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INDIA'S TRANSPORT INFRASTRUCTURE: BOTTLENECKS IN THE PORT INTERFACE AND POSSIBLE REMEDIES

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ABSTRACT

The present-day manufacturing boom in India has been a major factor for the demand surge on transportation facilities and a cause for the congestion that is prevailing. Presently, the Indian economy is showing an over 8% annual GDP (gross domestic product) growth. The projections show somewhat similar growth rates for India for a considerable period of time and the level of production is expected to escalate rapidly. But, India's transport and intermodal infrastructure is not ready/developed to keep pace with the requirements of the international trade, although the country is conceived to be an emerging world economy.

The inward and outward cargo projections for its container port sector alone show a four-fold increase to 20 million twenty equivalent units (TEU) by 2014. The Indian authorities with the involvement of the local and international private sector are planning and implementing projects for new container terminals and intermodal facilities/infrastructure to be in place in time for the increase. The aim of this paper is to explore the issues in the Indian port interface and suggest possible areas of focus for improvement. The research was exploratory in nature and used qualitative techniques. The methodology comprised of secondary data analysis from literature sources and semi-structured interviews conducted with managers from business entities involved in the Port interface in India. The data collection was done in line with methods suggested by Miles and Huberman (1994). The data was analysed using grounded theory methods to explore the issues further. This paper presents an initial research model derived from the data analysis. This will be explored further in the next stage of the research.

INTRODUCTION

India has been experiencing a manufacturing boom on account of low labour rates in recent years and is recognised as one of the strong sourcing centres for the developed world. As an emerging economy with a population of over one billion people, India is faced with many challenges in facilitating the logistical needs of its international trade. Hence, it is very important that India develops a modern infrastructure and the associated processes that go with it, in order to meet the requirements of growing international trading opportunities.

But, India's infrastructure, especially the port facilities, is still not completely in a position to provide the required level of service. There are a number of reasons and the following quotations highlight some of the acute difficulties the country's container ports are faced with.

'A cargo that takes six days to travel from Singapore to Mumbai could sit in the port for 30 days before it is unloaded. The reason is that there is insufficient

capacity to service today's large cargo ships at Indian ports.' (**Kundu – Asia Times, Feb 2005**)

'Congestion at ports, inland and roads have rapidly increased- thus directly augmenting logistics costs. ...average train speed is 23.3kmph in India. This is 100kmph in Europe.' (**Vaidyanathan, 2007**)

'Indian Ports are congested and inefficient. Port traffic has more than doubled during the 1990s, touching 521 million tons in 2004-05. This is expected to grow further to about 900 million tons by 2011-12. India's ports need to significantly ramp up their capacity and efficiency to meet this surging demand.' (**World Bank website, accessed on 24 November 2007**)

'India's port sector has reached a stage where the available capacity is facing saturation on account of growing traffic. This has resulted in congestion and delays. Owing to inefficiency and growing congestion, the average pre-berthing detention and the average turnaround time are high by international standards. The building of additional capacity is, therefore, critical for rapid improvement in the sector.' (**Planning Commission, Government of India, July 2007 p6**)

This highlights to some extent, the issues faced by India's ports and the necessity to carry out appropriate action to reduce the impact.

ISSUES AFFECTING CONTAINER PORTS

Container ports/terminals are one of the main interfaces in the maritime logistics chain. Notteboom and Winkelmans (2001, p.87) suggest that, *'...a successful port, like a successful actor, must constantly be prepared to adopt new roles in order to cope with the changing market environment'*. Ports are an integral third party in the supply chain between producers and consumers that add an interface in the value-driven chain with an increasing complexity (Robinson 2002). Carbone and De Martino (2003) recognise the fact that good supply chains contribute towards increasing the efficiency of ports. At present, however, most ports suffer congestion and this situation is on the rise, the container terminal utilisation level which is 79.3% (on average) in 2006 will go up to 94.8% in 2011 (Verschelden, 2007).

Notteboom and Rodrigue (2005) have suggested a 'Port regionalisation' model as a new port logistical concept to tackle issues related to challenges faced by ports. Various researchers have studied issues relating to port performance and efficiency. De Monie (1987) has discussed the importance of developing ways and means of measuring, and evaluating port performance, Briano, et al. (2005) discuss different simulation and mathematical modelling methods available to the maritime logistics operations as a proven technique to increase the efficiency, whereas, Cullinane (2002) cites the Data Envelopment Analysis (DEA) model as a non-parametric method that can be used in measuring the efficiency of ports and terminals. Bassan (2007) identifies the importance of both analytical methods and simulation to reach optimal levels of port/terminal efficiency with minimal investments in port operations, whereas Choi et al. (2003) suggest the use of Enterprise Resource Planning (ERP) in container terminals. Dragovic, et al. (2006) have analysed and modelled the "ship-berth" link in a terminal's overall efficiency and productivity. Bichou and Gray (2004) further discuss the lack of developed performance measuring mechanisms in ports as logistics centres. Tongzon (1995) suggests that finding suitable benchmarks to assess port efficiency is a difficult task. It is also suggested that port comparisons are only

valid if compared like with like. Bichou and Gray (2004) have also discussed the lower level of knowledge and awareness of port managers about logistics and supply chain management concepts as an important issue.

