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A Comparative Study on Indian Railways and World Wide Railways

Nagaraju B.S
Lecturer in Economics, Department of Economics
Government College (Autonomous) Mandya, Karnataka State

Abstract
Railways were the most important development from the point of view of the infrastructure in India from 1850 to 1947. In present scenario Indian Railways has become the prime mover of the Indian Economy. Railways in India in the sense of transportation are the only reliable and feasible source on land. Indian Railways is one of the largest railway systems in the World. According to Vision 2020 proposed by Indian Railways Ministry, a significant focus would be on Track Enhancement, Environmental Sustainability, Network Expansion of Railway, Capacity Creation, Train Safety, Reducing Carbon Footprint, High Speed Train Introduction and Technological Excellence. There are enormous challenges. It aims to develop a world class rail infrastructure as countries like USA, China etc. This paper presents the recent developments in Railways in developed countries, limitations and problems that are associated with Railways. Also an impression of Indian Railways at the global level will be presented. Solutions and visions that are proposed by Indian Government to meet and to match the technological development with the developed countries will also be discussed in this paper.
Keyword: Economy, Indian Railway, High Speed Trains

1. Introduction

Railways, which are one of the earliest forms of motorized transportation in the world, play a vital role in facilitating trade. An efficient railway system lowers the cost of transportation, integrates people and markets across the country, links backward regions with the mainstream economy and thereby increases the overall productivity and global competitiveness of the economy. For a land locked country (European countries), railways are one of the most important modes of international trade and cross-border movement of persons. In developing countries like India and China, railways are the main form of mass passenger transport at a price accessible to the majority of the population. Railways are also an essential component of the intermodal supply chain.

Indian Railways operates more than 11,000 trains per day of which 7000 are the passenger trains. The railways have played a critical role in catalysing the pace of economic development and continue to be an integral part of the growth engine of the country. Ministry of Indian Railways has proposed Vision 2020 for Indian Railways. The advancement in World-wide Railways systems have been gravitating towards heavy-haul in freight, high speed in passenger services and rail-based mass transit in urban transport. All the railways in the table except IR have either high-speed rail networks or are

building these. Heavy- haul freight operations are also common in USA, China and Russia with trains carrying in excess of 20,000 tons each compared to 5000 tons in our case. Japan, Germany, France and Russia have very well-developed rail-based urban transit systems. Other countries like China, Japan and USA are putting a lot of efforts in developing High Speed Trains and other remedies of Railways.

This paper endeavours to make an effective impression of Railways on the economy, productivity and employment. Also a comparison of recent technological developments in various developed countries like USA, China, and Japan etc. with Indian Railways has been discussed.

2. Objectives

The present study has the following two specific objectives:

1. To analyse a brief comparison of worldwide railways and Indian railways in terms of some selected variables
2. To study about some key challenges in Growth of Indian Railways

3. Historical Backgrounds of Railways

The history of rail transport began in 6th century BC in Ancient Greece. Later in 1515, wooden rails were introduced by human or animal power, through a tread wheel. The first full-scale working railway steam locomotive was built in the United Kingdom in 1804 by Richard Trevithick, a British engineer. The first commercially successful steam locomotive was introduced in 1812. The first public railway which used only steam locomotives, all the time, was Liverpool and Manchester Railway, built in 1830. The first known electric locomotive was built in 1837 by chemist Robert Davidson of Aberdeen in Scotland. In 1906, Rudolf Diesel, Adolf Klose founded diesel-powered locomotives. The first electrified high-speed rail Tōkaidō Shinkansen was introduced in 1964 between Tokyo and Osaka in Japan. Since then high-speed rail transport, functioning at speeds up and above 300 km/h, has been built in Japan, Spain, France, Germany, Italy, the People's Republic of China, Taiwan (Republic of China), the United Kingdom, South Korea, Scandinavia, Belgium and the Netherlands.

The first proposals for railways in India were made in Madras in 1832. The first train in India ran from Red Hills to Chintadripet bridge in Madras in 1837 but the first passenger train in India ran between Bombay and Thane on 16 April 1853. It ran for about 34 kilometres between these two cities carrying 400 people. The first passenger train in South India ran from Royapuram (Madras) to Wallajah Road (Arcot) on 1 July 1856, for a distance of 60 miles.

