Quadrant II - Notes

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Module No: 18

Transport System in India: Growth, Development, Projects, Importance and Problems

Transport system is an important component of an infrastructure system in the economy. An efficient system of the transport is a pre-requisite condition for other infrastructure development of a country. It is playing very important role in generation of national income and employment. Transport sector facilitates the entire movement of production and consumption system of modern economy.

Goods produced are of no economic value unless they are taken to consumption centres. An efficient, speedy and economical transport system helps the economy in adding value to its produced goods. It also expanded the geographical coverage of the markets for goods and thereby acts to their effective availability. Supply of raw materials and other inputs also facilitates efficient and uninterrupted production activity. Thus, it helps in development of input-output relationship between different production activities.

Transport System in India: Road Transport

Roads are the dominant mode of transportation in India today. They carry almost 85 per cent of the country's passenger traffic and more than 60 per cent of its freight. The density of India's highway network — at 0.66 km of roads per square kilometer of land – is similar to that of the United States (0.65) and much greater than China's (0.16) or Brazil's (0.20). However, most roads in India are narrow and congested with poor surface quality and 33 per cent of India's villages do not have access to all-weather roads.

Road is one of the important means of transport. India has an extensive road network of more than 3.3 million km. making it one of the largest in the world. The road network comprises of express highways, national highways, state highways, district roads, rural roads and special purpose roads.

National Highways are premier arterial routes span about 58,112 km. throughout the country and cater to about 45 per cent of the total road transport demand. The road transport is highly suitable for an agrarian economy like ours. However, our road transport system still suffers from some basic drawbacks including the following- (i) Lack of proper planning, (ii) Multiple authorities, (iii) Resource Cost.

Road Net work

India, having one of the largest road network of 3.314 million km, consists of National Highways, Expressways, State Highways, Major District Roads, Other District Roads and

Village Roads with following length distribution- National Highways/Expressways 70,548 km, State Highways 1,28,000 km, Major and other District Roads 4,70,000 km, Village Roads 26,50,000 km. About 60 per cent of freight and 87.4 per cent passenger traffic is carried by the roads.

Although National Highways constitute only about 2 per cent of the road network, it carries 40 per cent of the total road traffic. The number of vehicles has been growing at an average pace of around 10 per cent per annum (2001-02 to 2005-06). The share of road traffic in total traffic has grown from 13.8 per cent of freight traffic and 15.4 per cent of passenger traffic in 1950-51 to an estimated 60 per cent of freight traffic and 87.4 per cent of passenger traffic by the end of 2005-06. The rapid expansion and strengthening of the road network, therefore, is imperative, to provide for both present and future traffic and for improved accessibility to the hinterland. In addition, road trans-port needs to be regulated for better energy efficiency, less pollution and enhanced road safety.

National Highways Development Project:

In order to take up the improvement and development of National Highways, National Highways Development Project (NHDP), the largest highway project ever undertaken in the country, was initiated in a phased manner. Implementing agency for NHDP programme is National Highway Authority of India (NHAI).

NHDP programme began with Phase I and Phase II having following components:

NHDP Phase I & II envisage 4/6 laning of about 14,000 km of National Highways, at an estimated cost of about Rs.65,000 crore at 2004 prices. These two phases comprise Golden Quadrilateral (GQ), North-South & East-West corridor (NSEW), Port Connectivity and Other Projects. The GQ consisting of 5846 km connects four major cities, viz. Delhi, Mumbai, Chennai and Kolkata.

The NSEW corridors comprising a length of 7142 km connects Srinagar in the North to Kanyakumari in the South including a spur from Salem to Kochi and Silchar in the East to Porbandar in the West, respectively. The NHDP also includes Port Connectivity Project comprising a length of 380 km for improvement of roads connecting 12 major ports in the country and Other Projects involving a length of 962 km.

The Government has also predicted a massive programme for development of National Highways under NHDP to be completed during the period of 2005-15 with an investment of Rs.2,35,690 crore in a phased manner. This programme includes completion of National Highways Development Project (NHDP) Phase I and II, NHDP Phase-III for up-gradation of 12,109 km of National Highways on Build, Operate and Transfer (BOT) basis, NHDP Phase-IV for widening of 20,000 km of National Highways to two lanes with paved shoulders, NHDP Phase-V for six-laning of 6500 km length of selected National Highways, NHDP Phase-VI for development of 1000 km of Expressways, NHDP Phase- VII for construction of 700 km of ring roads in major towns and bypasses and construc-tion of other stand-alone structures such as flyovers, elevated roads, tunnels, under-passes, grade separated interchanges etc. on National Highways.

Public Private Participation:

Historically, investments in the infrastructure sector, particularly in the highways, were being made by the Government mainly because of the large volume of resources required, long gestation period, uncertain returns and various associated externalities. The galloping resource requirements and the concern for managerial efficiency and con-sumer responsiveness have led in recent time to an active involvement of private sector. To encourage participation of private sector, the government has also announced several incentives such as tax exemptions and duty free import of road building equipment's and machinery etc. It has been decided that all the sub projects in NHDP Phase-Ill to Phase-VII would be taken up mainly on Public Private Participation (PPP) route follow-ing either Build Operate and Transfer (BOT) toll mode or BOT (Annuity) mode.

Growing Importance of Urban Transport:

India is experiencing rapid urbanization with the present urbanization levels at 30% translating to a population of roughly 340 million living in urban areas. The number of million plus cities is presently at 42 and the urban economy accounted for roughly 60% of the GDP. Motorization rates in India are in double digits as in most developing economies. Only about 20 cities out of 87 cities with a population in excess of 500,000 and state capitals have any kind of organized transport and only 3-4 cities could lay claim to a mass rapid transit system. The share of public transport in cities with population sizes over 4 million has declined from 69% to 38% between 1994 to 2007. Accident and fatality rates are one of the highest in the world affecting' primarily the poor and vulnerable without their own means of transport.

