



Decide with Confidence

**Study on Innovative Interventions required in
Manufacturing Sectors to make them Globally
Competitive**

**Department of Scientific and Industrial Research
Ministry of Science and Technology
Government of India**

Presented by:

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Project Objective & Scope

- **Objectives**
 - To identify the critical manufacturing processes in the identified sectors
 - To identify the bottlenecks in the manufacturing processes of the identified sectors
 - Innovative interventions required to overcome the bottlenecks for attaining Global Competitiveness in the identified sectors

- **Scope of Work**
 - Identify parameters influencing the competitiveness of the identified sectors
 - Textiles and Garments
 - Leather and Footwear
 - IT Hardware and Electronics
 - Food Processing
 - Aerospace
 - Shipping
 - Capital Goods
 - Any other sectors where India has competitive advantage
 - Study the existing status of the identified manufacturing sectors w.r.t competitiveness
 - Benchmarking with international standards & norms
 - Identification of innovative interventions in the manufacturing sectors, e.g. interventions relating to technology, design, quality, automation, energy optimization, green production, etc.
 - Recommendations and framework for promotion of innovation in select manufacturing sectors for global competitiveness

- **Deliverables**
 - List of manufacturing processes requiring innovative interventions for the identified sectors
 - List of industries in the identified sectors requiring innovative interventions
 - Illustrative list of innovative projects
 - Models/frameworks for Global Competitiveness

Background Note

Competitiveness & Innovation are the corner stones of the study. Hence, defining their contours is extremely critical for the success of the study. This section explains the definition & interpretation of competitiveness and innovation considered for the study.

Definition & Interpretation of Competitiveness: D&B India has adopted the definition & interpretation of competitiveness given by “National Manufacturing Policy 2006” and “Report of the PM’s Group – Measures for Ensuring Sustained Growth of the Manufacturing Sector”

Manufacturing competitiveness broadly depends on two types of actions one which is external to the manufacturing concern and the other which is internal to the company. To improve competitiveness, actions would be needed on both fronts.

The important external policies that affect manufacturing are:-

- Cost competitiveness including tax policies
- Monetary policy
- Trade Policy
- Policy related to Raw materials & other inputs
- Infrastructure
- FDI policy
- Fiscal policy
- Labour policies
- Skill Development
- Research, Development and Technology policies

The following actions, among others, are to be taken at the firm level to improve competitiveness.

- Investing in Research, Development and Technology
- Skill development and knowledge enhancement
- Adopting global standards and bench marking their performance
- Adopting best manufacturing practices and production techniques
- Increasing scale of operations and delivering products of global quality

Basis the above two actions impacting competitiveness, D&B India has conducted benchmarking of both external and internal (factors) impacting global competitiveness of Indian manufacturing sectors.

Definition & Interpretation of Innovation:

“Decade of Innovation 2010-2020 - National Innovation Council”

“The aim is to re-define innovations to go beyond R&D laboratories and factories to offer novel solutions that lead to inclusive growth for the people and by the people; foster appropriate eco-system across domains and sectors to strengthen entrepreneurship; focus on key drivers to ensure scalability, sustainability, durability and quality and expand the space for dialogue and discourse on innovation.”

“Industry Innovation Clusters - National Innovation Council”

“Innovation is not limited to products or processes, but is horizontal covering all aspects including fund-raising, business models, collaborations and others, helping businesses take the next leap towards growth.”

