Chinese companies have emerged as leading construction equipment manufacturers among the top ten in the world. In key product categories, e.g. wheeled loaders, Chinese imports have cornered a 12 per cent share of the
Market. Competition is likely to intensify as many Chinese players have improved their distribution and after-sale networks in India. Companies from China and Korea are also expected to provide competition to India-based construction equipment exports to developed markets.

The mining sector is now graduating into utility of high-end technology products especially in institutional sector world over including India. High end technology is required for large size dump trucks, excavators, shovels, walking draglines etc. Such technology is not available in India and MNCs/Technology providers demand high Transfer of Technology fees for providing access.

A recent Industry Report by CII on the Indian Construction Equipment Industry lists the following issues of importance to the industry – (i) Rationalization of taxes to mitigate impediments for interstate movement of earthmoving and construction equipment, (ECE) and encourage ECE manufacturing in India, (ii) Need for skilled personnel, (iii) Unregulated import of used equipments, and (iv) Ambiguity about emission and safety standards.

The Working Group has recommended the following

- Emission standards must be made applicable to earthmoving equipments etc.
- To take initiatives for indigenous development of certain equipments like dredgers to achieve self-reliance in this area
- Bharat Earth Movers Ltd. already manufactures these equipments and has competence in manufacturing high end technology products to be strengthened to emerge as prominent players in this segment. The PSU need to be, inter alia, strengthened and need to be provided support for transfer of technology through the diplomatic route.
(B) Sectors for Basic Inputs:

6.6 Steel

6.6.1 Introduction

Indian Iron and Steel industry, with its strong forward and backward linkages contributes significantly to the overall growth and development of the economy. The industry today directly contributes 2 per cent to India’s Gross Domestic Product and its weightage in the official Index of Industrial Production is 6.2 percent. India has become the world’s 4th largest producer of crude steel, preceded only by China, Japan and USA. However, India has been lagging behind other major steel producing countries in terms of techno economic efficiency of operations and hence Indian Steel industries are not very globally competitive. The industry in fact continues to be characterised by low productivity, high energy consumption, heavy dependency on imported technology, low productivity, low priority for R&D initiatives and product diversification.

There is an urgent need to address its basic constraints irrespective of equity size and nature of operations. In 2010, our per capita consumption of steel was only 51.7 kg, as against the world average of 202.70kgs. There is tremendous potential for improvement in the domestic steel consumption given the economy’s large untapped markets, especially in rural areas.

With a GDP growth of ~9%, the sector is expected to grow by ~10.3% in terms of steel consumption. This translates to a total demand of finished steel in the country at ~115.3 MT by the end of the 12th plan (including an export demand of 7 million tonnes). Based on a conversion rate of 90% from crude steel to finished steel and an average capacity utilization rate of 90%, the total installed steel capacity for 12th Plan (year-wise) needs to be 142.3 MT.

Indian Iron & Steel Industry consists of various segments like Pig Iron, Sponge Iron and Ferro alloy Industry. The Pig Iron Industry made a good beginning in the XIth Five Year Plan, however, it has shown a declining trend from 2009 onwards. Similarly, the Sponge Iron Industry has shown a good growth rate during the XIth plan period, as has the Ferro Alloy Industry. As per the Working Group Report, it is felt that there is a need to keep special attention in areas of raw material availability, Infrastructure Development, Technology and R&D, to keep the pace of Indian Iron & Steel Industry
with the global standard. Indian Steel Industry comprises of three category producers viz. Main Producers, Major Producers and Other Producers etc. The Main producers include public sector and private sector Plants. This sector has a combined capacity of around 22.55 million tonnes per annum with current capacity utilisation rates exceeding 100%. Major Producers consist of Integrated steel plants with crude steel capacity of 0.5 MT and above. Total crude steel capacity is estimated to 17.40 million tonnes. Other producers in this segment include mini steel plants having capacity below 0.5 million tonnes. Re-rolling (RR) units and Cold Rolling (CR) units.

6.6.2 Key objectives

- Increase capacities to ~142.3 MT in accordance with demand projections
- Ensure raw material security, especially in terms of iron ore and coking / non-coking coal

6.6.3 Status and key challenges

The key challenges facing the Indian Iron & Steel Industry are:

1. Formulation of policy for regular supply & availability of Raw Materials and land acquisition for mining operations.

2. Infrastructure Development in and around mining areas related to Iron & Steel Processing Plants, with special focus on developing railway and port facilities.

3. Technology Development and R&D initiatives to produce high value added products and new product-mixes for specific uses.

4. Address the environmental issues and safeguard measures to make Indian Iron & Steel Industry sustainable.

5. Skill development at various levels to cater to Industry needs.
6.6.4 **Strategy and key recommendations**

**Achievements in the XIth Plan**

The Merchant Pig Iron units have grown at a rapid pace commanding a large share of the market. Due to modest increase in capacities, India has been able to meet almost all of its requirements through domestic production, and also exported 0.35 million tonnes of Pig Iron in 2010-11. At present, India is the largest producer of Sponge Iron in the country. The robust growth of the Sponge Iron industry in the country vis-à-vis growth in crude steel production has been continuing for the last 10 years. This growth has come due to a remarkable expansion in the number of Coal based units that have started operating in the Eastern, Western and Southern states. The factors that contributed to the rapid growth of the Sponge Iron sector include relatively easy availability of non-coking Coal, easy availability of Iron ore lumps at competitive prices, short gestation periods, low capital costs, cheap labour and availability of indigenously manufactured main equipment’s. The Indian Ferro-Alloy industry has added 1600 MVA capacity in the 11th plan period and the furnace capacity has crossed 2900 MVA. By tonnage, it has crossed 4.65 million tonnes. Relatively higher cost of electrical energy is considered a major area of concern by the industry. The other important problem is availability of required quality of raw materials.

**Steel Demand and Supply**

Demand for steel is closely linked with production activities in various sectors of the economy. Being a basic material for development of economic and social infrastructure, steel is used for producing capital goods as well as final consumption goods. As a result, one may establish a direct relationship between economic growth as measured by Gross Domestic Product (GDP) and demand for steel. It is, therefore, proposed that an econometric model with GDP as an explanatory variable may be adopted for projecting demand for the 12th Plan period. It needs to be noted, however, that for the same rate of GDP growth, the estimated relationship (as measured by the co-efficient of elasticity of steel demand with respect to GDP) will be stronger when that economic growth is driven by capital formation/investment and industrial growth rather than growth in other sectors of the economy. The implication is that at a more immediate level, steel consumption is also linked with sector-level
macro-economic variables such as capital formation/investment and industrial production which in turn are directly linked to GDP growth. Analyzing the past behaviour of these interrelated macro variables in a given general economic context, it is possible to estimate associated GFCF and IIP values required to attain the targeted GDP growth assumed for our projection.

While projections based on a shorter period may have statistical limitations, the shorter run elasticity (arc elasticity to approximate point elasticity) may help in capturing the latest trend in the correlation of selected variables, a scenario based analysis for steel demand forecast during 12th Plan has been attempted.

- Growth in Steel consumption in a country depends upon the rate of growth in its GDP; the estimated GDP-elasticity of steel taken while growth in GDP is a crucial determinant of growth in steel consumption. GDP elasticity of steel demand is a definitive parameter specific to an economy and determines the rate growth in its steel demand over time.

GDP elasticity of steel demand at a given period time, is a function of the development strategy adopted and is determined by the structure of the economy and the dynamics of its growth path in shifting shares of the Primary, Secondary and Tertiary sectors, rates of investment, levels of urbanization etc. It is therefore necessary to examine in detail the following in order to make a realistic assessment of future demand of Steel in India.

- Past performance of the Indian economy

- Analysis of the consolidation trends, especially in view of uncertain of economy scenario

- Review of changes in the structure of the economy, especially factors relevant for the 12th Plan period like increase outlays in Infrastructure, thrust of manufacturing issues etc.

The World Steel Association monitors the production and consumption of the Steel Industry in each country since the 1980s and also projects a short range outlook for steel at regular intervals. These projects are inclusive of demand of alloys and stainless steel and take into account current
developments affecting steel demand. As per the Working Group report, the projected demand for steel in the 12th Five Year Plan will reach 115.3 million tonnes in FY 2017, with crude steel production of 128.1 million tones and hence, crude steel capacity of 142.3 million tonnes.

**Raw Materials**

Iron Ore is the basic raw material used in Steel making. Though iron ore is abundantly available in the country, large scale exports of iron ore have raised serious concerns about the future availability of iron ore resources to meet the fast rising domestic steel demand. Raw materials are crucial in determining the competitive growth of any industry. This is more so for an input-intensive industry like steel, where efficient extraction of iron ore is critical. Requirement of major raw materials in the steel industry is determined not only by the rate of growth in output but also by the technology adopted for making the required steel. For obtaining access to basic raw material linkages especially iron ore and coal, the industry is dependent on interventions by the States and consensus building within the larger social space.

There is an urgent need to address the problems of degradation of the environment, displaced population, developing transportation network etc. These issues are bound to impact indigenous availability, cost of production and usage pattern of all steel making raw materials etc. It is reported that for a projected Crude Steel Production of 125.9 million tonnes, the requirement of iron Ore is 206.18 million tonne, Coking coal 90.16 million tonnes and non-coking coal 28.41 million tonnes. In addition other important raw materials like Manganese Ore, Chromites, Ferro-Manganese, Silicon Manganese, Ferro Silicon, Refractory’s are also required.

The Growth of the Steel industry and capacity creation is highly dependent on the growth of infrastructure. The Steel industry is a major consumer of infrastructural facilities especially for rails, roads, power and ports. While the demand for infrastructural facilities will increase manifold in the 12th Plan period, the already overburdened infrastructure in India, and more particularly in mineral rich states, is a matter of great concern. During the 12th Plan, emphasis should be laid on specific needs of the steel industry especially with regard to road/rail connectivity from ports/highways to the plant site. While the 12th Plan envisages investment of 1 trillion dollars in such infrastructure, there is
a need to focus on implementation of infrastructural projects as past performance in this regard leaves significant scope for improvement. India is endowed with abundant Iron ore resources - the basic inputs for steel making.

The domestic availability of Coking coal, a critical raw material required by steel industry is limited and therefore the Indian Steel Industry has to depend heavily on imported coking coal to meet its needs. To ensure raw material security and minimize the impact of volatility in coal prices, it is desirable to acquire overseas coking coal assets. Supply is controlled by a few large companies. It will be extremely important to increase the domestic production of coking coal and upgrade its quality to meet the requirements of steel making.

**Infrastructure**

The growth of the Steel industry and its capacity creation is highly dependent on the growth of infrastructure. Steel Industry is a major user of infrastructural facilities, especially of Railways, roads, power and ports. As per the working group projections, Steel production in the country will nearly double within the next five years. This requires rapid growth of railways, roads, ports and power facilities.

The requirement of imported coke coal and of thermal coal will increase substantially in the 12\textsuperscript{th} Plan, so an adequate increase in port capacity handling facility needs to be undertaken on priority so that the situation of shortage of coking coal does not affect the Steel Industry. National Investment & Manufacturing Zones have been proposed as a part of the National Manufacturing Policy. NIMZ may provide an excellent location for setting up of new Steel Plants as the transportation costs will be minimized due to close proximity to consumers of steel.

However, for this to happen it is desirable that in the perspective planning for NIMZs, some of the NIMZs are planned in the Eastern region of mineral rich states. The Government may also consider setting up special purpose vehicles to execute the preliminary work such as land acquisition, land development, obtaining all government clearances in identified steel plant sites and hand over the same to prospective investors on commercial terms. Emphasis should be laid on the specific needs of
the Steel industry, especially with regard to road/rail connectivity from ports/highways to the plant side. While the 12th plan envisages an investment of 1 trillion dollars in the infrastructure, there is a need to focus on implementation of infrastructural projects as past performance on this front leaves significant scope for improvement.

**Financial Resources**

The requirement of financial resources to create an additional capacity of around 60 million tonnes will be approximately Rs.2.5lakh Crores during the 12th Plan., Availability of such large quantum of investible funds at reasonable costs will be a challenging task. Government may also consider easing of norms connected with external borrowings. Special purpose long term financing facility may be created to finance huge investment in new steel plants.

**Technology and Research & Development**

It is observed that the technological performance of Indian Steel Plants in terms of specific consumption of raw material/consumables, specific energy/power consumption, environmental and pollution norms is significantly lower than those in advanced countries. The poor performance standards of the domestic industry are primarily attributed to poor quality of raw materials/inputs, prevalence of obsolete technology and lack of R&D to overcome the technological gaps. There is a need to focus attention in the area of quality of Iron ore in terms of high Alumina contents and high Alumina to Silica ratio. Besides there is a need to reduce Coal ash substantially to make over Coals suitable for Coke and Iron manufacturing process. It is essential to develop indigenous capacity to develop technologies to suit indigenous raw materials, improve energy inputs norms and meet national norms for emission per ton of production, and comply with global standards on emissions and carbon foot print etc.

Several small units engaged in manufacturing iron & steel products need to focus on R&D to improve their technology and performance standards. While readymade technological solutions for Steel making are available in the form of imported technology/equipments but there is a need to develop appropriate domestic technologies which are compatible with the resource endowment of the country. There is an urgent need to step up existing level of R&D expenditure to bridge the efficiency
gaps, develop indigenous technologies and design & fabricate important equipment related to steel production. There is also a mismatch between the skill requirement of the Steel industry and availability of the same from various educational/training institutions. In the 12th Plan, focus is required to impart training in handling of latest mining equipment’s and skill development for areas like mining operations, equipment handling, port handling etc.,

Improvement in raw materials is to be achieved through selection of appropriate beneficiation process and improvement in operational practices of ore beneficiation/coal washing circuit. Coal gasification of non-coking coals and recovery & utilization of CBM, are the important steps to address the issues such as coal coke shortage and CO2 emission. To alleviate the shortages of Iron, there is a need to put up pellet plants. Due to increasing demand for High Strength Steel, current Batch Annealing Furnace (BAF) technology may get replaced with Continuous Annealing Technology. Environmental concerns would be a major criterion for the selection/ adoption of new technology in near future. To create sound indigenous capacity to develop technologies to suit indigenous raw materials, improve energy inputs norms through energy-efficient technologies and meet international norms for emission per ton of products and comply with global responsibilities for carbon food print. Energy-efficiency, Pollutants emission control, Solid waste minimization, more efficient use of Indian coal resources and value addition to indigenous raw materials in public and private sector R&D would need to be promoted through a Challenge Award Scheme.

Environmental Management, Safety Measures and Energy Efficiency

The strategies for development of steel sector should not only focus on volume growth but also on quality of growth. It is necessary to evolve an approximate sustainable development framework which balances the need for rapid growth of the steel industry and also addresses the concerns on environment and climate change. Steel industry is a resource intensive industry and therefore it has the potential to negatively impact the environment unless regulated adequately. There is a consensus that there exists a lot of scope for the Indian Steel Industry to contribute to the National Mission on Enhanced Energy Efficiency (NMEEE) as well as National Action Plan on Climate Change (NAPCC) of 2008. Suggestions on strategies and thrust areas for the 12th Plan to achieve a sustainable growth of
Steel industry include Energy recovery and conservation, technologies such as Coke Dry Quenching (CDQ) and Waste heat recovery from sinter cooler.

National Mission for Enhanced Energy Efficiency (NMEEE) has planned four new initiatives namely Perform Achieve and Trade Scheme (PAT); Marketing Transformation for Energy Efficiency (MTEE); Energy Efficiency Financing Platform (EEFP) and Framework for Energy Efficient Economic Development with the aims is to reduce the emission intensity. The Indian steel industry currently is at a crucial stage with challenges of climate change. Existing plants need to evolve short term and long term action plan to phase out the old and obsolete facilities by State-of-art; clean and Green technologies with an aim not only to achieve higher standards of productivity but also to harness all waste energy with minimised damage to the environment. The several policies adopted in the Iron and Steel Industry in India are comparable to the policy followed internationally. However, implementation and monitoring of these policy guidelines on the ground leave much to be desired. It has been observed that adherence to safety measures and policy is lacking due to many factors, viz. Indifference on the part of management and workers, financial problems, lack of awareness, complicated and slack legal machinery and lack of adequate statutory provisions etc.

The Government has an important facilitating role in the development of the steel industry complying with all standards to meet the global benchmark. The Steel Industry needs policy support from the States to achieve the object of the National Steel Policy to make India a global producer.

**Plan Assistance/Allocation for the Steel Industry**

With the Plan Budget Outlay of Rs.118 crores. The Ministry of Steel has implemented various R&D Projects in the XIth Plan to accelerate R&D activities in developing innovative/path breaking technologies consistent with domestic resource endowments. Ministry of Steel proposes to undertake few more high value projects of National importance, particularly related to technology development and adoption in the 12th Plan taking into account the assistance required for both ongoing as well as new projects to be undertaken. A total budgetary allocation of Rs.550 Crores is proposed for continuation of the scheme during the 12th plan. The proposed outlay includes Rs.50 Crores for ongoing R&D projects and Rs.500 Crores for new projects to be taken up during the plan
period. The new schemes are in the areas of providing incentive for promotion of beneficiation &
Agglomeration of low grade Iron ore & Iron ore fines and improvement of energy efficiency in
secondary steel sector.
6.7 Mineral Exploration and Development

6.7.1 Introduction

India is blessed with ample resources of a number of minerals and has the geological environment for many others. The metals and minerals sector has a direct bearing on the growth, development, depth and sustainability of the manufacturing and infrastructure sectors. Minerals are a valuable natural resource since they are the vital raw materials for industries like capital goods, steel, etc. As a major resource for development, the extraction and management of minerals has to be integrated into the overall strategy for the country's development.

Raw material security, and the ability to provide the range of metal based mineral required in terms of quality, standards and prices is key to the process. Assured availability and proximity of mineral resources plays an important role in giving a competitive edge to Indian manufacturing.