4. Comparison of Indian Railways and World Wide Railways

According to Christian Walmer report (2010) the Railways have turned the World Economy and deemed as a momentous domain of both Developed and Developing country. Further in this report analysed that Railways have an impact on the economic development and growth as well as a greater impact on political history also.

Indian Railway Vision -2020 report (2012) has been quoted that Indian Railways lags behind the developed

countries, such as USA, Germany, France and Japan, in terms of route- kms per square kms or route-kms per million population served which are broad indicators of the level of rail connectivity in the country.

Table 1 shows world railway system ranked by total route, passengers, staff and freight activity during 2014. From the above table we can observe that India lags behind by various countries like America, Russia, and China and even than Canada in the total expansion of Railways in Kms. Hence, India has been placed fifth in the world for total length of the Railways in kms.

It can be noticed from above table Japan is transporting more number of passengers annually even though its railways kilometres are about one third of that of Indian Railways. This shows how the technological developments in Railways increase the number of travellers. Moreover, these data show that if more technology would be introduced in future in India, Railways can improve its ranking among the developed countries

Table 1: World Railway System Ranked by Total Route, Passengers, Staff and Freight Activity

Country	Total Route (km)	Passengers (000)	Staff	Freight Tons (000000)
India	**63273**	**6524377**	**1394520**	**727.7**
China	62200	1106510	1665588	2309.2
EU	150224	6361900	779470	860.3
Japan	12217	8987944	161930	36.2
Russia	85245	1338723	1161900	1281.3
America	224490	34988	233368	2115.7
All Other	319989	4087834	1802165	4030.1
World Total	**917638**	**28442276**	**7198941**	**11360.5**

Source: Research gate data bank-2014

5. High Speed Trains

The high speed train history traced from 1903 in Germany which was initially tested a speed of 200 kph. In the year 1964, the first high-speed train passenger service was launched on the Tokaido line between Tokyo and Osaka with trains running at speeds of 210 kph. Today, about 40 years later, the high speed train is in many respects a distinct mode of transport. In 1955, the French set a new speed record of 331 kph and they also hold the curre.nt speed record for a 'steel wheel on steel rail' train of 515 kph achieved in 1990 by a French TGV

However, the commercial speed that can be achieved is of greater importance. The maximum operating speed on the Tokaido line now stands at 270 kph, while on the TGV Atlantique line trains operate at a maximum speed of 300 kph. China latest fast train, the CRH380A, set a new record on December 3, 2010 by clocking 486.1 kilometres an hour in its Beijing to Shanghai trial. Whereas India's

fastest train Rajdhani and Shatabdi are far behind this speed.

The following are the list of High Speed Trains Models:
The Shinkansen
• The TGV
• The Tilting HST
• The MAGLEVHST

6. Key Challenges in Growth in Indian Railways

Although Indian Railways have progressed a lot, both quantitatively and qualitatively, during the last six decades, this system is still plagued by a number of problems and challenges which require immediate attention. Indian Railways has faced the following several challenges:

- Capacity Creation.
- Safety Reliability,
- Project Execution,
- Improving Carrying Capacity,
- Technology Upgradation, Connectivity Issues etc.

Apart from these challenges Supply Constraints, Upgradation of Quality of Services, Slow Moving Passenger Services and most important challenge is Speed. Because in order to stand in competition with other countries High Speed Trains evolution and their proper execution is the key challenge for Indian Railways.

7. Conclusion:

A brief comparison of Worldwide Railways and Indian Railways has been presented in this paper. India has gained first position as far as travelled passengers per km is concerned but is far behind in the field of latest technology used by other countries. Vision 2020 proposed by Ministry of Railways, India focuses only on the adoption of technology and High Speed Trains, but we still lack behind in the Research and Development in Infrastructure. Thus we are dealing with other countries and importing their products. Vision 2020 has proposed a good methodology for implementing and expanding the Railways Network in India.

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