Competitiveness Framework – Setting the Context

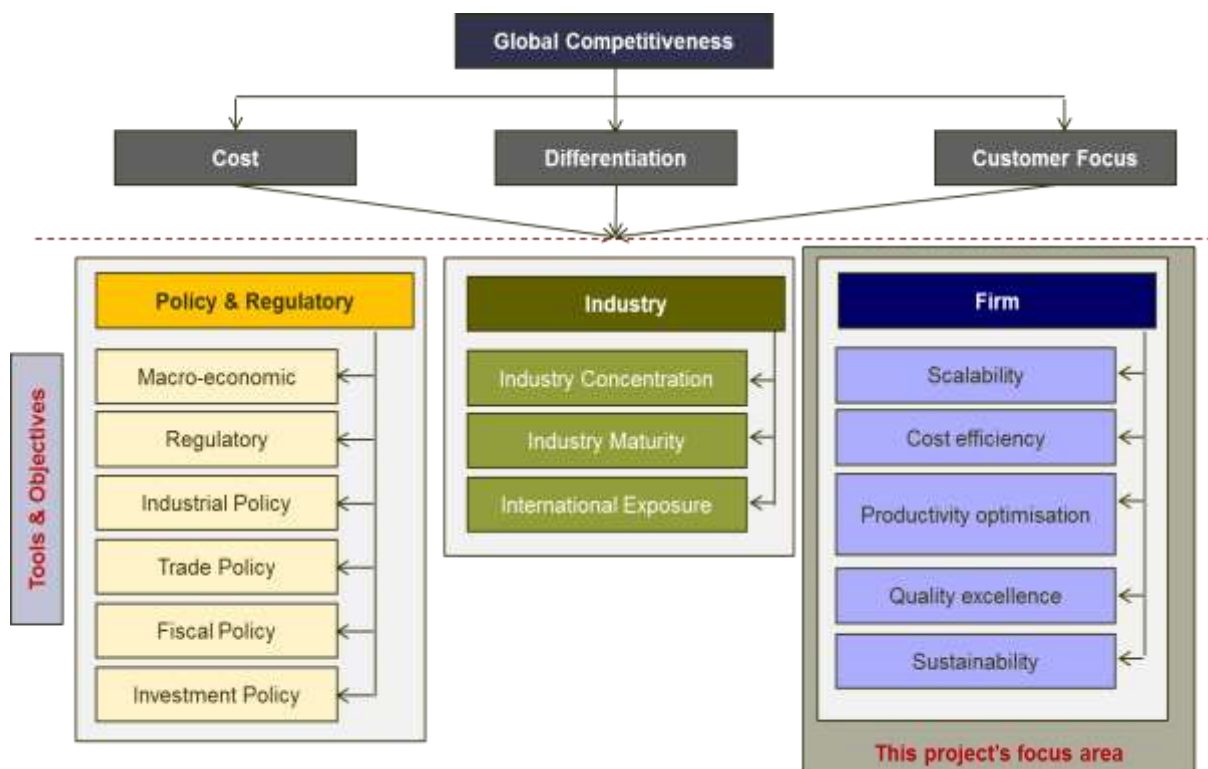
Project Objective: Study on **Innovative Interventions** required in **Manufacturing Sectors** to make them **Globally Competitive**

Project Framework – Global Competitiveness

The International Institute for Management Development defines global competitiveness as “a field of economic knowledge which analyses the facts and policies that shaped the ability of a nation to create and maintain an environment that sustains more value creation for its enterprises and more prosperity for its people.”

World Economic Forum defines Global Competitiveness as “the ability of a country to achieve sustained high rates of growth in gross domestic product (GDP) per capita.”

The imperatives for global competitiveness involve addressing the following issues: macroeconomic policies; government practices and regulations; the cost of doing business; education and skills upgrading; R&D and innovation; sustainable environmental management; conformity with international standards; and total factor productivity (TFP).