Major Strategies for Road Development:

The Government of India has initiated following strategies for road development:

(i) India's Eleventh Five Year Plan identifies various deficits in transport sector which include inadequate roads/highways, old technology, saturated routes and slow speed on railways, inadequate berths and rail/road connectivity at ports and inade-quate runways, aircraft handling capacity, parking space and terminal building at airports.

(ii) Increasing public funding for transportation in its Five Year Plans. Government aims to modernize, expand, and integrate the country's transport services. It also seeks to mobilize resources for this purpose and to gradually shift the role of gov-ernment from that of a producer to an enabler. In recent years, the Government has made substantial efforts to tackle the sector's shortcomings and to reform its transport institutions.

(iii) Launching the ambitious National Highway Development Programme which has seven phases and is expected to be completed by 2012. It includes improved con-nectivity between Delhi, Mumbai, Chennai and Kolkata, popularly called the Golden Quadrilateral, in the first phase, North-South and East-West corridors in phase two, four laning of more than 12,000 km in phase three, two laning of 20,000 km and six laning of 6,500 km respectively in phase four and five, development of 1,000 km of expressway in phase six and other important highway projects in phase seven. Total expected investment is INR 2.2 trillion.

(iv) Operationalising the National Highway Authority of India (NHAI) to act as an infrastructure procurer and not just provider. Accelerate Road Development Pro-gram for the North East Region to provide road connectivity to all State capitals and district headquarters in the North East region.

(v) Financing the development and maintenance of roads by creating a Central Road Fund (CRF) through an earmarked tax on diesel and petrol.

(vi) Improving rural access by launching the Pradhan Mantri Gram Sadak Yojana (Prime Minister's Rural Roads Programme).

(vii) Reducing the congestion on rail corridors along the highly trafficked Golden Quad-rilateral and improving port connectivity by launching the National Rail Vikas Yojana (National Railway Development Program).

(viii) The development of two Dedicated Freight Corridors from Mumbai to Delhi and Ludhiana to Dankuni.

(ix) Improving urban transport under Jawaharlal Nehru National Urban Renewal Mis-sion (JNNURM).

(x) Upgrading infrastructure and connectivity in the country's twelve major ports by initiating the National Maritime Development Programme (NMDP).

(xi) Privatization and expansion of the Mumbai and New Delhi Airports and develop-ment of new international airports at Hyderabad and Bangalore.

(xii) Enhancing sector capacity and improving efficiencies through clear policy direc-tive for greater private sector participation. Large parts of the NHDP and NMDP are to be executed through public private partnerships (PPP).

World Bank Support for Road Development Programme:

The World Bank has been a major investor in the transport sector in India. At present, it has ten projects in transport portfolio which include seven state road projects and one each for national highway, rural road and urban transport with total loan commitments for the transport sector in India as in June 2011 is US $5.9 billion spread over 14 projects.

The main activities include:

(i) National Highway Development Project:

The World Bank is financing highway construction on the Lucknow-Muzaffarpur corridors. The bank is also financing a technical assistance loan to improve the operational processes and systems of National Highway Authority of India including developing a comprehensive ERP system. Through these engagements, comprehensive improvements in road safety management and work zone safety practices have also been undertaken.

(ii) Rural Roads Program:

The program provides for the provision of all-weather roads to villages in seven States – Uttar Pradesh, Jharkhand, Rajasthan, Punjab, Uttarakhand, Meghalaya and Himachal Pradesh. Over the next five years, the two rural road operations would finance construction and up-gradation of 24,200 km of new all-weather rural roads connecting about 8,200 habitations.

The second rural road project uses a unique design and provides broad-based support for PMGSY. The project has adopted a result based methodology and focus on getting those results

rather than individual transactions leading to those results. Bank funds will be disbursed against achievements of agreed results formulated as a series of disbursement link indicators.

(iii) State Road Projects:

State Highways are being upgraded in the states of Andhra Pradesh, Mizoram, Tamil Nadu, Punjab, Himachal Pradesh, Orissa and Karnataka. Besides improving the capacity of the core road network in the project states, these projects aim to improve the overall capacity of the transport sector agencies including preparation of long term financing and asset management strategies and the road safety management capabilities.

(iv) Mumbai Urban Transport Project 2A:

The project aims to improve transportation in the Mumbai Metropolitan Region by building upon the progress made under the first Mumbai Urban Transport Project and further increase the capacity of the suburban rail system within the Mumbai Metropolitan area on the existing infra-structure network.

(v) Sustainable Urban Transport Project:

The project supports improving the usage of environment friendly transport modes through piloting of demonstration projects in select cities with a focus on priority to public transport and non-motorized trans-port. The project also supports capacity building for developing and implementing sustainable urban transport systems.

(vi) Eastern Dedicated Freight Corridor Project:

The World Bank is financing, in the first phase, the 343 km Khurja to Kanpur section of total 1,800 km Eastern Dedi-cated Freight Corridor (Ludhiana-Delhi-Mughal Sarai). The World Bank may finance a total of around 1,100 km of the Eastern Dedicated Freight Corridor in three phases. It will also help in developing the institutional capacity of the Dedi-cated Freight Corridor Corporation (DFCCIL) to build and maintain the DFC's infrastructure network.

(vii) Public Private Partnership:

The Bank is actively contributing to strengthening the PPP policy framework in the transport sector through its ongoing dialogue with and knowledge management support to GOI, various states and urban local bod-ies. Bank is also supporting transaction advisory services for structuring highway PPP program in Tamil Nadu, AP and Orissa and financing part of the Karnataka highway PPP program including providing direct construction cash support for the modified annuity contracts.

