Infrastructure Economics
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Module - 08
Lecture – 30
Physical Infrastructure in India's Post Reforms Era

In this lecture, we are going to discuss the Physical Infrastructure in India's Post Reform Era.

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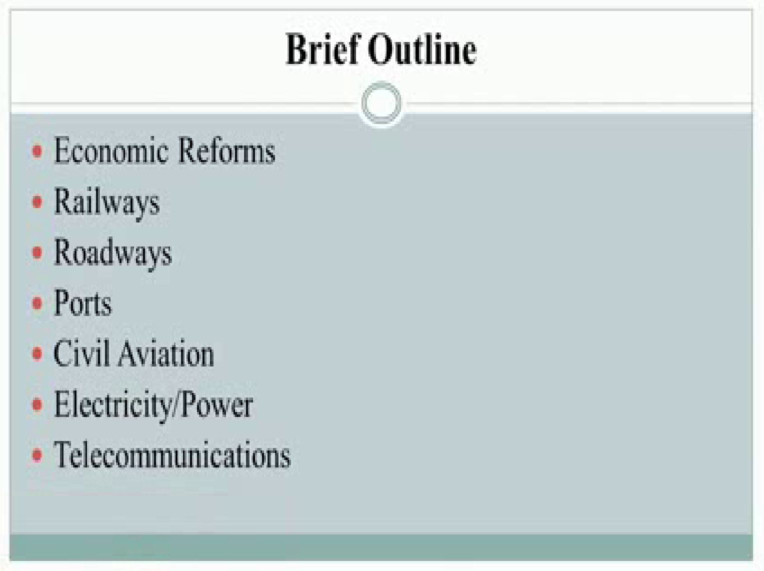

The brief outline of the presentation will be, a discussion is short discussion on economic reforms and then, we will try to find out how after the economic reforms, railways, roadways, ports, civil aviation, electricity and telecommunication received a new type of investment and how different models of public private partnership was also implemented. Let me begin with, what was the basically the main features of the economic reforms in India.

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One cannot really forget the New Industrial Policy announced in 1991 in July, which has really attempt to have the private participation from the industrialist. Industries which were in the complete control of the government, they were made free for the private sector. Apart from the few industries which were kept in the government control, most of the industries in India were kept out from the complete control of the government.

So, this is the first time when India realized a new type of industrialization. From 1948 to… to the beginning of the 1991 industrial policy regime, we found that India has continued with very restricted industrial policy and this type of industrial policy is named as the very inward looking industrial policy. It was the 1991 which has looked for the very outward looking industrialization model, which was well argued by Todaro, Pangaria, Jagdish Bhagwati and many other economists.

And a major part of that industrial policy was well supported by the trade liberalization adopted by India after 1991.Import tariff were reduced, restrictions on export and import were downsized and at the same time, in the domestic industrial atmosphere also, the industries which were and the enterprises which were completely controlled by the government, government has started disinvesting and depending on the private sector.

Evolution of the MRTP act in 1990 which was the old act of 1969 and the government of India have implemented the new act of the competition and it came in 2002. We do had the new telecom policy announced in 1999 which has really worked on inviting the foreign direct investment and opening up the telecom sector for the private people, finding the new partners in the telecom services. At the same time, as a part of trade liberalization government of India do announce the export import policy and the very liberal set of FDI policy was also announced in different sectors. So, this is the general steps taken by the government in 1991 and after that.

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And we do find that the infrastructure in reformed India was taken more seriously compare to the infrastructure progress, infrastructure development in the pre reformed India. So, India realized the need of infrastructure development to attract and exploit growth opportunities, first time very seriously and at the same time with the growing urbanization and migration, it became more imperative for India to achieve new targets in the infrastructure.

PPP model being practiced in the roads, bridge and other urban infrastructure development. FDI in many infra projects became easy and government do played a very important role as a new partner in facilitating the infrastructure projects and it has reduced the restrictions in many sub-sectors of infrastructure.

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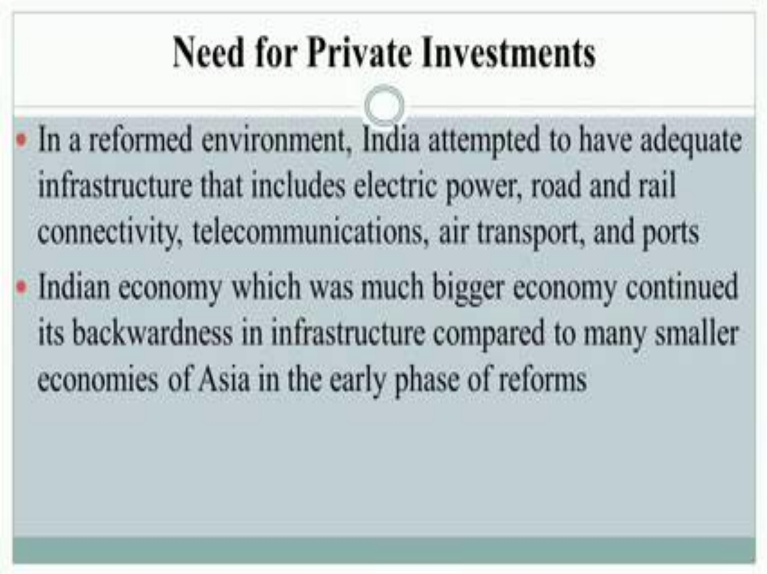

So, the need for private investment was realized, because 1991 was the year when government in India and government in many developing countries were started thinking to come out from the producer of many goods and services. And they were really started looking for the partners in production of varieties of infrastructure and varieties of manufacturing activity. So, in a reform environment, India attempted to have adequate infrastructure that includes electric power, road and rail connectivity, telecommunication, air transports and ports.

And Indian economy which was much bigger economy continued its backwardness in infrastructure compared to many smaller economies of Asia in the early phase of reforms.