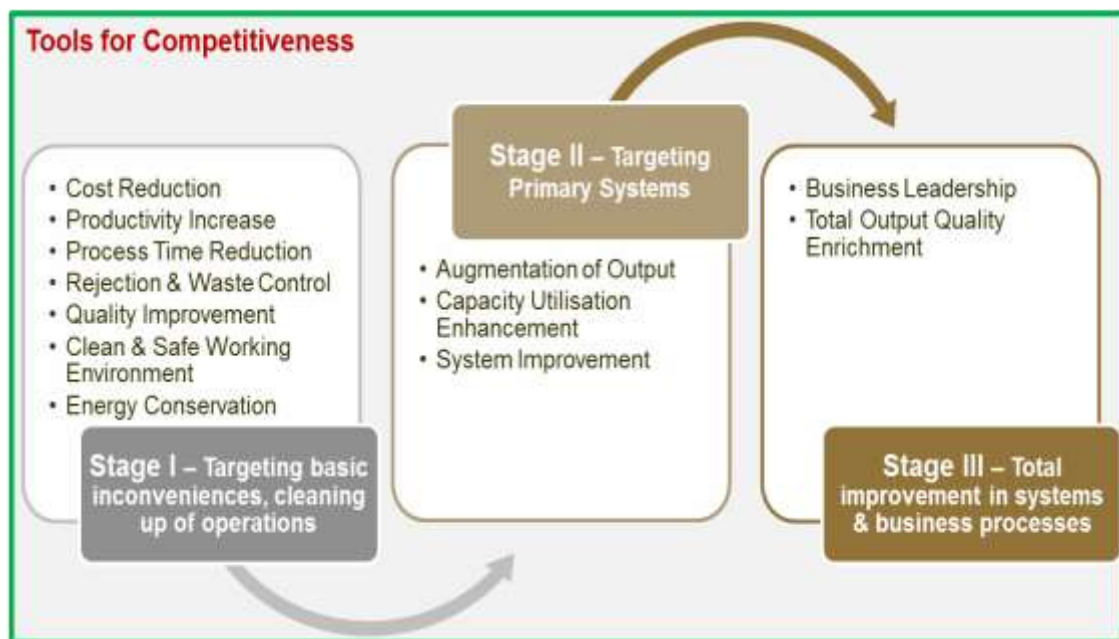


Global Competitiveness can be achieved through Cost, Differentiation (can be in terms of product, cost and pricing) and Customer Focus or a combination of any of these factors.

Broad parameters which will help achieve these include Policy and Regulatory Framework, Industry Competitiveness and Firm Competitiveness. Firm Level competitiveness has been the focus area of the project which has been detailed in the next section.

Competitiveness – Firm Level Tools

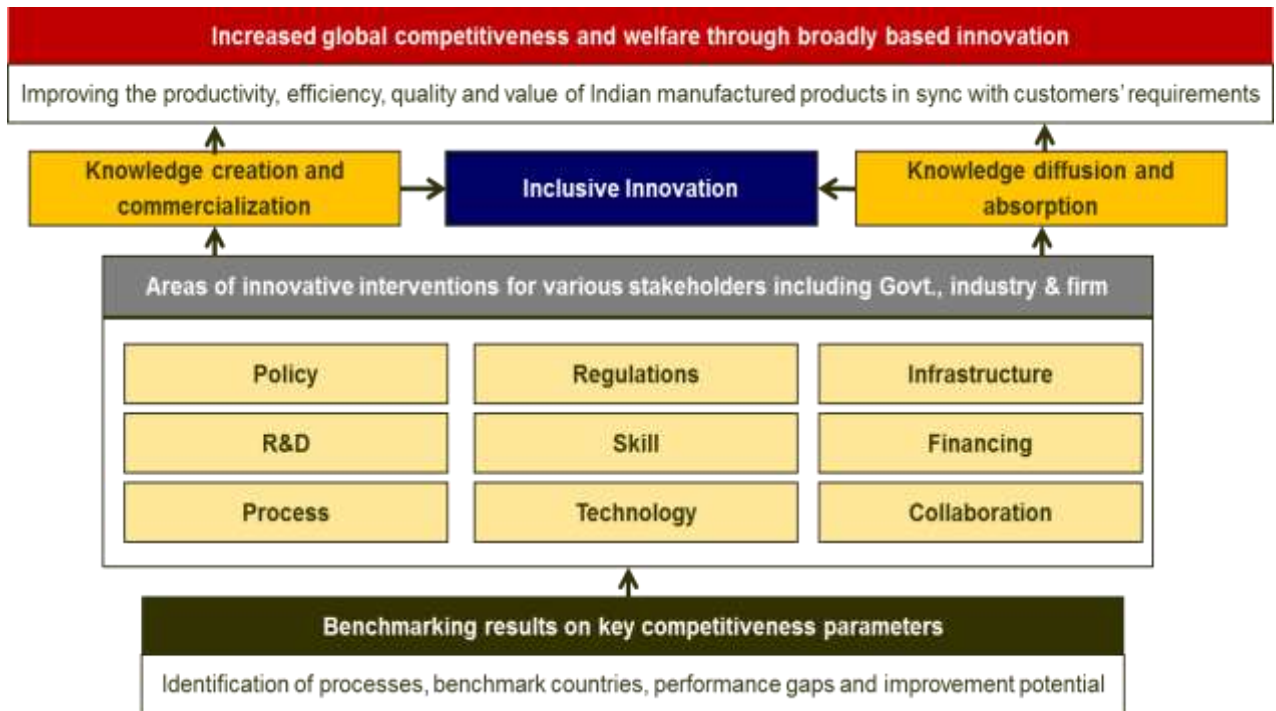
At the firm level, competitiveness is the ability to provide products and services more effectively and efficiently than relevant competitors. This includes sustained success in international markets without protection or subsidies. Measures of competitiveness at the firm level include firm profitability and measures of cost and quality, the exports or foreign sales divided by output, and regional or global market share. Performance in the international marketplace provides a direct measure of the firm's competitiveness.