INDIA CENTRIC ISSUES

India's container port/terminal transformation began in the mid-1990s. Venkiteswaran (1995) discusses the limitations that were in force in India's legal framework in respect of privatisation. The obstacles faced by India in restructuring its port industry and moving towards a landlord port system based on the Government's liberalisation policy adopted in 1992 are discussed in De Monie (1995). The paper deals with the decision made to privatise the Nhava Sheva container terminal at Jawaharlal Nehru Port which began the transformation process from an antiquated system to a modern customer-oriented format. This was an imperative step to facilitate India's manufacturing boom and growth in international trading opportunities. Bennett (1995) discusses the small scale private sector involvement in India's port sector activities and the importance of large amounts of funds to develop port facilities in the future. This paper which appears as one of the first academic piece of work further deliberates the need to progress on privatisation of the ports on an urgent basis irrespective of national consensus on labour issues. Baird (2002) argues that especially, for developing countries, such as India, the way forward is only with a higher level of private sector participation. Haralambides and Behrens (2000) discuss the transformation of the Indian port sector. The privatisation process that commenced in India at JNP in the mid 1990s with the trade liberalisation has now been embraced by almost all the container ports.

Cumbersome import/export procedures and their adverse effects have been examined by Taneja (2004). Kumar (2001) discusses the trading opportunities and the competition India is facing with China since its accession to WTO and the infrastructure bottlenecks. Compared with China, India's progress is slow, Kumar states. The study carried out by De and Ghosh (2003) to ascertain the co-integration and causality between performance and traffic found that performances precede traffic in most Indian ports.

Kumar (2001) discuss the infrastructure bottlenecks. The opportunities available for the development of transport and port infrastructure through Public Private Partnerships (PPP) and, successful implementation of such projects are discussed by Sharma (2008). India's maritime sector prospects and challenges have been discussed in Vaidyanathan (2007) and Deloitte (2006). India's democratic political structure is cited as one of the main reasons for slow decision making compared with China. The diagnostic work carried out by Raghuram (2006) and Ray (2004) on JNPT, the largest container port in India, are comprehensive studies on the limitations of the port, Intermodal connections (rail and road) and other logistics infrastructure that cause port congestion. The potential and the lucrative opportunities prevailing in the port sector, the inherent bottleneck and issues that get in the way have been discussed in Lloyd's List (2005).

A detailed impartial analysis about the infrastructural requirements of India to absorb its economic growth is made in RREEF (2007). The report discusses the weak transport networks and port infrastructure. The authors suggest that the present situation 'scares off' foreign investors. Raghuram and Gangwar (2007)

discuss India's challenges in the context of its robust growth in trading volumes. The authors stress the need to develop deeper and state-of-the-art container terminals in order to avoid transshipment over ports in another country.

RESEARCH APPROACH

The literature review on port issues in India highlighted the factors that affect the productivity and efficiency of India's port interface. These factors are: port capacity limitations, insufficient investment, limited intermodal facilities and government bureaucracy. To obtain a better insight into the factors affecting port interface, the research approach used was that of qualitative research. In order to explore the issues further, interviews were conducted with 10 senior executives of ports/ container terminals, the recipient organisations of port services and other parties who have commercial interests in the industry. This included; shipping lines, logistics service providers and the other auxiliary services providers to the industry, consultants and academics. As the interviews could not be recorded and transcribed, for analysis purposes, the information was taken from the notes written on the 'contact summary sheets' and 'document summary sheets'. The analysis was based on the suggested methods by Miles and Huberman (1994) using the early analysis technique following the date sequence of interviews. Relevant chunks of information were extracted from interviews. They were in the form of quotes and phrases. Subsequently, these were clustered into themes, which were initially referenced from the literature review. The clusters which didn't have identified themes were given new titles. Some of the major concepts from the contact summary sheets, were as follows: capacity limitations as the capacity growth doesn't follow the demand growth, the depth/length overall (LOA) restrictions in ports, high costs, obsolete equipment, heavy dependency on private sector funding/ investment.

The data which was derived from the literature was analysed using the same method. This information was transferred to the document summary forms. The document summary forms were analysed and new themes emerged. These themes were then compared with interview data and the focus was narrowed down for this research. Two new factors have emerged were;

- (a) Human perspective in interpretation of policy
- (b) The degree of human contribution to port inefficiencies

RESEARCH MODEL

Figure 1 shows the research model depicting the themes that were identified through the exploratory research. At the centre of the model is human involvement as this features very strongly throughout the research. This is shown to be affecting the four other themes: Bureaucracy, Infrastructure Investment, Capacity limitations, Port efficiency. Human involvement is an essential theme as:

1. it affects policy and decision making through bureaucratic processes
2. it affects investment decisions
3. it affects capacity utilisation
4. it affects port efficiency

The outer layer of the figure depicts a process map which is cyclical in nature starting with the bureaucratic process which affects infrastructure investment. The shortage of adequate infrastructure leads to capacity limitations which may lead to inefficient port operations. Inefficient port operations are looked on by bureaucracy as being a poor return on investments leading to a decision for reducing investment.