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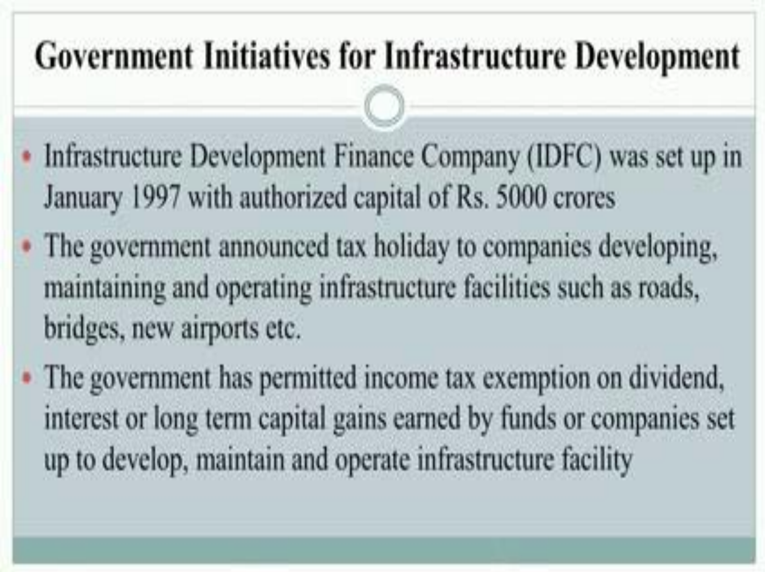

So, government initiatives for infrastructure development may be summarized, as the Infrastructure Development Finance Company was set up in January 1997 with authorized capital of 5000 crores. The government announced tax holiday to companies developing, maintenance and operating infrastructure facilities such as roads, bridges, new airports, etc.

The government has permitted income tax exemption on dividend, interest or long term capital gains earned by funds or companies set up to develop, maintain and operate infrastructure facility. So, these are the policy announcement, policy support which was very much practical for infrastructure development in the post reform India.

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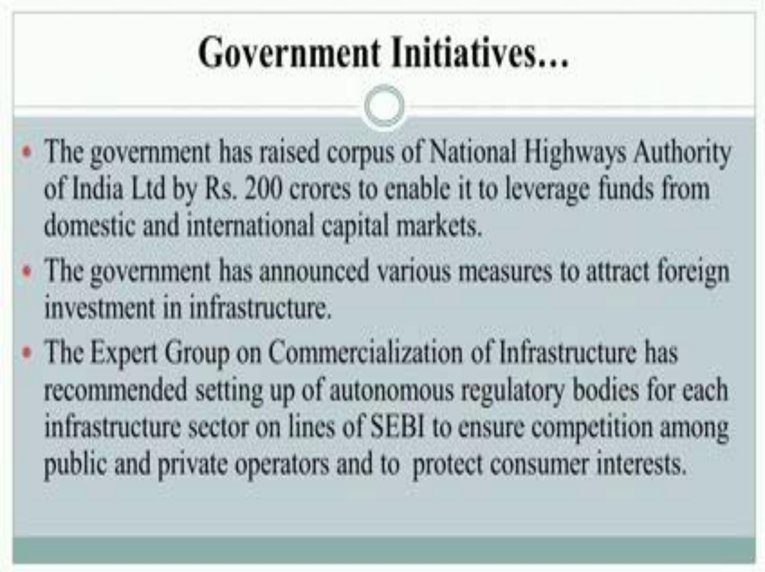

At the same time, we also found that the government has raised corpus of National Highways Authority of India Limited with 200 crores to enable it to leverage funds for domestic funds and international capital markets. The government has announced various measures to attract foreign investment in infrastructure. The Expert Group on Commercialization of Infrastructure has also recommended for setting up of autonomous regulatory bodies for each infrastructure sector on lines of SEBI to ensure competition among public and private operators and to protect consumer interest.

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So, railways which was one of the main sector for public investment and till today we found that it is a sector which has really protected by the government. It has been the major means of transportation of passengers as well as the freight in the country that needs modernization and capacity building. So, private participation is now allowed more recently in railways, since the opening of FDI in rail transport in 2014, no specific investment proposed has been received till now, but the private investment worth approximately 10,000 crore have been committed for 19 projects under different models.

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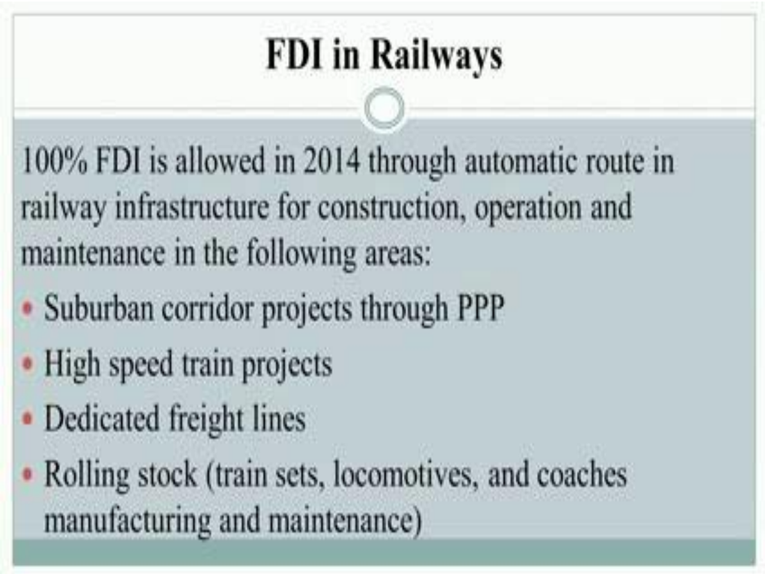

So, 100 percent FDI is allowed in 2014 through automatic route in railway infrastructure for construction, operating and maintenance in the following area: Suburban corridors projects through PPP, high speed train projects, dedicated freight lines and rolling a stock train sets, locomotives and coaches manufacturing and maintenance.