Source: **COMpro** (Competence Protocol), a competitiveness tool developed for manufacturing sector by Prof. P. Thareja, one of the experts empanelled by D&B for this project.

Professor Thareja is Head, Department of Materials & Met Engg, PEC University of Technology; an approved consultant of National Productivity Council; Chairman, Advisory Council, Moody International certification; author of many publications on technology excellence, quality management, manufacturing competitiveness etc.

Framework – Innovative Intervention



Note: Adapted from World Bank Report "Unleashing India's innovation towards sustainable & inclusive growth" and modified to suit current project requirements

Project Approach

Step 1 included selection of focus sectors from manufacturing sectors. Focus sectors were identified from the Report of the PM's Group on Ensuring Sustained Growth of the Indian Manufacturing Sector - September 2008, compiled by NMCC.

NMCC Committee finalized the sectors based on their strategic importance and their contribution towards employment - Manufacturing sectors identified as strategic for strengthening the national capabilities from the long-term point of view included Aerospace, Shipping, Capital Goods and IT Hardware & Electronics. Employment intensive sector identified and that needs additional focus and attention included Textile & Garments, Leather & Footwear and Food Processing Industries.

One additional sector Pharmaceuticals was also selected based on an evaluation process. Three parameters were taken into consideration for finalizing the sector: contribution of sector in world exports, rank of the sector in regards to exports CAGR for 5 years and based on these two parameters final ranks were provided to the sector. For calculating the final rankings, weightage of 65% was given to exports CAGR and rest 35% was given to World contribution.

Step 2 included selection of segments and processes from the selected sectors. Segments were selected from the respective sectors based on three parameters: CAGR of exports, exports as percentage of world segment exports and exports as percentage of India's sector exports. Various industry experts/associations were also contacted and their valuable inputs were taken into consideration.