Mining consists of various stages including prospecting, exploration, extraction, processing, etc, and there is a strong need to develop each of these stages in the country. While this section includes a brief summary of the strategy for this sector, detailed strategies and recommendations are available in the Working Group report.

6.7.2 Key objectives

The mining sector is strategically very important for India. The key goals that need to be met for this space are:

- Raw material security: for all the user industries
- Enhanced co-production of by-product metals for Technology Metals and Energy Critical Metals
- Ensuring sustainability of the environment
6.7.3 **Status and key challenges**

The Indian mining sector accounts for just 2.2% of the GDP. Exploration spending in India (incl. oil and gas) is ~$15/km² which is low, approximately 1/10th that of Australia / Canada. The value of mineral production currently stands at ~INR 53,793 Cr (2008-09)

There are select key challenges that need to be overcome in order to develop this space in India:

- Investments in exploration are grossly inadequate with respect to the potential
- There is a need to ensure availability of financial resources given the high investments, especially in the exploratory stages which are high risk ventures
- The Geological Survey of India's need to be modernized and reformed in an accelerated fashion
- There is an acute shortage of geoscientists, especially in GSI
- Low return has been seen so far through increased R&D investment
- Infrastructure available for ensuring development of mining is limited and needs to be improved
- There is currently significant environmental degradation as a result of mining activities, especially from illegal, small scale mining of small deposits. In addition, land acquisition is a major constraint and challenge that needs to be resolved.

A new Mines and Minerals Development & Regulation Bill (MMDR) has been drafted and approved for introduction in the Parliament. This includes significant recommendations and needs to be implemented as soon as possible

6.7.4 **Strategy and key recommendations**

The core function of the state in mining needs to be the facilitation and regulation of exploration and mining activities of investors and entrepreneurs, provision of infrastructure and royalty & tax collection. In order for the State to achieve the key objectives associated with the sector, a select set of reforms are essential.
Strengthening of institutions

- It is necessary to equip and position public agencies like the Mineral Exploration Corporation Limited, Directorates of States and other organizations to conduct detailed exploration at the State's expense to enable the State Govt to adopt a bidding route for exploration to a larger extent.

- The GSI must be positioned so as to enable its information to be used for the benefit of science, society and the nation, by placing emphasis on geospatial and multi-disciplinary work. An overarching mechanism to provide policy direction for geosciences is a must.

Encouraging R&D and technology development

- Select areas of mining need to be given special focus, and IBM needs to drive this process, and requires to be strengthened for this purpose.
  - The Mineral Process Laboratories of the IBM, and other research organizations must be strengthened for the development of processes for beneficiation and mineral and elemental analysis of ores, etc.

- Deposit-specific process R&D needs to be done by the concessionaires on a commercial basis.

- For the production of materials of high purity, an institutional mechanism to help direct lab scale research and then upscale to pilot project levels and commercialization must be developed.
  - This should take the form of a not-for-profit company with adequate funding from stakeholders who are involved in this sector.

- Development and training initiatives, specific to R&D, within the public domain, need to be reorganized into a single and cohesive R&D and training institution of excellence (a "National Institute of Mineral Development") under the umbrella of the Indian School of Mines.

- Organizations like Non-Ferrous Technology Development Centre, Jawaharlal Nehru Aluminium Research Development & Design Centre need to be reoriented to focus on process R&D for Technology and Energy Critical Metals.
Creation of infrastructure

- Principle of user charges and PPP models for the building of infrastructure need to be institutionalized
- Special emphasis needs to be given to linking infrastructure in mineral bearing areas

Skill development

- Educational and training facilities for manpower to meet the requirements of the mining industry
- Existing facilities for basic and specialized training need to be reviewed and upgraded

Ensuring full and productive coverage of survey and exploration

- GSI needs to ensure that its regional surveys cover all major geo-scientific datasets
  - All pre-competitive data must be available to facilitate entrepreneurs to take investment decisions
- GSI and state governments need to invest in IT systems to be able to authenticate, archive and integrate all data related to surveys and exploration
- India's Exclusive Economic Zone (EEZ) needs to be fully explored and exploited. This requires sea-bed exploration and mining, and the Ministry of Earth Sciences and GSI need to cooperate at an institutionalized level to expedite and complete this task

A database of mineral resources needs to be developed

- An efficient IT system must be considered to ensure that a comprehensive and up-to-date review of exploration data is available
  - For this purpose, investments may have to be made in GSI, IBM and State Directorates
- A National Geophysical Data Repository and a National Drill Core Library must be created
- Results of process R&D must also be integrated so that knowledge of techno-economic feasibility of extraction of by-product metals can be used
- This database must also have transactional layers
  - Include administrative tasks like status of applications, relinquishment and renewal of licenses, etc
- Instant information must be available through this portal to prospective investors on what is available for reconnaissance, prospecting and mining
- Pre-competitive data must be freely available and could be amenable to value addition at the user end, with appropriate safeguards in place

- The National Tenement Registry must be implemented and integrated with the cadastral maps being digitized under the National Land Records Computerization Scheme

Ensuring availability of financial resources

- Access to "risk funds" from capital markets and venture funds needs to be facilitated since prospecting is a high risk venture
  - Early stage exploration and mining companies must be encouraged, as must investments in joint ventures for exploration
- A suitable scheme for taking full advantage of the HTREL licence must be completed in consultation with the major financial institutions in India, including SEBI, RBI, CBDT and IVCA
- Fiscal incentives must be provided appropriately to promote venture capital investments in high risk activities

Ensuring environmental sustainability of mining

- A scientific and efficient process of small scale mining of small deposits must be promoted
  - Regulations related to safeguarding the ecology must be ensured and their compliance strengthened.
  - A cluster approach must be adopted with a single lease model for multiple small deposits within a defined area
  - The IBM and State Directorates have to be strengthened to manage information regarding small deposits and ensure proper regulation
- All mining must be undertaken within the parameters of a comprehensive Sustainable Development Framework
  - Under such a framework, no mining lease should be granted without a proper mining plan including an approved environment management plan
- For this purpose, the IBM must acquire the expertise to approve Environment Management Plans and conduct Environmental Impact Assessments. Thus the IBM should be able to position itself as the internal environmental regulator as well as the official mining regulator for the sector.
- While the SDF first level documentation has already been prepared, the 2nd and 3rd levels, for use at State level and as an operational manual at the mine/lease level, respectively, must be developed and implemented
- The SDF must be implemented as soon as possible at the mine level.

Select policy changes in line with the overall strategy

- Open-sky policy of non-exclusivity for reconnaissance work must be adopted
- A new instrument called the High Technology Reconnaissance and Exploration License (HTREL) should be introduced (present in the MMDR bill) to attract large investment and better technology
- It is critical to ensuring higher value addition in the sector – it is important to curb non value-added exports
  - Mineral value addition through techniques of beneficiation, pelletization, agglomeration, and technologies and processes making use of fine ore must be encouraged
  - Incentives and measures must be developed to export minerals in value added form, and for this a coherent long term strategy must be developed
  - In line with this, long-term relationships with countries with complementary resources, in terms of minerals and technologies, need to be forged
  - The user industries need to be encouraged to develop long-term linkages with mineral producing units. This should be through freer transfer of concessions, preference to value addition and end use during bidding process, etc
  - Appropriate linkages need to be ensured between exploitation of minerals and their end use
- A fair and transparent process for land acquisition must be ensured. This is already under way through the LARR bill
- A systematic approach to health and study, including corrective practices must be applied, and the National Institute of Miners' Health must be reoriented as a National Institute of Mining Community Health
The MMDR bill aims at enabling some of these key recommendations, and must be pushed for implementation at the earliest.
6.8 Fertilizer

6.8.1 Introduction

The Indian fertilizer industry, given its strategic importance in ensuring the food security in the country has remained under Government control. Through its impact on agricultural productivity, fertilizer usage directly impacts food security of the country. Government has been consistently pursuing policies conducive to availability of adequate quantity of quality fertilisers throughout the country and their appropriate use. The annual consumption of nutrients (N+P+K), has increased by 62%, from 17.4 million tonne in 2001-02 to 28.1 million tonne in 2010-11. The nutrients N, P and K accounted for 16.6, 8.0 and 3.5 million tonne respectively in 2010-11.

Urea is the largest straight Nitrogenous fertiliser in terms of capacity and accounts for 78-79% of the nutrient Nitrogen (N) consumption. An important issue confronting the ‘N’ sector is with respect to the feedstock because natural gas which is the preferred feedstock for production of nitrogenous fertiliser is available in limited quantities in the country and competes with the power and petrochemical sector for it. In case of nutrient Phosphorous (P) consumption, DAP constitutes about 55% of nutrient ‘P’ demand while share of SSP is about 21% and the rest is provided by complex fertilisers. Due to limited availability, bulk of the requirements of raw material / intermediate for Phosphatic sector is met through imports. The country is solely dependent on imports for nutrient Potash (K). The high dependence on imports of raw materials/ intermediates exposes the Indian Phosphatic industry to highly volatile international markets.

In recent years, there has been a significant increase in imports of urea and DAP because there has been hardly any investment for major capacity additions, coupled with rise in demand for fertilisers. Fertiliser consumption in India is highly skewed, with wide inter-regional, inter-state, inter-district and inter-crop variations. The average intensity of fertiliser use in India is much lower than most countries in the world but in certain states/ districts it is consistently high.

Government introduced Nutrient Based Subsidy (NBS) for Phosphatic & Potassic (P&K) fertilizers w.e.f. 1st April 2010 with broad objectives of ensuring balance use of nutrients, introduction and
promotion of innovative and efficient fertiliser products and allowing market dynamics in pricing of products.

6.8.2 Key objectives

The key objective for the fertilizer sector is to ensure national food security by generating sustainable rapid growth in fertilizer use to increase agricultural production and productivity at the desired rate. In order to meet the growth targets in fertilizer use, the following measures are needed:

- Ensuring adequate and timely availability of quality fertilizers to the farmers at affordable prices
- Equitable distribution of fertilizers across the country
- Creating an attractive environment for improving indigenous fertilizer production and overall supply
- Optimizing level of fertilizer subsidy disbursed

6.8.3 Status and key challenges

1. Imbalance in Fertilizer Use

Current trends in agricultural output depict that the marginal productivity of soil in relation to the application of fertilizers is declining. There is a need for balanced and efficient use of fertilizers to overcome the widespread deficiency of secondary and micronutrients.

2. Stagnation in Domestic Capacity and Production

Production of fertilizers in the country has remained largely stagnant during the past decade; the growing demand for fertilizers has been met mainly through rising imports.

3. Import at high prices and Increase in Quantum of Subsidy

Fertilizer subsidies have increased significantly – for example, in 2005-06, the total subsidies were `19,390 crores while in 2010-11, it has increased to ` 65,837 crores. Subsidies kept on increasing mainly due to stagnant MRP (particularly from 2002-03), steep increase in cost of feedstock/ raw
materials/intermediates and sustained increase in consumption of fertilizers. Only 15% of the increase in subsidies is due to increase in fertilizer consumption and the rest is due to the other factors.

4. Shortage in the availability of raw material

As per conservative estimate, at least 72.39 MMSCMD gas shall be required by 2016-17 for the proposed/ under implementation projects. It would be 100 MMSCMD if all Greenfield projects are also considered. The availability of gas is critical for the growth of the urea sector and it assumes greater importance, given the additional demand from existing operation and new capacities.

6.8.4 Strategy and key recommendations

Improving Fertilizer Use

There is undisputable need for continuous rapid growth in fertilizer use to increase agricultural production and productivity at the desired rate. Fertilizers Monitoring System (FMS), a meaningful instrument for monitoring the availability and flow of fertilizers to the various consuming areas, could be strengthened to pre-empt any shortage in a timely manner and monitor the soil health. There is a need to produce and promote right kind of efficient fertilizers like customized, water soluble and fortified fertilizers.

Attracting Investment in the Sector

With rising demand and no major domestic capacity addition during the last few years, the industry has been exposed to world markets which are highly volatile. There is an urgent need to create a conducive environment for new investments in the sector. There is also a need to review the existing investment policy for fertilizer production in the country as it has not yielded the desired results. Investment for revival of closed units of Fertilizer Corporation of India Ltd (FCIL) and Hindustan Fertilizer Corporation Ltd (HFCL) will significantly bridge the gap between production and demand of urea in the country.
Availability of Feedstock

The government needs to ensure long-term supply of natural gas at reasonable prices with pipeline connectivity which is crucial to attract fresh investment in urea sector and reduced dependence on imports. The country can achieve self sufficiency in urea provided part of future gas finds are committed for the new investment in urea units and incentivising alternative feedstock like coal, CBM etc. to enlarge the choice of raw materials. There is a need to explore the possibility of investment in R&D for extracting potash from other resources in the country.

Rationalizing Subsidy

The burden of fertilizer subsidy has increased substantially during the last few years. The increasing international prices of inputs as well as finished fertilizers are making the growing fertilizer subsidies unsustainable. A phased approach towards reforming the subsidy disbursement mechanism needs to be developed as under:

- Phase 1: Create information visibility of the movement of fertilizers along the supply chain from the manufacturer till the retailer (NIC to provide systems implementation support)
- Phase 2: Release subsidy to the retailer through transfer of subsidy directly to the retailer’s bank account on receipt of fertilizer from the wholesaler.
- Phase 3: In the long run, once the coverage of Aadhaar is extensive throughout the country, and Aadhaar enabled payments are operational, subsidy disbursement to the farmer can be made directly into the bank accounts of the intended beneficiary.

Joint ventures abroad

Rising imports of fertilizers are a cause of concern and require urgent attention. India, being one of the largest consumer of fertilizers in the world, has significant impact in world trade and prices. Since world fertilizer market is highly concentrated in few countries, it leads to high volatility in prices. There is a need to ensure long-term supplies of raw materials / intermediates to fertilizer sector by promoting investment in mining capacities of the countries with rich reserves of natural gas, rock phosphate and potash to improve the efficiency of the sector. Joint venture projects for ensuring
sustained supply of raw materials/ intermediates/ finished fertilizers are to be encouraged with buy-back arrangements or entering long term off-take arrangements with countries that have large reserves of raw materials or surplus capacities.

**Setting up R&D Centre**

R&D centers need to be encouraged especially in the area of catalyst efficiency, retrieval of elements from spent catalyst, new fertilizer development, improving fertilizer use efficiency etc. Possibility of establishing a fertilizer R&D institute should be explored to encourage and strengthen R&D activities in the country.

**Fertilizer Prices Regulatory Authority**

With the implementation of Nutrient Based Subsidy (NBS) regime in non-urea sector and likelihood of extension to urea sector, the fertilizer sector moved towards a free market system. The controls over subsidy payment and distribution will also go once the government decides to transfer subsidy directly to farmers. Therefore, it may be necessary to consider a fertilizer prices regulatory authority to oversee and regulate fertilizer prices in the interest of the agriculture sector.

**Roadmap for sick CPSUs**

The overall health of the fertilizer industry is fairly satisfactory. Among central CPSUs, three units BVFCL, MFL and FACT are incurring losses due to outdated technology, high energy consumption and in-efficient management. Government has been providing budgetary support to sustain their operations during 11th plan period. There is a need to explore various possibilities for their revival and sustainable operation. Planning Commission has been repeatedly advising the Department of Fertilizer to come up with a holistic revival plan for the sick CPSUs. This must be done in the 12th Plan, rather than adopting a piece-meal approach.
Key features of cement industry

- Cement production is one of the world’s most energy intensive industries. On average 850 kg of carbon dioxide is emitted for every tonne of cement produced during calcinations adding to the environmental burden, approximately half coming from the chemical processes involved.
- Cement Industry is in a way a scavenging industry and has been burning alternative fuels in the kiln, waste materials such as, Residue derived fuel, Municipal sewage wastes, Agro wastes, Plastic and Polythene wastes, Paint Sludge, Shredded Tyres etc. that might otherwise go to landfill and conserves fossil fuels.
- Because of low value high density product, cement movement is normally restricted to nearby markets and has very limited international trade.
- Though it is not a patent dependent industry, initial investment in setting up a plant is very high.

Production trends

Global Cement Production has continued to be expanding at an average rate of 6.4% in last five years from 2,568 million tonnes in 2006 to 3,294 million tonnes in 2010. Around 56% of production originates in China. China (with an average annual growth of 11.4%) and India (with an average annual growth of 9.8%) have been the drivers of the growth in global cement output, with increase in production in rest of countries remaining virtually stable. Production of cement in India has increased from 100.1 million tonnes in 2000-01 to 228.3 million tonnes in 2010-11. The demand for the cement in India has been influenced mainly by the housing, infrastructure and irrigation etc.