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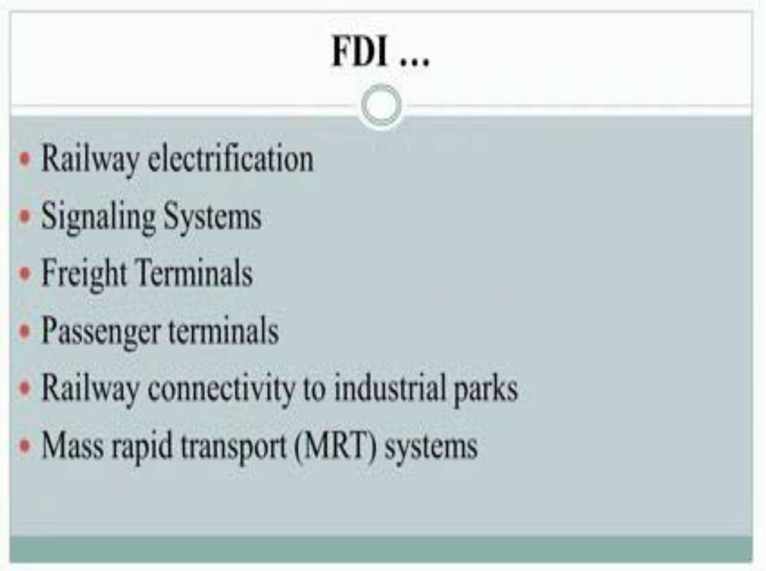

Railway electrification, signaling system, freight terminals, passengers terminals, railway connectivity to industrial parks, mass rapid transports, where the areas where FDI were allowed.

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Railway Route Electrified

Year	Total Route kms	Route Kms Electrified
1990-91	62367	9968
2000-01	63028	14856
2005-06	63332	17907
2006-07	63327	17786
2007-08	63273	18274
2008-09	64015	18559

Source: Indian Railways Civil Engineering Portal

In terms of railway route electrification, in the reform period, we do find that the route which is electrified was 18,559 in 2008-2009, which was only 9,968 in 1990-1991 at the time of economic reforms. So, we can say that in 20 years time, around 20 years time

India has achieved just double growth in terms of electrification of routes in terms of kilometers.

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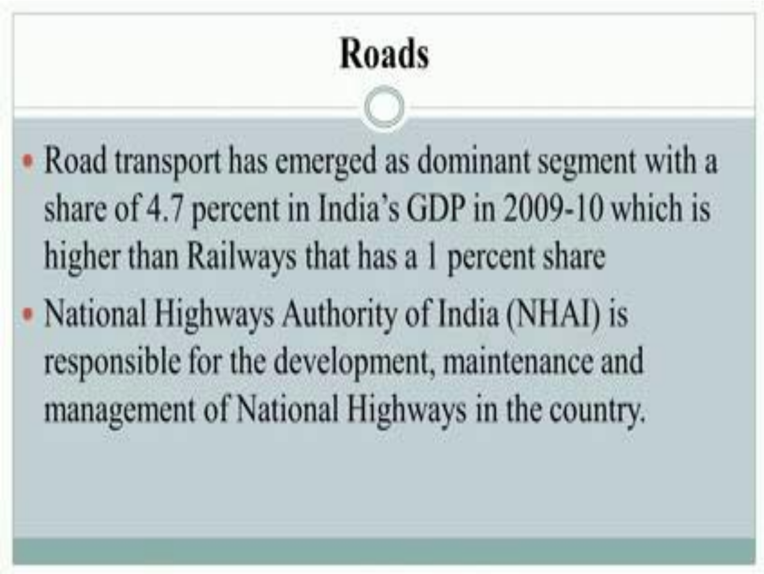

In terms of roads, road transport has emerged as dominant segment with a share of 4.7 percent in India GDP in 2009-2010, which is higher than the railway that has 1 percent share. So, the national highway authority of India is responsible for the development, maintenance and management of national highway in the country as I have also presented a cases study of National Highway Authority of India in my previous lecture.

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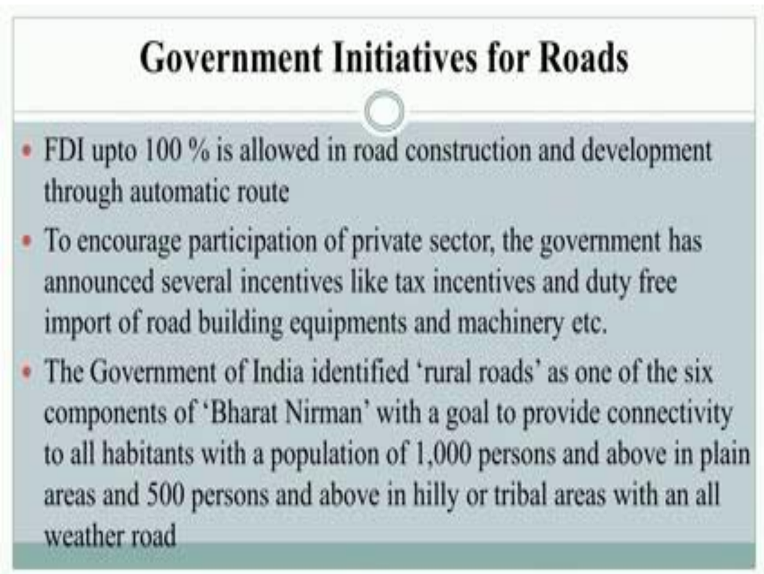

So, government initiatives were also well supported for this type of road construction activity. FDI up to 100 percent is allowed in road construction and development through automatic route. To encourage participation of private sector, the government has announced several incentives like tax incentives and duty free import of road building equipments and machinery, etc.

Government of India identified rural roads as one of the six components of Bharat Nirman with a goal to provide connectivity to all habitants with a population of 1,000 persons and above in plain areas and 5 persons and above in hilly or tribal area with an all weather roads.