(viii) Indian Road Construction Industry Study:

Given the large development programs being launched to support the rapidly growing economy, the supply side constraints in terms of the construction industry capacity are a serious cause of concern. The study reviews these limitations and suggests mitigation measures.

Rural Roads during Twelfth Plan (2012-17):

Rural Roads:

As an effective poverty alleviation strategy, "Pradhan Mantri Gram Sadak Yojana" (PMGSY) was launched in the year 2000, as a centrally sponsored programme and a one-time special intervention. The primary objective of the programme was to provide connectivity by way of all-weather roads to unconnected habitations with popu-lation 1000 and above by 2003 and those with population 500 and above by 2007 in rural areas. In respect of hilly/tribal areas, the objective is to link habitations with population 250 and above.

Up-gradation of selected rural roads to provide full farm to market con-nectivity is also an objective of the scheme, though not central. The programme has since been implemented by the Ministry of Rural Development, Government of India. The basic time frame for completion of the programme was perceived to be 2007; how-ever, because of constraints of capacity of implementation in the States and availability of funds, the targets of the programme have not been achieved so far. On the whole this scheme is considered to be a successful scheme. The investment in this scheme in the Eleventh Plan is expected to be 59,751 crore. The projected investment by the working group for the twelfth Plan is Rs.2 lakh crore. Since the opportunity of attracting PPP in this sector is not high, the working group has projected the entire demand from the budgetary support.

Central Roads:

In the Eleventh Plan, around 9,044 kms of road would be constructed under various phases of the NHDP programme. Besides this, 1,012 km in the North-East package and 1,051 km under the road building under the Left Wing Extremism affected area would be completed. At present, out of 71,772 km of National Highways about 24 per cent length is of 4-lane and above standard, 52 per cent length is of Two-Lane stan-dard and 24 per cent length of single and intermediate standard.

Out of the projected investment of Rs.1.9 lakh crore expected in the Eleventh Plan, the actual investment is likely to be Rs.1.52 lakh crore which reflects a shortfall of 25 per cent. The share of private investment is expected to be Rs.60,630 crore or 41 per cent. This shows that the PPP programme in the road sector has stabilized and progressing well.

The working group on central roads for the Twelfth Plan has projected an investment requirement of Rs.4.83 lakh crore of which the private sector component is Rs.1.75 lakh crore or 37 per cent, the rest expected to come from budgetary and extra-budgetary sources, including Cess on petrol and diesel.

More than 30,000 kms of national highways as well as 7000 km of roads under the North East and nearly 13,000 km of roads under the LWE areas would also be targeted to be completed during the Twelfth Plan. There is a Plan to invest in expressways also, although these may not be very cost effective.

Problems:

Major problems of road transport are as follows:

(i) The road length is inadequate considering the size of the country.

(ii) A number of areas, particularly interior areas and hilly tracts remain to be linked with roads.

(iii) Large tracts of rural roads are mud roads which cannot be used for plying heavy traffic.

(iv) A number of urban roads are also poorly maintained. This is due to constraints of financial resources, organizational inadequacies, procedural delays, shortage of essential materials etc.

(v) Most of the State Road Transport Corporations are running on heavy losses. This is because of rising cost of operations, inefficiency in operations and corruption.

Transport System in India: Rail Transport

Indian Railways is one of the largest railways under the single management. It carried some 19.8 million passengers and 2.4 million tonnes of freight a day in year 2009 and is one of the world's largest employers. The railways play a leading role in carrying passen-gers and cargo across India's vast territory. However, most of its major corridors have capacity constraint requiring capacity enhancement plans.

Railways provide an efficient and low cost means of transport provided the system itself is made operational with timely investment in technological advanced rolling, stock sig-nalling equipments and the like. The Indian railway is one of the largest railway systems in the world. It has an extensive network which is spread over about 69400 route kilometer comprising broad-gauge (69,146 RKM) and Narrow Gauge (254 RKM).

Approxi-mately, 25% of the network is electrified. The Indian Railway has historically played an important role in the social and economic development of the country. Railways have an innate advantage as a mode of surface transport, being less energy intensive and more environmental friendly. There is need for strategic shift in Railways approach to give optimal benefits of these advantages to the economy.

For this purpose, the thrust to be on augmentation of capacity in the high density corridors sufficient reorientation among commercial lines and necessary tariff rationalization while continuing to play the desired social and developmental roles. Indian railways being a public utility service has been undertaking certain uneconomical operations in the larger social and national in-terest so as to provide affordable transport facility to the common man and to carry certain essential commodities meant for mass-consumption at very low freight rates.

Performance of Indian Railways:

During 2009-10 there was an excess of Rs.0.75 crore, which was appropriated to Deve-lopment Fund. The originating revenue loading was 887.79 million tonnes in 2008-09. The transport output in terms of revenue net tonne kms. (NT Kms) was 600.55 billion in 2009-10 compared to 551.45 billion in 2008-09. Earnings from freight traffic (excluding miscellaneous goods earnings) was Rs.56,911.51 crore – up by Rs.5,162.17 crore (9.98%) from 2008-09. During

2009-10, the number of passengers carried was 7,246 million com-pared to 6,920 million in 2008-09 thus registering an increase of 4.71%.

Passenger kms which is the product of the number of passengers carried and average distance tra-versed was 903 billion, up by 7.76% from 838 billion in the previous year. Passenger earn-ings increased by Rs.1,547.96 crore (7.1%) compared to 2008-09. All the country's high-density rail corridors face severe capacity constraints. Also, freight transportation costs by rail are much higher than in most countries as freight tariffs in India have been kept high to subsidize passenger traffic.

