

Shipbuilding - Executive Summary

The Shipbuilding industry is critical to India's strategic and economic interests and is characterized by high growth potential. Shipbuilding has spin offs to other industries, including steel, engineering equipment, port infrastructure, trade and shipping services. The indirect potential of shipbuilding industry in employment generation and contribution to GDP is therefore tremendous. India has about 8,000 kilometres long coastline, around 32 shipyards, 12 major ports and 200 ports under states' jurisdiction¹. This presents huge scope for development of shipbuilding sector considering that country's opportunities in the sector have not been utilized fully. The annual turnover of the industry during 2010-11 was US\$ 1.3 billion and has grown at a CAGR of 8% during the period 2007-11². The Indian shipbuilders occupied 6th rank globally accounting for 1% of the global order book aggregating compensated gross tonnage (CGT) of 2.4 million with 257 vessels on order in year ending 2010.

Globally, the top three countries in international shipbuilding – South Korea, China & Japan – had a near hegemonic hold in the industry with a combined new building order of more than 90%. China was the runaway leader with 40% of the tonnage compared to South Korea's 34%³. These three countries contributed to around 65% of global shipbuilding exports of US\$ 174 billion in 2010⁴. Korea led the pack with contribution of 27% to global shipbuilding exports, closely followed by China with global exports contribution of 23%. Japan stood third with contribution of 15% to global shipbuilding exports. India, in spite of being number six in world exports and global order book for shipbuilding, accounts for a share of close to 2.5% to world exports with figures of US\$ 4.22 billion in 2010. The gap between India and other top performing countries is substantially high.

South Korea has been a global leader in shipbuilding since 2003, when it outpaced Japan and European countries who dominated the industry for centuries. Today, it is home to seven of the world's ten largest shipbuilding companies. The shipbuilding industry remains as major contribution to the Korean export sector. The growth of Korean shipbuilding can be attributed to the government strategies that included capital funding, supportive policies and facilitation of joint ventures with international companies to access latest technologies. Additionally, the Korean government has taken active measures such as cutting corporate taxes and reducing the trademark evaluation period, to stimulate FDI through deregulation and by enhancing vehicles for investment promotion. Furthermore, the government has made considerable efforts to solicit foreign investors' opinions and incorporate their suggestions into its policies. The Invest Korea Plaza and the G4F website (www.g4f.go.kr) which were set up in 2006 are good examples of the government's efforts to provide one-stop administrative services to foreign investors.

Japan has held a leading position in the global shipbuilding industry since 1970s and has thus played a major role in shaping the worldwide development of the industry. Japanese shipbuilding industry's core products include oil tankers, bulk carriers and container ships; which comprise majority of world's fleet today. Japan began deregulation of industry in 1950s by adopting private administration and a liberal monetary policy. The interest rates were deliberately kept very low & stable and banks were lenient in the disbursements of loan; generally providing 'overloan' and allowing deferment of loan. These measures helped in meeting the businesses' need for capital investment, especially the heavy industrial sectors like shipbuilding that have huge capital needs. Other forms of special

¹ Position Paper on ports sector in India

² Assocham Report on Shipbuilding sector

³ IHS "World Shipbuilding Statistics"

⁴ ITC, D&B Analysis

supports for the shipbuilding industry included various tax benefits, and financing through the Ex-IM Bank and the JDB. Thus, 1950s & 60s witnessed a rapid growth in Japanese commercial shipbuilding industry. These government subsidies were continued for most of the 1960s, and by 1970 shipbuilding in Japan became highly competitive in world markets.

Over the last decade, the Chinese government has also taken several measures to foster the growth of its industry; measures include direct aid, loss reimbursements, tax subsidies, etc. At the same time, Chinese shipbuilders entered into a number of technical cooperation agreements and joint ventures with shipbuilding firms in Japan, South Korea etc. which gave them access to advance ship designs and manufacturing technologies that has resulted in increased competitiveness of China's shipbuilding industry.