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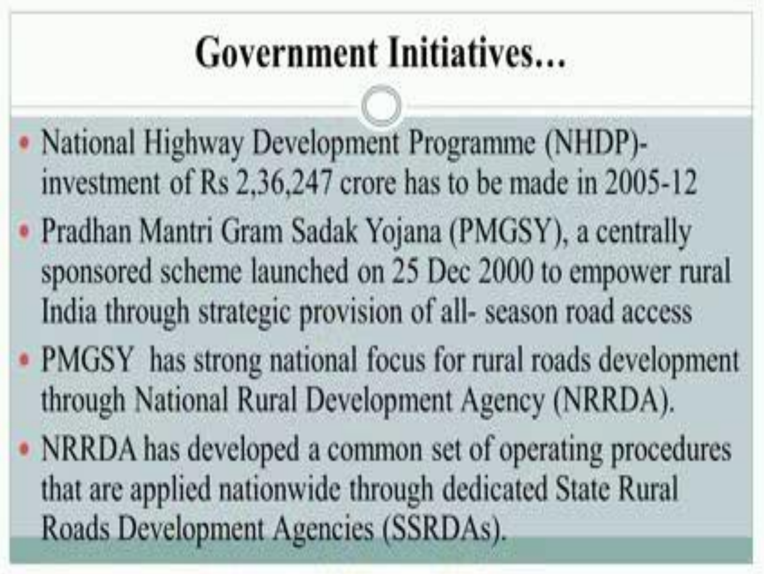

National Highway Development Program, the investment was 2,36,247 crore was made between 2005 to 2012. Pradhan Mantri Gram Sadak Yojana, a centrally sponsored scheme launched in 2000 to empower rural India through a strategic provision of all season road access. Pradhan Mantri Gram Sadak Yojana has strong national focus for rural roads development through National Rural Development Agency and National Rural Development Agency has developed a common set of operating procedures that are applied nationwide through dedicated State Rural Roads Development Agency.

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Development of Road Network in India

Roads	1991	2001	2011
National Highways	33650	57737	70934
State Highways	127311	132100	163898
Rural Roads	1260430	1972016	2749805
Urban Roads	186799	252001	411840

Source: Ministry of Road Transport & Highways , Govt. of India , 2012 figures in Kms

Development of road networks if one can compare between the initiation of economic reform process in 1991 and the development by 2011 we find out the national highway has reached to the level of 70,934 a state highways… 1,63,898 and the rural roads… 27,49,805, while the urban roads are being constructed has reached to the level of 4,11,840 in the year of 2011 which was hardly 1,86,799 at the time of economic reforms in 1991.

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Roads at Present

Roads	Length in Kms
Expressways	200
National Highways	92,851.07
State Highways	1,31,899
Major District Roads	4,67,763
Rural and Other Roads	26,50,000
Total Length	33 Lakhs (Approx.)

Source: NHAI, Ministry of Road Transport & Highways, Govt. of India, 2015

In terms of express ways around 200 length in kilometers, were developed as the express ways, national highway as discussed 92,851 kilometers, a state highways 1,31,899 kilometer, major district roads 4,67,766 and total length is 33 lakhs approx which is the current, which is the present scenario in the road.

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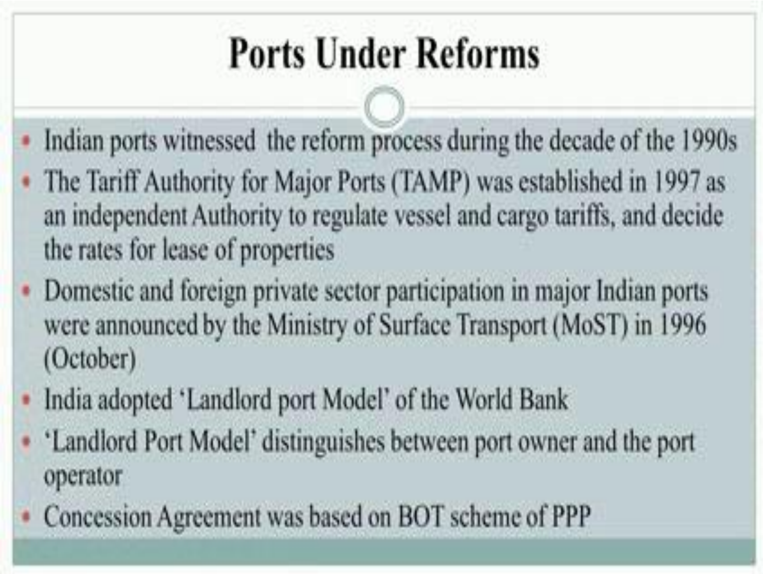

In terms of ports under reforms Indian ports witnessed the reform process during the decade of the 1990's. The tariff authority for major ports was established in 1997 as an independent authority to regulate vessel and cargo tariff and decides the rates of the lease of the properties. Domestic and foreign private sectors participation in major Indian ports were announced by the ministry of surface transport in 1996.

India adopted landlord port model of the World Bank which I have also discussed during my previous presentation. So, this is distinguishes between the port owner and the port operator. Concession agreement was based on the BOT scheme of the POP in the port sector.

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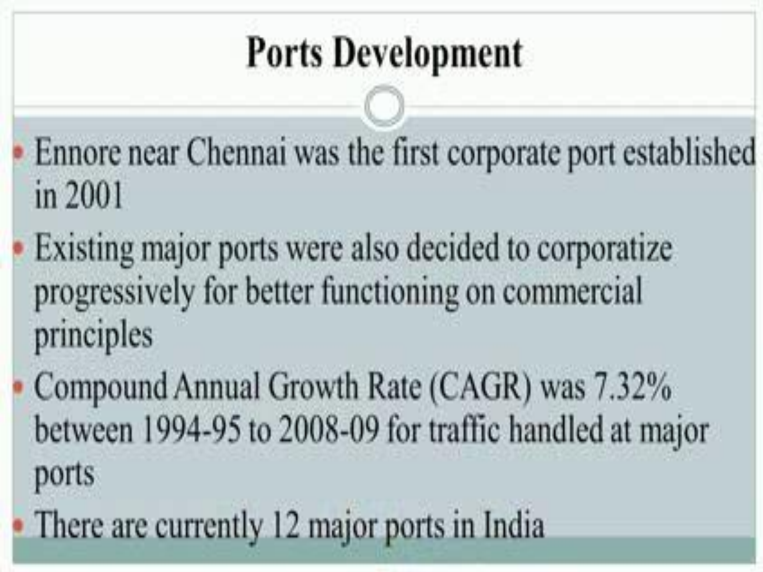

So, Ennore near Chennai was the first corporate port established in 2001. Existing major ports were also decided to corporatize progressively by better functioning on the commercial principles. Compound annual growth rate was 7.3 percent between 1994 to 1995 to 2008-2009 for the traffic handled at major ports. There are currently 12 major ports in India.