Railways during Twelfth Plan (2012-17):

Railways were expected to generate investment of Rs.2.33 lakh crore in the Twelfth Plan against which the actual investment is likely to be Rs.2.03 lakh crore i.e. a shortfall of nearly 13 per cent. The financing pattern of the Railways has progressively shifted to-wards greater reliance on support from general exchequer and market borrowings dur-ing the course of the Eleventh Plan.

The Twelfth Plan for Railways is being formulated in the perspective of Vision 2020. Some key issues that have to be considered are urgent need to modernize, problem of saturated routes, low average speed and payload to fare ratio; safety; an extremely large still being sanctioned; huge committed financial liabilities on assured off-take models, equity requirements and counterpart funding for DFC, ROBs/RUBs, feeder route strengthening, debt servicing of IRFC; setting up of North Eastern Region Railways Development Fund; growth of earnings not commensurate with increase in expenditure with rising pension liabilities.

There is a growing realization that investment will have to be hiked for the railways to address the capacity constraints in the sector. In the coming Plan period, the two dedicated freight corridors are likely to be completed. There are Plans for the feasibility of another three or four more desiccated freight corridor – Delhi – Chennai, Howrah – Mumbai, Mumbai – Chennai and Chennai – Kolkata – to be taken up during the Twelfth Plan. There is a need for taking up a high speed rail corridor also.

The capacity of passenger segment needs augmentation by adding coaches and increasing speeds as does the freight segment by addition of wagons and enhancing speeds. The projection of invest by the working Grouping of the Railways for the Twelfth Plan is Rs.7.19 lakh crore of which more than 50 per cent is expected from the budgetary support and less than 10 per cent from the private sector.

Among the transport sectors railways have to be given priority in view of the energy, land and environmental consid-erations. Despite this thrust, Railways may have to work out a strategy for attracting a higher share of the planned investment from the private sector including PPP given the likely difficulties in generating such a high level of budgetary support.

Problems of Indian Railways:

Major problems are as follows:

(i) The existing technology of both electric and diesel locomotive is very old.

(ii) The railway network is smaller and inadequate vis-a-vis the requirements of the economy.

(iii) The railways are facing the problem of financial crunch. The conventional meth-ods of increasing the net revenue, like rising of tariffs and expenditure control are inadequate for generating the levels of investment required.

(iv) Because of social responsibilities, railways are forced to operate a number of un-remunerative lines and suffer heavy losses. Often, essential goods like food-grains, fruits and vegetables have to be carried at a loss.

(v) Railways also suffer from overcrowding and poor passenger services.

Transport System in India: Air Transport

India is one of the fastest growing aviation markets in the world. The Civil Aviation sector has made significant strikes in coping with the growth of international and domestic traffic. It is now increasingly recognised that aviation far from being a mere mode of transportation for small elite group, makes an important contribution to the national economy and its crucial for sustainable development for trade and tourism.

With the liberalization of the Indian aviation sector, the industry had witnessed a transformation with the entry of the privately owned full service airlines and low cost carriers. As of May 2009, private carriers accounted for around 75% shares of the domestic aviation

market. The sector has also seen a significant increase in number of domestic air travel passen-gers.

Aviation as an Emerging Sector:

Following reasons are responsible for emerging growth profile of the aviation sector:

(i) Growing middle class and its purchasing power for air travel.

(ii) Low airfare offered by low cost carriers.

(iii) Dynamic growth of the tourism in the country.

(iv) Modernization programme of non-metro airports.

(v) Increasing out bound travel from India.

(vi) Improvement in overall growth of the country.

(vii) Continuous fleet expansion by airlines.

(viii) Development of repair and overhaul (MRO) industry in the country.

(ix) Opening of new international routes by the government.

(x) Establishment of new airports.

(xi) Renovation and restructuring airports.

India has 128 airports, including 15 international airports. Indian airports handled 142 million passengers in 2010-11 and 1.6 million tonnes of cargo in year 2009-10. The CAGR for the

domestic passenger and freight growth over the last decade has been 14.2% and 7.8% respectively. The dramatic increase in air traffic for both passengers and cargo in recent years has placed a heavy strain on the country's major airports. Passenger traffic is projected to grow more than 15% annually over 2011-13 and it is estimated that the aviation industry, currently 9th largest in the world, will require 30 billion USD invest-ments in the next 15 years to keep pace with the growing demand.

India is among the countries with the fastest growing passenger traffic. Some of the factors that have resulted in higher demand for air transport in India include the grow-ing middle class and its purchasing power, low airfares offered by low cost carriers, the growth of the tourism industry in India, increasing outbound travel from India, and the overall economic growth of India.

The first round of consolidation happened in the mid-1990s when airlines such as Damania Airways, East-West Airlines and Modiluft which has opened shop after the 'open skies' policy of 1991 either shut down or sold out, due to lack of management bandwidth or financial constraints. It was an era of high fares which made air travel a luxury restricted to business executives and moneyed individuals. This scenario continued till the early part of the last decade.

Emergence of Low Cost Carrier (LCC):

The low cost carrier (LCC) model introduced by Air Deccan in 2004 proved a game changer. By offering seats at rock bottom fares unheard of before, it democratized air travel in the country and catalyzed rapid growth in passenger traffic. The full service carriers- Indian Airlines, Jet Airways and Sahara Airlines who till then were operating in an oligopolistic market with high fares and plum profits found themselves at the receiv-ing end and saw market share erode.

The advent of the LCC also set into motion some key structural changes in the sector, perceiving a burgeoning opportunity in Indian aviation, three more LCCs (Spice Jet, GoAir and IndiGo) and a couple of full service carriers – Kingfisher Airlines and Paramount Airways opened shop during 2006 and 2007.