6.9.2 Key objectives

- Maintaining existing capabilities
- Reducing environmental impact of industry and encouraging use of fly ash
• Modernization of plants based on older technology and further improvement of plants

6.9.3 **Status and key challenges**

• India is the second largest producer of cement after China
• Today cement industry in India comprises of 183 large cement plants and more than 360 mini cement plants. Large producers contribute about 97% to the installed capacity while mini plants account for the rest. Among these, 98% of the capacity is in the private sector and the rest in public sector.
• Cement industry in India has made tremendous strides in technological upgradation and assimilation of latest technology. Presently, about 97 per cent of the total capacity in the industry is based on modern and environment-friendly dry process technology.
• Indian cement industry has also acquired technical capability to produce different types of cement like Ordinary Portland Cement (OPC), Portland Pozzolana Cement (PPC), Portland Blast Furnace Slag Cement (PBFS), Oil Well Cement, Rapid Hardening Portland Cement, Sulphate Resisting Portland Cement, and White Cement etc.
• At present cement industry utilized about 27% of fly ash generated by power plants & 100% of granulated slag generated by steel plants, as compared to almost 100% fly ash and 84% of granulated slag in the Japanese cement industry
• In last five years, during 2006-2011, while installed capacity increased at an average annual rate of 13.6 per cent, production witnessed an increase of 9.1 per cent during this period, this has resulted in underutilization of installed capacity.
• Indian cement industry provides direct employment to ~ 140,00 people and ~50,00 people downstream

6.9.4 **Strategy and key recommendations**

**Measures to maintain existing capabilities**

• Incentivizing sectors having demand for cement, such as infrastructure. This will boost demand for cement and in turn will help address the underutilization of existing capacity
• Allocation of coal of better quality and consistency to cement plants and also speeding up privatization of collieries for captive consumption of cement plants should be considered
  - Equal priority should be given to cement industry while allocating coal linkages
  - Reserving sufficient coal blocks for cement industry
  - Coal blocks should be placed for bidding only after detailed exploration. This will avoid speculative bidding. Further, all clearances should be obtained before placing any coal block for bidding
  - Coal mining should be done in accordance with a re approved mining plan

• To ensure availability of limestone process of limestone mining lease approval/ renewal need to be streamlined and simplified
  - Integrating small mines into a mining belt
  - Incentives for usage of low grade limestone
  - Incentives for mining of limestone at remote areas
  - Strict compliance to mining guidelines to be ensured

• In case any road, electrical line or a similar facility passes through the mining lease area, these facilities should be allowed to be move to some other area

• Providing power at global rates and exemption from bearing the cost on account of cross subsidization of power. Abolition of Energy Duty on power purchased from Grid and captive power plant and water cess

• Rationalizing duty structure
  - Simplification of excise duty to have specific rate or percentage of sale price with appropriate abatements
  - Rationalization of inverted duty structure to address any inversions

• Availability of land
  - Land records should be on line available
  - Process of allotment of government land, land conversion, land diversion should be simplified

Reducing environmental impact of the industry

• Incentives for non-polluting cement plants should be provided, which are adopting newer technologies and pollution abatement techniques
• Cogeneration of Power through Waste Heat Recovery in Cement Industry to be granted status of renewable energy
• A cement plant which fulfils the co-processing prequalification criteria should be issued a permit to co-process all types of waste, while remaining within maximum permissible emission norms
• Cement plants should be permitted to move waste from other states with minimum restrictions if they are following standing guidelines
• Encouraging use of fly ash
  - Data on fly ash generation, disposal, stock and its pricing should be available online either through Ministry of environment and central electricity authority or power plants
  - Provision of transportation of dry fly ash in closed wagons because otherwise transit losses are high as it is a fine powder
  - Standards for making composite cement so that all the fly ash and other industrial wastes viz. slag are fully used
  - Thermal Power Plants should have a policy for paying to user of Fly-Ash which shall aid in increasing consumption of fly-ash and thus save the environmental damage

Considering the high capital cost of setting up a Cement plant, funds at concessional interest rate ~10% may be provided for initial two years. Suitable amendments in the FDI policy may be carried out to attract FDI to the sector.

**Up gradation of existing plants and research in further developed technologies**

• Funding from corpus of clean energy fund for cement sector may be provided in the cement sector for modernization of cement plants, processes for using alternate fuel and municipal and solid waste and development of energy efficient technologies
• NCCBM, which is primarily an R&D organization would need support for development of infrastructure.

**Development and adoption of nanotechnology**

• Promoting collaborative research involving national laboratories as well as laboratories abroad especially on technologies to produce nanoparticles and the latest characterization techniques used for elucidation of nanostructure
• Establishing a well-equipped Centre of Excellence for development and adoption of nanotechnology practices to cement and concrete through PPP mode

**Human Resource Development**

• Activities of Regional training centers (RTC) need to be expanded to include training of trainers and Interactive Computer Based training programs. This activity need to be carried on with technical support from organizations such as NCB

• ITI passed workers should be trained at RTC for 3 months before they join cement plants

**Improving the transportation facilities for Cement Industry**

• Rail transport: Railway should try and attain a share of 50% in total dispatches of cement and clinker
  - Developing world class infrastructure at railway terminals in major cities
  - Ensuring availability of wagons and two point and three point rakes
  - Loading capacity of BCNHL wagons should be reduced to 62 tons and free time for loading/unloading should be increased
  - Providing special infrastructure for clinker movement
  - Policy on giving fiscal benefits for incremental traffic should be modified
  - Policies should be clear, transparent and simple and should not be changed frequently
  - A suitable rail traffic regulatory mechanism may be established to resolve all rail matters including tariff and demurrages

• Road Transport
  - Load carrying capacity of trucks may be increased to 1 tonnes.

• Inland waterways
  - Sufficient infrastructure need to be provided at IWT terminals/jetties to integrate with other modes of transportation
  - Fiscal measures to be at par with other modes of transport
  - Multimodal transportation concept may be followed, wherever possible
  - Ro-Ro facility to be encouraged
(C) Sectors for Depth & Value Addition:

6.10 Automotive

6.10.1 Introduction

The Automotive Industry is one of the largest industries globally. It is also a key sector for the Indian economy. Owing to its deep forward and backward linkages, it has a strong multiplier effect and acts as one of the drivers of economic growth.

With the gradual liberalization of the automotive sector in India since 1991, the numbers of manufacturing facilities have grown progressively. It produces a wide variety of vehicles: passenger cars, light, medium and heavy commercial vehicles, multi-utility vehicles such as jeeps, two wheelers such as scooters, motor-cycles and mopeds, three wheelers, tractors and other agricultural equipment’s etc.

The competitive paradigm for the automobile sector world over is rapidly undergoing complete transformation on account of environmental and energy security concerns. Some studies have indicated that, in the near future, green alternatives such as electric cars will find greater acceptance; however the outcome of consumer preference will also depend heavily on government policies.

It is estimated that by 2020, EV and other green cars will represent up to one third of total global sales in developed markets and up to 20% in urban areas of emerging markets. The Indian auto sector which has close linkages with international auto industries will be deeply impacted by the evolving trends.

6.10.2 Key objectives

The long term goals of the sector were initially reflected in the Auto policy of the Government formulated in 2002 which envisioned the establishment of a globally competitive automotive industry in India and to double its contribution to the economy by 2010. The policy aimed at promoting
integrated, phased, enduring and self-sustained growth of the Indian automotive industry. Stated below are the objectives of the policy which are indicative of the country’s aspirations in the automotive sector:

1. Exalt the sector as a lever of industrial growth and employment and to achieve a high degree of value addition in the country;
2. Promote a globally competitive automotive industry and emerge as a global source for auto components;
3. Establish an international hub for manufacturing small, affordable passenger cars and a key center for manufacturing tractors and two-wheelers;
4. Ensure a balanced transition to open trade at minimal risk to the Indian economy and local industry;
5. Conduce incessant modernization of the industry and facilitate indigenous design, research and development;
6. Steer India’s software industry into automotive technology;
7. Assist development of vehicles propelled by alternate energy sources;
8. Development of domestic safety and environmental standards at par with international standards.

The midterm goals in respect of the sector are articulated in the Automotive Mission Plan 2006-16, a ten year strategy and plan prepared jointly by Government and industry and formally released by the Prime Minister in January 2007. The Plan laid down a 10 year roadmap for the industry covering every aspect of its growth ranging from broad direction on fiscal policies, emissions, safety and globalization in terms of technical standards, enhancing competitiveness, skill development, testing and homologation, R&D etc. The specific targets set up AMP are as follows:

- To continue to be the world’s largest tractor and three wheeler manufacturer in the world
- To continue as the world’s second largest two wheeler manufacturer.
- To emerge as the world’s fifth largest car producer (as compared to the seventh largest currently)
- To become world’s fifth largest commercial vehicle manufacturer.
- Automotive sector would double its turnover ratio to India’s GDP in ten years
- To export USD 35 billion by 2016
The industry is planning to take a mid-term review of the AMP in 2013 and come up with objectives and targets for beyond 2016.

6.10.3 **Status and key challenges**

With a CAGR of over of 15% during the last 5-7 years, it is aptly described as the next sunrise sector of the Indian economy. In the last ten years, the volumes, exports and turnover have increased by 3.8, 19.6 and 6 times respectively. The turnover of the auto component industry, in 2010-11 was USD 40 Billion (Rs. 1, 79,320 crores approx.). The contribution of this sector to the National GDP has risen from 2.77% in 1992-93 to close to 6% now and is expected to reach the level of 10% by 2015-16. In 2010-11, the contribution of the automotive industry to the Manufacturing GDP and excise duty was at 22% and 21% respectively. The export of vehicles and auto components during 2010-11 stood at USD 6 Billion and 5 Billion respectively. The Automotive industry (including auto components) employs 13m people in 2010-11, which is expected to reach levels of 35m by 2015-16.

The industry has been able to achieve many of its targets set under the AMP. Some of the issues that need to be addressed so that the industry can reach the remaining targets are:

- Simplification and rationalization of labour laws to ensure availability of Human resources with the requisite skill and competence
- Commissioning centres of excellence; to be set up under NATRIP, NID, IITs, etc.
- Infrastructure to be upgraded to remove bottlenecks in road, port, power, etc
- Formulation of a long term emission roadmap beyond 2010 based on the Auto Fuel Policy
- Clarity on fuel availability and the fuel pricing policy, as this influences the demand for diesel and petrol vehicles
- Support for Hybrid / Electric vehicle industry, which is in its nascent stages
- Duty structure that encourages investments in domestic industry and discourage import of CBUs

In the Auto Component sub sector, India will need import of auto components to the tune of US $5 billion in 2010-11. The negative trade deficit in auto components has been growing continuously. This is mainly on account of following facts:
- Increased competition from other low cost countries, especially China. The Indian industry is currently hampered by lower efficiencies, especially in tier 3-4 levels and higher transaction costs of doing business in India in this sector.
- Lack of design capabilities with the domestic industry has led to major OEMs sourcing the requirement of parts for their new launches and variants from abroad.
- Lack of adequate capacity coupled with the inability of the industry to upscale its capacity forcing the auto component industry to meet a large portion of domestic demands through imports.

In view of these facts, it becomes imperative that the Auto Component Industry is supported through interventions like the ACMA Technology Development Fund, the ACMA-UNIDO Cluster Development Programme, availability of adequately skilled manpower, stability of policies especially with regard to on-going Foreign Trade Agreement (India EU-BTIA) etc.

6.10.4 Government Initiatives

Development Council on Automobile and Allied Industries (DCAAI) takes up issues of the industry with the Government. Recently, Government has also decided to constitute National Council for Electric Mobility (NCEM) and National Board for Electric Mobility (NBEM) for fast policy and decision making at the apex level for promoting electric mobility and for encouraging manufacture of electric vehicles in the country. Deliberations at the level of NBEM have been initiated to define short term and long term objectives and to develop short / long term plans.

To address the issue of lack of testing infrastructure, a Plan scheme – National Automotive Testing and R&D Infrastructure Project (NATRIP) was initiated in the Tenth Plan. With the coming up of NATRIP facilities (in the first year of Twelfth Plan), the industry would be in a position to adopt higher safety standards. NATRIP implementation Society (NATIS) is overseeing the implementation of NATRIP.

6.10.5 Strategy and key recommendations
• Providing an enabling environment to the industry in which government policies encourage growth, promote domestic competition, stimulate innovation and help it achieve operational efficiency.

• A moderate, stable and rational domestic tax structure that eliminates multiplicity of taxation at the central, state and municipal levels. Early implementation of GST is critical.

• Removal of taxation on inter-state movement of goods to make the Indian market a genuine “free trade area” domestically.

• A stable import tariff structure consonant with the AMP that encourages investments rather than trade in fully built vehicles.

• Continuation of lower Excise Duty (in future GST) for manufacture of vehicle types that are a national priority for the country e.g. small cars, MUVs, two wheelers and commercial vehicles which are used for transportation for the masses and the common man.

• Ensuring that the Free Trade Agreements being entered into with other countries do not distort markets for Indian Automobile and Auto component manufacturers.

• Removing the key bottlenecks affecting the growth.
  ▪ Infrastructural bottlenecks
  ▪ Inadequate availability of skilled labour – to be addressed with partnership with NSDC
  ▪ Pending reforms in labour laws

• Government to prepare a strategy paper on utilization of different fuels in the transport sector to meet our national priorities of emission control, energy security as well as fuel efficiency.

• Evolving the emissions and fuel availability roadmap beyond 2010.

• Deepening competence in manufacturing of fuel efficient cars and electric vehicles including the hybrid segment
  • Investment in technology development through PPP route
  • User incentives for adoption of EVs
  • Mandating EV use for some purposes & customer segments

• Building the “Made in India” brand for Indian automobiles and auto components in the world market

• National policy on vehicle retirement / end-of-life should be evolved

• Auto component industry needs to be supported by the Government in the following ways:
• Access to capital: Request for easy access to finance for all manufacturing requirements
• Logistical & infrastructure development in auto component hubs
• Uninterrupted supply of power for manufacturing activities in auto component hubs such as NCR, Pune & Chennai
• The introduction of safety/emission standards for motor vehicles is the domain of Ministry of Road, Transport & Highways (MoRTH). The regulations are notified under the Motor Vehicle Act. To address the issue of road safety, MoRTH also introduced a National Road Safety and Traffic Management Board Bill, 2010 in Lok Sabha in May 2010. However, the Department related Parliamentary Standing Committee of Rajya Sabha recommended that the Bill may be withdrawn and the Government should come out with holistic perspective that addresses the entire gamut of road safety. The issue of road safety is critical, with increasing number of vehicles and high incidence of accidents in India, and needs to be addressed. For this an appropriate regulatory body would be required.

6.11 Electronics Systems Design and Manufacturing

6.11.1 Introduction

Electronics Systems Design and Manufacturing comprises semiconductor design, high-tech manufacturing, electronics components, electronics manufacturing services and electronics systems design for consumer electronic products, telecom products and equipments, IT systems and hardware and other segments. Electronics, along with Information and Communications Technology, is considered a meta-resource: the competitiveness of various industries often depends on their ability to integrate ICTE in their business processes. At 1.75 Trillion, Electronics is the largest and the fastest growing manufacturing industry in the world. It is expected to reach USD 2.4 Trillion by 2020.

6.11.2 Key objectives

The key objectives for the ESDM Sector are:
• To achieve domestic production of USD 122 Billion by 2017 (growth of 30%)
• To ramp up domestic value addition in ESDM manufacturing
6.11.3 **Status and key challenges**

The demand in the Indian market was USD 45 Billion in 2008-09 and is expected to reach USD 400 Billion by 2020. The growth of domestic production was at a CAGR of 22% in 2008-09. In 2008-09 and domestic production was about USD 20 Billion (estimated to be about USD 33 Billion in 2011-12, at a growth rate of 33%). The gross value addition from manufacturing was between 5 to 10 percent. Indian electronics hardware constituted around 1.3% of the global production. Extrapolating the current situation, without a significant impetus in growth of domestic manufacturing, the total imports in the ESDM sector will go up to USD 152 billion in 2016-17.

The key challenges faced by the sector are:

- **Competition from China**: India’s biggest competition in the sector is from China which has achieved significant economies of scale and has a highly subsidized operating environment which is largely opaque.

- **Zero Duty Regime**: As a signatory to the Information Technology Agreement-1 (ITA-1) of the World Trade Organization (WTO), India has implemented zero duty regime on 217 product lines. Under the FTAs and PTAs with various countries, the import of electronics hardware from these countries is allowed at a duty which is lower than the normal duty rate.

- **Disability Costs in local Manufacturing**: Infrastructure, Power and Finance issues pose significant challenges to Indian manufacturing. Infrastructure challenges arise from poor supply chain logistics and inadequate ready availability of land. The finance costs in India are typically 5 to 6 points above international rates. Power supply is, in several parts, inadequate, unreliable and costly. High transaction costs due to stringent rules and regulations, complex administrative processes also add to the disability costs. An analysis by the Federation of Indian Export Organizations (FIEO) reveals that cost disabilities including the transactions costs borne by Indian exporters vary and range from 19-22% compared to 2-3% in developed countries.

- **Diversity and Velocity of Technological Change**: Electronics is pervasive and spans all sectors. Therefore the development of the sector involves domain knowledge of each of the sectors which
it serves. The half-life of technologies in the sector has been continuously reducing. Currently it is estimated to be even less than six months in certain verticals. Convergence between different technologies, devices, software and hardware are also driving technology changes.

6.11.4 **Strategy and key recommendations**

The key strategies are:

- Create a level playing field between domestic and imported ESDM production.
- Create an enabling environment, both at the central and state level for the industry to take up ESDM
- Provide support across the value chain to achieve global competitiveness.

The recommendations across these strategies are:

**Creating a level playing field**

- Introduce Modified Special Incentive Package Scheme for improved value-addition
- Provide preferential market access to domestic industry in the ESDM industry
- Mandate Indian standards for ESDM to safeguard against sub-standard items, and institute a mechanism for mandating compliance to standards for electronics goods.
- Introduce reforms in Government procurement procedure for electronics hardware.
- Carry out effective negotiations in WTO for market access to Indian industry in foreign countries and for removal of barriers to trade

**Creating an enabling environment**

- Set up a national electronics mission
- Promote exports of ESDM by providing appropriate incentives and schemes
- Provide stable fiscal policy framework and simplify procedures and approval processes for ESDM industry
- Promote Human Resource/Skill Development for ESDM sector
• Communications and brand development as well as international and national marketing of investment opportunities in ESDM
• Promote sustainable growth through waste management practices
• Promote international collaboration in ESDM
• Promote systematic data collection for ESDM sector

Providing support across the value chain
• Set up at least two semiconductor fabs in India
• Promote and develop Innovation, R&D and Indian IP by setting up of Electronics Development Fund
• Promote the semiconductor chip design, electronics components and strategic electronics industry.
• Promote Vendor Development and Electronics Support Services like repair and maintenance.
6.12 Drugs & Pharmaceuticals

6.12.1 Introduction

Indian Pharmaceutical Industry is one of the high performing knowledge based segments of the Domestic Manufacturing Sector. The industry has achieved a global status through firm level strategies, industry initiatives and also appropriate policy support. The soft patent regime prior to 2005 provided opportunity for this industry to consolidate its position and witness significant growth in generic production and exports. Indian Pharmaceutical Industry has entered an era in which it has to play a pivotal role in providing generic medicines to the world and also become a global hub for R&D activities.

