

## CHAPTER 8

### INFRASTRUCTURE

*The performance of infrastructure sectors during April-December, 1991 shows mixed trends. While energy, railways, and shipping exceeded their respective targets, the performance in the coal and telecommunications sectors fell short of the respective targets and the petroleum sector performed poorly, the production being lower than the level achieved last year. However, in the background of a general slowdown in industrial production, infrastructure sectors have registered an encouraging trend. The trend of falling growth rates of the previous two years shows signs of being reversed in the current year.*

*During April-December, 1991, coal production and despatches increased by 10.9 per cent and 10.5 per cent, respectively. However, pithead stocks rose by 21 per cent reemphasising the need for faster loading and movement arrangements. Power generation increased by 9 per cent. Thermal and nuclear power generation increased by 10.8 per cent and hydel generation by 4.2 per cent. The average plant load factor improved from 52.0 per cent to 53.4 per cent. The production of crude oil declined from 24.71 m.t. to 22.97 m.t. Total refinery crude throughput declined by 0.45 m.t. and capacity utilisation of refineries by 1.8 per cent. However, the consumption of petroleum products increased by 1.8 per cent over the same period last year.*

*The freight traffic carried by the railways during April-December, 1991 increased by 7.6 per cent over the corresponding period last year. The major ports handled 114.1 m.t. of cargo which was 3.3 per cent higher than the cargo handled last year. During 1991-92, the available seat kilometres and passenger kilometres deployed by Air-India are expected to show a modest increase of 4.2 per cent and 1.5 per cent, respectively. Indian Airlines is also expected to register a modest increase in its traffic during the year. The share of road traffic in total passenger and freight traffic is expected to be maintained at 80 per cent and 50 per cent, respectively.*

*The net telephone switching capacity added and net telephone connections provided were below targets but substantially higher than the achievement in the corresponding period last year.*

*Besides increasing the domestic production of crude oil, the other important areas in the infrastructure sectors requiring urgent and effective steps would include improved planning and management practices to avoid time and cost overruns, better inter-sectoral coordination, particularly in the working of the railways, coal and power sectors and for effecting an improvement in physical efficiency, productivity, capacity utilisation and quality of output. The potential for overall growth in the industrial sector is crucially dependent on continuing adequacy of investment and performance in the infrastructure industries.*

#### Introduction

The performance of infrastructure sectors during April—December, 1991 shows mixed trends. However, in the background of a general slow down in industrial production, infrastructure sectors have registered an encouraging trend. The following table shows trends in the performance of infrastructure sectors.

#### ENERGY

##### Coal

8.2 Coal production during 1990-91 recorded an increase of 5.4 per cent over the production in 1989-90. The production level achieved was, however, below

the target both in Coal India Ltd. (CIL) and Singareni Collieries Company Ltd. (SCCL), which together account for most of the coal production in the country. While in CIL, coal production was marginally below the target by 2.2 per cent, SCCL's production fell short of the target by 21.2 per cent. Performance in SCCL was adversely affected by unfavourable industrial relations and law and order problems.

8.3 CIL improved its productivity in terms of output per man-shift (OMS) during 1990-91. It achieved an overall OMS of 1.31 tonnes against 1.21 tonnes in 1989-90. The OMS in SCCL during the year was 0.96 tonnes compared to 0.99 tonnes in 1989-90.

8.4 Coal production during the period April—December, 1991 has been 153.76 million tonnes

TABLE 8.1  
Trends in the Performance of Infrastructure Sectors

Item	Unit	1988-89	1989-90	1990-91†	April-December‡		Percentage change		
							1989-90	1990-91	1991-92*
					1990-91	1991-92	1988-89	1989-90	1990-91
1	2	3	4	5	6	7	8	9	10
<b>Energy</b>									
<b>1. Coal</b>									
(a) Production . . .	Mn. tonnes	194.60	200.89	211.73	138.59	153.76	3.2	5.4	10.9
(b) Pit-head stocks (year-end) . . .	„	33.97	37.43	42.88	28.68	34.69	10.2	14.6	21.0
(c) Despatches . . .	„	184.02	191.93	201.07	142.78	157.71	4.3	4.8	10.5
<b>2. Electricity generated (Utilities only) . . .</b>									
	Bn. kwh	221.4	245.4	264.6	194.0	211.4	10.8	7.8	9.0
(a) Hydel . . .	„	57.9	62.1	71.7	54.5	56.8	7.3	15.5	4.2
(b) Thermal (incl. nuclear) . . .	„	163.5	183.3	192.9	139.5	154.6	12.1	5.2	10.8
<b>3. Petroleum</b>									
(a) Crude oil production . . .	Mn. tonnes	32.04	34.09	33.02	24.71	22.97	6.4	-3.1	-7.0
(b) Refinery throughput . . .	„	48.80	51.94	51.77	38.36	37.54	6.4	-0.3	-2.1
<b>Transport and communications</b>									
<b>1. Railways revenue earning goods traffic . . .</b>									
	„	302.05	309.97	318.40	227.79	244.91	2.6	2.7	7.6
<b>2. Cargo handled at major ports . . .</b>									
	„	146.43	148.14	152.55	110.49	114.13	1.2	3.0	3.3
<b>3. Telecommunications—new telephone connections provided (DELS) . . .</b>									
	'000 Nos.	374.94	416.22	485.76	174.56	277.62	11.0	16.7	59.0
£ Provisional									* April-December

(m.t.) compared to 138.59 m.t. in the corresponding period last year, recording an increase of 10.9 per cent. Total coal despatches during the period stood at 157.71 m.t. which were 10.5 per cent higher compared to the same period last year. Despite higher despatches, total pit-head stocks stood at 34.69 m.t. as on 31-12-1991 registering an increase of 21.0 per cent over the pit-head stocks as on 31-12-1990. This re-emphasises the need to have adequate arrangements for faster loading and movement.

#### Lignite

8.5 Production of lignite in Neyveli Lignite Corporation (NLC) at 11.76 m.t. in 1990-91 was 6.9 per cent higher than the target. Trends in production of lignite continued to be good during April—December, 1991. Production from NLC during this period was 9.01 m.t. against the target of 8.87 m.t. NLC has

also recorded significant achievements in the field of power generation and is functioning as the nodal agency for exploration of lignite deposits in Rajasthan, Gujarat and J&K.

#### Projects

8.6 During April—December, 1991, 27 projects costing Rs. 100 crores and above were under implementation. Of these, 21 projects were in the coal sector and 6 in the lignite sector. Second Mine Expansion stage II project in the lignite sector has been completed in the month of December, 1991. The implementation of 9 projects has been delayed in the coal and lignite sector due to problems relating to land acquisition, rehabilitation of land oustees as well as supply of equipment by local manufacturers (Table 8.3).

TABLE 8.2  
Trends in the Coal Sector

(Million tonnes)

Sl. No.	Item	1988-89	1989-90	1990-91£	April-December£		Percentage change			
							1989-90	1990-91	1991-92*	
					1990-91	1991-92	1988-89	1989-90	1990-91	
1	2	3	4	5	6	7	8	9	10	
1.	<b>Production</b>									
	(i) CIL . . . . .	171.50	178.62	189.64	122.81	136.05	4.2	6.2	10.8	
	(ii) SCCL . . . . .	18.61	17.80	17.71	12.51	14.32	-4.4	-0.5	14.5	
	(iii) Others . . . . .	4.49	4.47	4.38	3.27	3.39	-0.4	-2.4	3.7	
	<b>Total</b> . . . . .	<b>194.60</b>	<b>200.89</b>	<b>211.73</b>	<b>138.59</b>	<b>153.76</b>	<b>3.2</b>	<b>5.4</b>	<b>10.9</b>	
2.	Pit-head stocks (year-end) . . . . .	33.97	37.43	42.88	28.68	34.69	10.2	14.6	21.0	
3.	Despatches . . . . .	184.02	191.93	201.07	142.78	157.71	4.3	4.8	10.5	
4.	Lignite (Production) . . . . .	12.40	12.60	13.77	8.63@	9.01@	1.6	9.3	4.4@	

£ Provisional                      \* April-December                      @ Production of Neyveli Lignite Corporation only

**Electricity**

8.7 Total electricity generation (total utilities in terms of hydel, thermal and nuclear) at 264.6 billion kwh recorded a growth of 7.8 per cent during 1990-91 but fell short of the target by 2.6 per cent.