However, with as many as 10 carriers operating, the market soon became too crowded for comfort, and several players started feeling the heat. Due to growing completion some high-profile mergers and acquisitions were took place in 2007-08. Jet Airways took over Sahara Airlines (renamed JetLite) after false starts and a continuing spat; Air India and Indian Airlines merged to form NACIL- a move which has generated more pain than synergies; Kingfisher

Airlines took over the original low cost warrior AirDeccan (renamed Kingfisher Red) which had high leverage and found the going unsustainable.

Finally, the growing market share of LCCs and the economic slowdown in 2008 and 2009 meant that the pure full service model have lost its relevance. Full service carriers em-braced the low fare model in good measure to ride out the downturn.

While Air India had its low cost arm, Air India Express, Jet and Kingfisher shifted a majority of their seats to the low fare category. Meanwhile, Paramount Airlines which was showing promise in South India was grounded in 2010 with some of its planes seized on reports of non-payment of lease dues. At present, the aviation market in India com-prises three LCCs- Spice-Jet, IndiGo and GoAir and three full service carriers- NACIL, Jet Airways and Kingfisher Airlines which also offer low fare seats.

In the meantime Kingfisher's plans to do away with its low fare offering (Kingfisher Red) and focus only on the high yield segment of the market. The company claims that reconfiguration of planes towards this exercise led to some flight cancellation.

Poor Financial Performance:

Not only did LCCs chip away at market share, they also dented the financials of full service carriers by lowering yields across the board. This even as they themselves suf-fered start-up pangs. Full service carriers were also badly impacted by the high debt they had taken to expand fleet capacities and at the time of acquisition of other airlines.

However, amidst the LCC churn, the financials of most airlines inspired little confidence. The last time Indian Airlines (now NACIL) posted operating profits was in 2006. Among private Airlines, only Jet Airways managed to make an operating profit in 2006, while Paramount alone made minor operating profits in 2007.

The situation was no better in 2008 and 2009 with slowdown induced demand contrac-tion and fleet oversupply conditions causing most players to report operating losses. Paramount and IndiGo were the only exceptions posting minor profits in 2009. The pic-ture however improved in 2010 with the revival in the economy, curtailed seats and relatively benign crude oil prices. Except Kingfisher, all private airlines posted operating profits, though the net level, only the low cost carriers managed to remain in the green.

Again, it was debt which dragged down the full service carriers. The situation was simi-lar in 2011 when buoyant demand conditions and reasonable crude oil prices for most part of the year led to a good operating performance by many Airlines.

However, only the LCCs have managed to post profits at the next level. In essence, for most of its history a chunk of the Indian aviation sector has been in the red.

The 2012 sadly is turning out to be a nightmare for the sector. Oil prices have shot up sharply beyond $100 a barrel levels. However, though demand is growing at a healthy clip, Airlines are not able to hike prices to the extent needed, thanks to alleged predatory pricing by NACIL in a bid to recoup its lost market share.

The present scenario continues a washout for most Airlines, including LCCs, even at the operating level. However, given their low levels of leverage (at least till now) LCCs will happen again seem better positioned to tackle the current turbulence. They, in fact seem to be optimistic about the prospects of the sector and have place large fleet order.

Cost-Effectiveness of LCCs:

Besides having low leverage, LCCs are true to their moniker exercise for effective con-trol over cost. Latest data from DGCA for 2010 suggests that the cost per revenue pas-senger kilometer (a key metric of cost measurement in Airlines) was as low as Rs.2.9 for IndiGo, Rs.3.16 for SpiceJet and Rs.3.8 for GoAir. Comparable numbers for Kingfisher (Rs.5.59), NACIL (Rs.5.7), Jet Airways (Rs.4.5) and JetLite (Rs.4.2) were much higher.

Among the factors which help LCCs keep costs low is the limited type of aircraft in their fleet. This reduces maintenance cost. Also, the average age of their fleet is quite low which aids in curtailing costs. Besides, LCCs sweat their aircraft better by reducing turn-around time and making optimum use of aircraft space.

Growing Debt Burden of Full Services Carriers:

All of India's full service carriers are laden with heavy debt in excess of Rs.47,000 crore for NACIL, more than Rs.14,000 crore in the case of Jet Airways and round Rs.7,500 crore for Kingfisher. The high interest burden on these loans prevents the airlines from reporting profits even when times are good. Adding to NACIL's pain is the botched merger between Air India and Indian Airlines which is reflected in continued human resources integration issues.

Civil Aviation during Twelfth Plan (2012-2017):

During the last five years, India has become the ninth largest civil aviation market in the world with the passenger handling capacity having risen three-folders from 72 million

2005-2006 to over 220 million 2010-2011 and cargo handling capacity having risen from 0.5 million MT (2005-2006) to 3.3 million MT (2010-2011). The projected investment in the Eleventh Plan in the civil aviation sector is Rs.50,000 crore from GBS and extra-budget-ary sources and Rs.30,000 crore of private investment in the airports.

In the Twelfth Plan, the working group has projected an investment requirement of Rs.75,000 crore for airports of which 75 per cent is expected from the private sector and another Rs.55,000 crore for other aspects of civil aviation investment such as Air India which is expected to be funded from the budgetary and extra-budgetary sources.

Problems and Prospects:

Indian aviation sector is largely affected by high costs (turbine fuels) and inability to revise fares due to severe competition from LCC so full airlines are incoming huge losses.

The aviation sector is a crucial cog in the country's infrastructure wheel. To ease its troubles, the government could consider reducing the high taxes on aviation turbine fuel. Also, allowing investment by foreign airlines in the aviation sector (reportedly being considered by the government now) would be welcome.