On the domestic front, it has to play a complex role in provision of health care. It has a special obligation, inherent to this sector, whose products and services are needed by common people including those in the lowest strata of society.

Although the domestic pharmaceutical industry has already shown signs of flexing its muscles to counter the challenges of the changing environment, a reorientation of business strategies and practices in the sector would be essential to withstand pressure of a new patent regime and increasing competition from low cost manufacturing and R&D destinations.

Various Government Institutions are already working to boost the industry. However, there exist multi-departmental issues arising out of globalization and challenges including social expectations, which need to be addressed. In addition, despite our success, we are still at the periphery of a vast unexplored opportunity. At this juncture, it is all the more important to recognize the challenges and opportunities and realign our strategies along with appropriate policy and institutional frameworks for shaping the future of the Indian Pharmaceutical Industry.
6.12.2 **Key objectives**

- The Indian pharmaceutical sector should grow to US$ 60 Billion size in 2017 (CAGR of 18%) and have a 5% share of the global pharmaceutical industry by the end of the 12th Five Year Plan. By 2020, the sector should be at US$ 100 Billion.
- Exports should be at INR 130,000 Crores by the end of the 12th Five Year Plan.
- The sector should employ 1.5 Million people by 2015, 1.898 million people by 2018 and 2.464 million people by 2022
- Domestic R&D should be internationally competitive
- Universal access of quality medicine at affordable prices
- Improve domestic content in medical devices
- Make all the CPSUs self-sustaining by 2020

6.12.3 **Status and Key Challenges**

**The Domestic Market**

The Indian Pharmaceutical Industry is ranked 3rd globally in volume and 14th in value, supplying around 10% of total global production. It has witnessed a growth of 14% since the beginning of the 11th Plan and achieved a turnover of Rs 1 lakh crores in 2009-10 comprising of exports volume of over Rs 42,154 crores. During first three years of the XIth Plan, it had seen a CAGR of 12% in case of the domestic market and fresh investments worth Rs.29,000 crore for Pharmaceutical sector.

The pharmaceutical sector consists of branded drug manufacturers, generic drug manufacturers, providers of biopharmaceuticals and Contract Research and Manufacturing Services (CRAMs) and non-prescription drug manufacturers. The Indian pharmaceutical sector is composed of strong domestic and export components. India is largely self-sufficient in case of formulations though some life-saving, new-generation-technology-barrier formulations continue to be imported - 348 medicines enlisted as “Essential Medicines” in the NLEM 2011 are all manufactured by domestic pharmaceutical industry. Bulk drugs make up about 50% of the domestic market. Indian drugs are exported to around 200 countries in the world including the highly regulated markets of USA, UK etc. The top five
exporting destination countries are USA, Russia, Germany, Austria and UK with USA alone accounting for almost 20% of total export.

The industry is quite fragmented and comprises of nearly 10,500 units, of which about 300-400 units are in the medium to large category. The top 10 manufacturers account for 36.5% of the market share. The domestic market is skewed towards cities with the top 23 cities accounting for almost 25% of sales. The bulk drugs component of the domestic market is around Rs 42,000 crores which is equivalent to about 9% of the global bulk drugs market. While the Indian bulk drug industry caters to around 70% requirement of Indian Pharmaceutical Industry, cheaper imports from China are increasingly giving competitive pressure. Growing dependence on China is more significant in fermentation base APIs such as Penicillin, Erythromycin, etc.

**Regulatory & Intuitional Reforms**

Policies that influence Indian pharmaceutical industry can be broadly categorized into healthcare policy, industrial policy and health safety policy. Some of the concerns of the industry, regulators and end users such as accessibility and affordability of medicine by the common man, ensuring quality and efficacy of medicines, strengthening the growth of generic medicines, promoting R&D, technology transfer, strengthening industry-institutional linkages and capacity development are addressed through such policy framework. At present, both central and state Governments regulate Indian pharmaceutical industry. Complexity in the regulatory system has impeded its growth and new ventures.

An integrated regulatory system is required. Strengthening of regulatory system is also required in the context of the new patent regime. There is a need to simplify procedures and shorten the timeline for various approvals. Strengthening of regulatory system with respect to data protection is also crucial. Such measures will help in attracting R&D outsourcing to India. With India emerging as a major hub for contract research, particularly clinical trials, it is important to ensure good clinical practices in the country.
Human Resources Development

The institutes set up or being set up by the Government such as National Institute of Pharmaceutical Education and Research (NIPER) established at Mohali, Chandigarh and six new NIPERs (RaeBareilly, Hajipur (Patna), Hyderabad, Ahmedabad, Guwahati and Kolkata) provide post graduate and PhD level education and contribute to some 1800 Masters and PhDs per year. Other Central Government research organizations include Indian Institute of Chemical Technology (IICT), Centre for Cellular and Molecular Biology (CCMB), National Institute of Nutrition (NIN), Centre for DNA Fingerprinting and Diagnostics (CDFD), Indian Immunological Ltd (IIL), etc. A number of Universities and Colleges, both in government and private sectors also offer both graduate and post graduate education in pharmaceutical sciences.

All these sources roll out some 51000 graduates and 5200 PGs in pharmaceuticals sciences every year. However, capability gaps exist around core health-care innovation skills such as principal investigators, biologists, medical device specialists, clinical research associates, biostatisticians, epidemiologists and toxicologists.

Indigenous Research and Development

Against the global average R&D expenditure of $68 billion i.e. 8% of global Pharmaceutical sales, the aggregate investment in India is much lower as a percentage of total sales (about 4.4%). Interestingly, R&D investments of the top 15 Indian manufacturing companies have risen from 3% to 8.68% sales between 200 and 2010. Effort is however limited to generics APIs or formulation with focus on cost-effective process development. This has resulted in poor development of new products.

In order to lay a greater focus on R&D efforts, a larger team of experts comprising chemistry, biology, biotechnology etc. has to work concurrently for quick and quality-focused outcomes. This underlines the need to bring universities, public institutions and industry on a common platform for ensuring better coordination of R&D efforts.

NIPER has to re-invigorate itself to assume an important role for spearheading such research efforts, coordinating with the related Government Departments/ Ministries and inducing an effective partnership amongst the stakeholders. Visibility of efforts put forth so far by NIPER in the areas of
research, patent generation, commercialization of research leads, linkage with industry etc. remains limited. A comprehensive evaluation of its physical facility and infrastructure, intellectual and knowledge capability is a prerequisite to device specific action plans.

**Access to Healthcare and Medicines**

Although drugs manufactured in India are considered to be amongst the lowest priced internationally, a vast section of the population is yet to have access to the needed healthcare and medicines. Unlike public healthcare or subsidised/prepaid healthcare services in most other developed countries, out of pocket expenditures on healthcare are quite high in India. Therefore, any increase in any component of healthcare costs tends to impact a wide cross-section of people. Costs of supply chain management (SCM) and distribution in India being higher than that in the US or EU due to inherently poor transport structure eat up one-third of the revenues (www.biopharminternational.com). The medical retail industry is also highly fragmented with more than 550,000 retail pharmacies spread across the country. Vast distances and poor connectivity lead to problems concerning drug recalls, controlling counterfeit drugs, meeting cold chain requirements and quality checking during shipment (especially biotech products). Overcoming these impediments would improve affordability and quality of healthcare for all.

**Medical Devices Industry**

The medical device Industry in India is in a very nascent stage. More than 65% of India’s requirements, especially high technology medical devices and equipments are met through imports. Domestic production is largely restricted to low technology disposable equipments. The domestic producers in the medical device industry are small in size and capacity. The regulatory regime is still under development and the current lack of regulations (especially in medical disposables and surgical items) is leading to spurious products.

**Pharmaceutical PSUs**

Pharmaceutical PSUs have had mixed success so far. KAPL and RDPL have been declaring profits over the last few years. The remaining three companies viz. IDPL, BCPL and HAL were sick and referred to the Bureau of Industrial and Financial Reconstruction (BIFR). As a result of allowing rehabilitation packages through infusion of funds, waiver of interest & penalties and re-phasing of financial
liabilities, BCPL and HAL are on the path of revival. The rehabilitation proposal of IDPL is still under consideration. However, IDPL has started producing some essential medicines to cater to orders placed by Government departments/ agencies.

**Exports and Global Competitiveness**

Exports have grown very significantly at a CAGR of around 19% in the period, from Rs 25666 crs. in 2007 to over Rs 45,000 crores during 2010-11. Indian drugs are exported to around 200 countries. The top five exporting destination countries are USA, Russia, Germany, Austria and UK; with USA alone accounting for almost 20% of total exports. India has accepted the WHO-GMP standards for export of pharmaceuticals products. It is estimated that at present about 800 units are certified by CDSCO as WHO-GMP compliant.

In the generics segment, the Indian industry is becoming increasingly competitive on a global scale. A large number of Abbreviated New Drug Applications (ANDA) and First to File (FTF) fillings (for the formulations sector) and Drug Master Files (DMF) filings (for the bulk drugs) by Indian companies in the USFDA in 2009 was worth US $ 300 Bn. Additionally, India has around 461 Certificate of Suitability i.e.19.78% of the total granted by European Directorate of Quality Medicine (EDQM). However, both large and SME units are finding it difficult to cope up with the increasing compliance requirements relating to IPRs, EDQM standards, third party audits (for bulk drugs), EU verification of pedigree of API (for formulation exports) etc. Multiple trade agreements viz. Trade Related Intellectual Property Rights (TRIPs) of WTO, Anti-Counterfeit Trade Agreement (ACTA), Trans-Pacific Partnership Agreement (TPPA), new regional free trade agreements, etc. through up new challenges to Indian exports. In the formulations sector, non-tariff barriers like ever-greening strategy of MNCs, local protection to firms in countries like China, East Europe and Russia affect domestic exporters.

Restrictions imposed by USA - like allowing only units of WTO signatory countries to bid for government procurement, and the need for submission of separate state level applications for marketing drugs - call for additional preparedness.

In order to face these challenges, the domestic pharmaceutical sector will have to focus on following areas.
• **Intensifying R&D Activities**: By Strengthening of Pharma Research Organizations and inducing Public Private Partnership in R&D.

• **Revitalizing Indigenous capability in intermediates and Bulk Drugs**

• **Leveraging Bio-technology & Biopharma Convergence**: Seizing the opportunity of indigenous sophisticated chemistry and biology capabilities in developing non-infringing processes for manufacturing excellence.

• **More Thrust on Patent Filing**: Reinforcing the institutional structure to inspire and handhold domestic innovators.

• **Diversification of Markets**: Exploring new markets in other countries of Africa, South Africa as well as Latin America apart from traditional destinations.

• **Market Penetration Acquisition in LDCs**: Focus on strategic acquisitions and increasing penetration by Indian generic producers in other countries, especially LDCs to take the benefit of extended transition period for compliance granted under TRIPS Agreement.

**Strategy and key recommendations**

The recommendations made by the 12th Plan Working Group on Drugs and Pharmaceuticals Industry are summarised below:

• Capacity building of private sector to meet WHO-GMP standards and other international manufacturing standards

• Enabling the Indian pharmaceutical industry to develop competence in advanced areas of drug manufacturing
• Developing common infrastructure in drug discovery and development, manufacturing, distribution, exports, medical devices, etc. such as:
  - GLP Compliant Animal Facilities
  - Biological Sample Storage Facilities
  - Shared Infrastructure for Optimal Capacity Utilization

• Education of SMEs about country specific SOPs for testing their products
  - Making reference standard products available not only for Indian Pharmacopeia but also for other major export targeted countries

• Creation of a coordinated strategy between Department of Commerce, Pharmexcil, Ministry of Health and FW and Department of Pharmaceuticals to tackle non-tariff barriers through counter measures and during signing of FTAs

• Develop competencies for 2D Bar-coding for SMEs

• Coordination between NPAA and DGCI through an authority such as National Authority on Drugs and Therapeutics to address all issues related to quality and pricing of drugs and standards of manufacture

• Developing capacity of Central Drug Standards and Control Organization to ensure timely clearance for new drug trials, pharmaco-vigilance, and assistance to the willing industry members to shore up their technical capacities for better regulatory compliances and adequate number of labour inspectors

• Developing, evolving and rationalizing regulatory frameworks for bio similar drugs, fixed drug combinations, clinical trials and early drug development

• Developing the ecosystem to take advantage of the opportunity in clinical research through:
  - Registration and training of ethics committees
  - Training of investigators to evaluate protocol feasibility and its ethical administration
- Focused training of nurses to be study coordinators
- Capacity building for site inspections
- Development of Clinical Research Centres for high risk trials such as Phase-I

- Supporting SMEs for IT tools deployment and technology enhancement for better, newer and cheaper drugs

- Continuation of setting up and Intellectual Property Rights Facilitation Centres

- Create a level-playing field for domestic manufacturers in the bulk drugs industry
  - Enforce anti-dumping regulations
  - Provide subsidized electricity at par with rates prevailing in China
  - Subsidize sugar for Pen-G manufacturing fermentation unit

- Induce higher levels of research and development:
  - Develop the NIPERs along the IIT model to boost patent filing from these institutes
  - Improving industry-academia linkages by creating a strong platform for incentivizing innovation in producing safe, affordable medicine, arranging public-private-partnerships with industry and leading academic partners, conveying the importance of commercially oriented needs to public institutions, encouraging and broadening scope of programs such as PRDSF and encouraging start-up companies based on academia generated IP through equity linked funding
  - Providing subsidized loans/grants for funding for New Drug Development
  - Providing incentives through attractive licensing schemes
  - Reviewing current state of research activities at various centres and institutes

- Make changes in the regulatory system including expanding tax deduction (to cover activities such as international patenting costs, regulatory consultants, outsourced R&D services and patent litigation expenses), reducing approval timelines, providing subsidies on salaries of NRI specialists/experts, reducing excise and customs duty of chemicals and raw materials that are imported for biotech products, and to partner pharmaceutical giants with specific higher education institutes.
- Regular regulatory inspections of sites/IRBs/CROs/Sponsors to ensure quality
- Tax incentives for products designed by domestic companies and for application within India e.g. grant-in-aid funding, soft loans, higher weighted average tax deduction for drug innovation, 5 year NPPA exemption for novel drugs, 5 year tax and duty exemption for new drugs, etc.

• Improving access to quality healthcare by ensuring that:
  - Hilly, tribal and inaccessible areas that have a relatively much lower level of per capita expenditure on hospitalization and medicines in rural areas need to be given special treatment in a mission-mode approach, through which the health services and medicines are provided at affordable rates/prices. The Jan Aushadhi Scheme needs to be expanded to cover these areas.
  - A consistent and transparent system of government procurement should be in place at a central level within states so that the prices of required medicines are decided by a single entity in each state. This would provide the manufacturers with an easier way of providing medicines to the government.
  - Promotion of unbranded generics through Jan Aushadhi Stores (JAS) needs to be implemented as soon as possible for which the Ministry of Health needs to bring out legislation for prescription of medicines in generics nomenclature by the doctors on a mandatory basis.
  - Utilizing PPPs appropriately in areas such as ambulance services, mobile medical units, diagnostics, urban health centers etc.

• Inducing greater level of domestic manufacture of medical devices by:
  - Instituting independent definition for medical devices and a separate provision for the regulation of these devices.
  - Creating infrastructure for setting up green-field medical devices and equipment parks. This park may contain facilities like Research and Development Centre focused on Medical Device Industry, Testing Laboratory, Common Sterilization facility, Medical Instruments/Equipment calibration and validation facility, Engineering Services, a training centre to train labours, managers and entrepreneurs etc.
- Setting up a National Centre for Medical Devices, which may focus on new product development and assessment for medical device products

- Enabling CPSUs to be self-sustainable by:
  - Upgrading the existing manufacturing facilities to WHO-GMP compliance levels
  - Identify and introduce products in key therapeutic segments for mass public use
  - Introducing products from latest socially relevant diseases like AIDS, Cancer etc.
  - Rationalizing human resources for optimal productivity
  - Engaging and expanding the prescription market

India, with its significant advantage of low cost of innovation, low capital requirements and lower costs in running facilities, well established manufacturing processes, R&D infrastructure, is strategically well positioned to emerge as a major force to reckon with in the pharmaceuticals sector. In addition to generating revenues and securing appropriate medicines for its citizens, the domestic pharmaceutical industry has created potential for the country to transform itself into a knowledge-driven economy.

Moving to a higher growth trajectory will require focussed institutional support and incentivize the clusters to foster innovation, encouragement to maximize investments in enhancing manufacturing capacities and aggressive drive for creation of ‘Brand India’ image in select segments including biopharmaceuticals/ Biosimilars and Indian systems of medicines. Due to an excellent regulatory and fiscal climate, we have travelled a significant distance. India needs to protect what it has achieved, and draw key milestones, road maps in order to measure our success with conscious effort to emerge as an alternate power in the global health sector.
6.13 Chemical

6.13.1 Introduction

The Chemical industry is one of the oldest industries in India. Chemical industry is also a major demand driver for other sectors such as energy and environmental technology. The industry is heterogeneous in nature with many sectors such as organic, inorganic, petrochemicals, dyes, paints, pesticides and specialty chemicals. The industry comprises of both, small scale and large manufacturers (including MNCs), and produces several thousands of products and by-products.