8.8 Thermal power generation during 1990-91 increased by 4.5 per cent, hydel generation by 15.5 per cent and nuclear power generation by 32.6 per cent. Thermal generation fell short of the target by 7.4 per cent mainly due to loss of generation because of short supply of coal. The other reasons which contributed to the shortfall were low system demand due to excess hydro generation resulting in reduction of irrigation load and for keeping some units under shut-down due to shortage of funds. Low

PLF in some of the States also contributed to shortfall in thermal generation. Hydro generation was 13.5 per cent more than the target and nuclear power generation 8.8 per cent below the target due to problems in nuclear power reactors.

8.9 Total generation of power in April-December, 1991 was 211.4 billion kwh compared to 194 billion kwh during the same period last year showing a growth of 9 per cent. Hydel power generation at 56.8 billion kwh increased by 4.2 per cent. The thermal (including nuclear) sector at 154.6 billion kwh has registered a growth of 10.8 per cent compared to the same period, last year.

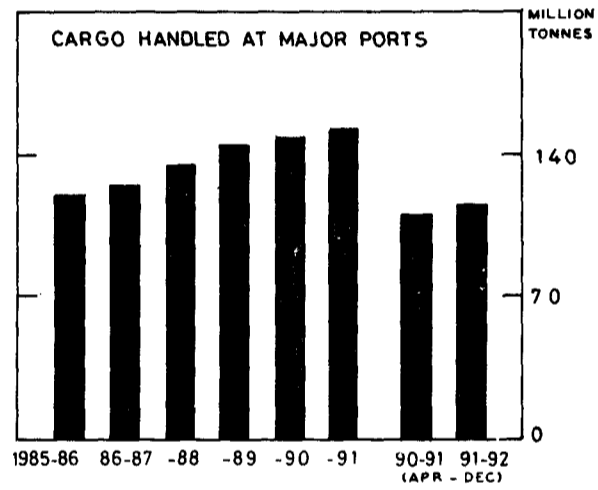
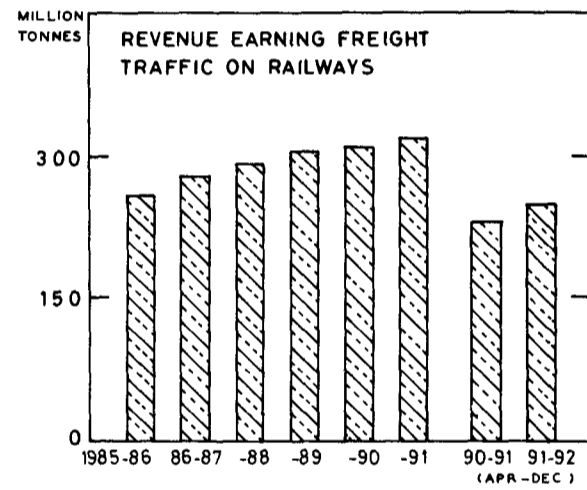
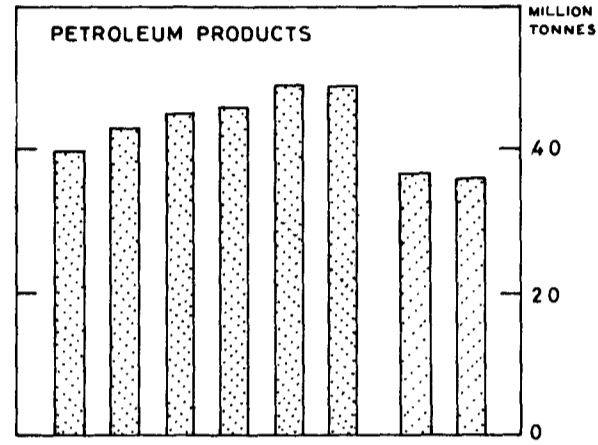
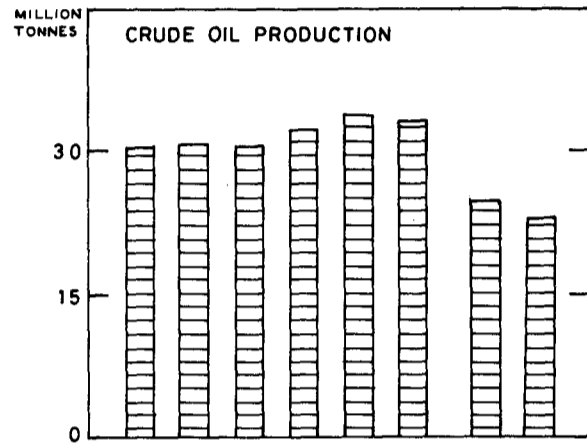
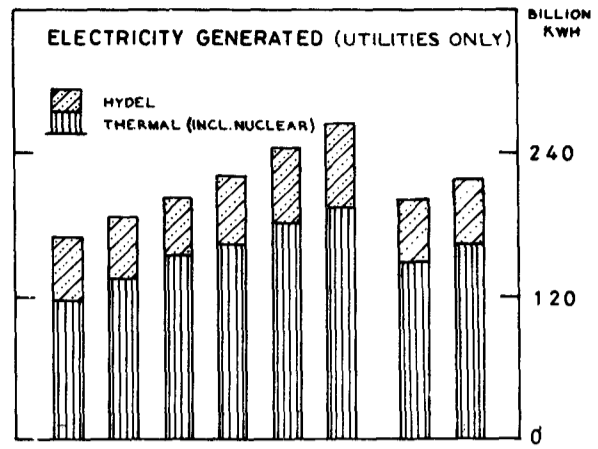
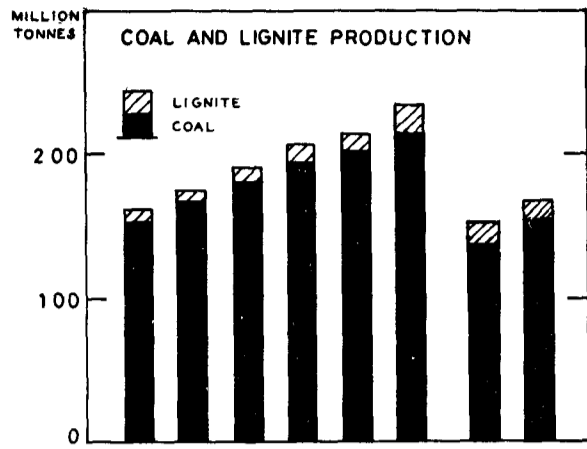
8.10 Trends in the power sector (utilities only) are shown in the following table.