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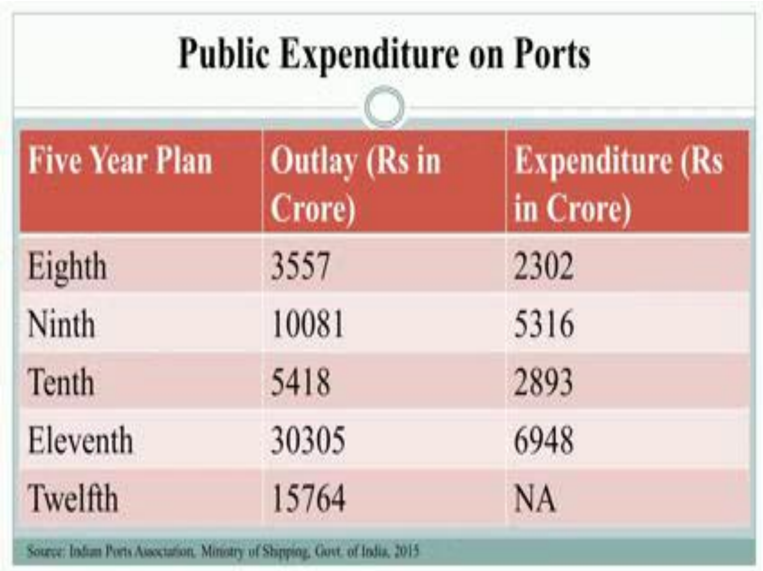
Public Expenditure on Ports

Five Year Plan	Outlay (Rs in Crore)	Expenditure (Rs in Crore)
Eighth	3557	2302
Ninth	10081	5316
Tenth	5418	2893
Eleventh	30305	6948
Twelfth	15764	NA

Source: Indian Ports Association, Ministry of Shipping, Govt. of India, 2015

In terms of public expenditure the eighth plan had 3557 crore rupees as the outlay while the expenditure was 2302 crores rupees, in ninth plan around 5316 crore rupees was the expenditure. At the same time in the tenth plan 2893 crore rupees was the expenditure on ports development, in eleventh plan 6948 while in the twelfth plan 15764 crore rupees was allotted for the ports development.

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Traffic Handled by Ports in India

Ports	1994-95	1998-99	2014-15
Major Ports	197.26	251.70	581.33
Minor Ports	18.41	35.66	471.19
Total	215.67	287.36	1052.52

Source: TERI, New Delhi — in million tonnes

Traffic handled by the ports in India has also shown a quite improved data, major ports which were having around 200 traffic, now it has increased to the 581, while the minor ports which was handling 18, now it has increased to 471.

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Civil Aviation Policies

- Open Sky Act-1990
- Airports Authority of India (AAI)Act- 1994
- Private Scheduled Airline Operators Permitted-1995
- Entry of low cost carriers-2003
- Major Mergers Initiated-2007

So, in case of civil aviation policy, Open Sky Act 1990, Airport Authority Of India Act 1994, private scheduled airline operators was permitted in 1995, entry of low cost carriers introduced in 2003 and major mergers initiated in 2007.

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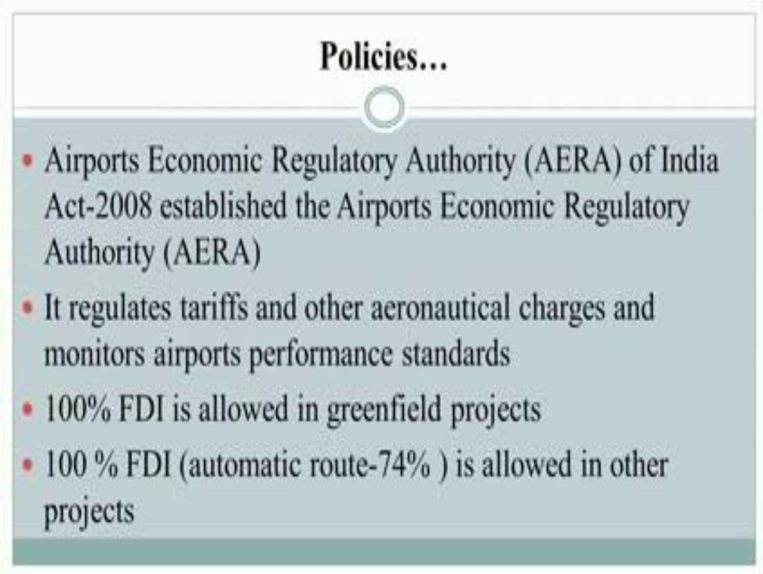

Airports Economic Regulatory Authority of India Act, 2008 established the Airports Economic Regulatory Authority; it regulates tariffs and other aeronautical charges and monitors airport performance standards. 100 percent FDI is allowed in Greenfield projects and at same time 100 percent FDI is also allowed in other projects. Automatic route is 74 percent.

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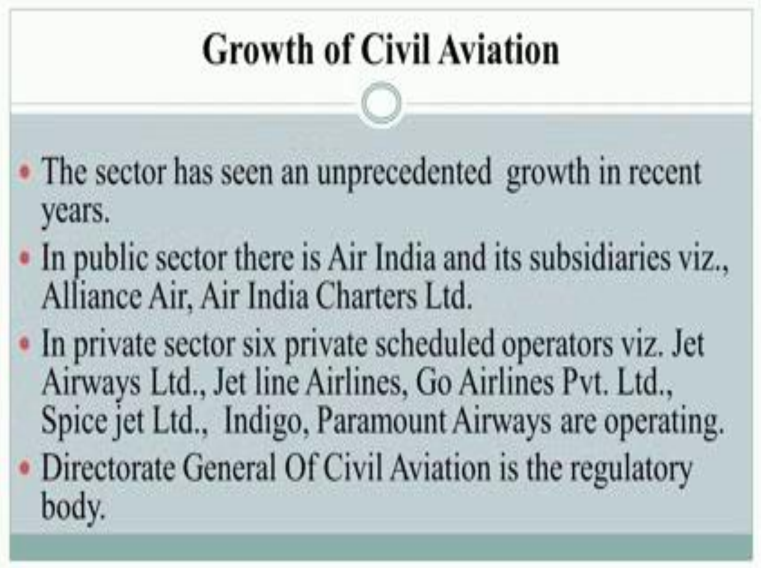

The sector has been an unprecedented growth in recent years, in public sector there is Air India and it is subsidiaries like Alliance Air and Air India Charters Limited. In private sectors six private scheduled operators, such as Jet Airways, Jet Line, Go Air, The Spice Jet, Indigo, Paramount Airways are operating. Directorate general of civil aviation is the regulatory body in the civil aviation sector.