The industry is increasingly moving eastwards in line with the shift of its key consumer industries (e.g. automotive, electronics, etc.) to leverage greater manufacturing competitiveness of emerging Asian economies and to serve the increasing local demand. Share of Asia in the global chemical industry has risen from 31% in 1999 to 45% in 2009.

With Asia’s growing contribution to the global chemical industry, India emerges as one of the focus destinations for chemical companies worldwide. With the current size of $108 billion, the Indian chemical industry accounts for ~ 3% of the global chemical industry.

6.13.2 Key objectives

- Industry uses coal, natural gas, naphtha and refinery cuts as basic feedstock. It is necessary to ensure optimum allocation of existing resources and discovering new sources of raw material.
- Developing new and more energy efficient technologies and processes
- Clustering and providing common infrastructure to units
- Ensuring compliance to environmental regulations and managing the negative image of sector

6.13.3 Status and key challenges

Availability of basic feedstock

- India is experiencing very good growth for polymers, bulk petrochemicals, fertilizers etc. as a growing Indian population and improving infrastructure including housing boost up for
consumption. However, most of the increasing demand is met by imports and no new domestic production capacity is forthcoming. One major reason for this is shortage in availability of basic feedstock and building blocks.

**Fragmented nature of Industry and lack of common infrastructure**

- Chemical Industry in India comprises of many small plants which are fragmented in different locations of the country. Further, the basic nature of industry is such that it requires some common infrastructure both in process chain as well as in supply chain.

**Low level of R&D**

- Technology is becoming a key enabler in the world chemical industry with the wake of increasing complexity. Since, chemical industry is a knowledge based industry, the competitiveness of the units can be strengthened only through supply of new and innovative products. However, current levels of R&D spend as a percentage to total sales is very low in Indian Chemical Industry.

**Environmental Issues**

- The concept of sustainable development is receiving a growing recognition in the chemical industry. In order to implement sustainable development, environmental and safety standards have been set for the chemical industry, which addresses the problems of users (both intermediate and end users), as also the production related issues (consumption of energy and energy resources as raw materials).

6.13.4 **Strategy and key recommendations**

**Ensuring availability of feed stock**

- Encourage a consortium of crackers which can produce all building blocks. Refinery configuration to focus more on feedstock availability then fuel and put restriction on export of surplus feedstock and encourage export of downstream products.
- Source feedstock from feedstock rich countries. For doing this, long term contracts are needed with such countries, or PSUs can set up their refineries in such countries.
• NCL and IICT to take initiative towards development of processes to use bio based raw material instead of crude based ones.
• Allocation of coal blocks on priority basis & long term lease for limestone is essential.
• Reconsidering pricing/export ban to ensure naphtha is available locally at international prices
• Alloting chemical grade limestone mining rights for soda ash industry

Development of Common infrastructure
• Govt should float an SPV to fund and maintain common infrastructure (e.g., power generation and distribution, effluent treatment) for Greenfield PCPIRs centrally through public private partnership. This SPV should also setup and operate R&D parks which can work on exploratory research, process development, optimization, and problem solving, as well as running pilot-scale projects

• Establish a site operator, with the right functional expertise, to market and manage each PCPIR. The site operator will be responsible for establishing comprehensive services and marketing of the site to potential manufacturers to ensure timely participation from companies in the PCPIR

Focus on R&D
• Establish chemical sector specific council having representation from government, chemical companies, industry associations and reputed research/educational institutes to develop the innovation roadmap for chemical industry.
• Develop three regional clusters and two innovation centers in universities dedicated to chemical industry, in regions with large share of chemical industry

• Sign international collaboration agreements with Germany and Singapore

Focus on Green technology and consolidation of environmental regulations
• Consolidation of rules governing environment protection for chemical industry.
• Providing single window clearances for all environmental clearances for pesticide plants.
• Development of Green technologies
- Introduce special fiscal policy initiatives to encourage and support use of renewable feedstock, adoption of Green processes and build energy efficient housing.
- Facilitate R&D towards development & commercialization of non-conventional and renewable energy sources

- Central and State government to work together to ensure more rigorous and transparent enforcement of pollution and environment related regulations in chemical units and give positive incentives for compliant industries. Further, Indian industry and government should jointly develop a workable and much less “expensive” set of regulations covering the entire lifecycle of chemicals.

- Creation of standards of energy benchmarking and publish them also Companies with turnover >50Cr to publish audited energy consumption figures

### Human Resource Development

- Setting up specialised vocational training institutes near clusters for chemical industry
- Upgradation existing ITIs and tier 1 and tier 3 universities
- Government should work in collaboration with industries to upgrade the current chemical Departments in universities to become state-of-the-art Departments
- Tax rebates for training expenses for companies

### Other strategies

- Fiscal incentives to the chemical sector for tackling the threat from cheap imports
- Simplifying the process of registration of pesticides to reduce the amount of export losses caused due to delays in getting registration. Department of Chemicals & Petrochemicals can be set up to deal with all the issues such as pesticide registration, its use, fixation of standards for residue in food chain etc.
- Promoting made in India brand for Indian products
- Better testing mechanisms are required for tackling the problem of spurious pesticides
6.14 Petrochemicals

6.14.1 Introduction

Petrochemicals are chemicals derived from petroleum or natural gas and they form an essential part of the Chemical industry today. Petrochemical industry is comparatively new to the economy and had started in 1940. Petrochemicals do not reach the final consumer; they are first sold to customer industries, undergo several transformations, and then go into products that seem to bear no relation whatsoever to the initial raw material.

Due to its very nature, Petrochemicals is an “enabler” industry playing a vital role in the functioning of virtually all key sectors in the economy including packaging, agriculture, infrastructure, healthcare, textile and consumer goods. Petrochemicals provide critical inputs which enable other sectors to grow. Even though this industry is capital and technology intensive, the downstream sector is a major avenue for large scale employment. The downstream plastic processing industry employs over 3.53 million people who derive their livelihood from this sector.

6.14.2 Key objectives

- Developing new technologies
- Reducing the environmental impact of the sector
- Development of clusters

6.14.3 Status and key challenges

- Low levels of R&D
- Environmental impact

While the sector makes important contributions to the agriculture, healthcare, construction, FMCG and consumer durables industry, by making available products that are critical inputs to these, its importance is often overshadowed by its negative perception.
6.14.4 Strategy and key recommendations

Technology upgradation

- Setting up a petroleum Research and Development fund
  - Feasibility of setting up under PPP model to be evaluated
- Augmenting existing testing centers to act as certifying agencies for testing plastic products and raw materials to meet international as well as BIS standards.
- Funding & supporting existing centres
  - To provide help in development & absorption of advanced technology.

Ensuring sustainable growth of the sector

- Setting up a code of conduct for the industry
  - To ensure that industry growth does not have a negative environmental impact.
- Certain types of industries, beyond a particular size, to be permitted only if they can ensure zero discharge. The effluent is either recycled or used for horticulture. In case of medium and small industries, which can’t afford or is not capable of having effluent treatment, should direct industrial waste to some centralized channels. These centralized effluent treatment plants should be the responsibility of state administration.
- Focus on rain water harvesting. Wastelands available around the plant sites to be converted to Green belts
- Fiscal incentive to encourage use of renewable feedstock, adoption of Green processes and build energy efficient housing
- Focus on recycling industry
  - Setting up pilot demonstration plants on Plastics Waste Management and recycling
    - Pilot can be established at all CIPET Centers.
  - Plastic recycling centers can also be established as a part of the Plastic Park
  - Adoption of latest and sophisticated plastic recycling technologies.
  - A focused scheme can be developed for promoting best practices in plastic waste management in India
  - Improving public awareness about recycling industry through campaigns in schools, advertisements in print and electronic media, and support to NGOs
Creating infrastructure

- Formation of industrial clusters / plastic parks
  - Benchmark similar clusters in China, Singapore, Taiwan and other areas which have successfully built such facilities over the years to serve as a blue-print on policy actions.
  - Institute outcome based measurable targets for infrastructure development after establishing benchmarks
    - E.g. for road transport, benchmarks of safety, security, speed and reliability can be established
- Setting up land acquisition policy by states
  - To allow for the development of industries to proceed expeditiously in a mutually agreeable manner between landowners and project developers.

Human resource Development

- Specialized programs for technical training, which can address the specific requirements of plastic industry
- Training Programs for executives in plastic industry
- Conducting Entrepreneurship Development Programs and provide technical assistance to the potential entrepreneurs in establishing their industries from the “concept to commissioning stage”

Other policy initiatives for promoting the sector

- Branding "Made in India" products for increasing export competitiveness of the sector
- Ensure strict and effective enforcement of the ‘Edible Oil Packaging (Regulation) Order’, 1998 by all state governments.
- Encourage use of plastic packaging in key applications, e.g. milk packaging.
- Encourage the use of plastic components in housing to reduce energy requirements
- Fiscal incentives to the sector
6.15 Paper

6.15.1 Introduction

The Indian Paper industry produces 10.11 million tons of paper per annum and accounts for 2.6% of total world production. The annual turnover of the Indian Paper Industry is nearly Rs. 30,000 crores and it employs about 3.70 lakh people. Per capital consumption of paper in India is also very low. The paper mills are spread throughout India with majority of mills located in Gujarat, Uttar Pradesh, Maharashtra and Tamil Nadu. The industry was relicensed from July 1997 and foreign participation is permissible. Most of the paper mills are in existence for a long time and hence technologies used by them fall in a wide spectrum ranging from oldest to the modern.

The mills use a variety of raw materials viz. wood, bamboo, recycled fibre, bagasse, straw, rice husk etc. As many as 30 large integrated paper mills, accounting for about 31% of total domestic production, use wood/ bamboo based pulp. 150 paper mills, contributing 22% of domestic production, use agro based (bagasse and straws) and about 473 mills, accounting for 47% of total production, use recycled fibre or waste paper for paper production.

6.15.2 Key objectives

The per capita consumption of paper in India stands at 9.3 kg as against 42 kg in China, 25 kg in Malaysia and 312 kg in US. Hence, there is enormous scope for growth of the domestic paper industry. The total production of paper is currently around 10.11 million tonnes. Assuming an average 9% GDP growth in the medium term, domestic consumption of writing paper is expected to grow @ 8.1%, packaging paper @ 10% and newsprint @ 8.1%. Consequently, the total is expected to reach 18.4 million tonnes in 2016-17 (terminal year of the 12th Plan) and 36.9 million tonnes in 2024-25. In case of baseline scenario, the corresponding projections are 16.5 million tonnes and 23.5 million tonnes. Accordingly, domestic production of paper is projected to be 16.7 million tonnes and 33.4 million tonnes in 2016-17 and 2024-25 respectively. Under the baseline scenario, the corresponding production is estimated to be 14.8 million tonnes and 22 million tonnes respectively.
6.15.3 Status and key challenges

Achievement of projected production level would call for appropriate measures to remove constraints being faced by the domestic paper industry. The key challenges are diverse and concerned with deficient raw materials vis-à-vis increasing dependence on imported raw materials, technological obsolescence, predominance of sub-optimal capacity, environmental issues emerging from inefficient production practices etc.

These can be represented by the following diagram. It (Fig.I) represents a schematic idea of key issues and challenges of the paper sector.

The increasing demand for papers brings with it new challenges of economies of scale, efficient uses of resources, sustainable use of fibre value chain management etc. Indian Paper Industry, despite its importance, unfortunately stands fragmented with dominance of small and medium sized units. The consumption of basic inputs by domestic norms is significantly higher in comparison with global average and acts as a various to achievement of international competitiveness (Table I).

<table>
<thead>
<tr>
<th>Input norms (per tonne)</th>
<th>Domestic Mills</th>
<th>Global Norm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw materials (tonnes)</td>
<td>2.0-2.4</td>
<td>1.8 – 2.0</td>
</tr>
<tr>
<td>Energy (Giga Joule)</td>
<td>23-37</td>
<td>18-22</td>
</tr>
<tr>
<td>Water (Cu M)</td>
<td>80-150</td>
<td>25-80</td>
</tr>
<tr>
<td>Chemical recovery (%)</td>
<td>88-96</td>
<td>95-98</td>
</tr>
<tr>
<td>Man Power (Nos.)</td>
<td>14-20</td>
<td>5-7</td>
</tr>
</tbody>
</table>


The above scenario underscores a growing need to modernize Indian Mills, improve productivity and build new capacities.
The other major deterrent relates to fibre deficiency. The Working Group estimates that the domestic mills would require 21 million tonnes of wood, 21.8 million tonnes of agro-based raw materials and 39.5 million tonnes of recycled fibre/waste paper. Majority of these raw materials should come from indigenous sources to ensure viable operations in order to achieve projected level of production indicated above.

Wood base segment of paper industry meets its current requirements mainly through social/firm forestry and supplements with purchases from the State Forest Development Corporations. However, resources are becoming limited making them costlier in global comparison. There is an urgent requirement to develop enabling policies favouring industrial/production plantation to secure future supply.

Likewise availability of agro residue may turn out to be inadequate to cater to the future growth of the industry. It may be required to examine the option of use of bagasse for paper making to bridge the gap. However, bagasse is increasingly used by sugar mills for co-generation of power.

In regard to use of waste paper as a raw material for paper sector, it is important to recognise that recovered fibre consumption is going up globally, leading to gradual rise in prices and thus making the import option unviable. However, the recovery rate in India is about 20% which is much lower in comparison with 65% recovery achieved by many global players. India needs a well defund and aggressive system for correction, sorting, grading and utilization of recyclable waste paper to contain imports.

6.15.4 **Strategy and key recommendations**

The deliberations of the Woking Group on Pulp and Paper Sector have shown that expected increased in demand of paper in the country will require considerable increase in the indigenous production base of the paper sector in the next 15 years. Clearly, this would require in-depth planning to address critical issues like non-availability of fibrous resources, technological obsolescence and lack of economies of scale. The group has come out with a set of recommendations in respect of areas requiring improvement and focus. The key recommendations are given in the Box-i below.
The Indian paper and pulp industry has potential and also capabilities to service the growing demand in domestic and international market. It can also create huge employment avenues in rural-India through agro-forestry and can provide direct employment in production at mills through capacity addition/ expansion, provided the competitiveness of the value chain is ensured. This warrants an enabling policy environment to gear up productive capacity, ensure varied raw material options, induce new technologies and promote local innovation.

Box. I Key Recommendations of the Working Group on Pulp & Paper Industry

- Ensuring availability of basic raw material and power
  - Wood: Large scale promotion of agro based plantation and substantial improvement in productivity of agro based plantation activity; Restoration of degraded forest land
- Bagasse: Review of incentives policy for use of bagasse in sugar mills,
- Identification and promotion of alternate lingo-cellulosic raw materials
- Setting up waste paper collection centres and creation of awareness
- Modernising entire RCF/ WP bases industry to adopt state of the art technology

- Technology Improvements for better energy efficiency and reduced environmental impact
  - Improving energy efficiency of existing and designing of incentives for technology up gradation for paper industry
  - Development of indigenous technologies to make agro based industries competitive and environmentally sustainable
  - Development of energy efficient technologies
  - R&D institutes like CPPRI to be strengthened with appropriate funding support
- Support for indigenous manufacturing facility for capacity expansion.

- Fiscal measures to support the sector
  - Rationalisation of duty structure to address inversions, if any
  - Assistance to forestry / plantation
**D) Sectors for Employment Generation:**

6.16 Textiles

6.14.1 Introduction

The strength of the Indian Textiles and clothing Industry lies in its strong raw-material base, indigenous design capabilities, presence in the entire value chain, large and growing domestic demand, and the availability of trained manpower at internationally competitive rates. The Indian Textiles and Clothing Industry consumes a diverse range of fibres and yarns but is predominantly cotton based.

The sector plays a pivotal role in the economy, contributing about 12 per cent of the manufacturing output, 11% of merchandise exports and employs about 45 million people. It has a major presence in the unorganized sector as compared to the organized sector, both in terms of the workforce and number of enterprises.

6.14.2 Key Objectives

The National Manufacturing Plan targets an increase in manufacturing sector growth to 12-14% over the medium term. Since the Textile Sector contributes about 12 per cent of the manufacturing output, the growth of this Sector is crucial to the realization of targets relating to total output and employment growth. The following detail the key objectives of the Textile sector over the 12th plan period:

- Achieve an annual average growth rate of 11.5 per cent in volume terms in cloth production and 15 per cent in value of exports in the 12th Five Year Plan by increasing domestic value addition and technological “depth” and by enhancing the global competitiveness of Indian Textile products.
- It is expected that training to 35 lakh persons would be provided.
- Additional employment to the tune of 15.81 million by 2016-17 would be created.
6.14.3 Status and key challenges

11th Plan progress:

The per capita availability of cloth has been lower than the target during the first 4 years of the 11th Plan period. Textiles exports were significantly lower than the target in each of the first 4 years of the 11th Plan period.