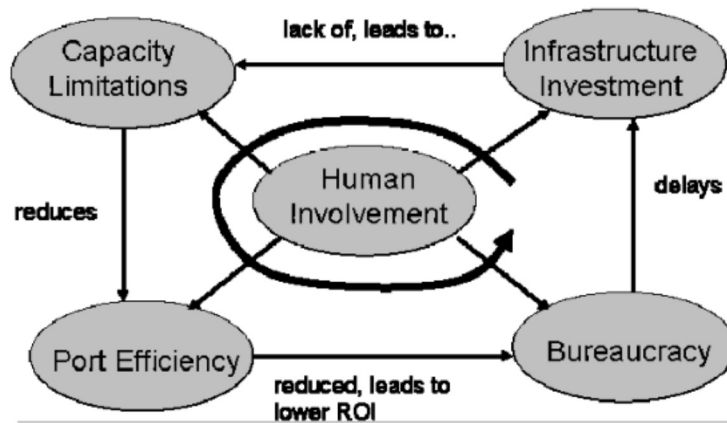


Fig.1 Issues affecting Indian Port interface

DISCUSSION

This research focuses on the bottlenecks and other pertaining issues that hinder the performance of Indian ports. The port interface is a vital component of the supply chain for a country such as India, which is experiencing an exponential growth rate in international trade. The port privatisation process that commenced in the 1990s required some control methods in place to maintain the true spirit of competition as the traditional government-controlled port trusts shifted to a 'landlord' role. This paved the way to set up government regulatory bodies such as Tariff Authority for Major Ports (TAMP) to look into the complaints of unfair practices and price increases in port services. The interviews revealed that some of the recent decisions made by TAMP are unfair to the private sector port management companies that have invested large sums to improve the facilities. It was further revealed that the private operators cannot apply a commercial 'cost plus' approach to pricing and the basis for the same is not driven by market forces. The attitude of the authorities who are interpreting the country's policies appears to be a distraction to the present and prospective private sector port management companies for investing in the port sector. This can create a substantial impact on the port capacity of the country. Also a cap on the rate of return on investment has been introduced and does not allow covering all recurring costs which may discourage the port operators to achieve optimal utilisation levels of the capacity/facilities or higher efficiency levels. This could create a detrimental situation for a developing-country such as India, which is expecting two thirds of its port funding requirement from the private sector. Further, this may even shrink the existing capacity due to management complacencies based on the 'why bother' attitude.

In contrast to long delays owing to environmental restrictions/procedures in Europe, India is suffering from delays due to cumbersome bureaucratic procedures in approving and implementing projects. Also, it is vital that India

sends the right message to the world to prove its consistency and reliability in the process of attracting new investors/terminal operators. The research, however, revealed that it is imperative that India expedite the processes in order to create the container port capacity ahead of demand. At present, the throughput growth is higher than that of capacity. The capacity utilisation of the Jawaharlal Nehru Port, which is the main container port of India, is about 112%, compared with its designed annualised capacity of 3.6 million TEUs. These situations usually bring the service standards down and may pose an adverse impact on productivity as a result.

Occasional port strikes and 'work to rule' situations are adding to the labour inefficiencies of Indian ports. Also, the stringent inflexible regulations such as export cargo cut-off times seem to be creating undue delays and adding to the congestion in some ways. The bureaucracy and procedural delays in export/import document processing are another factor that could adversely affect the efficiency of the ports. The literature search and the interviews highlighted the antiquated and complicated approval procedures that are still in place. Also, it has been noted that the security procedures should bring in a compromise situation with efficiency. Even though some modern terminals are equipped with modern access systems with a large number of gates, the bottlenecks in the access roads curtail the gate efficiency. Although this area is out of the scope of this paper, it is a contributory factor to port inefficiencies. The crane productivity level, however, have improved immensely with the private sector involvement in port management and at least, in a comparable situation with the main ports in Colombo, Hong Kong or Colombo. But, the efficiency levels of the areas where manual labour is involved has a lot of room for improvement.

The required periodical capital dredging, which is a responsibility of the government-controlled port trusts to maintain the right depth in entrance channels seems to be another area posing challenges to Indian ports. It was revealed that tenders are not being awarded in an organised way to carry out the dredging operations in time. As a result, some ports are unable to bring in larger vessels, and, therefore, facing difficulties in utilising the capacity. Most of the main ports do not possess higher depths required for larger vessels that are in service.

CONCLUSION

This paper has presented the results of a qualitative study conducted to explore the issues pertaining to the Indian port interface. The data was analysed to form themes and "human involvement" has been identified as one of the most important themes for this research. This is relevant in terms of recommending actions and suggestions with respect to more training of people involved in port operations, less bureaucracy, better resource utilisation. The research is still in the initial phases. In the future, more in-depth data will be collected to understand the processes as depicted in figure 1.

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