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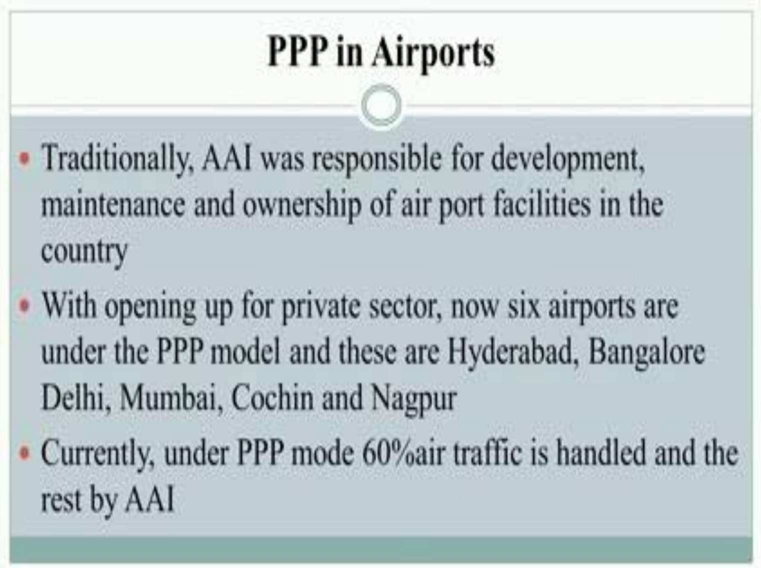

Traditionally AAI was responsible for development maintenance and ownership of airport facilities in country. While opening of the private sector, now six airports are under the PPP mode and these are Hyderabad, Bangalore, Delhi, Mumbai, Cochin and Nagpur. Currently under PPP mode, 60 percent air traffic is handled and rest is by the Airport Authority of India.

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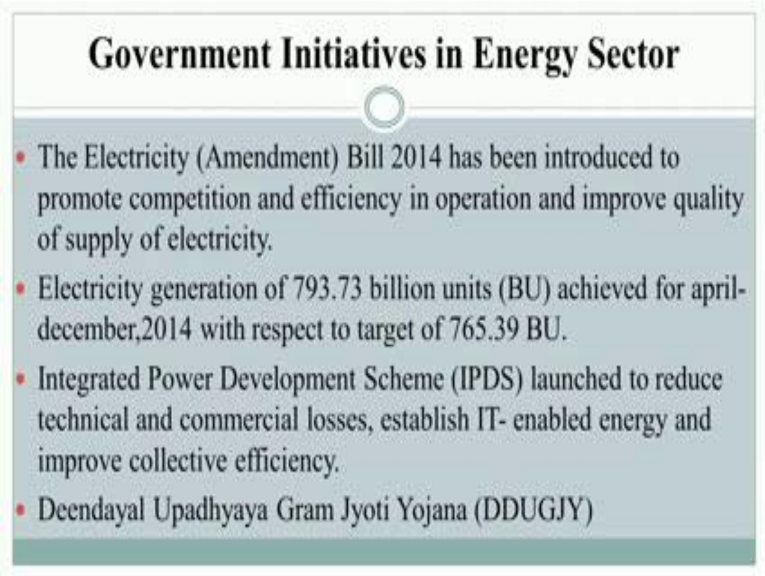

Government initiated in energy sector, the 2014 has been introduced to promote competition and the efficiency in the operation and improving the quality of supply of electricity. Electricity generation of 793.73 billion units achieved for April to December 2014 with respect to the target 765.39 billion units. Integrated Power Development Schemes launched to reduce technical and commercial losses, which establishes IT enabled energy and improve collective efficiency.

Deendayal Upadhyaya Gram Jyoti Yojana was also launched. So, National Mission on Energy Efficiency to improve energy efficiency in all areas of the economy including transport, urban housing, consumer goods and industries.

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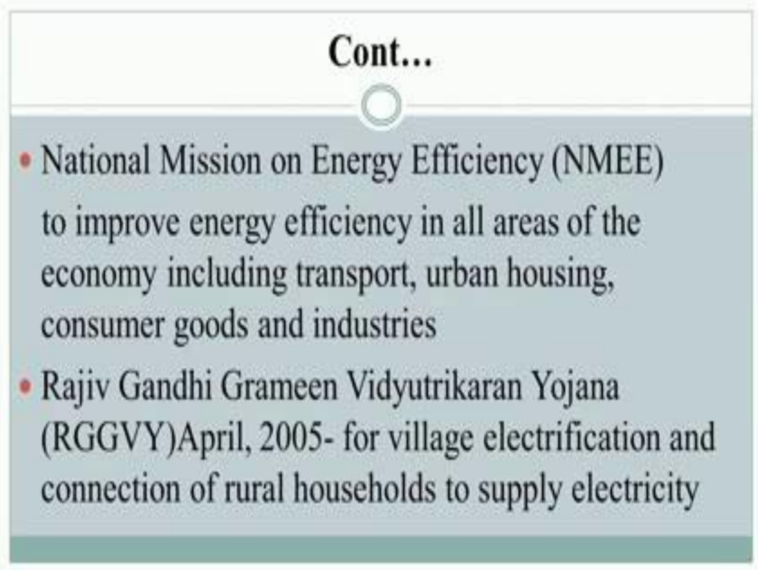

And the Rajiv Gandhi Grameen Vidyutrikaran Yojana April, 2005 for village electrification and connection of rural households to supply electricity was also one of the prime program which has enhanced the electricity consumption in the rural area.