In fact, the targets were not met by any of the segments of the Industry during any of the first 4 years of the 11th Plan. This indicates that the growth rates estimated for working out the projects were too optimistic and support measures were inadequate.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Items</th>
<th>Units</th>
<th>2007-08</th>
<th>2008-09</th>
<th>2009-10</th>
<th>2010-11</th>
<th>Target</th>
<th>Achievement</th>
<th>Target</th>
<th>Achievement</th>
<th>Target</th>
<th>Achievement (P)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Production of Yarn</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(i)</td>
<td>Spun Yarn</td>
<td>Mn. Kg.</td>
<td>4180</td>
<td>4003</td>
<td>4680</td>
<td>3912</td>
<td>5240</td>
<td>4193</td>
<td>5870</td>
<td>4647</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(ii)</td>
<td>Filament Yarn</td>
<td>Mn. Kg.</td>
<td>1457</td>
<td>1510</td>
<td>1596</td>
<td>1417</td>
<td>1748</td>
<td>1523</td>
<td>1915</td>
<td>1549</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Production of cloth</td>
<td>Bn. Sq Mtr</td>
<td>60.5</td>
<td>56.0</td>
<td>67.6</td>
<td>54.9</td>
<td>75.6</td>
<td>60.3</td>
<td>84.5</td>
<td>61.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(incl.K.W.S)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3.</td>
<td>Per capita availability of Cloth</td>
<td>Sq. Mtr</td>
<td>42.84</td>
<td>41.85</td>
<td>46.9</td>
<td>39.01</td>
<td>51.60</td>
<td>43.12</td>
<td>56.62</td>
<td>43.25</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. Textile Exports (incl. Jute, Coir, Handicrafts)  

<table>
<thead>
<tr>
<th></th>
<th>Bn. US $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apr-Jul</td>
<td>24.0</td>
</tr>
<tr>
<td></td>
<td>22.1</td>
</tr>
<tr>
<td></td>
<td>31.2</td>
</tr>
<tr>
<td></td>
<td>20.9</td>
</tr>
<tr>
<td></td>
<td>40.0</td>
</tr>
<tr>
<td></td>
<td>22.1</td>
</tr>
<tr>
<td></td>
<td>51.1</td>
</tr>
<tr>
<td>Source: Working Group Report on Textiles &amp; Jute Industry for the 12th Five Year Plan</td>
<td></td>
</tr>
</tbody>
</table>

5. Production of Textile Machinery  

<table>
<thead>
<tr>
<th></th>
<th>Rs. in Bn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apr-Jul</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>61.55</td>
</tr>
<tr>
<td></td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>40.63</td>
</tr>
<tr>
<td></td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>42.45</td>
</tr>
<tr>
<td></td>
<td>79</td>
</tr>
<tr>
<td>Source: Working Group Report on Textiles &amp; Jute Industry for the 12th Five Year Plan</td>
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</tbody>
</table>

6.14.4 Strategy and key recommendations

Building on the foundation laid down during the 11th Plan and continuing with the thrust on technology upgradation and modernization, the 12th Plan envisages critical interventions in the weaker segments of the textile value chain such as processing and garmenting. The main elements of the strategy for the Textiles Sector would be as under:

Technology with focus on weaving and processing sectors

The Technology Upgradation Fund Scheme (TUFS) has been in operation since last three Plans and its benefits have mainly been availed by the Spinning and Composite Sectors. In order to achieve the growth target of 11.5% in value in cloth production and 15% in exports, an investment of Rs.1,45,000 crore would be required for the 12th Five Year Plan. A study by CRISIL has recommended that the interest subsidy for spinning should be allowed only when it is accompanied by matching investments in weaving or knitting. The Spinning Sector has received the bulk of the investments under TUFS, accounting for around 35% of the disbursements.

While continued investments in Spinning are essential to ensure yarn availability and domestic value addition of cotton, it is also important to promote forward integration. Disallowing standalone investment in spinning is also necessary to correct the current skew in disbursements. Rather investment for technology upgradation in the downstream segments of weaving and processing is necessary to ensure that maximum quantity of yarn produced in the country is converted into
spinning products domestically in order to meet the increasing requirements of the garment industry. Up-till now an amount of Rs.14,248 crore has already been disbursed by GOI as TUF subsidy and it is imperative now, to specify a sun set clause to avoid ballooning of subsidies.

**Infrastructure**

The Scheme for Integrated Textile Parks (SITP) was launched in 2005 to neutralize the weakness of fragmentation in the various sub-sectors of textiles value chain, and the non-availability of quality infrastructure, Under the SITP, 40 projects were sanctioned in the 11th Plan, out of which 9 projects are reported to be completed.

Since the impact of these Parks is yet to emerge, it would be prudent to focus on consolidation of the gains for existing Parks rather than spreading resources thin over too many interventions. The nature of units in the parks are Powerlooms, Handlooms and Readymade garments. It is observed that there is no evidence of vertical integration in these parks, which appear standalone in nature. Integration specifically encourages both forward and backward linkages in the entire textile value chain. The proposed new scheme of setting up of Integrated Apparel Clusters, activities laid down in the Technology Mission for Knitwear and Wovenwear should be subsumed in SITP.

**Cotton Sector**

As per the evaluation study carried out by ICRA Management Consultancy Services Limited, trash content in Indian cotton has reduced from high levels of 4-8% during the pre-TMC period to 1.5 – 3% post modernization under Mini Mission – IV of the Technology Mission on cotton. Under Mini Mission – III, Upgradation / improvement in the Market Yards with regards infrastructure such as pucca roads, pucca platforms, covered sheds for storage of kapas, parking spaced for carts / vehicles. boundary wall etc. has arrested the level of contamination added at the market yards. Improved market yards have attracted large number of farmers and traders to the Market Yards, resulting in increased participation in the auction of cotton and thus, fair price realization to the farmers.
In the 11th Plan, 860 Ginning and Pressing factories have been modernized under Mini Mission IV of the TMC. At present, there are 1700 modernized G&P factories in the country with an average production of 20,000 bails in one factory, total processing capacity is around 340 lakh bales. Based on the estimated cotton production of 438 lakh bales by the end of the terminal year of the 12th Five year Plan, the efforts of modernization of G&P factories through MM IV of TMC and modernization of Market Yards under Mini Mission – III may be required.

**Environmental concerns**

The major challenges faced by the processing sector in textiles are availability of water, effluent treatment and disposal of the treated water and solid effluents. Therefore, a scheme for Common Effluent Treatment with Marine Outfall could be introduced by the Government for the existing textile processing clusters on a PPP mode. Such CETPs could also be set up in processing units in coastal areas.

**Jute**

The bulk of Jute Mills depend on Government orders for sacks for foodgrains, which are mandatory under the Jute Mandatory Packaging Act. This dependence is one of the major barriers to modernization and product diversification within the industry. The Jute Sector must plan for a gradual phasing out of this order and more self-reliance through modernization and diversification.

The proposed policy framework for jute includes the development of jute Industry includes improving the technology for retting, interventions for marketing and price stabilization of raw jute, modernization of jute industry and product diversification, focus on the North East Region and programmes for skill development and labour welfare are also envisaged.

At present India has the highest area under jute cultivation and is the largest producer of raw jute. During 2009-10, production of Jute, Kenaf and Allied Fibre in India was 1620,000 tonnes, while it was 1080,000 tonnes for Bangladesh and 80,000 tonnes for China. Closer examination reveals that agriculture yield of raw jute in India has improved in the 11th Plan but is much still less than in the two largest competing countries viz. Bangladesh and China. The Indian Jute Industry is affected
because the quality of raw jute is better in Bangladesh. Therefore, the Bangladesh jute farmers get much better returns per acre than the average Indian jute farmers. The Indian Jute Industry needs to proactively develop both agricultural practices and processing methods to survive increasingly intense global competition.

As per the evaluation carried out by ICRA Management Consulting Services Limited for Mini Mission – III & IV of the Jute Technology Mission, the extent of benefit derived for development of Market Yards, construction of Departmental Purchase Centres, construction of Retting Tanks and development of High-Speed Ribboners was low, while demonstration of Retting technology was medium. All the Schemes may have taken steps in the right direction, however, results have only started to become visible under the Mini-Mission-III Results are not widespread right now. Under Mini-Mission-IV, most of the schemes have already started yielding results and benefits for the Jute Mills and Jute Diversified Sector. A view on whether the JTM has to be continued in 12th Plan will have to be taken.

**Technical Textiles**

During the 11th Plan, under Mini Mission I, upgradation of four Central of Excellence (Non-Wovens, Composites, Indutech & Sportech) have been upgraded for indigenous development of prototypes and resource centre with IT infrastructure, incubation centre and creation of common testing facilities with national/international accreditation. The major focus of interventions during the 12th Plan would be on aggressive implementation of Technology Mission on Technical Textiles which would include implementation of regulatory framework in specified areas, encouraging indigenous production of specialty fibres and yarns, encouraging investment in high end technical textiles products, including FDI, encouraging R&D in technical textiles, formulation and notifications of standards by BIS and ensuring availability of data base

**Silk**

India is the second largest producer of silk in the world, a distant second to China, with 15.50% share of the world production. Major portion of the silk produced in India is from the southern states of
Karnataka, Tamil Nadu and Andhra Pradesh. Raw silk production during the 11th Plan would be lower than the Plan target of 26,000 M.T. Overall performance of mulberry silk production will not be at the expected level. This is mainly due to the below par performance in the bivoltine raw silk production against the target. However, the average annual growth rate during the plan period is expected to be 4.25%, which is being considered satisfactory considering the fact that this sector competes with other cash crops and is also affected by large scale urbanization and loss of land to infrastructure projects.

The objectives in the 12th Plan would be to facilitate and create conducive conditions for achieving the targeted silk production of 32,000 M.T. at a CAGR of 7.14% by the terminal year of the 12th Plan. This would be done through intensive efforts in research and development, technology transfer and enterprise development, creating an inbuilt pyramid structure of federated farmers and farmer associations to synergize and synchronize the production processes. Also, efforts will be directed to develop 3rd Generation multivoltine crossbreeds to increase production and matching quality parameters of bivoltine silk & accelerate the growth in vanya silk production and explore better value realization in domestic and international markets.

**Powerlooms**

The decentralized powerloom sector plays an important role in the textile economy in terms of fabric production and employment generation. It contributes 62% to the total fabric production in the country and provides employment to the tune of 57.2 lakh persons. Fabric production in the powerloom sector increased to 37,517 million sq. mtr. in 2010-11 from 32,879 million sq. mtr., in the year 2006-07.

The technology level powerloom sector has improved considerably during the 11th Five-Year Plan. Approximately 50,000 shuttleless looms have been installed during the first two years of the Eleventh Five Year Plan.

The interventions required for Powerloom Sector development during 12th Plan period include Powerloom Cluster Development Programme, setting up of Common Facility Centres, Yarn Bank, setting up of Design Development Centres in the clusters, conducting awareness
programmes/seminars/workshops/pilot activities and Distress Relief Fund Scheme for powerloom weavers.

Powerloom Sector has not received due attention. Number of shuttle less looms need to be increased considerably as presently these are only less than 5% of the total number of looms in the country. Poweloom Survey should be got completed soon. A separate provision exclusively for Powerloom Sector may be made under TUFS for its modernization. Also, in order to give a focused and dedicated attention for Powerloom Sector, creation of an office of the Powerloom Commissioner may be considered.

**Wool & Woollens Textiles**

The woollen industry in the country is of the size of Rs.10,000 crore and broadly divided and scattered between the organized and decentralized sectors. India has the third largest sheep population in the world, having 6.40 crore sheep producing 43.30 million kgs of raw wool, out of which, about 85% is carpet grade wool. The production of indigenous wool was of the tune of 44 to 45 million kgs during the 11th Plan period with no improvement in quantity and quality since last twenty years. There has been no success in developing good quality apparel grade wool indigenously.

Therefore, complete efforts needs to be made by improved manufacturing and processing facility in the woollen sector and by increasing marketing of woollen and worsted items to increase exports. India depends on imports as indigenous wool is meant for manufacture of carpets only. It has been estimated that the raw wool production and imports would double from 114.2 million kgs. in 2008-09 to 260.8 million kgs. by 2019-20. During the period 2009-10 and 2014-15, exports of woolen yarn fabrics and made-ups are expected to record a CAGR of 11.6%.

There is a need to have proper data base and action plan to reduce mortality rate of sheep, increasing coverage of shepherds as well as sheep under insurance, faster development of CFCs, improvement in productivity in wool production. Thrust of the scheme/programmes has to be oriented accordingly.

**Human Resource Development**
In a study carried out by CRISIL, the requirement of human resources in the report viz. Textile Sector Vision 2010, indicates a requirement of 50 lakh workforce with an investment of Rs. 1,40,000 crore by the end of 2011. A study conducted by National Skill Development Corporation indicates that the overall Textiles & Clothing Sector will grow at a CAGR of 9.5%. It implies that by the end of 12th Plan i.e. 2016-17, the textile sector’s incremental human resource requirement would be about 17.8 million, of which 11.0 million human resources would be required in the mainstream Textiles and Clothing sector.
6.17 Food processing Industries

6.17.1 Introduction

As a leading producer of food grains, milk, fruits and vegetables, India has the advantage of adequate food at the farm gate to ensure food security for the nation and to even have a surplus for exports. This is provided timely measures are taken to ensure that the produced food does not get wasted at the farm gate but reaches the market in time.

A recent study by CIPHET in 2010 has assessed the losses in fruits and vegetables (6-18%), Cereals (4%), and meat/poultry/fish (2-4%). A repeat survey is being done in the same districts to assess the change over time. Food processing industry in India has immense potential for boosting the rural economy as it brings about synergy between consumers, industry and agriculture. A well-developed food processing industry is expected to increase farm-gate prices, reduce wastages, ensure value addition, promote crop diversification, generate employment opportunities and boost export earnings. Buoyed by a favourable policy environment and the demand-push of an emerging young consuming class with growing disposable incomes, India undoubtedly offers a huge growth opportunity in the food processing and agribusiness sector and is said to become a global leader in food business.

The Government initiated extensive reform measures to catalyze private sector participation in food and agriculture sector. Some of the key measures undertaken (Box-I) have ushered new paradigm in food processing sector to spur economic interests in terms of investment, value addition and employment generation. The Sector’s contribution to the GDP has grown at an average rate of 8.5% between 2005-06 and 2009-10. The growth rate for registered manufacturing units has been even higher at over 10%. The sector currently employs around 8.5 million people. In 2011-12, this sub sector has emerged as the fastest growing sub sector in the manufacturing sector. Over the period of April-November 2011, it has grown at 17.2% vs. 4.3% for all manufacturing (Source: IIP data of M/o St. & PI)
Box-I Policy and regulation for food processing sector

- Tax concessions (100% IT deduction for 5 years and 25% in next 5 years for new agro-processing, waiver of excise duty on dairy machinery, zero input duty on EOU etc.)
- External commercial borrowings to be available for cold storage
- Project import status at a concessional custom duty of 5% with full exemption from service tax to the initial setting up and expansion of cold chain projects and processing units
- Cold chain and post harvest storage designed as an infrastructure sub sector
- Capital investment in creation of modern storage capacity eligible for viability gap funding
- Launching of National Mission on Food Processing
- 100% FDI under automatic route
- Emphasis on PPP–driven approach for setting up production infrastructure.

6.17.2 Key objectives

Following are the main objectives for the 12th Plan period:

- Develop the food processing sector to enable containment of food inflation and food wastage
- Create 1 million additional jobs during the 12th plan period

6.17.3 Status and challenges

The government has been fully recognised the importance and relevance of the food processing sector and has identified a set of major challenges for the Indian food industry (Box II)

Progress in the 11th Plan

The 11th Plan approach was primarily driven by the targets set out in the ‘Vision 2015’. A major factor that shaped the activities/programmes of 11th Plan stemmed from the fact that the food processing
sector would spearhead growth and value addition in domestic agriculture and ensure better income at the farm level.

**Box-II Major Challenges**

- Development of Processing Infrastructure
- Low price-elasticity for processed food products
- Promotion of local innovation
- Need for distribution network and cold chain
- Backward-forward integration from a farm to consumers
- Development of marketing channels
- Development of linkages between industry, government and institutions
- Further rationalization of Taxation, Streamlining/rationalization of food laws
- Land acquisition

In order to elicit better response of all the stakeholders, the 11th Plan included various novel components like promoting the spirit of public private partnership and integrated approach with appropriate emphasis on backward linkages. The major thrust areas were development of value chain and processing infrastructure, upgrading or modernization of technologies, promoting quality certification and standards, strengthening of institutional mechanism for skill development etc. Summarised pictures of the activities/ schemes are given at Table 1 below.

The Working Group has highlighted an important point regarding progress of implementation in case of schemes/ projects of MFPI. While the major schemes taken up for implementation during 11th Plan were able to evince keen interest of the stakeholders and beneficiaries, translation into actual projects yielding desired outcomes was inordinately slow due to various reasons, main impeding factor being problems in land acquisition, lack of capacity among promoters and institutions, and overall economic slowdown.
Compliance with requirements of two-stage approval process, complexities relating to structuring of SPVs, policy of even distribution of projects amongst states etc. added to the delays. Besides centralized mechanism of identification, approval and monitoring etc. of projects has sometimes taken time to appreciate local factors and capture local requirements.

**Strategy and key recommendations**

Based on lessons learnt during 11th Plan and keeping in view the priorities of the proposed manufacturing plan, the strategy for 12th Plan has been devised based on three basic principles. Firstly, greater emphasis would be laid on decentralized process of implementation with greater involvement of states in selection of projects vis-à-vis beneficiaries and monitoring their implementation.

Secondly, instead of project implementation, focus would be on policy making and coordination so as to address critical issues impacting the value chain in the sector. Lastly, the existing focus on infrastructure development will be continued with expansion of scope and depth so as to ensure sustainability of the value chains. The major recommendations of the Working Group in regard to 12th Plan activities are in Box III.

Adoption of a decentralized approach to instil greater involvement of states and appropriate coordination between states and stakeholders is a well-conceived idea for development of Food Processing Sector. Launching a National Mission on Food Processing (NMFP) will be appropriate vehicle to carry forward the idea of decentralization.

Likewise shift of focus of the Ministry from project implementation to policy initiative is in right direction towards holistic development of the sector. The policy to be effective will have to be comprehensive and should evolve through consultation with the states and the industry. It should promote the development of viable agri-business and agro-industry models based on different agro climates and regional characteristics. It should look at institutional strengthening and capacity building across the value chain.
Box III: Key Recommendations

- Setting up of National Mission on Food Processing to improve coordination and implementation of schemes and to enable greater involvement of state governments.

- Expanding and modifying existing infrastructure development schemes
  - New Mega Food Parks
  - Additional Cold Chain Projects

- Modernized Abattoirs – Establishment of new abattoirs and modernization of existing abattoirs

- Develop and strengthening of existing and new institutions

- Taking up a nation-wide skill development program along the lines of special projects for skill development of rural youths under SGSY of MoRD.