It is also critical for the sector players to revert to rational fares, as soon as possible. In this regard, continued shielding of NACIL by the government needs to be stopped. Also, there is little case for bailout of private airlines.

Transport System in India: Water Transport

Water transport includes inland waterways, shipping and ports services. It provides a cheap and efficient mode of transporting bulky cargo over long distances. It can be of great help in both coastal trade and international movements. However, the fleet of ships flying Indian flag compares poorly with those of other countries. It accounts for only about 1% of world's shipping tonnage. India has a very long coastline. It has 11 major ports and 148 minor operable ports along the coastline. With a long coast line and a strategic geographical location, India has

a vast potential of adding to its shipping fleet and ports. By doing so it cannot only add to its foreign exchange earnings, but can also reduce its dependence upon foreign carriers. The major port of India handles around 90% (about 252 million tonnes) of the total cargo.

It is reported that over the past few years' labour and equipment productivity of Indian ports has increased but it still continues to be quite low compared with the major ports of several Asian countries. The main reason for this low productivity is not on account of underutilization of port capacity. The development of minor ports is the responsibility of the state governments, through the centre is always ready to help.

The Maritime States Development Council has been cre-ated to provide an integrated approach towards port development. Water transport is the cheapest mode of transport known to human being. Its efficiency can be further enhanced by taking advantage of the wind and solar energy. India has over 14,500 km. of navigable inland waterways comprising rivers, canals, and creaks, etc. Unfortunately, this means of transport stands grossly neglected. Out plans failed to pay adequate atten-tion to this mode of transport.

A. Inland Waterways:

It covers waterways system available on big rivers of the country. In earlier days, goods were transported with the help of boats and ships through major rivers. These rivers are Ganges, Brahmaputra, Son, Mahanadi, Kaveri etc. but now-a-days, these inland water-ways are losing their popularity. Actually, road transport has taken over the transport of inland waterways.

B. Shipping:

Shipping industry is one of the most globalised industries operating in a highly competi-tive business environment. It is far more liberalized than most of the other industries and is, thus, intricately linked to the world economy and trade. India has been a founder member of the International Maritime Organization (IMO), a specialized agency set up under the United Nations primarily dealing with the technical aspects of shipping relat-ing to Maritime Safety, Protection of Marine Environment, Standards of Training and related legal matters.

The Directorate General of Shipping has been participating in vari-ous meetings of the IMO Committees, Sub-Committees, Council and Assembly and has actively contributed towards the development of various Conventions, Protocols, Codes, Guidelines developed by the IMO.

C. Ports:

India has 13 major and 199 minor and intermediate ports along its more than 7500 km. long coastline. India's seaborne foreign trade being 95% by volume and 67% by value, the ports play a very significant role in improving foreign trade in a growing economy. These ports serve the country's growing foreign trade in petroleum products, iron ore, and coal, as well as the increasing movement of containers. Indian ports handled cargo of 850 million tonnes and about 9.0 million TEU container traffic in year 2010.

Over the last decade, the average annual growth rate of port cargo volume has been about 10%. The future potential for port sector, particularly container ports is huge considering that the container traffic is projected to grow to 40 million TEU by 2025. Inland water transporta-tion also remains largely undeveloped despite India's 14,000 kilometers of navigable riv-ers and canals.

Ports provide an interface between the ocean transport and land-based transport:

(a) Kolkata Port

(b) Paradip Port

(c) New Mangalore Port

(d) Cochin Port

(e) Jawaharlal Nehru Port

(f) Mumbai Port

(g) Ennore Port Limited

(h) Chennai Port

(i) Mormugao Port

(ii) Tuticorin Port

(k) Kandla Port

(I) Visakhapatnam Port

The average annual growth of cargo volume in the ports in the last decade was close to 1096. However, capacity utilization in some of the major ports remain as low as 58-60%. Both bulk and containerized traffic is expected to grow at a much faster pace in future and by some estimate the container traffic is projected to grow to about 4.5 times of the current volume by 2025. India's ports need to significantly ramp-up their capacity and efficiency to meet this surging demand.

Ports during Twelfth Plan (2012-2017):

Progress in the port has been relatively lower than expectations. The original target was Rs.87,995 crore, including private sector investment. The public sector component was Rs.30,305 crore of which the amount likely to be realized is lower at a value of Rs.7,685 crore. The private sector investment in the port sector is likely to be Rs.36,868 crore thereby bringing the total investment to around Rs.44,500 crore, nearly 50% of the origi-nally targeted.

The main reason for the slow progress is because the Ministry of Shipping did not award any PPP projects during the first two years of the Plan because of the pending amendments to the model contract agreement. The major expansion has taken place in the non-major port sector being promoted by the states which have contributed to nearly 80 per cent of the private sector investment. In the Twelfth Plan period, Capac-ity expansion is a major thrust area for both the major and non-major ports.

The total investment proposed in the Twelfth Plan (without the private sector) is Rs.4,338 crore. It is expected that the thrust of the private sector port expansion strategy will continue in the Twelfth Plan and it is expected that the capacity in the non-major segment will over-take the major ports capacity during the Twelfth Plan period. Looking at capacity expan-sion in the port sector overall, it seems that the capacity will be more than the demand which will be a positive aspect for the quality of services.

Problems:

Major problems of water transport are as follows:

(i) Operational constraints such as frequent breakdown of cargo handling equipment due to obsolescence.

(ii) Inadequate dredging and container handling facilities.

(iii) Inefficient and non-optimal deployment of port equipment.

(iv) Lack of proper coordination in the entire chain.

(v) Indian containers are costlier than other ports in the region for handling contain-ers. The additional cost burden due to use of second and third generation vessels is as quite high.