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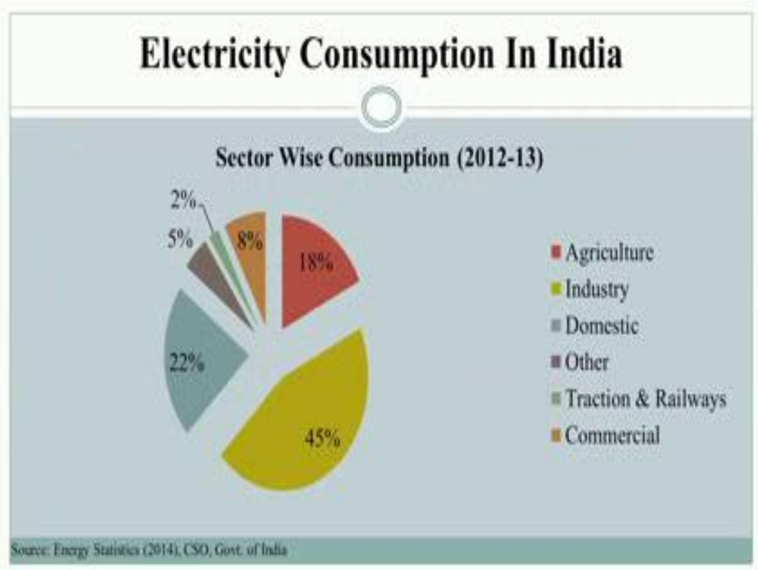

If one can see here the state wise consumption of electricity in India, it is the commercial sector and the industry which really consumes more electricity. Agriculture do consume 18 percent of the electricity and that shows that backwardness of agriculture in terms of electricity consumption.

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Household Energy Access (%)

Energy Source	2004-05			2009-10		
	Rural	Urban	Total	Rura l	Urban	Total
Electricity	54.9	92.3	65.2	67.3	93.9	75.5
LPG	8.6	57.1	21.9	15.5	66.2	31.2

Source: XIIth Five Year Plan, Planning Commission, Govt. of India

In case of household energy consumption, the electricity the percentage of electricity is 75.5 percent in total while the LPG is 31.2 percent as a part of household energy access in 2009-2010. We find out there is a slight improvement in the LPG access, energy access, 8.7 percent in rural and 57.8 percent in urban which has improved from 8 percent to 15.5 percent in rural and 66.2 percent in urban.

So, we find here that there are certain challenges in the energy sector India is the fourth largest consumer of energy in the world. Due to limited production it depends on the imports. Meeting energy requirements at affordable price is a major challenge. Over 70 percent of electricity generated from coal based power plants.

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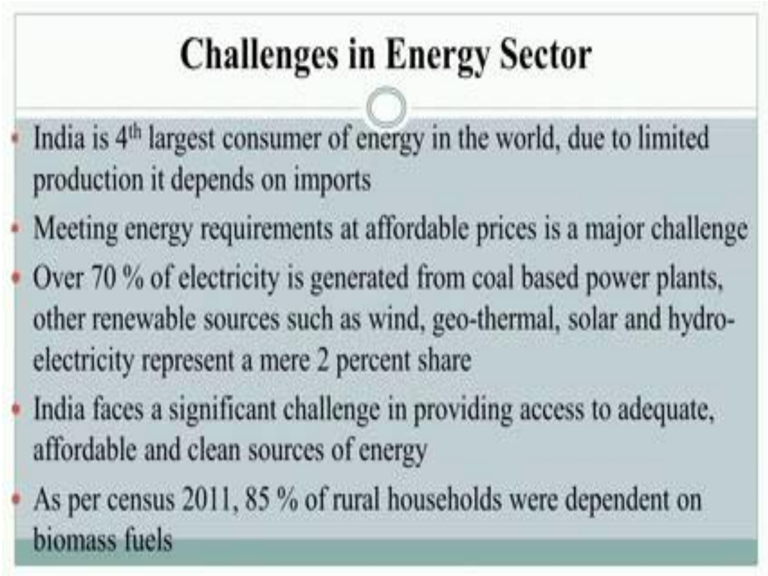

And India faces a significant challenge in providing access to adequate affordable and clean sources of energy. As per census 2011, 85 percent of rural households were dependent on biomass fuel.

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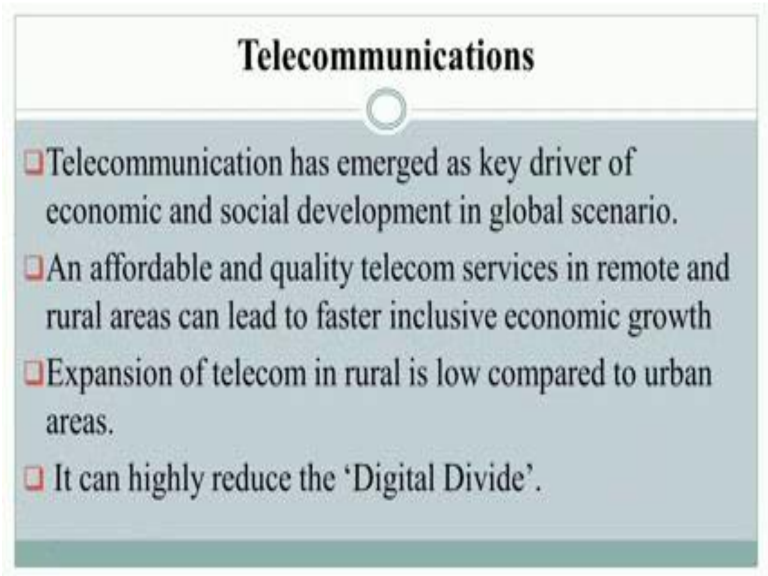

In case of telecommunication which is emerged as the key driver of economic and social development in global scenario.