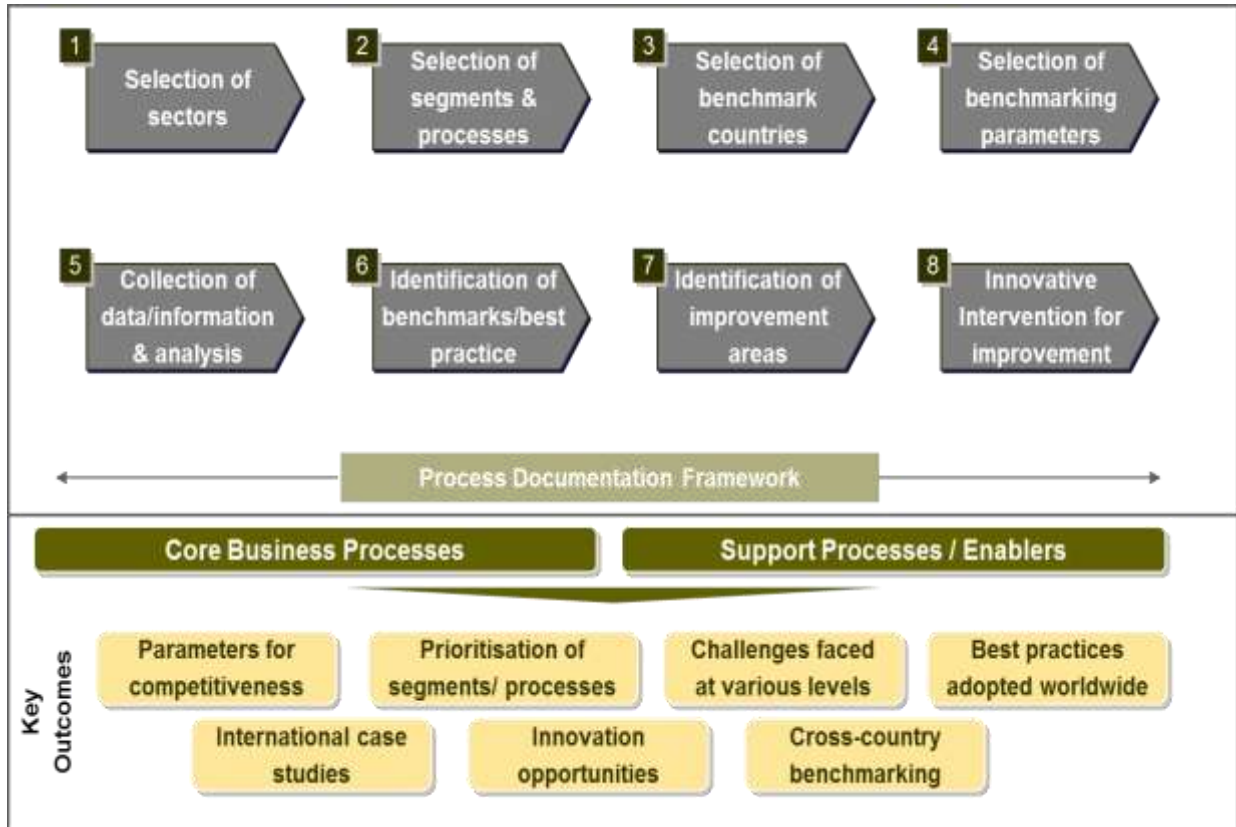
After selecting the segments from the sectors, processes were identified within identified segments where India needs to improve to enhance its overall competitiveness in the sector. Entire value chain of the selected segments were mapped and qualitative inputs of various industry stakeholders like associations, players, experts were taken into consideration for selecting the processes within the segments.

Selection of Segments and Processes included primary interviews with industry experts and associations, referring to various primary databases like ITC, UNIDO, World Bank and other information available on the public domain.

Step 3 included selection of benchmarking countries. Countries were selected based on various parameters including country's share in the global exports for the selected segment, export CAGR from 2005-2010 and country's segment exports as percentage of total sector exports. Ranks were provided to countries based on weightage of parameters. 50% weightage was given to global exports contribution and remaining 50% was divided among remaining parameters.

Step 4 included selection of benchmarking parameters which included Policy & Regulatory Parameters, Industry Parameters.