TABLE 8.3  
Trends in the Power Sector (Utilities only)

Sl. No.	Item	1988-89	1989-90	1990-91£	April-December£		Percentage change		
							1989-90	1990-91	1991-92*
					1990-91	1991-92	1988-89	1989-90	1990-91
1	2	3	4	5	6	7	8	9	10
1.	<b>Power generation (Billion kwh)</b> . . . . .	<b>221.4</b>	<b>245.4</b>	<b>264.6</b>	<b>194.0</b>	<b>211.4</b>	<b>10.8</b>	<b>7.8</b>	<b>9.0</b>
	(i) Hydro-electric . . . . .	57.9	62.1	71.7	54.5	56.8	7.3	15.5	4.2
	(ii) Thermal (incl. nuclear) . . . . .	163.5	183.3	192.9	139.5	154.6	12.1	5.2	10.8
2.	Plant Load Factor of thermal plants (per cent) . . . . .	55.0	56.5	53.8	52.0	53.4	-	-	-

£ Provisional                      \* April-December

# PERFORMANCE OF INFRASTRUCTURE SECTORS



8.11 At present, thermal power contributes about 70.6 per cent of the total power generated. There has been continuous improvement in the performance of thermal power stations over the years. At the beginning of the Sixth Plan, the Plant Load Factor (PLF) of thermal power plants was 44.6 per cent. It increased to 50.1 per cent by 1984-85 and 56.5 per cent in 1987-88. The PLF of the thermal plants in 1990-91 was 53.8 per cent against the target of 56.1 per cent.

8.12 The Central sector PLF in 1990-91 was 58.1 per cent against 62.2 per cent in 1989-90. The PLF of the State sector was 51.3 per cent compared to 53 per cent during the previous year. The Private sector PLF during 1990-91 was 58.4 per cent compared with 69.5 per cent in 1989-90.

8.13 The Average PLF of the thermal plants during April—December, 1991, had improved to 53.4 per cent against 52 per cent in the same period last year. The PLF of Central sector units was 61.6 per cent against the target of 59.5 per cent. The PLF of NTPC improved to 66.2 per cent from the level of 58.8 per cent achieved in the corresponding period last year. Average PLF in the State sector plants at 48.9 per cent was lower than last year's level of 49.3 per cent. The States viz., West Bengal Power Development Corporation, Rajasthan, Maharashtra, Andhra Pradesh, Karnataka, Gujarat, Punjab, Delhi Electric Supply Undertaking and Tamil Nadu continued to maintain PLF at more than 50 per cent during April-December, 1991. Private utilities could maintain the PLF at 58.2 per cent against 61.2 per cent during the same period last year.

8.14 The Organisation-wise PLF targets and actual achievements during the year 1990-91 and April-December, 1991 are shown in the following table:

8.15 The target for additional capacity in 1990-91 was revised to 4212 MW. Against this, the actual capacity rolled/commissioned was 2776.5 MW, resulting in a shortfall in capacity addition of 1435.5 MW. During 1991-92, target for additional power generation capacity has been fixed at 3810.8 MW comprising 2586.5 MW for thermal, 754.3 MW for hydel and 470 MW for nuclear. During April-December, 1991 a capacity of 1090 MW comprising 763.5 MW for thermal, 91.5 MW for hydel and 235 MW for nuclear had been commissioned/rolled against the target of 2180 MW comprising 1326.5 MW for thermal, 383.5 MW for hydel and 470 MW for nuclear. The main reason for the shortfall in achieving target was failure to commission the additional generation capacity in the Hydro sector (Table 8.5).

TABLE 8.4

Organisation-wise Plant Load Factor : Targets and Actual Achievements during 1990-91 and April-December, 1991

Sl. No.	Board/Undertaking/ Sector	Plant load factor (Per cent)		
		1990-91 Actual	April—December, 1991	
			Target	Actual
1	2	3	4	5
<b>PLF above 50%</b>				
1.	West Bengal Power Development Corporation . . . . .	57.3	54.0	64.1
2.	Rajasthan State Electricity Board . . . . .	42.8	44.9	61.0
3.	Maharashtra State Electricity Board . . . . .	58.2	58.0	59.6
4.	Andhra Pradesh State Electricity Board . . . . .	65.8	68.9	57.0
5.	Karnataka Power Corporation . . . . .	76.3	77.7	55.1
6.	Gujarat State Electricity Board . . . . .	57.7	52.7	55.0
7.	Punjab State Electricity Board . . . . .	53.0	66.2	54.9
8.	Delhi Electric Supply Undertaking . . . . .	50.9	56.7	53.1
9.	Tamil Nadu State Electricity Board . . . . .	58.3	59.0	51.6
<b>PLF 40% to 50%</b>				
1.	Madhya Pradesh State Electricity Board . . . . .	52.7	53.5	46.9
2.	Uttar Pradesh State Electricity Board . . . . .	52.1	46.7	44.5
3.	Haryana State Electricity Board . . . . .	34.6	41.5	42.7
<b>PLF below 40%</b>				
1.	Uttar Pradesh Vidyut Utpadan Nigam . . . . .	—	30.7	36.6
2.	West Bengal State Electricity Board . . . . .	30.9	37.3	30.4
3.	Orissa State Electricity Board . . . . .	34.0	36.1	28.4
4.	Assam State Electricity Board . . . . .	27.7	30.4	24.3
5.	Durgapur Project Ltd. (DPL) . . . . .	24.5	25.7	20.4
6.	Bihar State Electricity Board . . . . .	24.0	32.2	20.4
<b>PLF of Central Sector (Total) . . . . .</b>		<b>58.1</b>	<b>59.5</b>	<b>61.6</b>
<b>PLF of Individual Units :</b>				
1.	Neyveli Lignite Corporation . . . . .	69.6	63.7	63.6
2.	National Thermal Power Corporation . . . . .	60.9	62.0	66.2
3.	Damodar Valley Corporation . . . . .	33.3	40.4	30.9
<b>PLF : Private Utilities (Total) . . . . .</b>		<b>58.4</b>	<b>63.8</b>	<b>58.2</b>

TABLE 8.5  
Power Generation Capacity Targets/Achievements

Sector	Commissioned/Rolled Actual 1990-91		Target 1991-92		April-December, 1991			
	No.	Capacity (MW)	No.	Capacity (MW)	Target		Commissioned/Rolled	
					No.	Capacity (MW)	No.	Capacity (MW)
Thermal . . . .	22	2331.0	24	2586.5	18	1326.5	6	763.5
Hydro . . . .	9	445.5	35	754.3	15	383.5	10	91.5
Nuclear . . . .	—	—	2	470.0	2	470.0	1	235.0
Total . . . .	31	2776.5	61	3810.8	35	2180.0	17	1090.0

### Petroleum

8.16 Production of crude oil during 1990-91 at 33.02 million tonnes fell short of the target of 35.90 million tonnes and was 3.1 per cent lower than the production of 34.09 million tonnes in 1989-90. The Oil and Natural Gas Commission (ONGC) produced 30.37 million tonnes of crude oil out of which 9.18 million tonnes was from the on-shore areas and 21.19 million tonnes from off-shore areas. The on-shore production by Oil India Limited (OIL) at 2.65 million tonnes in 1990-91 was 0.25 million tonnes short of the target.

8.17 The production of crude oil during April-December, 1991 was 22.97 million tonnes against 24.71 million tonnes achieved during the corresponding period last year. The shortfall in crude oil production during the current year is mainly due to the disturbed law and order condition in Assam and on account of technical reasons.

8.18 The production of natural gas in 1990-91 was 18 billion cubic metres. This was higher by 6.0 per cent compared to the production of 17 billion cubic metres during the previous year. The utilisation of natural gas during 1990-91 was 12.8 billion cubic metres compared to 11.2 billion cubic metres in 1989-90.

8.19 The production of natural gas during April-November, 1991 was 12.2 billion cubic metres which was 5.2 per cent higher than the production of 11.6 billion cubic metres in the same period last year. The utilisation of natural gas upto November, 1991 was 9.4 billion cubic metres compared to 8.2, billion cubic metres during the corresponding period last year.

8.20 Flaring of Natural Gas continues to cause considerable concern. However, this has been brought

down from about 17 million cubic metres per day a year ago to about 11 million cubic metres per day currently. Further, with the implementation of the Gas Flaring Reduction Project, the flaring of natural gas is expected to be eliminated in the Western Off-shore by 1995. Projects to install compressors and pipelines in the Gujarat region are also under implementation to eliminate flaring in the Western Off-shore region.