The shipbuilding industry in India has not succeeded in building competitiveness primarily due to inadequate policy support, lack of private participation and firm level inefficiencies. A comparative assessment of Indian shipbuilding industry vis-à-vis that of competing countries points out to the following key points:

1. **Supportive government policies: Major factor in establishing global competitiveness:**

The governments in all major shipbuilding countries have laid a thrust on development of the sector through formulation of supportive policies and measures such as subsidies, financial aid, easy finance, tax benefits, preferential orders, etc. Japanese and South Korean shipbuilding industries received substantial government support during the 1970s and 80s, which helped them to emerge as top players in the world. While Korean government provided a major thrust to the industry under the HCI policy that included capital incentives, trade incentives and tax holidays, the Japanese government provided huge subsidies in the form of easy finance and loan deferments. Another example of government's commitment and support towards the sector is that of Japanese government's export promotion policies during the 1970s and 1980s, like the link system, wherein the losses caused by unprofitable orders were made up by profits from the import of raw sugar. Over the last decade, the Chinese government has also taken several measures to foster the growth of its industry; measures include direct aid, loss reimbursements, tax subsidies, etc. Indian government too has provided various support measures to the shipbuilding industry, but these have been largely directed towards the public sector.

2. **Foreign investments have helped in building global competitiveness of competing nations**

The South Korean government has taken active measures to stimulate FDI in the sector such as cutting corporate taxes, providing tax incentive packages and reducing the trademark evaluation period. The Korean government has also established eight different Foreign-Exclusive Industrial Complexes (FEICs) inside national industrial complexes across the country (viz. Hyungok, Geumyui, Cheonan, Ochang, Pyungdong, Daebul, Jinsa and Kumi) to provide foreign investors with low-cost plant sites at discounted rates with government subsidies. The foreign invested company can enjoy a 50 year rent free lease in these complexes based on the level of investments. Further, the development of Free Economic Zones that host world class infrastructure including airport and 3 seaports have also attracted foreign investment in the country. The foreign investment in ship building and shipping machinery sector has helped the Korean ship building industry in receiving world class technology, which puts it at almost par with the Japanese counterparts and way ahead of China and others. Singapore government also provides incentives schemes such as Approved International Shipping Enterprise (AIS) scheme to attract shipping companies to reside in Singapore. There are currently more than 100 international shipping companies in Singapore, forming an important anchor for the International Maritime Centre. In India though, present requirement to obtain multiple clearances

covering land acquisition, environmental clearance, power and water etc., from various departments for new projects in shipbuilding acts as a deterrent to attracting investment into this sector.

3. Focus on skill development and R&D is a key factor for maintaining competitiveness

The major shipbuilding countries viz. Japan and South Korea have taken special efforts towards skill development and R&D of the shipbuilding industry. Japan established Shipbuilding Skill Development Centre in 2004, to develop training material and prepare necessary equipment to support training efforts. With respect to R&D and innovation, Japan's key measures include creating replacement demand by developing environmentally friendly and safer ships. During the 1980s, the South Korean government promoted University-Industry R&D activities which resulted in several collaborative initiatives. Recently, the Ministry of Knowledge Economy of South Korea has initiated convergence of shipbuilding and IT sectors to support the Smart Ships agenda. However, in India there is limited investment in R&D in ship designing and innovation. For overall growth of the industry, there is a need to create an R&D base along with developing in-house design capability, infusing new technology, developing skilled workforce, adopting appropriate fiscal measures and industry-friendly regulations, so that Indian shipbuilding can achieve credibility for delivering quality ships on time.

4. Support to ancillary industries enhances competitiveness

Development of ancillary industries is critical for increasing cost competitiveness of shipbuilding and repairs. Both Japan and South Korea have formulated suitable industrial policy for the shipbuilding and ship repair ancillary industry. The South Korean government provides support to the ancillary industry by way of incentives, R&D support, and business to business network to increase the indigenous contents of equipment in ships built by Korean yards.