Next steps include collection of data/information and analysis of benchmarking, identification of benchmarks and best practices, identification of improvement areas and suggestive innovative interventions for improvement.



Project Methodology

Both primary and secondary sources of information were perused to develop an in-depth knowledge of the sectors.

Primary sources include industry experts/associations (domestic as well as international)/domestic & international players who were contacted and their valuable inputs were taken into consideration.

Various secondary sources were also referred, including Sectoral Industry Reports, World Bank Data, data from World Trade Organization and the United Nations etc.



Refer to appendix for list of organizations contacted for the survey, detailed questionnaires, and bibliography containing references of all secondar data used

Selection of Sectors

Focus sectors were identified from the Report of the PM's Group on Ensuring Growth of the Manufacturing Sector – September 2008, compiled by NMCC.

Strategic Sectors: Manufacturing is not only the backbone of the economy but is also the muscle behind National Security. Therefore, a robust manufacturing sector is sine qua non for any major industry. Keeping this in view, five manufacturing sectors have been identified as strategic for strengthening the national capabilities from the long-term point of view.

Sectors Specified by PM Group	Employment Intensive Sectors	Strategic Sectors																				
	<table border="1"> <thead> <tr> <th>Sl.No.</th> <th>Sector</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Food Processing</td> </tr> <tr> <td>2</td> <td>Textiles & Apparel</td> </tr> <tr> <td>3</td> <td>IT Hardware & Electronics</td> </tr> <tr> <td>4</td> <td>Leather & Footwear</td> </tr> </tbody> </table>	Sl.No.	Sector	1	Food Processing	2	Textiles & Apparel	3	IT Hardware & Electronics	4	Leather & Footwear	<table border="1"> <thead> <tr> <th>Sl.No.</th> <th>Sector</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>IT Hardware & Electronics</td> </tr> <tr> <td>2</td> <td>Aerospace</td> </tr> <tr> <td>3</td> <td>Shipping</td> </tr> <tr> <td>4</td> <td>Capital Goods</td> </tr> </tbody> </table>	Sl.No.	Sector	1	IT Hardware & Electronics	2	Aerospace	3	Shipping	4	Capital Goods
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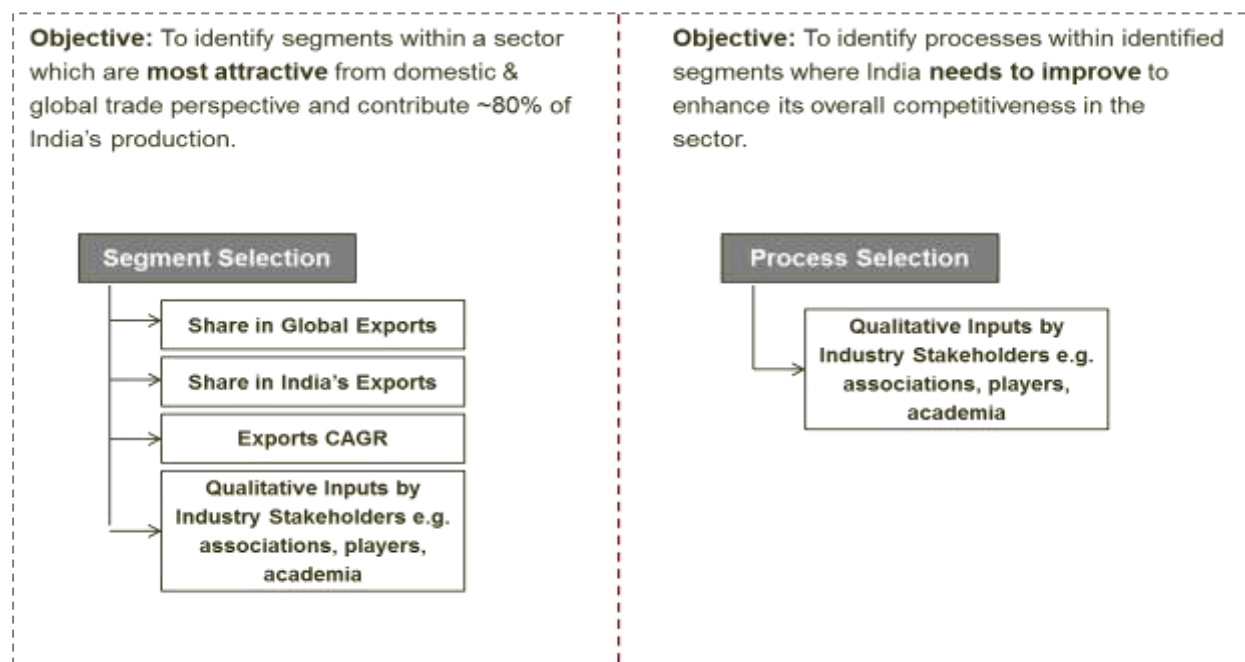
Additional Sector	Pharmaceuticals					
	Sector Rank by World Exports Contribution		Sector Rank by Exports CAGR for 5 years		Final Sector Rankings *	
	Rank	Sector	Rank	Sector	Rank	Sector
	1	Iron & Steel	1	Automotive	1	Pharmaceuticals
	2	Pharmaceuticals	2	Pharmaceuticals	2	Automotive
3	Automotive	3	Iron & Steel	3	Iron & Steel	
<small>* For calculating the final rankings, weightage of 65% is given to Exports CAGR and 35% is given to World contribution</small>						