### Refinery Production

8.21 The total refinery crude throughput during 1990-91 at 51.77 million tonnes was marginally lower than 51.94 million tonnes achieved in 1989-90. The average capacity utilisation of all the 12 refineries was 99.8 per cent as compared to 100.2 per cent during the previous year.

8.22 The refinery crude throughput during April-December, 1991 at 37.54 million tonnes was marginally lower than the target of 37.99 million tonnes. The target of refinery crude throughput for 1991-92 is 51.65 million tonnes. The achievement upto end-December, 1991 works out to 72.7 per cent of the target. The capacity utilisation of the refineries during April-December, 1991 was 96.4 per cent compared to 98.2 per cent achieved in the same period last year.

8.23 The Government also attaches high priority for expanding the refining capacity in the country. The total refining capacity of the 12 refineries in the country at present stands at 51.85 MTPA. The creation of new refining capacity is sought to be achieved by expansion or de-bottlenecking of the existing refineries and by setting up new grassroot refineries which will lead to creation of additional refining capacity of about 8.2 million tonnes. It is esti-

ated that the total refining capacity in the country will go upto about 90 million tonnes per annum with the setting up of a number of new refineries during 8th and the 9th Plans period.

TABLE 8.6  
Trends in the Petroleum Sector

(Million tonnes)

Item	1988-89	1989-90	1990-91£	April—December£		Percentage change		
				1990-91	1991-92	1989-90	1990-91	1991-92*
						1988-89	1989-90	1990-91
1	2	3	4	5	6	7	8	9
1. Crude oil production	32.04	34.09	33.02	24.71	22.97	6.4	-3.1	-7.0
(i) On-shore	10.93	12.37	11.83	8.78	8.62	13.2	-4.4	-1.8
(a) ONGC	8.50	9.67	9.18	6.78	6.69	13.8	-5.1	-1.3
(b) OIL	2.43	2.70	2.65	2.00	1.93	11.1	-1.9	-3.5
(ii) Off-shore (ONGC)	21.11	21.72	21.19	15.93	14.35	2.9	-2.4	-9.9
2. Refinery through-put	48.80	51.94	51.77	38.36	37.54	6.4	-0.3	-2.1
3. Production of petroleum products	45.70	48.69	48.57	35.82	35.10	6.5	-0.2	-2.0
4. Natural gas (Bn. cub. metres)	13.22	16.98	18.00	11.59@	12.23@	28.4	6.0	5.5@

£ Provisional

\* April—December

@ April—November

## Imports

8.24 The Gross import of crude oil and petroleum products during 1990-91 at 29.36 million tonnes was 12.7 per cent higher than 26.05 million tonnes imported in 1989-90. The value of POL imports during 1990-91 is Rs. 10,779 crore against Rs. 6,344 crore during the previous year. The import of POL during April-December, 1991 was 23.35 million tonnes valued at Rs. 9,260 crore against the import of 20.47 million tonnes costing Rs. 7,089 crore during the same period last year. The import of crude oil and petroleum products during the current year is likely to be 32.8 million tonnes.

## Consumption

8.25 During 1990-91, consumption of petroleum products at 55.04 million tonnes showed moderate growth of 1.7 per cent over the previous year. The various demand management measures adopted by the Government in the wake of the Gulf War have helped to curtail the demand for POL during 1990-91. During April-December, 1991 consumption of petroleum products increased by 1.8 per cent over the same period last year. The demand for LPG and Bitumen have showed significant increase, while the demand for HSD and Petrol, has increased by 5.1 per cent and 1.7 per cent, respectively. There has been substantial reduction in the demand for ATF and LDO. It may, however, be added that the demand for petroleum products generally declines in the first half and picks up in the second half of the financial year.

TABLE 8.7  
Consumption of Petroleum Products@

(Million tonnes)

Item	1988-89	1989-90	1990-91£	April—December£		Percentage change		
				1990-91	1991-92	1989-90	1990-91	1991-92*
						1988-89	1989-90	1990-91
1	2	3	4	5	6	7	8	9
1. Light distillates	8.62	9.41	9.80	7.20	7.49	9.2	4.1	4.0
(a) Naphtha	3.36	3.35	3.45	2.50	2.55	-0.3	3.0	2.0
(b) LPG	1.96	2.27	2.42	1.77	1.92	15.8	6.6	8.5
(c) MOgas	3.05	3.49	3.55	2.65	2.70	14.4	1.7	1.9
2. Middle distillates	29.96	32.48	33.11	24.53	24.90	8.4	1.9	1.5
(a) Kerosene	7.73	8.24	8.42	6.21	6.18	6.6	2.2	-0.5
(b) Diesel oil	18.80	20.71	21.14	15.65	16.45	10.2	2.1	5.1
3. Heavy ends	11.52	12.20	12.13	8.88	8.93	5.9	-0.6	0.6
Fuel oil	8.46	8.82	8.99	6.64	6.69	4.3	1.9	0.8
Total	50.09	54.10	55.04	40.61	41.32	8.0	1.7	1.7

@ Excluding RBF

£ Provisional

\* April—December

### Conservation of Energy

8.26 Conservation of energy in different sectors has shown rapid increase in recent years. Commercial sources of energy which account for over 60 per cent of our total energy supply is likely to go up to 80 per cent in the next decade and a half. Of the commercial sources of energy, coal and lignite contribute about 56 per cent, oil and natural gas around 40 per cent, hydro-electric power about 3 per cent and nuclear power 1 per cent. With the widening of the gap between demand and supply, energy management through conservation of fuel in primary and secondary form and measures for demand management have assumed increasing importance. There is considerable scope for improving efficiency in use of different sources of energy. Bulk of electricity is consumed by energy-intensive industries in industrial sector like aluminium, iron and steel, textiles, chemicals, paper and collieries. Energy consumption per unit of product does not compare favourably with other countries. Similarly, transmission and distribution losses at around 23 per cent are much higher than about 6—12 per cent in other countries. There is evident need to reduce these losses and improve the energy efficiency of industrial sector.

8.27 In view of the imperative need to conserve petroleum products in the context of the rapidly increasing oil import bill, the Government has accorded high priority to the conservation of petroleum products. A variety of measures have been taken to promote conservation of petroleum products, covering transport, industry, agriculture and household sectors. These, *inter-alia*, include the adoption of measures and practices conducive to increased fuel-efficiency and training programmes in the transport sector; replacement of old and inefficient boilers and furnaces with efficient ones and promotion of fuel-efficient measures and equipment in the industrial sector; standardisation of fuel-efficient irrigation pump sets and rectification of existing pump sets to make them more energy efficient in the agricultural sector; and development as well as promotion of the use of fuel-efficient equipment and devices like kerosene and LPG stoves in the domestic sector. These activities are being promoted and co-ordinated through the Petroleum Conservation Research Association (PCRA), a registered society under the Ministry of Petroleum and Natural Gas.

8.28 Endeavours for conservation of petroleum products have been augmented further. New and inadequately covered areas of oil conservation and inter-fuel substitution have been identified and appro-

priate action in regard to these areas initiated. These efforts are expected to yield positive results. During 1991-92, the monetary equivalent of petroleum products conserved is estimated to be about Rs. 238 crore.

8.29 Another area where conservation is being attempted is the oil refineries themselves which also consume fuel in their operations. The refineries have been able to achieve savings in consumption by adopting measures to conserve fuel and reduce its losses and the saving during 1991-92 on this account is estimated to be about Rs. 130 crore.