5. Costs and availability of critical input material- raw material, manpower and technology

India has the lowest labor costs amongst the competing countries like China, Japan & Korea. The labour cost per worker in India is estimated at \$1,192 per year, against \$10,743 and \$21,317 per worker in leading shipbuilding countries like South Korea and Singapore⁵. However, this advantage is not translated into cost effectiveness because of factors like: reliance on imports of critical raw-materials and higher financing costs etc. From raw material perspective, India relies on imports for most of the inputs consumed in shipbuilding which puts cost pressures on Indian shipbuilding firms. On the other hand, China is one the cheapest steel manufacturer in the world which helps its yards to reduce costs and lower their shipbuilding prices in the global market. Further, India has a disadvantage with respect to financing costs. In China, the government provides sovereign refund guarantees for certain class of vessels, thus removing any related burden on the shipyard. In Korea, shipyard financing has matured and the evolved mechanisms drive the cost lower.

6. Lower interest rates

A shipyard typically requires a working capital of around 25-35% of the cost of the ship during the entire construction period. The interest rates on working capital in India are in the average range of 10-10.5%. In contrast, the interest rates presently offered to shipbuilding yards overseas are significantly lower. They stand at 5-6% in Korea and around 4-8% in China.

7. Labor Productivity

⁵Bharati Shipyard Annual Report 2006-07

Labor productivity for India’s shipbuilding sector is less than one-tenth of Japan & Korea. India had labor productivity of 11,134 US\$/Employee in 2007⁶ , while Japan and Korea had labor productivity of 151,487 US\$/Employee and 122,994 US\$/Employee respectively .This gap in labor productivity has been due to several reasons like acute shortage of basic skills required for the industry in India, small scale of operations etc. Workers working as welders, fitters, etc. are uneducated, in many cases even illiterate. The technology used at the shipyard has to be friendly for them to use. There is lack of manpower with techno-economic specialization in shipbuilding. Further, manufacturers in India also suffer from the disadvantages accruing from small scale of operations. The shipbuilding sector in China and South Korea has received government fiscal and policy support, enabling them to develop scale as well as a cluster of ancillaries. These advantages of scale are not available to Indian shipbuilding industry, and hence dent the overall labor productivity.

8. Technological processes and innovation

India is lagging behind competitors in all the aspects of technology and innovation. India has disadvantage in terms of poor infrastructure, innovation and less investments in Research & Development as compared to Korea, Japan and China. It may be noted that leading East Asian shipyards in Japan and Korea who had invested heavily in skilled manpower such as naval architects & engineers and innovations are reaping the benefits now. In India though, there are less than a dozen firms that have basic design expertise. Some of these are standalone design units that do not have manufacturing facilities but team up with shipyards to form consortiums that leverage each other’s competencies. Indian players need to work hard to meet the international players in ship automation and technology. Indian yards lack the capability to build large and modern ships. Presently, the Cochin shipyard is the only one that has the capability to build large and modern ships.

Based on analysis of the current status and international norms & standards, the gaps & issues in the Indian shipbuilding industry can be summarised as following:

S.No.	Areas	Gaps & Issues
1	Scalability	High dependence of ship owners in old ships due to constraints of investment capacity to buy new ship.
		Present requirement to obtain multiple clearances covering land acquisition, environmental clearance, power and water etc., from various departments for new projects in shipbuilding acts as a deterrent to attracting investment into this sector.
2	Cost Efficiency	High interest rates on working capital in India as compared to competing countries (Difference as high as 5-6% as compared to competing countries)
		Customs duty of the order of about 35% is imposed on all capital equipment required for shipbuilding
3	Productivity Optimization	Limited investment in R&D in ship designing and innovation.
		Non-availability of organized component and service supply manufacturers.
		Dependence on imports for critical raw-materials like high quality steel plates and other structural items.
4	Quality Excellence	Lack of basic skills like welding and fitting.
		Inadequate skills & infrastructure availability for conducting research in the areas of ship designing, ship building technology & equipment design etc.
		Inability of smaller suppliers to keep abreast with the rising quality