Selection of Segments & Processes

Segments were selected from the respective sectors based on three parameters: share in global exports, share in India's exports and exports CAGR. Various industry experts/associations were also contacted and their valuable inputs were taken into consideration.

From the selected segments processes were identified where India needs to improve to increase its overall competitiveness. Qualitative inputs of various industry stakeholders like associations, players, experts were taken into consideration for selecting the processes within the segments.

Selection of Segments and Processes included primary interviews with industry experts and associations, referring to various primary databases like ITC, UNIDO, World Bank and other information available on the public domain.



Selection of Benchmarking Countries

Objective: To identify best performing countries in the selected segments within the identified sectors which can be taken as benchmark for understanding the possible reasons of their success (policy & regulatory advantage and productivity & efficiency advantage).

Countries were selected based on various parameters including country's share in the global exports for the selected segment, export CAGR from 2005-2010 and country's segment exports as percentage of total sector exports.



Summary of Selected Sectors, Industries/Segments, Processes & Benchmark Countries

S.No	Sector	Industry/ Segment	Sub-Segment/ Process	Countries
1	Textiles & Garments	Cotton	Weaving, Processing/Knitting+Processing	China Vietnam
		Man Made Fibres	Blending+Processing, Weaving	Japan Taiwan
		Electrical Equipment	Raw Material Production, Components Manufacturing	China Germany
2	Capital Goods	Process Plant Equipment	Raw Material Production, Components Manufacturing	China Italy
3	Food Processing	Fruits & Vegetables	Secondary Processing	Brazil China
		Meat & Poultry	Primary Processing, Secondary Processing	US Brazil
		Fish & Seafood	Primary Processing, Secondary Processing	China Thailand
4	IT Hardware & Electronics	Electronic Components	Passive Components, Electro Mechanical Components	Singapore Taiwan
		Communication & Broadcast Equipment	Design, Component Manufacturing	China Mexico
5	Leather & Footwear	Leather Footwear	Tanning & Finishing, Finished Products	China Vietnam
		Leather Apparel	Tanning & Finishing, Finished Products	Pakistan Italy
		Leather Goods	Tanning & Finishing, Finished Products	China France
6	Pharmaceuticals	Bulk Drugs	NA	USA China
7	Shipping	Shipbuilding	NA	Japan Korea
8	Aerospace	NA	Engineering Design	US
			Component Manufacturing - Tier III	China