8.30 An important dimension of the oil conservation efforts is the multi-media publicity campaigns launched to make the general public aware of the importance and urgency of the conservation of petroleum products. An Oil Conservation Week was observed from 7th to 13th January, 1991 throughout the country to disseminate this message. This gave new thrust to the ongoing efforts for oil conservation.

8.31 An Action Plan to produce and sell high grade lubricants to the extent of 2.50 lakh tonnes to replace lubricants of lower efficiency, in a phased manner, has been drawn up and the oil companies have started implementation of the Plan. This programme has an excellent potential for conservation of liquid fuels.

8.32 A programme has also been launched to replace the use of kerosene in the textile industry, substituting it with synthetic thickeners. It is proposed to achieve 40 to 50 per cent conservation of kerosene in this sector.

8.33 An Action Plan for the introduction of Compressed Natural Gas (CNG) as automotive fuel in the transport vehicles at selected locations in Assam, Tripura, Delhi, Bombay and Gujarat in a phased manner has been considered by the Government. The first phase of conversion of 220 petrol powered vehicles on experimental basis has been approved. Efforts have also been initiated to promote conservation of petroleum products in the sectors not covered adequately earlier, such as shipping, defence, civil aviation, unorganised road transport and inland water transport.

### Renewable Sources of Energy

8.34 The major programmes launched in the country for the development and utilisation of new and renewable sources of energy areas include programmes relating to bio-energy, solar energy, wind power and



micro-hydel. Over 14.03 lakh biogas plants had already been set up in the country till end-March, 1991 under the National Project on Biogas Development with an estimated biogas generation capacity equivalent to about 50 lakh tonnes of fuel wood per year valued at Rs. 200 crore and 5 lakh tonnes of NPK in the form of manure. The target for 1991-92 is fixed at 1.47 lakh plants. During April-December, 1991 88,815 plants have already been installed against the target of 73,500 plants. Under the National Programme for Improved *Chullahs*, about 19.87 lakh fuel efficient and smokeless *chullahs* were set up in 1990-91, bringing the total number installed to about 103.77 lakh. These improved *chullahs* are estimated to have the potential of saving 72.6 lakh tonnes of wood valued at Rs. 290 crore per year, in addition to the benefits of preserving the environment. During April-December, 1991, 8.72 lakh *chullahs* had been installed against the target of 9.24 lakh. Appropriate feed-back and monitoring systems have been introduced to ensure the functionality of the installations set up under these programmes.

8.35 Physical achievement under the solar thermal extension programme for the period ending March, 1991 include setting up of a total collector area of 1.74 lakh sq. mts. for purposes such as water heating, distillation of water, timber seasoning, etc. Over 2,00,000 solar cookers have been sold so far. Over 7,000 villages and hamlets have been provided with solar photovoltaic lighting systems and over 50 village level solar photovoltaic power plants have been installed. The aggregate capacity of photovoltaic systems installed in the country for various applications is about 4 MW. A programme for the development of amorphous silicon solar cell technology has been taken up as a science and technology project in a mission mode and a pilot plant for the production of amorphous silicon solar cells and modules is undergoing trial runs.

8.36 Under the wind energy development and demonstration programme, 2,756 wind pumps have been installed and wind farm projects of an aggregate capacity of 38.3 MW have been set up in 7 States. Over 106 million units of electricity have been fed to the respective State grids since the commencement of the Wind Farm Programme in 1986 with a capacity of 3.3 MW. A major wind resource assessment programme is under implementation in 22 States. 848 biomass gasifier systems, of about 6.4 MW capacity, which can each achieve a diesel replacement of 60-65 per cent, have also been installed under a demonstration programme.

8.37 Under the demonstration programme of Alternate Fuels for Surface transportation, 25 buses of the Delhi Transport Corporation have been successfully run over 20 lakh kilometre with ethanol induction to the engine achieving approximately 14 per cent diesel replacement. Battery operated Mini buses for group transportation have also been successfully demonstrated at Delhi. These programmes are being extended to other cities.

8.38 The Indian Renewable Energy Development Agency Ltd. (IREDA), set up in March, 1987 had by end-December, 1991 sanctioned a total of 167 projects for about Rs. 63 crore relating to areas such as biomass utilisation for heat, steam and power generation, solar energy thermal energy, generation of biogas/power from industrial effluents, battery powered vehicles as well as for manufacturing equipments needed for various NRSE systems and devices. In 1990-91, IREDA sanctioned a total of 55 projects against 31 projects in 1989-90 involving a total outlay of Rs. 2,629.35 lakh against Rs. 582.87 lakh in 1989-90. The sanctioned projects are expected to result in the additional saving of 3,88,176 million tonnes of coal valued at Rs. 3,598.16 lakh per annum; 8,543.16 kilo litre of furnace oil valued at Rs. 300.09 lakh per annum, 32,202 m.t. of wood valued at Rs. 129.42 lakh and generation of 90.35 million units of electricity valued at Rs. 895.70 lakh per annum.

## TRANSPORT

### Railways

8.39 The size of the Railway network during 1990-91 increased to 62,366 route kilometres, an increase of 155 route kilometres over 1989-90. The electrified network increased to 10,083 route kilometres with electrification of additional 831 route kilometres in 1990-91. By the end of 1990-91, three trunk routes, viz., (a) New Delhi-Howrah, (b) New Delhi-Kota-Bombay, and (c) New Delhi-Madras, had been fully electrified. During 1991-92, two trunks, viz., (a) New Delhi-Bhusawal-Bombay and (b) Bombay-Howrah, are scheduled to be electrified. Track renewal was completed on 3,611 kilometres against a target of 3,500 kilometres.

8.40 The originating freight traffic in the year 1990-91 was 341.4 million tonnes, comprising 318.4

million tonnes of revenue earning traffic and 23.0 million tonnes of non-revenue earning traffic. The freight transport effort in 1990-91 was 242.7 billion tonne kilometres comprising 235.8 billion tonne kilometres of revenue earning traffic and 6.9 billion tonne kilometres of non-revenue traffic. The freight traffic carried in 1990-91 in terms of tonne kilometres was about 2.4 per cent more than the traffic carried in 1989-90. In terms of tonnage, it was 2.1 per cent more than in 1989-90.

8.41 During April-December, 1991 the freight traffic carried was 244.9 million tonnes against 227.8 million tonnes in the same period last year, implying an increase of 7.5 per cent. The traffic

measured by freight transport output was 185.9 billion tonne kilometres against 176.0 billion tonne kilometres last year, implying an increase of 5.6 per cent.

8.42 The passenger traffic in 1990-91 was 3,854 million as against 3,653 million during 1989-90, implying an increase of 5.6 per cent. The volume of passenger traffic in terms of passenger kilometres was 295.7 billion as against 280.8 billion in 1989-90, implying an increase of 5.3 per cent. During April-December, 1991 the passenger traffic was 3,062 million against 2,835 million in the same period last year which was higher by 7.3 per cent.