⁶ UNIDO’s Country’s Statistics Briefs

		issues
5	Sustainability	Absence of a strong ancillary industry
		Inverted duty structure. All ships including dredgers imported by Indian owners from abroad are fully exempted from customs duty. However, customs duty of the order of about 35% is imposed on all capital equipment required for shipbuilding
		Lack of synergy between public and private yards

The analysis of various facets of the global and the Indian shipbuilding industry clearly shows that India needs to look at multiple interventions including in the areas of Regulatory framework, Investment policies, Trade policies, Fiscal policies, Infrastructure, R&D, Skill, Financing, Process, Collaboration and Technology. These interventions have been detailed in the main report.

However, recommendations only related to technology and research & development have been detailed which could form part of several schemes undertaken by Department of Science & Industrial Research in this section.

Intervention 1 : Focused scheme to improve raw-material competitiveness	
S.No.	Tasks
1	<p>Focused scheme to induce indigenous production of critical components & equipment for ship-building industry like high quality steel plates, gearboxes, shafting, propellers, generators, switchboards, valves, pumps etc. Cluster based development approach needs to be followed for the same. Some of the steps that may be adopted are:</p> <ul style="list-style-type: none"> • Compile a list of critical raw-materials which have enough demand in India but very limited domestic production to match the demand. • Identify international companies present in the above product categories and encourage these companies to collaborate with Indian counterparts to create manufacturing facilities in India. • Create a centralized fund which could be utilized for acquisition of international companies/assets operating in various raw-material categories. For the same designate an implementing agency to invite shortlist and grant the funding to the SMEs.
Intervention 2 : Foster R&D and encourage more participation from private players	
S.No.	Tasks
2	<p>Creation of innovation centres for conducting collaborative research on pay-per-use model. This may be done on PPP model with investments shared between government and private players. Some of the facilities that should be created are:</p> <ul style="list-style-type: none"> • CAD/CAM packages such as Tribon, Foran, and Autoship etc. • Drafting • Design development • Dimensional management • Incubation centres for providing supportive framework for the researcher that enables him to turn a technological idea that has an economical-marketing potential into a product of interest for investors
Intervention 3 : Provide database & technology support to domestic firms	
S.No.	Tasks

3	<p>Provide database & technology support to domestic firms in the following areas:</p> <ul style="list-style-type: none"> • Quality standards followed globally for various components & products in India. • Technology- and innovation-related international journals from major publishers. • Country wise/OEM wise SOPs for testing the products. This will include testing labs availability and tests conducted by them, fees for conducting the tests etc. • Database of industry experts (either retired or from the industry) who can be contacted by SME's for any kind of technical support required. For the same, profiles of the experts need to be invited and kept in a repository. On receipt of any request from the industry, communication can be sent to the relevant experts and the interested one's can then be suggested to the requestor.
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The interventions mentioned above are further prioritized on the basis of their role in fulfilling various objectives* of the Government of India for the growth of the manufacturing sector. Each intervention is tagged with the objective that it may help achieve. The intervention impacting maximum number of objectives has been prioritized for implementation.

*These objectives have been picked up from "PM's Group Report on Measures for Ensuring Sustained Growth of The Manufacturing Sector", "National Manufacturing Policy 2006" and "National Manufacturing Policy 2011".

Intervention	Government Objectives				
	Employment	Building Strong Capacity & Scale	Local Value Addition	Technology Adoption	Skill Development
Focused scheme to improve raw-material competitiveness	✓	✓	✓	✓	✓
Foster R&D and encourage more participation from private players			✓	✓	✓
Database & technology support to domestic firms			✓	✓	✓

Shipbuilding: Innovation Framework