Prospects of Water Transport:

India's transport sector is large and diverse; it caters to the needs of 1.1 billion people. In 2009, the sector contributed about 5.5 per cent to the nation's GDP, with road transportation contributing the lion's share. Good physical connectivity in the urban and rural areas is essential for economic growth.

Since the early 1990s, India's growing economy has witnessed a rise in demand for transport infrastructure and services. However, the sector has not been able to keep pace with rising demand and is proving to be a drag on the economy. Major improvements in the sector are therefore required to support the country's continued economic growth and to reduce poverty.

Energy Crisis in India

Energy crisis is one of the most talked topics in present times. People all over the world are somehow or other affected by the ongoing energy crisis. We all have to know the causes of the energy crisis, its effect on our daily life and what is the solution to this problem. Because trade and finance all over the world are largely dependent on the oil market alone. Not only trade but also the overall political and social balance of every state highly depends on the availability of fuel, its price and its usage. Because most of the countries are still dependent on fossil fuel.

What is Energy Crisis?

Energy crisis represents the huge demand for fuel which is increasing day by day. But the sources of energy are limited, and the stock limitation is more. For this reason, we all are facing a crisis, a crisis or a fear of having no fuel to produce electricity and use our favorite gadgets.

Now the point is how many energy sources do we have? And how much fuel do these sources store for us? In a nutshell, energy can be of two kinds according to the sources. They are-

i) Non-renewable energy or Conventional energy.

ii) Renewable energy or Non-conventional energy.

We all did not even used to care about this topic only a few years back. We all were happy with our conventional sources as the population on earth was low. In modern times gadgets are consuming so much power that every nation is now more or less concerned about their stock of energy.

energy crisis causes, effects and solutions

What Are Conventional Energy Sources?

Any energy source that is not renewable rather it is basically any sort of fossil fuel is known as a conventional energy source. There are many types of conventional energy sources. They are-

Oil, Natural gas, Coal, Nuclear power etc.

A secured and sustainable supply of energy is the key to prolongation and development of prosperous and modern society. Day by day energy consumption has been increasing steadily with civilization development. In the near future the energy consumption will be further increased to sustain the current human development. In 2016, worldwide energy consumption was 18 TW and 80% of that energy came from fossil fuel such as coal, oil and natural gas. The main issue of those sources is sustainability, especially with the continuous increase of the demand for energy. One quarter of the total energy used in the world was consumed in the US alone, and 85% of that energy dependent on fossil fuels (coal, oil, and natural gas). The energy demands have kept on increasing very quickly and the consumption will increase even faster with the population growth and the development of underdeveloped regions. The predicted energy consumption for 2050 will amount to as much as 28-35 TW.

What Are the Problems with Fossil Fuel?

After 1950 the CO2 emission due to fossil fuel has increased rapidly. After 2000, the CO2 emission has crossed 10000 million tons. Thus, fossil fuel usage has a detrimental effect on the environment such as greenhouse gas emission, air pollution, water and soil contamination and recent climate change. The enhanced use of fossil fuel increases the amount of CO2 emission which is responsible for global warming. A cumulative total of 420 billion tons of CO2 were emitted between 2000 and 2011.Moreover, fossil fuels are a finite source of energy. Oil and gas will run out in the near future. It took millions of years to produce, but finished in a single lifetime. For these reasons we have to think of alternative sources of energy. Nuclear energy would not meet the current energy demand and is quite hazardous to mankind too. The control of nuclear power is very difficult, any disaster may arise at any time and disposal of nuclear products is another unsolved problem. Global Warming is one of the greatest threats towards our planet right now. Developed countries are trying to overlook the present scenario so that they can carry on their electric plants. However, this huge burn of fossil fuel at a regular basis

is a direct threat to the Islands and sea side countries. By collecting huge amounts of fossil fuels we are creating empty spaces under the ground level of our planet which is increasing the probability of earthquakes and other natural calamities.

What Are the Causes of Energy Crisis?

Overpopulation, Overconsumption of electricity, Misuse of electricity, Poor infrastructure,

the low popularity of renewable energy, Wastage of fossil fuel, War, Terrorism

Nowadays we all are highly dependent on electronic equipment around us. From morning to night, we use hundreds of gadgets without even thinking about how much electrical energy these devices are consuming. For this reason, every country is trying to secure the future of its energy sector for its citizens. The population is increasing rapidly and as a result, the demand for power is increasing day by day. Another major reason behind the energy crisis is misuse of power. General people who are not very considerate about the importance of power make misuse of it every now and then. In third world countries, mismanagement in the energy sector is prominent. Energy crisis is the sequel to the inefficiency of the workers working in this sector as well as their inter-union rivalry.

Renewable energy sources are yet to get popularity. Most of the developed countries which play the key role in producing electricity are not very much encouraged to use renewable energy sources to produce electricity. As the renewable energy sources are not as efficient as the conventional ones.Various terrorist organizations like Taliban, Al-quayda, ISIL, ISIL etc. try to capture mines so that they can use those fuels for their own weapons and they also sell those fuels to arrange fund for their notorious acts.

What Are the Effects of Energy Crisis?

War at the middle east, Iraq crisis, Syria crisis, US sanctions on Iran, Setting up more and more nuclear reactors

We admit it or not, the middle-east countries are facing so many issues only because of their mines. All the developed countries whether it is USA or Russia are trying heart and soul to control as many middle-east countries as possible. So that they can ensure uninterrupted fuel supply to their electricity generating plants. Another problem occurring because of the energy crisis is that each developed country as well as the developing ones also are trying to establish nuclear power plants. Whereas we all know the dangers of nuclear reactors.

What Are the Solutions to Energy Crisis?