TABLE 8.8

*Performance of Railway Sector*

Sl. No.	Item	1988-89	1989-90	1990-91E	April—December£		Percentage change		
					1990-91	1991-92	1989-90	1990-91	1991-92*
1	2	3	4	5	6	7	8	9	10
<b>Total revenue earning freight traffic (million tonnes)</b>									
		302.05	309.97	318.40	227.79	244.91	2.6	2.7	7.6
	(i) Coal	128.01	130.15	135.16	96.66	106.56	1.7	3.8	10.2
	(ii) Raw Materials for steel plants (excl. coal)	26.97	27.43	25.90	18.83	20.93	1.7	-5.6	11.2
	(iii) Pig iron & finished steel from steel plants	10.18	10.15	10.01	7.13	7.96	-0.3	-1.4	11.6
	(iv) Iron ore for export	13.64	14.76	13.14	9.48	9.52	8.2	-11.0	0.4
	(v) Cement	25.91	27.45	28.78	20.33	21.51	5.9	4.8	5.8
	(vi) Foodgrains	24.88	23.66	25.35	18.46	19.39	-4.9	7.1	5.0
	(vii) Fertilizers	16.10	16.97	18.36	13.79	14.08	5.4	8.2	2.1
	(viii) POL	22.60	24.31	25.06	18.35	18.89	7.6	3.1	2.9
	(ix) Balance (other goods)	33.76	35.09	36.64	24.46	26.07	3.9	4.4	6.6
2.	Net tonne kilometre (million)	222.37	229.60	235.78	171.13	181.30	3.3	2.7	5.9
3.	Net tonne kilometre per wagon per day (BG)	1453	1428	1455	1361@	1431@	-1.7	1.9	5.1
4.	Passenger traffic originating (million)	3500	3653	3858	2855	3062	4.4	5.6	7.2
5.	Passenger kilometres (billion)	263.7	280.8	295.7	218.5	235.1	6.5	5.3	7.6

£ Provisional

\* April—December

@ April— November

**Ports**

8.43 Cargo handled at major ports during 1990-91 at 152.6 million tonnes exceeded the target of 151 million tonnes and was also higher than the throughput of 148.1 million tonnes in the preceding year. The re-assessed cargo handling capacity at major ports at the end of 1990-91 was 163.5 million tonnes. No increase in port capacity is scheduled to materialise during 1991-92.

8.44 During April-December, 1991 the major ports handled 114.1 million tonnes of cargo against the target of 112.8 million tonnes, which was also higher than the throughput of 110.5 million tonnes handled in the corresponding period last year. Major increases over traffic handled were in the traffic of POL (23.8 lakh tonnes) iron ore (10.3 lakh tonnes) and coal (24 lakh tonnes). However, general cargo traffic declined as compared to the same period last year.

8.45 The container traffic during 1990-91 recorded an increase of 8.6 per cent over the level reached in 1989-90. More than 50 per cent of the containerised cargo traffic continued to be handled at Bombay Port. Capacity utilisation during 1990-91 was 102 per cent against 99 per cent in 1989-90.

8.46 Container traffic at 5.2 million tonnes during April-December, 1991 declined by 13.2 per cent over the level reached in the same period last year. However, it registered an increase of 24,000 in terms of TEUS during April-December, 1991 as compared to the same period last year. About 45 per cent of

the containerised traffic was handled at Bombay Port.

#### Shipping

8.47 During 1991-92, acquisition of Indian shipping tonnage has declined. The fleet strength at the end of December, 1991 was 415 vessels of 5.94 million GRT compared with 418 vessels of 6.03 million GRT in the same period last year. The overseas trade during 1990-91 was about 110.35 million tonnes against 106.75 million tonnes in 1989-90. The share of Indian flag in the total traffic has decreased marginally from 35.8 per cent during 1989-90 to 35.6 per cent in 1990-91.

TABLE 8.9

#### Trends in Traffic at Major Ports

Commodity	1988-89	1989-90	1990-91£	April—December£		Percentage change		
				1990-91	1991-92	1989-90	1990-91	1991-92*
				1988-89	1989-90	1990-91		
1	2	3	4	5	6	7	8	9
1. POL . . . . .	64.33	63.60	65.78	47.74	50.12	-1.1	3.4	5.0
2. Iron Ore . . . . .	32.74	33.21	31.87	21.44	22.47	1.4	-4.0	4.8
3. Fertiliser & raw materials	5.15	6.74	7.73	5.52	5.85	30.9	14.7	6.0
4. Foodgrains . . . . .	2.50	1.16	0.78	0.58	0.90	53.6	-32.8	55.2
5. Coal . . . . .	15.39	17.60	19.80	14.39	16.79	14.4	12.5	16.7
6. Vegetable Oils . . . . .	1.37	0.49	0.73	0.74	0.23	-64.2	49.0	-68.9
7. Other liquids . . . . .	2.80	2.26	2.39	2.47	3.37	-19.3	5.8	36.4
8. Containerised cargo . . . . .	5.55	7.29	7.92	5.97	5.18	31.4	8.6	-13.2
9. Others . . . . .	16.60	15.79	15.55	11.64	9.22	-4.9	-1.5	-20.8
Total . . . . .	146.43	148.14	152.55	110.49	114.13	1.2	3.0	3.3

£ Provisional

\* April—December.

#### Road and Road Transport

8.48 The road network has increased steadily during the Seventh Plan. In the terminal year of the Sixth Plan (1984-85) the road network which had a total length of 16.9 lakh km increased to 19.7 lakh km by the end of the Seventh Plan showing an increase of 17 per cent. The total length of national highways increased from 31.7 thousand km to 33.6 thousand km during the same period registering a growth of about 6 per cent. The Seventh Plan also witnessed spectacular growth in the number of registered vehicles. The number of such vehicles increased from 90 lakh in 1984-85 to about 190.7 lakh in 1989-90 and further to about 214.9 lakh in 1990-91.

8.49 The National Highway Network is in need of considerable improvements. Around 5400 km of National Highways (out of total 33,600 km) are still

single-lane wide or have low-grade surface. Moreover about 15,000 km are due for widening to 4-lanes considering the traffic levels. A beginning has been made on the construction of the first National Expressway having a length of 95 km. The Expressway network needs to be expanded in high-density corridors. In addition, over 200 weak/major bridges require reconstruction.

8.50 There are also numerous deficiencies in the State road network in terms of missing, weak and narrow bridges, besides inadequate pavement width and thickness. Accessibility of the villages also requires considerable improvement. According to Report of the Steering Committee on Transport Planning (1988), to connect all villages with a population of 500 and above with all weather roads will, need virtual doubling of the rural road network.

8.51 The share of road traffic, both passenger and freight, in total traffic has been maintained. It is estimated that at present the share of road traffic in total passenger traffic is about 80 per cent while that in total freight traffic is about 50 per cent.

8.52 There are 66 Road Transport Corporations in the country. These undertakings operate a fleet of nearly 1.02 lakh buses with a total investment of over Rs. 3,700 crore. They provide direct employment to over 7.63 lakh workers and carry about 600 lakh passengers each day.

8.53 An analysis of the performance of the State Transport Undertakings during the period 1984-85 to 1990-91 reveals the following facts. The fleet utilisation improved from 84 per cent in 1984-85 to 89 per cent in 1989-90. Vehicle productivity increased by 39 km from 218 km per bus/day to 257 km. The staff productivity and fuel consumption have shown improvement. There are, however, wide differences in the performance, efficiency and productivity of the various SRTUs.

8.54 Net losses declined from Rs. 222.20 crore during 1984-85 to Rs. 167.30 crore during 1987-88. Thereafter the net losses increased to Rs. 354.99 crore in 1990-91. One reason for the decline in the losses till 1987-88 is attributed to the fact that in most of the SRTUs during the first two years of the Seventh Plan, passenger fares were revised. Excepting for a few SRTUs, fare revision did not materialise in the last two years of Plan period. During the year 1989-90 it is reported that only six out of the 66 SRTUs earned net profits.

8.55 In the de-centralised sector the total number of registered goods vehicles in the country till end of March 1991 was 14.79 lakh. Even though they have about half the shares in total transport operations, very little is known about their performance.

#### Civil Aviation

8.56 The Civil Aviation sector consists of two distinct segments—Operational and Infrastructural. Indian Airlines and Air India provide domestic and international services on the operational side. In addition, Pawan Hans provides Helicopter services to ONGC and to inaccessible areas and difficult terrains. Infrastructural facilities are provided by the International Airports Authority of India (IAAI) and the National Airports Authority (NAA).