- Putting in place a network of food testing labs (Government/ Private) through providing incentives.

- Encouragement for larger participation in Codex deliberations and setting up of Codex Cell to promote, coordinate and monitor related initiatives at the level of stakeholders such as industry associations, national research institutions etc.

- Setting up of an Innovation Fund and Venture Capital Fund for Food Processing to promote innovations and technology development as well as to support conversion of the innovations into viable business opportunities.

The policy intervention should seek to inspire innovation and technology development to prolong shelf-life of fruits and vegetables, to economize cost of plant and machinery especially in case of packaging and cold storage system etc. While basic agricultural research has strong and large
institutional network in the country, there is inadequate focus on the food processing sector. There is an urgent need for building a bridge between agricultural universities, premiere technological and industrial research institute and the private sector to actively undertake collaborative strategic research in this important sector.

Apart from National Institute of Food Technology Entrepreneurship & Management (NIFTEM), the Central Food Technology Research Institute (CFTRI) should play a more central, pro-active role to strengthen knowledge base of the industry through greater public and private partnership in technology development. Launching of innovation fund or specialised venture capital could be gainfully integrated with schemes/initiatives available from the Department of Science & Technology as well as Council of Scientific & Industrial Research.

Another critical objective should be for the industry to reach international standards of food safety and quality. There is no reason why Indian consumers should not demand and get products meeting the highest quality and safety standards. This will require a multi-pronged effort starting from a sustained campaign to build consumer awareness, promote quality in industry to establishment of world class food testing laboratories in public and private sectors. All efforts should be made to harmonise Indian Food Standards with Codex. Enactment of the comprehensive legislation, the Food Safety & Standards Act, 2006 in the recent past has already provided an enabling vista for taking the above aspects forward.

Last but not the least, it is required to recalibrate the existing schemes of MFPI for greater effectiveness. The proposed Centrally Sponsored Scheme of NMFP has to be structured in such a manner so that it is efficiently managed. It may be desirable to bring most of the schemes under the aegis of NMFP to ensure greater flexibility in implementation and responsiveness. Location of mega food parks/cold chains along the length and breadth of the country could increase the overall impact.

It may also be worthwhile for new mega food parks to explore options of identifying one or more anchor industry(ies) to speed up their pace of implementation.
6.18 Leather & leather goods

6.18.1 Introduction

The Leather & Leather Products industry occupies an important position in the Indian economy in view of its massive potential for employment generation, potential for growth both in domestic and export markets.

The leather industry is spread in different segments, namely, tanning and finishing, footwear and footwear components, leather garments, leather goods including saddlery and harness, etc.

6.18.2 Key objectives

- To increase the number of employed in the industry – ensuring the availability of trained / skilled labour
- To improve the export competitiveness of our products and facilitating exports
- Improving the scale of businesses in the sector
- Ensuring clean processes (environmental pollution)
- Improving the social conditions

6.18.3 Status and key challenges

India’s share in global value added from this sector at constant 2000 prices was 2.1 per cent in 2000 and declined to 1.8 per cent in 2009. Leather industry is amongst the top ten foreign exchange earners for the country. Indian Leather Sector has registered consistent growth in exports during the six year period from 2003-04 to 2008-09 with exports increasing from US$ 2.22 billion in 2003-04 to US$ 3.60 billion in 2008-09 (about 41% of total production). Though India has distinct advantages in the leather industry in terms of availability of raw materials with the largest livestock population in the world, the tapped potential (especially in high end value chain) in the leather sector is still limited. This untapped potential provides the sector significant opportunities for expansion and diversification. There has been an increasing emphasis at optimum utilization of available raw materials for maximizing the returns, particularly from exports.
As per the NAS, total output of the leather sector increased from Rs 27,233 crore in 2004-05 to Rs 39,585 crore in 2008-09 at an average annual rate of 9.7 per cent. The growth in the organized sector at 16.2 per cent was significantly higher than the unorganized sector, which recorded a growth of 3.2 per cent during this period. The organized sector contributes to around 57.2% of the total output.

It was expected that the ban on exports of semi-finished leather in 1990-91, and a structural shift in favour of the organized sector, the leather industry would move up in the value addition ladder. The organized factory sector data, however, reveal that resource intensity in the organized leather manufacturing has actually increased. The ratio of value added to output declined from 22.8 per cent in 1993-94 to 13.6 per cent in 2007-08. The value of inputs consumed in the production process increased to close to 84 per cent in 2007-08. The share of value added in output in leather sector was also lower than the share in the overall organized manufacturing.

Lack of indigenous development and acquisition of technology, lack of brand building and inadequate emphasis on human resource (skill) development may have contributed to this stable (increased) material resource intensity in leather manufacturing.

Leather industry in India is geographically well diversified, though Tamil Nadu, Uttar Pradesh and West Bengal account for bulk of the output. The major production centres for leather and leather products are located at Chennai, Ambur, Ranipet, Vaniyambadi, Trichi, Dindigul in Tamil Nadu, Calcutta in West Bengal, Kanpur in Uttar Pradesh, Jalandhar in Punjab, Bangalore in Karnataka, Delhi and Hyderabad in Andhra Pradesh. The sector is dominated by micro and small units with bigger units accounting for just around 5 per cent of the total manufacturing units (170 out of 2305 units).

As per the projections by working group, the Leather sector is expected to grow at a rate of 12-14% during the twelfth five year plan.

The key issues facing the industry are:
- The number of people employed in the industry went down from 1.4m in 2004-05 to 1.1m in 2009-10. However, total factor productivity growth rate in the organized leather sector
increased from 0.78 per cent per annum during 1980-81 to 1990-91 (pre reform period) to 1.18 per cent during 1992-92 to 2003-04 (post reform period). The industry will need about 4.6m incremental human resources till 2022

- Many players are unaware of stringent international standards
- Fragmented nature of the industry – large number of unorganised players; Relative unsophistication of the industry players and lack of communication skills
- Lack of strong presence in the global market
- High level of environmental pollution

6.18.4 **Strategy and key recommendations**

**Attracting large scale investments through FDI & domestic companies**

- China and Vietnam have built a strong leather industry through this model GOI allows 100% FDI in this sector
- Promotional activities in foreign countries to be carried out in various formats
  - Organization of Road Shows
  - Visit of Investment Promotion Delegations abroad
  - Sourcing Missions for collaborations on raw materials
- Print campaign in International magazines to reach out to the prospective investors
- Investment Meet to be organized in various parts of the country
- Informative publications on leather sector to be brought out

**Skill development initiatives**

- Establishment of 1-2 new Footwear Design & Development Institutes under 12th Five Year Plan & by upgrading the existing infrastructure – To meet Human Resource requirement at middle & higher level.
- ‘Support to Artisans’ scheme – 360 degree intervention plan
- Placement linked Skill Development Program & Training of Trainers – For providing employment opportunity & to fill the demand of operators in the footwear sector & improving the quality of training.
Ensuring environmental sustainability

- Animal Husbandry Measures, Slaughter & Skin Collection Improvement Measures & Rural Tanning Improvement Measures
- Technology Up gradation and Modernization of Tanneries
- Technology Benchmarking of Tanneries
- Environmental Management measures in Tanning Sector

Improving export competitiveness

- Brand Building
- Constitution of Domestic Council - Footwear & Leather Products Development & Promotion Council (FLPDPC)
- Indian Leather Mark
- Research & Development and Design & Development
- Outsourced Consultancy Program

Others

- Database of global standards on a day-to-day basis
- Improving the availability of raw-materials
6.19 Gems & jewellery

6.19.1 Introduction

India’s Gem and Jewellery (G&J) industry is a bright star of the economy, and one of the important foundations of the country’s export-led growth. It is a leading foreign exchange earner and one of the fastest growing sectors accounting for 16.67 per cent of India’s total merchandise exports during FY 2010-11. The industry has registered a remarkable growth over the last four decades, with exports grown from US$ 28 million in 1966-67 when the Gem & Jewellery Export Promotion Council (GJEPC) was established, to US$ 43.14 billion in FY 2010-11(provisional figures). India now accounts for nearly 55% of world net exports of cut & polished diamonds in value terms, 90% in terms of pieces and 80% by caratage. The industry employs about 2 million highly skilled workforce out of which one million are exclusively engaged in export production.

India is known to be the largest consumer of gold in the world. It is estimated that the current annual demand for gold in the country is well over 800 tonnes. Naturally India is also the largest fabricator of gold. India has for long also been a major centre of the coloured gemstone trade. Nine out of 10 emeralds in the world are polished in India. Recently Tanzanite has swept the jewellery fashion world, and 7 out of 10 tanzanite by pieces and 80 per cent by value are polished in and exported from India.

In the diamond segment, the industry is importing rough diamond from countries such as Belgium, UK, UAE, Israel, Hong Kong, Switzerland and other mining countries. The polished diamond is exported to countries such as UAE, Hong Kong, USA, Belgium and Israel. In Gold also we are dependent on imports.

6.19.2 Key objectives

- To ensure access and availability of raw material to the industry
- To make Indian products attractive at global markets

6.19.3 Status and key challenges
India has huge market and requisite skill availability, but has no raw materials. India has one of the highest demands for diamond and gold jewellery. We also have a skilled labour available for polishing the rough diamond, designing jewellery and manufacturing jewellery. However, we do not have raw materials of both – diamond and Gold – domestically. We are relying on import of these materials to grow this industry. We need to ensure the availability of all the raw materials – Gold, Diamond and precious stones.

India will need more skilled labour as the industry grows. The current level of employment is around 2 million (3.4m as per a study conducted by ICRA Management Consulting Services Limited for GJEPC). Given the high value of diamond and gold processed, trust becomes an important factor in choosing workers to work in these firms. As a result, most of the labour comes from a few regions only. However, as the industry grows there will be a need to train more people. The ICRA Management Consulting Services Limited study projects an incremental requirement of 4.6m skilled labour by 2022.

Also, the industry provides indirect employment to about 10million people – in the form of jewellers, sales persons, designers, goldsmiths, artisans and craftsman from the smallest towns. This number will also have to go up substantially. The types of training needed for the sector needs to be identified. The challenge of skill development becomes high in the industry, especially when the existing skills are mainly tacit in nature, and rests with the artisans in their minds.

Industry is highly unorganized

This industry is highly unorganized with more than 90% of the industry participants running their businesses from home with hardly any managerial or technological inputs. They suffer from many problems – Lack of access to credit, lack of access to technology and lack of quality systems. Many of these units are also unregistered. Making them part of clusters is one way of doing the same.

Jewellery industry needs technological upgradation

Given the fragmented nature of Jewellery industry and the smaller sizes of its players, the industry needs to upgrade its technology to serve its global customers effectively. Some areas of research will
include areas like improving the product quality, reducing wastes, technology sourcing and absorption, upgrading the manufacturing centers, creating new product designs, etc.

Improving infrastructure can boost the trade
As the industry is fragmented, cluster approach with common facilities in it will help the industry in a great way. The types of infrastructure that could be useful to the industry are bourses (for supporting marketing activities), Jewellery Park (manufacturing units with the entire value chain) and common testing facilities, to name a few.

Some fiscal measures are not helping the industry

‘The Benign Assessment Procedure’ announced in the Union Budget of 2007 had a very detrimental impact on the industry. While the measures were supposed to simplify the assessment procedure for G&J companies, the norms were very stringent. A threshold net profit of 8% (later on revised to 6%) or more for companies to qualify for assessment under this scheme. However, with the majority of the industry having net profit of less than 2-3%, it did not help the industry.

It also made income tax officers raise demands on those who do not have 6% net profit margin, which raises the anxiety level of the G&J players. Also, some of the procedures needed to satisfy bank - Submission of Bank realisation certificate as a proof of exports of precious metal Jewellery for further release of their bank guarantee and the recovery charges paid to maintaining DPCCC are adding to the transaction costs affecting the small margin the industry makes.

Branding and Promotion

The industry is facing competition from other luxury goods, both in India and abroad. In order to sustain its competitive advantage, it is important to carry out brand promotion activities, both in India and abroad by the industry consortium.
6.19.4 Strategy and key recommendations

Secure Raw Material Sources:

Diamond:
- In order to ensure the security of rough diamond and coloured stone availability, the country should restrict the export of diamonds produced from domestic mines and invest in diamond reserves abroad. The investments in overseas mines can be through PPP model.
- The overseas diamond companies should be allowed to open their offices in Bharat Diamond Bourse.

Gold:
- Import of precious metal gold should be completely free, for manufacturing exports, which would ensure decrease in manufacturing cost as at present around 4.5% is spent as a processing cost.
- Currently import of gold is permitted in the form of bars by canalizing agencies only through banks and start trading houses. With their limited network and limited experience, their sourcing inefficiencies has led to erratic supply and frequent shortages. Instead, import of gold to be permitted as per international practice.
- Improving the distribution of gold in the country through banks, post offices, uniform VAT for Gold across the country, removal of duties like octroi / entry tax, creation of a courier / transport mechanism for free movement of gold in the country could help the industry get gold across the country.

Coloured Gem Stones:
- Commissioning exploration programmes and surveys to ascertain availability of coloured gemstones in India.

Training & Development
- Identifying and standardizing the skills that are required by the industry and evolving training programs to address the same.
• Create Sector Skill Council, under the aegis of NSDC, GJEPC and other critical stakeholders. Develop and administer ‘Train the Trainer’ programs, create training infrastructure and roll out the training programs.

**Research & Development and Technological Upgradation**

• Documentation of existing tacit knowledge of traditional artists.

• Develop a Design Center of Excellence & Product Development at Mumbai

**Infrastructure facilities**

• Setting up Gem Bourses, jewellery parks / clusters, Gem trading centers and G&J training centers in some key cities across the country

**Marketing & Brand Promotion**

• The industry will set up a fund with contribution from its members towards promoting ‘Made in India’ brand image across the globe. Government of India should also contribute to this fund. The industry council will work with IBEF in this regard.

• Government of India should sign up FTA/PTA/CECA with untapped market for G&J products and work towards reducing the tariffs on the same

• Government should encourage the participation of the industry in international trade forums.

**Regulatory & Fiscal**

• Introduction of Turnover based taxation system for Indian Gem & Jewellery industry

• Relaxation in EPC norms for import of machineries from Italy

• Introduction of trade friendly regulatory framework by RBI in place of current stringent fiscal control measures

• Allowance of credit at Interest rates at par with international market

• Allowance of External Commercial Borrowings for working capital as well

• RBI to allow financing for retail jewellery business abroad

• Allowance of use of courier mode of transportation for gems and jewellery items apart from designated ports in the country
• Create dollar fund to refinance banks to finance industry at competitive international rate.
• Introduction of adequate credit guarantee mechanism for Gem and Jewellery Sector
• Decrease of transaction cost – Introduction of regulatory control like IRDA to monitor the different transaction charges that an exporter pays to the different government agencies & financing institutions.
• The counter guarantee for ECGC should not be less than Rs 1500 crores and looking at the high value product, 50% of which should be reserved for Indian Gem & Jewellery Industry.
7 Way forward

7.1 Principles of Policy Implementation

Research on success of countries that built effective implementation systems to create sustained competitive advantage across multiple manufacturing sectors provides some principles for a robust implementation process.

- **Build an implementation system, don’t just do the task**: Explicit attention to the process of policy development and implementation has been lacking to a large extent in the Indian context. An effective implementation system is not limited to the success of a single initiative. It builds broad-based capabilities across several industries.

- **Systemic experimentation and learning help to progressively, and rapidly improve implementation**: Even carefully designed programs are likely to face challenges from unforeseen changes in the environment. Therefore it is important to have learning and feedback mechanisms in place to ensure that implementation effectiveness improves through successive cycles. Good policy development (and implementation) should follow the PDCA cycle (Plan – develop strategy; Do – implement strategy; Check – diagnose issues in strategy and its implementation; Act – rectify issues identified)

- **Prioritize, sequence, and create momentum through results**: Often it takes time for results of policy recommendations to become visible. When results are not visible, the implementation process may lose momentum. Therefore, to build momentum, some early wins must be targeted. They build confidence and commitment to the process.

- **Performance measures for government programs have to be defined consultatively**: The old management adage – ‘you can’t manage what you don’t measure’ - is especially true with regards to complex government programs. The need for performance measures is well accepted. However it is also very important to define these measures appropriately. A key difference between public sector and private sector programs is that the value required to be produced by public programs is generally more intangible than in private programs where shareholder value and profit may be good measures. Outcomes of public programs must deliver against expectations of diverse public stakeholders.
Therefore, it is imperative that time is spent, up front, to define outcomes in consultation with key stakeholders. Failure to do this causes the system to adopt simplistic measures of performance against expenditure targets, which are not good indicators of the outcomes that were desired.

- **Co-ordination between government departments is critical:** Given the complexity of policy issues relating to manufacturing, most solutions are likely to require coordinated actions between a number of government departments. While the default solution is to create another agency/committee to oversee this co-ordination, this is not always the optimal solution. Before setting up such an agency/committee, the tasks required to be performed by such an agency/committee must be analyzed and the existing system of agency/committees must be mapped to eliminate any overlaps and redundancies.

  Otherwise additional agencies/committees can increase the clutter in the system rather than improve its performance. Since coordination is an essential function to improve system performance, coordination/oversight should be accountable for performing its task and its performance must be measured too.

- **Stakeholder consultations are key to improve the quality of policy development and implementation:** Rather than seeking to a priori design a detailed plan in an unpredictable environment, it is better to create effective forums to identify problems, and for joint teams to be formed to tackle them. These forums should be broad-based and inclusive to ensure that all stakeholders can contribute to the process.

- **A good ‘backbone’ organisation provides strength to the multi-stakeholder policy and implementation process:** The common feature of successful cases of implementation has been the creation of a web of institutions, processes and other mechanisms. For this web to be effective, it must be strengthened and animated by a central actor to give it coherence and direction. This does not require an organization with a large amount of resources or manpower, nor one with the power to command top-down.