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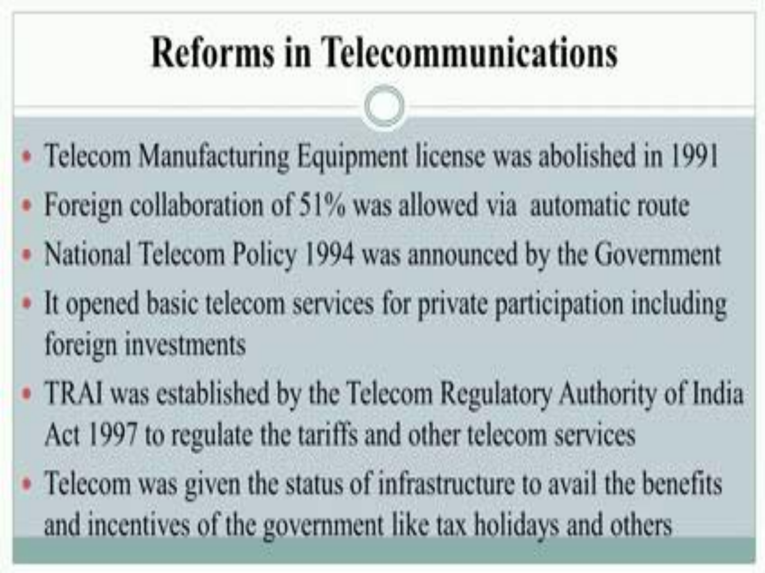

We find here that there are reforms in telecommunication. Telecom manufacturing equipment license was abolished in 1991. Foreign collaboration of 51 percent was allowed via automatic route. National Telecom Policy 1994 was announced by the government, it opened basic telecom services for private participation including foreign investment.

TRAI (Telecom Regulatory Authority of India) was also established by the Telecom Regulatory Authority of India Act 1997 to regulate the tariff and other telecom services. Telecom was given the status of infrastructure to avail the benefits and incentives of the government like tax holidays and others.

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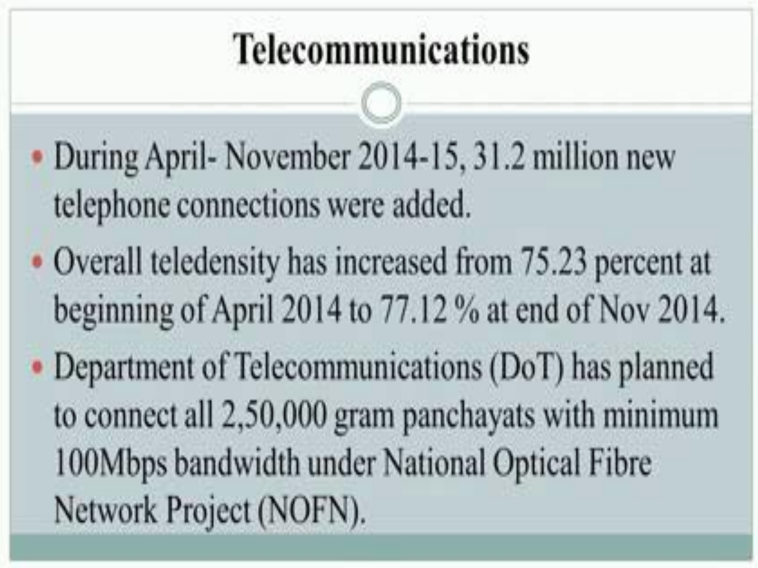

So, during April-November 2014-2015 we found that 31.2 million new telephone connections were added. Overall Tele density has increased from 75.23 percent at the beginning of April 2014 to 77.12 at the end of November 2014. These are the new data which shows the growing Tele density. Department of Telecommunication has planned to connect all 2,50,000 gram panchayats with minimum 100Mbps bandwidth under the National Optical Fiber Network Project. And India has really in case of digital, in case of Tele density, it has improved a lot not only from the period of independence, but also from the beginning of economic reforms in1991.

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Growth of subscribers one can see here in 2009 it was 429 million which has now reached to the new level and now around plus 90 million people are having the telephone connectivity plus 90 crore population is having the telephone connectivity. To conclude after the reforms, India has allowed private participation in different sectors for the development of infrastructure. There is wide variation in private investment in different sectors, some sectors like ports, roads and telecom has been the more attractive compared to other sectors of physical infrastructure.

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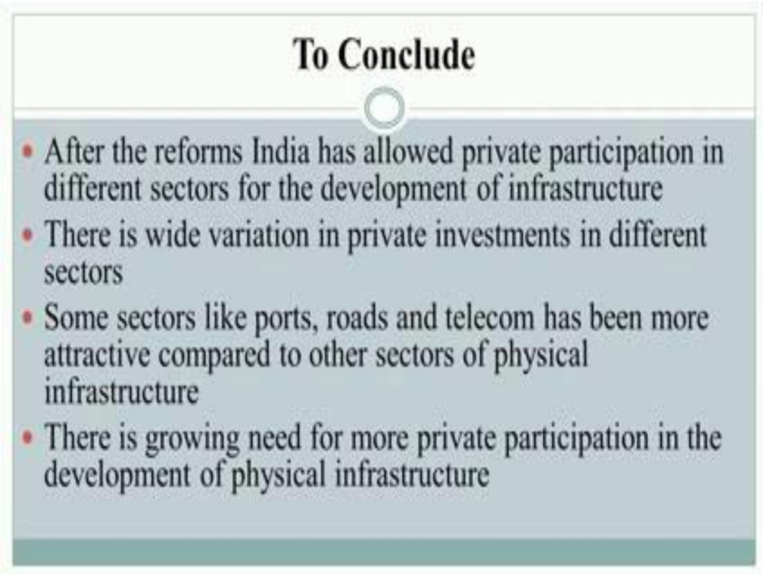

And this shows that how there is a growing need for more private participation in the development of physical infrastructure. To sum up the entire discussion, one can only say that in the past few years after the economic reforms we do have new sources of investments from the FDI from FII and we have different models of implementation in the infrastructure sector. But, at the same time we do not find a proper equilibrium in the investment in different sectors.

So, when we are moving ahead in case of infrastructure development the past lessons are very important to understand and like a good example of telecommunication, we do have to set the new examples in electricity, we do have to set the new examples in roads and ports and other infrastructure sector. I hope this discussion will give you a wide range of idea that how economic reforms which was supported and added by the government policy in different sectors has really made India a new India and improved India, a reformed India and which is now ready to get some more funds, some more facilities in infrastructure development.

Thank you.