#### Air India

8.57 During 1991-92, the recession of the western economies deepened having its impact on Air India's

traffic. On the other hand, with the resolution of crisis in Kuwait outlook for Gulf traffic improved. However, opening up of the Indian economy, which is expected to boost international business traffic, has not yet had a significant impact. The Available Seat Kilometres (ASKMs) deployed by Air India is expected to increase by 4.2 per cent. However, the Passenger Kilometres (PKMs) is expected to increase only marginally by 1.5 per cent. In view of the discontinuance of leasing of aircraft, the total capacity offered by Air India in 1991-92 is expected to decline. Cargo operations of Air India have become uneconomical consequent to the devaluation of Indian Rupee as the freighter lease charges are denominated in hard currency but most of the freight revenue is received in Rupees. Air India operates in a competitive international market and therefore, has to match its competitors in pricing and there is no element of subsidy as available to some other public sector undertakings.

#### Indian Airlines

8.58 The capacity of Indian Airlines in terms of ATKMs has increased from 959.6 million tonnes in 1984-85 to 1100 million tonnes in 1991-92. The traffic in terms of RTKMs increased from 664 million to 800 million during the same period. Compared to the last year the performance in terms of ATKMs and RTKMs is expected to be higher by 19 per cent and 14 per cent, respectively.

8.59 Following the accident of A-320 aircraft and its subsequent grounding, the financial position of the Corporation has been somewhat difficult during the years 1989-90, 1990-91 and 1991-92. With the resumption of A-320 operations, the utilisation of A-320 aircraft is gradually to be stepped up. This is expected to mitigate the hardship of the passengers and improve the financial position of the Corporation.

8.60 Following the signing of agreement with Air-bus Industry in June, 1989, the Corporation is expected to receive two A-320 aircraft by 1992-93 and five aircraft each during the years 1993-94 and 1994-95.

8.61 During 1991-92, the Corporation's expenditure has gone up significantly with the downward adjustment of Indian rupee vis-a-vis major international currencies and hike in ATF rates by 20 per cent effective 25th July, 1991. In order to offset the impact of increase in expenditure, Government approved enhancement of fares by 20 per cent in September, 1991. The revised fares were implemented effective 7th October, 1991.

**Pawan Hans**

8.62 The Corporation's operations in 1991-92 showed remarkable operating efficiency as compared to 1990-91. Although the number of helicopters deployed on contract with the Corporation showed a decline in number from 18 to 17 in 1991-92 but due to larger capacity of MI-8 helicopters taken on lease from USSR, these helicopters carried more passengers and cargo than in 1990-91. A total of 7 lakh passengers and 15.6 lakh kg of cargo is estimated to be carried by the Pawan Hans in 1991-92 as compared to 2 lakh passengers and 5 lakh kg. of cargo in 1990-91. It is also estimated that the flying hours of the fleet would touch 18,300 hours as compared to 15,295 hours in 1990-91, i.e. an increase of 20 per cent. Even the performance of Dauphin fleet has improved remarkably and it is expected to register an increase of 12 per cent over the performance achieved in 1990-91.

**Vayudoot**

8.63 Vayudoot was incorporated in January, 1981 as a jointly owned company of Indian Airlines and Air India with the objective to connect inaccessible areas and to meet the Air transport requirement of the North Eastern region. Consequent upon an exercise undertaken by the Corporation in November, 1990, the operational net work has been rationalised to provide uninterrupted and reliable operations and to reduce the gap between the revenue and the expenditure. As a result of this exercise number of stations on the operational net work was brought down from 105 stations in 1990-91 to 55 stations. Due to capacity constraints, Vayudoot is at present operating to 45 stations.

8.64 The capacity of Vayudoot in terms of ATKMs during 1990-91 at 29.8 million tonnes was 11 per cent lower than in 1989-90. The RTKMs achieved during 1990-91 at 18.7 million tonnes was 9.7 per cent lower than that in 1989-90. This decline was mainly due to reduction in the operational net work.

**International Airports Authority of India**

8.65 Established in 1972 to manage airports in the four metropolitan cities of Bombay, Calcutta, Delhi and Madras, the International Airports Authority of India has been assigned the development and management of Trivandrum airport from January 1, 1991. The operations at this airport were, however, transferred to the Authority in April, 1991. During 1991, the Authority registered an overall growth and development both in terms of physical and financial targets. The four international airports at Bombay, Delhi, S7/151 M of Fin./91—17

Calcutta and Madras handled 18 million passengers representing a four time increase over traffic in 1972. The IAAI Integrated Cargo facility handled a total of 3.77 lakh tonnes of freight as against 0.81 lakh tonnes in 1972-73. Aircrafts movement went up from 1.13 lakh in 1972-73 to 1.38 lakh in 1990-91. During April-October, 1991 aircraft movement was 0.85 lakh and passengers handled were 108.16 lakh. The cargo handled for the same period was 2.08 lakh tonnes.

**National Airports Authority**

8.66 The National Airports Authority set up in June, 1986 is responsible for providing safe and efficient Air Traffic Transport Service across the Indian Air space including overflights, providing aeronautical communication services, rescue and fire fighting services at the domestic aerodromes, plan, develop and construct domestic civil aerodromes, procurement, installation of radio navigational aids and communication systems. There are at present 86 civil aerodromes, 28 civil enclaves including Defence air-fields and 117 aeronautical communication stations, in addition to communication and navigational facilities rendered at 5 international airports.

8.67 The programme of work of the Authority during 1991-92 includes construction of various civil and electrical works, aeronautic, communication and navigational facilities and provision and augmentation of various ground facilities at different aerodromes.

**COMMUNICATIONS****The Post**

8.68 India ranks foremost among the postal systems of the world in terms of number of post offices. Besides the vastness of the country and large population, this is attributable to the conscientious efforts made by Government since independence to develop postal network as a means of social integration and as an instrument of economic development and rural re-generation. Apart from the basic objective of extending communication, the expansion of postal network has also significantly contributed to other socio-economic goals of the Government such as, rural development, employment, promotion of small savings and setting up industries in backward areas.

8.69 By the end of the seventh Plan, the National Postal Network had touched the 1,47,236 mark of which 16,249 post offices were in the urban sector and 1,30,987 in the rural sector. The all-India averages with regard to population served per post office and the

average area served by a post office as on 1-4-1991 are 4607 persons and 22.10 sq. km., respectively. The long-term objective is to strive for location of a post office in a radius of 3 km in a village without a post office at present. Upgradation and consolidation of postal services is also proposed to be accorded due attention.

#### **Technology, Modernisation and Computerisation**

8.70 A new orientation is proposed to be given for changing the traditional profile of the postal services through induction of high technology. The thrust areas in this regard are computerisation, networking for electronic mail and money transfer and mechanised sorting, better quality seals and stamps etc. These measures are expected to result in new facilities, better customer care, improved performance, reduction in cost as well as generation of surpluses in certain sectors. The rural areas of the country are also expected to benefit in a significant manner through induction of high technology, specially through improved money-order service.

#### **Mail Transmission**

8.71 In the area of mail transmission, the speed post service, introduced in August, 1986 has played a crucial role. The number of speed post centres has grown from initially 6 to 60 and there are about 250 pairs of cities under point to point service. Since its inception, the traffic and revenue have also increased phenomenally. Traffic increased from 1.19 million in 1987-88 to 3.86 million in 1990-91 and revenue from Rs. 3.17 crore to Rs. 13.60 crore, respectively. During April-August, 1991, traffic and revenue figures were 1.96 million and Rs. 8.06 crore, respectively.

#### **Savings Bank**

8.72 Computerisation has been introduced in Savings Bank operations in 7 Head Post Offices in Delhi, which will increase productivity and ensure proper utilisation of man-power. In the ensuing year, it is planned to introduce computers in 24 other head post offices in the Savings Bank area.