Popularize renewable energy sources, Population control, Introduction of energy efficient gadgets, Proper energy management, prevent misuse of energy, Energy reproduction, Regular energy audit, prevent climate change, Promote green economy. The first thing that we need is proper media coverage on the bad impacts of fossil fuel and make people aware of the causes of the energy crisis, its effect and what are the solutions of the energy crisis. Then general

people will start to understand how vicious it would be for all of them. After that we can make renewable energy sources acceptable to them.

We should keep a close eye on the energy sector. Every year a huge amount of energy is lost only because of the lack of seriousness of the officials responsible for the supply of power. regular audit and manipulation should be arranged by the governments of every country. Green economy should be encouraged by every state so that its financiers stop thinking about making revenue by tormenting the environment. Government should take proper steps to permit a proper budget to develop the renewable energy sector. Every country should establish an autonomous committee to research and decide which renewable energy source would be appropriate for them. And then according to the decision made by the committee renewable energy should be produced. We all should learn about green technology to solve energy crisis

This planet is meant to be green and we all should let it be green. We all should promote tree plantation not deforestation. Global temperature increases on world scale have been a matter of concern and concern, on the other hand people are troubled by the rise in petroleum products. Within the country, the Prime Minister is presenting nuclear energy as an inevitable alternative to meet the energy needs. As the cumulative reserves of coal and petroleum will decrease, the energy crisis will be deepened.

At present, about 70% of the electricity in India comes from coal based thermal power plants. Approximately 20% of the electricity is obtained from big hydro projects. But since the movement against big dams has started on the question of displacement, these projects have not been practicable since then. The life of a large dam is about 40 years. That is, the two biggest sources of power generation in India are coming to an end. Then where will our electricity come from?

At present, only 3% of the electricity is obtained from nuclear power in India. When the nuclear energy program was started here, its parent Homi Bhabha had predicted that by 1987, we would make 20-25,000 MW of electricity from this program. Obviously, this program is not very successful. If the program of nuclear bombs was not connected with it then it would have been possible to close the program till now. The nuclear energy program is also facing difficulties on the scale of the world. The main difficulty in this program is that scientists have no solution to safeguard the radioactive waste from the nuclear power plants. The waste from 104 nuclear power houses in the US is currently being kept in drums in the plant premises. The local public made such a huge opposition to the plan to bury the waste by making tunnels in the Ucca Hills of the state of Nevada that the US government has abandoned this idea at the moment.

This is the reason why there is no plan to set up a new nuclear power plant in the USA in 35 years. New nuclear power has ceased to be built in England, Canada and Germany over the last two-three decades. France, which today fulfils its 75% power requirement with nuclear energy, is only going to introduce a new factory in the coming days. In the coming two to three decades, France, which is presented as a successful example in the use of atomic energy, will fall in the percentage of contribution of nuclear energy in the generation of electricity. Japan is also looking for new sources of energy, especially transparent recovery resources.

A 2006 study by the Planning Commission of India stating that if India's nuclear deal is finally approved by crossing all obstacles and by 2020, we also make 40,000 megawatts of power, even then it will be able to generate electricity from India's total electricity Not to exceed 9% of the production Given the quality of the nuclear energy program so far, the actual production will probably be up to 5-7%. That is, we will have to rely on other sources for our 91-95% power. Thus, the Prime Minister says that nuclear energy is the only alternative in front of us to maintain India's 8-10% growth rate, it is unrealistic.

India has made remarkable progress in the field of wind energy over the last ten years. In the world, we have become the fourth largest country in terms of power generation from wind power. While the Department of Atomic Energy has been fully funded by the government for 60 years, in just ten years without the help of wind power, 5% electricity generation capacity in India has been established. That is, the power generation capacity of wind power has more than nuclear power. Wind power in India is likely to generate 45,000 MW power.

According to the Energy Engineering Administration, a US-based organization, about two-thirds of those plants will be found in electricity production in the world in the coming two to three decades. There can be two major sources of gas for India- Burma and Iran. Because the military ruler of Burma did not get angry, the Indian government did not openly support Aung San Sookie's democracy movement. But Burma has decided to sell its gas to China. In this way, Iran's gas which could come from the proposed Iran-Pakistan-India gas pipeline has become even more important to us. This is an agreement which is in the interest of the three countries, and between India and Pakistan, there is going to be such a thing after a long time, in which the interests of both of them are linked. This agreement will be more democratic and equitable than the Indo-US nuclear deal, and will be beneficial for the purpose of regional stability and peace.

For the next two to three decades, India will have to base its power generation on good quality coal and gas only. Even after coal, maybe carbon emissions from burning coal will be set to limit the use of coal. Carbon emissions in the use of gas is less than coal. For this, gas based technology will be more prevalent in the coming days. But after three decades, we have to make the renewable resources the mainstay of our energy needs. In addition to wind, solar, biogas and micro hydro electricity will be the major ones. The way Japan and the European Union have decided that by 2050 they will create a low carbon emissions society, they should be ideal for us. America is not ready to impose any restrictions on this type of situation. Therefore, we will make a big mistake by considering America as an ideal. A responsible country should play its role in keeping ecological balance and keeping the environment clean.

The real energy challenge in front of India is how the majority of Indian nationals have access to electricity from villages and villages. In order to meet the needs of villages of India, they need cheap, micro / small, decentralized and local energy options. Renewable energy sources can also meet these needs better. We should also look at the fact that whenever it comes to meeting the energy requirements, we should not just think about the generation of electricity. Power without electricity can also be met. For example, the energy of solar energy can be cooked directly from the heat. Our objective should be that we develop alternatives to the needs of the society's energy in the wider public and environmental interest, with complete understanding and responsiveness from equitable misconceptions.