  In economies as diverse as Taiwan and Argentina, this role has been played by often small organizations that: facilitate a common vision; act as a disinterested party in finding solutions to common problems; maintain momentum through transparent monitoring and evaluation; store and distribute learning; and induce effective stakeholder consultation.

  Such a role is often modest and unobtrusive, but can be the key to implementation and growth.
7.2 A two track process of implementation

The manufacturing plan makes many recommendations developed through a managed, participative process with structured involvement from a diverse set of stakeholders. Previous experiences of implementation in India have shown that the inability of various stakeholders to work together is a root cause of failure of policies.

The conventional response to this has been to try and create a structure with a chain of command. However this becomes untenable when there are many stakeholders and owners who cannot all be included within such a structure. The recommended approach for policy implementation, based on the principles enunciated before, is characterized by three ‘L’s: enable Local action, create Lateral connections; and focus on Learning. Local actions and Lateral connections require a process of implementation that coordinates multiple entities in a consultative manner. Learning requires a process that systematically distils lessons from experience to improve the ongoing evolution of policies and their implementation.

Therefore, a two track approach for implementation and learning is recommended: the first track delineates the steps required to convert the recommendations of the plan to implementation and the second track concentrates on the systemic changes that need to be undertaken to strengthen the process of consultation, learning policy making and ongoing implementation.
The ‘third rail’ that provides the power to accelerate learning and institutional capacity improvement is an ongoing process of evaluation and learning, which must be proactively facilitated through the creation of a ‘backbone’ organisation and other means. This approach is schematically represented in Figure 1.

7.3 Track 1: Develop an implementation process for the Manufacturing Plan

The Plan has recommended several actions for each of the cross cutting issues and sectoral areas. The recommendations are varied in nature – policy changes, institutional improvements, fiscal measures, new schemes, etc. While some of the recommendations can be implemented in the form of schemes by respective ministries / departments, many of the recommendations do not lend themselves to such an approach. These recommendations have to be handled through a broader program-based approach and a well-defined implementation system. Such an implementation system would entail a web of institutions, processes and other mechanisms, characterized by:

- Clear and tangible goals housed where they are most achievable
- Institutions and processes clearly aligned to support those goals
- Significant amounts of cross-links, creating thick information networks
- Incentives for each participant to monitor, evaluate and discipline performance, supported by clear, neutral benchmarks

As a first step, the existing recommendations of the plan have to be converted into ‘Projects’ through a process of grouping related recommendations together. Having converted the recommendations to projects, the next step will be to identify owners of these projects and the various stakeholders who have a stake / can influence the project outcome.

These projects are then managed through a program management structure, schematically explained in Figure 2.

Thus this implementation system has a number of functions that need to be performed. More than one function can be performed by the same agency:

- Steering (Sponsorship, Directing and Advising): As implementation of the Plan requires consensus from a very wide set of stakeholders, the function of providing directional leadership is best performed through a forum consisting of representatives from these stakeholder groups who can then provide input into the
direction of the implementation plan as well as ensure that major roadblocks to implementation are identified and removed. The steering function essentially ‘owns’ the 5 objectives of the Manufacturing Plan mentioned at the outset.

![Track 1: A program-based approach is recommended for implementation of Plan recommendations](image)

Figure 2 – Program-based approach

Its task is not just to ensure implementation of the strategies recommended in the plan but also to enable a process of modifying recommended strategies if they are not leading to the objectives.

- Program Management: For complex cross-cutting issues identified in the Plan (for instance, Business Regulatory Framework), there is usually no single agency or owner that can be identified for the entire issue. Therefore, a program management function must be created to integrate efforts across different projects in that area, continuously measure success and failure, and ensure good communication with those steering the overall implementation program. The group fulfilling the program management function should also facilitate the organizational learning and knowledge management processes.
• Stakeholder consultation facilitation: Solutions to many issues will require agreement amongst several concerned stakeholders. Consultation among stakeholders must be professionally conducted to obtain working agreements. A small central unit that has access to professional resources can provide facilitation assistance to policy makers at the centre and at the states.

• Governing: For each cross cutting area, it is important to ensure that there are a set of people who represent different agencies that need to work together to implement recommendations in those areas. They would perform a ‘steering function’ for their area.

• Project Execution: The projects identified will need to be executed through a set of ad hoc teams consisting of members from various departments of Government / industry associations / industry representatives as appropriate. The teams will be accountable for achieving their results. They will be overseen and supported by the governing and Steering functions as appropriate.

In addition to the functions described above – there is also a ‘Setting Up’ function which should bring this entire structure and process into being – this is a onetime activity. Some points to consider while setting up the structure described above are:

(a) The program management and stakeholder facilitation functions are critical for ensuring success of the entire structure. These functions need to be fulfilled by a set of individuals who, between them, can contribute in three ways:

i. Manage the process by which various projects are identified, implemented and tracked

ii. Work with the people fulfilling the steering function to ensure that the quality of the process is reviewed from time to time and appropriate improvements are made to the same based on learning from these reviews

iii. Facilitate the stakeholder dialogues professionally with the right techniques and skill, so that agreements are more likely to be arrived at.

(b) For sectoral areas, it is assumed that the Secretary for the line ministry will be best placed to play the governance function – and the administrative set up within the ministry can play the program management
role. However, even in sectoral areas, there is a need to categorize and group together recommendations into projects and ensure that explicit ownership is identified for each of these projects.

(c) The Secretaries of the sectoral ministries should be part of the Steering Function to ensure that they are able to provide linkages for the sector with cross-cutting issues.

(d) The roles of DIPP, NMCC, and Planning Commission in the performance of these functions should be clarified and they should be equipped to perform their respective roles.

7.4 Track 2: Make systemic reforms

In the course of developing the Plan for Manufacturing, through intensive discussions with stakeholders, ‘root causes’ for present problems in the country with implementation of such ambitious and complex programs were located. Ways to address some of these have been built into the Way Forward for the Manufacturing Plan. However, some root causes require broader institutional changes. Efforts are being made by Government to address these. Implementation of those changes by Government will accelerate the implementation of the many actions required to achieve the country’s ambitious goals for its manufacturing sector. These broader institutional changes, the benefits of which will be in all sectors of the economy, are described below.

7.4.1 Improve architecture of government programs and schemes

Schemes, especially those that aim to provide financial incentives to encourage specific behaviours from the private sector, are popular instruments of manufacturing policy in the country. However, significant reforms are required in the architecture of schemes to ensure that they effectively and efficiently help to fulfil policy goals:

i. Change the role of the central Government ministry from micro-manager to scheme designer and facilitator: The role of the central government ministry should not be to micro-manage the implementation of schemes. Therefore the central government ministry should focus on policy making and coordination instead of detailed project implementation. When necessary to initiate and establish a scheme, the ministry may be more hands-on initially but the objective must be to establish the capacity in the system to take over and implement the scheme. The ministry’s role should be to act as a knowledge partner and enabler to the project implementers (which will typically be in the states). In order to be able
to play this role effectively, the ministry will need to develop capabilities which are focused on scheme
design, and creation of learning systems and networks from which the states and other local implementers
can learn.

ii. **Establish strategic alignment of schemes:** Schemes need to be aligned with the strategies articulated by
the ministry. Schemes should have strategic outcomes defined (such as employment generation, number
of patents, output generation, etc.) so that measures of schemes’ performance are not limited to
expenditures against targets.

iii. **Invest in good scheme design:** A number of schemes fail because they have not been designed well. While
the Planning Commission includes schemes in principle during the five year plan process based on the
strategic logic supporting them, the actual monies should be released only when the scheme design meets
well-defined quality considerations. The ministry should be provided funds to design the scheme – which
might require hiring consultants/experts or reaching out to numerous stakeholders – after which they
should be provided funds for the schemes only if the design can demonstrate that the scheme will deliver
on the desired outcomes.

iv. **Establish an evaluation and feedback mechanism:** While it is the usual practice for schemes to be audited
for compliance, it is important to evaluate them against strategic outcomes as well. Schemes should be
measured on productivity of the money being spent – this allows various schemes to be compared with
each other. Also, the ministry should demonstrate how learning from implementing a scheme is being
used in improving it.

### 7.4.2 Reform Government institutions

The 2\textsuperscript{nd} Administrative Reforms Commission has made several important recommendations that will improve
the performance of Government generally and that will substantially improve Government effectiveness in
growing the country’s manufacturing sector. Since the recommendations are very well developed and
explained in the ARC’s reports, they will not be elaborated here, However, the following may be highlighted.

- In its Report No. 10, the ARC has recommended changes in the career structure of the administrative
  services that will ensure that senior postings have adequate tenure. It has also recommended an ‘up or
  out’ evaluation system so that only the better officers will stay in service and move to postings at the top.
  And it has provided for lateral entry from outside Government, of suitably qualified personnel for such top
  positions.
In its Report No. 13, the ARC has recommended that policy-making functions of Government and execution functions be separated and organized in appropriate structures. For ‘execution’ functions, the ‘agency’ structure has been strongly recommended. ‘Agency’ structures have enabled several countries – UK, Sweden, Japan, Australia and Thailand, to name a few – to substantially improve Government’s performance.

The concept of "agencification" is to carve out of government departments, “executive agencies” to carry out, under competitively selected professional managers on fixed tenures, specific executive functions within a framework of policy and resources. Each such agency is institutionalized in a framework document which spells out its mandate, mission and objectives, structure, accountability, standards and targets, financial arrangements, etc, and is mandated to release an annual performance report and accounts. The agency has the freedom to mould its management style, strategy, operations, systems, workforce, etc within broad government guidelines.

The advantage of the ‘agency’ structure is that it leads to clarity about outcomes. It also allows for an inculcated culture of service delivery, empowerment of frontline staff, greater accountability and openness, improved management, transparency, etc.

7.4.3 Ensure Accountability

It is widely accepted that government's accountability is a primary concern that needs to be addressed on an urgent basis in India. We need to move from goals of meeting expenditure targets in Government programs to goals of meeting physical targets, and, even more, towards increasing satisfaction of the range of stakeholders of government policy.

It may be useful to look at the difference between the accountability related to government and that related to private organizations. Private, profit-motivated organizations are generally more efficient in delivering results whereas they are often poor in management of equity. Private organizations have a narrower set of stakeholders to whom they are accountable, principally their shareholders and customers of their specific products or services. On the other hand, Governments are compelled to account to citizens at large and a much broader set of stakeholders. While private organizations are characterized by "intensive accountability", i.e. being answerable to a narrower set of masters in a far more focused way, governments require "extensive accountability".
Because governments’ accountability is broader, management of public programs require more attention to the definition and measurement of the accountability. In a recent reform initiative, the Performance Management Division in the Cabinet Secretariat has introduced the Results Framework Document, which provides a summary of the most important results that various departments and ministries expect to achieve in the year. The main purpose of this is to move the focus of the department from the current resource-allocation mode to result orientation, and to provide an objective and fair basis to evaluate the departments' or ministries' overall performance.

In the first round, the RFD targets had emphasised financial and physical targets. It was observed that ‘outcomes’ from the citizens’ and stakeholders’ perspectives were generally missing. Therefore in the later round, stakeholder consultation and feedback has been built into the RFD framework. By ensuring a broad range of well-managed consultations to determine goals, ‘extensive accountability’ can be brought about.

Some, and often the most important, outcomes that citizens and the economy need are not within the ambit of any single ministry. Collaboration is required among several departments and ministries. The roles of departments and ministries to achieve these outcomes requires a systemic analysis of the issues from which the actions required of the various departments/ministries can be determined and their goals developed. Overall this critical system’s input to the RFD process can be provided by the Planning Commission. The ‘Steering Function’ proposed for implementing the Manufacturing Plan can also provide this input with respect to responsibilities, and hence performance measures, of various ministries with respect to the Manufacturing Plan.

7.4.4 Effective Stakeholder Consultations

International experience shows that successful industrial strategies evolve from an on-going productive interaction between Government and producers. Therefore the Government must concentrate on improving the process of interaction, collaboration, and learning amongst producers and the Government. In a federal structure, such as India’s, State Governments have a strong role too. Considering the variety of issues that impinge on manufacturing growth, civil society organisations must be involved too. Therefore, to understand issues and to arrive at consensus, consultation is required amongst many stakeholders. For India, a large, diverse and democratic country, the effectiveness of its consensus building process is key to achieving national goals. Some ways in which consultations can be more effective are described below.
1) **Mandate Consultations:** The government has taken steps to increase public engagement by inviting stakeholders to consult on some of the proposed bills (such as the Electronics Service Delivery Bill, 2011, regional consultations over the direct tax code, etc.). However as the consultation process is not mandatory, not all bills have gone through this consultation process. In countries like Germany, South Africa and Canada, public participation is well defined and mandatory. We should also consider making the consultation process mandatory while formulating new legislation or modifying the existing legislation substantially.

2) **Improve the Consultation Process:** Consultations must be properly structured and managed well. Merely inviting people into a room for a meeting does not lead to a good consultation. Indeed, badly managed meetings can lead to further acrimony and even reluctance to participate in further meetings. Since consultations and consensus will be essential to move forward on many matters relating to growth of manufacturing, some principles for effective consultation are mentioned here.

3) **Provide resources to improve quality of consultations:** This could be in the form of an agency whose sole purpose is designing and facilitating consultation. For any issue on which consultation is required, the agency will help the Government to identify stakeholders, create the agenda and host the consultation events. The agency will have access to various tools required for consultation and can put together the process rather swiftly. In the absence of any immediate legislative issues, the agency can identify issues of national importance and can create a process of discussion on them. This agency should not be a large bureaucratic agency. It should be an agency with a lean structure, with access to the tools required for consultation and to a network of organisations that can be drawn upon to facilitate the consultation process on demand. This agency could be located in the Planning Commission.
### Guiding Principles for Effective Consultation Process

<table>
<thead>
<tr>
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<th>Objective of consultations</th>
<th>Who should be involved</th>
<th>Environment for effective consultation</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>To understand the views and bring about a common understanding between the various stakeholders.</td>
<td>Identification of key stakeholders is an important task; stakeholders are those, who:</td>
<td>An environment of trust, in which all the stakeholders can exchange their frank views;</td>
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<td></td>
<td>The objective should not be to sell the finalized set of recommendations or policy measures.</td>
<td>• get directly benefited / impacted from the process;</td>
<td>• The participants feel heard;</td>
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<td></td>
<td></td>
<td>• can derail the process;</td>
<td>• The facilitator should be credible, trustworthy and neutral person;</td>
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<td></td>
<td></td>
<td>• are key influencers to the beneficiaries.</td>
<td></td>
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<td>2</td>
<td>Coordinator of the consultation process</td>
<td>Creating knowledge base for consultation process</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>The coordinating agency need to have the following characteristics:</td>
<td>Case-studies – experiences from States and other countries;</td>
<td></td>
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<td></td>
<td>• Demonstrated commitment to the cause;</td>
<td>White Papers / Concept papers on the subject;</td>
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<td></td>
<td>• Understanding of the subject;</td>
<td>Soliciting views of experts, who may or may not be involved in the process directly;</td>
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<td></td>
<td>• Time and resources to commit to this resource / time intensive process.</td>
<td>Comprehensive analysis of likely solutions emerging during the process.</td>
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</table>

#### Figure 3 – Guiding Principles for an effective consultative process

4) **Role of industry associations**: Industry associations have a vital role to play in the evolution and implementation of the Manufacturing Plan at the centre and in the states. They provide platforms for their members to come together to analyze the constraints in the environment that must be addressed. Good quality associations, that are democratic in their governance, transparent in their functioning and represent their industrial sector, or perhaps all industry, satisfactorily (i.e. have large membership) can be invaluable partners of government in the development and implementation of plans for manufacturing growth. Associations can also arrange platforms for consultations with government and other stakeholders on the lines described above and thus can facilitate the achievement of the country’s goals for its manufacturing sector.

5) **Involve commercial banks in the analysis process**: Commercial banks, who provide finance to manufacturing enterprises, large as well as small ones, are a valuable (and neutral) source of insight into constraints of different sectors. They should be involved, more systematically, in the processes of evaluation of sectoral performance and for developing solutions, along with other stakeholders.

6) **Disseminate information to public effectively**: Government must become much more effective in communicating with the public. Citizens are not aware of many schemes set up by central and state governments for their benefit. Stakeholders, who will be affected by new government policies, realize only after the policies are announced, that they have great concerns whereas government departments claim that
the policies were posted on their websites and views had been invited. Moreover, with the ubiquity of
electronic communications, including 24x7 TV news, and the advent of social media, Government’s
communication processes must be modernized, become more pro-active, and reach out to citizens more
effectively.

7.5 Next Steps

The immediate next steps for implementing the Plan are:

• Take the Plan to the States: Much of the implementation of the Manufacturing Plan will be in the states.
  Therefore, state Governments, and stakeholders in the states must be engaged.

• Put the implementation system in place: The implementation system described in this section will need to
  be instituted through the collaboration of various national and state agencies as well industry
  associations. The DIPP, NMCC and the Planning Commission will need to collaborate to delineate their
  roles in the implementation process.

• Ensure sectoral schemes align with overall strategy: The financial outlay of the Plan should be aligned
  with the strategies identified in the Plan. Rather than following the process where budgets are
  determined as variances to previous year’s outlays, allocations should be designed and reviewed in
  accordance to the strategies identified.

• Communicate the Plan to a broader audience: Communication is critical to the successful implementation
  of any major change program. Communications must be designed to suit the audiences for which they are
  intended. Some can be delivered in the form of documents or presentations. Others should be delivered
  through interactive discussions where clarifications can be given and even suggestions obtained. Industry
  Associations can play a very important role in these. The Planning Commission, DIPP and NMCC would
  have to provide leadership and play a major role in the Communications outreach.