#### **Postal Life Insurance**

8.73 Most of the centralised work in the Central Accounts Office has been decentralised. Procedure for premium collections has also been tightened which has led to an increase in collection by 10 per cent. Further, all premium rates have been rounded off to the nearest rupee, which has led to increase in productivity and simplified accounts.

#### **International Relations**

8.74 A satellite project is under consideration which can handle activities such as FAX, GIRO, Electronic Mails, Tracking and Tracing of International Speed Post. This will also lead to cutting down of per unit cost of postal activities and services provided. During 1991-92, tracking and tracing centres are also proposed to be set up in Delhi and Bombay.

#### **Telecommunications**

8.75 The performance of telecom sector during 1990-91 in creating additional switching capacity, providing new telephone and telex connections and production of switching equipment has been good. Net additional capacity added during 1990-91 was 5.57 lakh lines which is 16.5 per cent higher than 4.78 lakh lines in 1989-90. About 25.9 per cent of this capacity expansion was in metro telecom districts of Delhi, Bombay, Calcutta and Madras.

8.76 4.86 lakh direct exchange lines (DELS) were provided during 1990-91, which was 16.8 per cent higher than 4.16 lakh lines provided in 1989-90. 27.4 per cent of the total new telephone connections were provided in four metro telecom districts. The demand for providing new telephone connections is increasing very fast. Total number of people on waiting list as on 31-3-1991 was 19.15 lakh which is 14.4 per cent higher than the waiting list as on 31-3-1990.

8.77 The increase in telex switching capacity during 1990-91 was 2051 lines, which was 101.1 per cent higher than 1020 lines added in 1989-90. During 1990-91, the number of new telex connections provided was 2156 which was 30 per cent lower than 3080 telex connection provided in 1989-90. This has been mainly due to decrease in the demand for the new telex connections, because the FAX service has now become very popular.

8.78 M/s. Indian Telephone Industries (ITI) produced 9.44 lakh lines of switching equipment (strowger cross-bar and electronic) during 1990-91, which was 3.1 per cent less than the production in 1989-90. The less production was mainly due to scarcity of diesel and disturbances in the country during the year.

8.79 70.85 lakh conductor kilometres (LCKMs) of cable was laid during 1990-91, which was 9.5 per cent higher than 64.70 LCKMs in 1989-90. The cable laid in four metro telecom districts accounted for 27.5 per cent of the total LCKMs.

8.80 3.26 lakh lines Net Telephone switching capacity has been added during April-December, 1991 which is 90.6 per cent higher than 1.71 lakh lines

TABLE 8.10

## Performance of the Telecommunications Sector

Group/Total	1988-89	1989-90	1990-91£	April—December £		Percentage change		
				1990-91	1991-92	1989-90	1990-91	1991-92*
				1988-89	1989-90	1990-91		
1	2	3	4	5	6	7	8	9
<b>I. Net additional switching capacity : (Lakh lines)</b>								
(i) Metro Districts . . . . .	1.19	1.45	1.44	0.60	1.25	21.8	- 0.7	108.3
(ii) Others . . . . .	3.49	3.33	4.13	1.11	2.01	- 4.6	24.0	81.1
<b>Total (All- India)</b>	<b>4.68</b>	<b>4.78</b>	<b>5.57</b>	<b>1.71</b>	<b>3.26</b>	<b>2.1</b>	<b>16.5</b>	<b>90.6</b>
<b>II. Net telephone connections provided : (DELS) (000 Nos.)</b>								
(i) Metro. Districts . . . . .	102.83	122.45	133.09	52.98	91.52	19.1	8.7	72.7
(ii) Others . . . . .	272.11	293.77	352.67	121.58	186.10	8.0	20.0	53.1
<b>Total (All-India)</b>	<b>374.94</b>	<b>416.22</b>	<b>485.76</b>	<b>174.56</b>	<b>277.62</b>	<b>11.0</b>	<b>16.7</b>	<b>59.0</b>
<b>III. Telex service :</b>								
(i) Telex capacity (lines)	2358	1020	2051	1665	1744	-56.7	101.1	4.7
(ii) Telex connections (Nos.) . . . . .	3900	3080	2156	1201	1167	-21.0	-30.0	-2.8
<b>IV. Production of switching equipment : (000 lines)</b>								
(i) Strowger . . . . .	213.2	175.8	85.8	53.5	39.2	-17.5	-51.2	-26.7
(ii) Crossbar . . . . .	86.5	63.5	57.9	25.9	37.3	-26.6	-8.8	44.0
(iii) Electronic . . . . .	483.3	735.1	800.3	444.4	496.6	52.1	8.9	-11.7
<b>Total (All—India)</b>	<b>783.0</b>	<b>974.4</b>	<b>944.0</b>	<b>523.8</b>	<b>573.1</b>	<b>24.4</b>	<b>- 3.1</b>	<b>9.4</b>
<b>V. Laying of telephone cable : (lakh Conductor KMs)</b>								
(i) Metro. Districts . . . . .	23.36	22.37	19.48	11.2	13.6	- 4.2	-12.9	21.4
(ii) Others . . . . .	35.90	42.33	51.37	28.2	42.3	17.9	21.4	50.0
<b>Total (All- India)</b>	<b>59.26</b>	<b>64.70</b>	<b>70.85</b>	<b>39.4</b>	<b>55.9</b>	<b>9.2</b>	<b>9.5</b>	<b>41.9</b>
<b>VI. Addition in Rural Communications :</b>								
(i) No. of exchanges . . . . .	747	484	2727	362	1122	-35.2	463.4	209.9
(ii) No. of LDPTs. . . . .	2631	1633	1742	203	7663	-37.9	6.7	3674.9

£ Provisional  
\* April—December

added in the same period last year. The performance during April—December, 1991 was 64.2 per cent of the target for this period. Out of the total capacity added during this period, four metro districts accounted for 1.25 lakh lines.

8.81 2.78 lakh Direct Exchange Lines (DELS) have been provided during April—December, 1991 which is 3.8 per cent less than the target and 59.0 per cent higher than 1.75 lakh lines provided in 1989-90. The demand for new telephone connections is increasing with a fast speed. As on 31-12-1991, 23.55 lakh persons were in the waiting list.

8.82 ITI produced 5.73 lakh lines of switching equipment during April—December, 1991 which is 0.5 per cent lower than the target and 9.4 per cent higher than 5.24 lakh lines in the same period last year.

8.83 55.9 LCKMs cable has been laid during April—December, 1991 against 39.4 LCKMs during the same period last year. 1122 exchanges were opened in rural areas during April—December, 1991 which is 209.9 per cent higher than 362 exchanges opened in the same period last year. The number of LDPTs opened is 7663 which is 3674.9 per cent higher than 203 opened during the same period last year. The performance in respect of LCKMs cables during April—December, 1991 was higher by 41.8 per cent than the target. The opening of rural exchanges and the number of LDPTs opened during April—December,

1991 was lower by 37.7 per cent and 14.8 per cent, respectively, than the target.

#### OUTLOOK

8.84 The performance of the infrastructure sectors shows mixed trends. Railways, Power and Shipping Sectors are expected to perform better in relation to their respective targets. Other sectors, except petroleum, are also likely to register positive growth rates over the previous year's level. The shortfall in the domestic production of crude oil would put additional pressure on the Balance of Payment situation and would call for more effective management of demand and supply of petroleum products and their substitutes. Energy conservation measures, particularly for petroleum products would also require to be implemented vigorously. Other important aspects of the infrastructure sectors requiring urgent and effective steps would include improved planning and management practices to avoid time and cost over-runs, better inter-sectoral co-ordination, particularly in the working of Railways, Coal, and Power sectors; and for effecting improvements in physical efficiency, productivity, capacity utilisation and quality of output. The potential for overall growth in the industrial sector is crucially dependent on continuing adequacy of investment and performance in the infrastructure industries.