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MANUAL

INFRASTRUCTURE STATISTICS

सत्यमेव जयते

CENTRAL STATISTICS OFFICE
MINISTRY OF STATISTICS AND PROGRAMME IMPLEMENTATION
GOVERNMENT OF INDIA
NEW DELHI

(http://mospi.nic.in)

PREFACE

To assess the status of infrastructure in the country, it is of utmost importance to have a reliable and up-to-date database on infrastructure. Although definition and concept of infrastructure has different meanings in different contexts, CSO has compiled statistical publication on economic infrastructure of the country i.e. infrastructure required to facilitate the economic development of the country.

As recommended by Rangarajan Commission, a consolidated publication on infrastructure statistics "Infrastructure Statistics 2010" was prepared by CSO in 2010. The publication contains statistical information on various aspects of infrastructure sub sectors like roads, railways, airways, energy, telecommunication, irrigation, storage etc. that were recommended by the Standing Committee on Infrastructure Statistics (SCINS) to be considered as Infrastructure sub sectors.

It was felt that a similar publication needs to be compiled at state level as well that would facilitate the planning of infrastructure at state level. Thus, this manual on infrastructure statistics is prepared to guide the State Statistics Offices (SSO) in preparing statistical publications on Infrastructure statistics at state level. The scope of this manual has been kept limited to the publication "Infrastructure Statistics, 2010" so that SSOs are able to compile the publication at state level.

It is expected that SSO will utilize this manual in preparing the statistical publication on Infrastructure and present the infrastructure statistics in a meaningful way that would help the policy makers in the assessment and planning of infrastructure in the country, thus facilitating the growth and development of the country.

The manual is prepared by the Economic Statistics Division of Central Statistics Office under the guidance of a Task Force comprising representatives of Ministries/Departments dealing with the infrastructure sub sectors and headed by me. I appreciate the support and cooperation of all members of the Task Force in bringing out this manual. I congratulate the Additional Directors General Sh. H.K.Sharma and Sh. Ashish Kumar and Deputy Directors General Sh. G.C.Manna and Dr. Sunita Chitkara for the excellent work done in bringing out this manual.

(S.K.Das)
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CHAPTER 1

NEED TO MEARSURE INFRASTRUCTURE

INFRASTRUCTURE, ECONOMIC DEVELOPMENT AND INCLUSIVE GROWTH

1.1. World Bank in its "World Development Report 1994" pointed out that productivity growth is higher in countries with an adequate and efficient supply of infrastructure services. Provision of infrastructure services to meet the demands of business, households and other users is one of the major challenges of economic development. In many surveys conducted by World Bank Group, private investors have cited reliable infrastructure services as an important consideration in their investment decisions. The report also points out that "infrastructure capacity grows step by step with economic output – a one percent increase in the stock of infrastructure is associated with a one percent increase in gross domestic product (GDP) across all countries". In an increasingly globalising world, availability of good quality infrastructure is a crucial factor in attracting foreign investments. Availability and accessibility of adequate infrastructure in a country on par with international community is an indicator of the presence of high quality of life.

1.2. Role of infrastructure in fostering economic growth has been supported by the empirical literature. A number of studies have highlighted the importance of physical infrastructure as a determinant of economic growth. A country's development is strongly linked to its infrastructure strength and its ability to expand trade, cope with population growth, reduce poverty etc. Infrastructure is important for the services it provides. Infrastructure provides people with the services they need and want. Infrastructure is an input to production and raises the productivity of other factors. Infrastructure connects goods to the markets, workers to industry, people to services, and the poor in rural areas to urban growth centres. Infrastructure

lowers costs, enlarges markets, and facilitates trade. Thus, Infrastructure provides services that support economic growth by increasing the productivity of labour and capital thereby reducing the costs of production and raising profitability, production, income and employment.

1.3. Although role of infrastructure in economic development was recognised in the 1970s and 1980s its linkage with poverty alleviation was examined in 1990s only. The WBG explored new ways to design and manage projects that relied more on community participation to ensure that the infrastructure investments it supported would reach the poor. The "voices of the poor" survey published in 2000 validated the finding that the linkage was strong. Poor people pointed to the dramatic impacts that access to potable water, sanitation or to a road made to the quality of their life.

1.4. In Millennium Development Goals also the role of infrastructure in reducing poverty has been recognised. It has set increasing access to water supply and sanitation service as targets to be achieved by 2015. Infrastructure services contribute to poverty reduction and improvements in living standards in several ways. Demonstrating this empirically is not straightforward because of the complex interrelationship between these variables. Poverty reduction requires economic growth which, when accompanied by sound macroeconomic management and good governance, results in sustainable and socially inclusive development (ADB 1999). Greater access of the poor to education and health services, water and sanitation, employment, credit and markets for produce is needed. Lack of access to product and factor markets, prevents the rural poor to be a part of growth process. Making markets work for poor is the key element in reducing poverty. Infrastructure development enables the markets to expand and fall within the reach of the poor, thus making them part of the growth process.

INFRASTRUCTURE STATISTICS AND ITS ROLE

1.5. "You cannot manage what you cannot measure" is the stated adage. Measuring infrastructure performance is required for decision making purposes to improve the availability and capacity of existing infrastructure and extend it in other directions as well. Therefore to create and manage good quality infrastructure, we need to have

some measures of infrastructure. To collect meaningful statistics for measuring infrastructure it is desirable to know why we need these statistics. In case of infrastructure the statistics are required for following purposes:

- *Assess the condition of the existing assets;*
- *Evaluate the extent to which the infrastructure meets current demand;*
- *Assess whether infrastructure is likely to be able to meet demand in the future;*
- *Benchmarking: to compare our infrastructure availability with others.*

1.6. For assessing the existing assets and generating meaningful information from it the infrastructure statistics are classified into five broad categories:

- *Access indicators:* they measure the availability of infrastructure over geographic area and the proportion of population.
- *Quality indicators:* they measure the quality i.e. whether the available infrastructure is of use or not.
- *Fiscal costs & revenue indicators*: they include Budget outlay, Expenditure, Investment and Revenue generated.
- *Utilization indicators:* they indicate whether the infrastructure is being utilized to its full capacity or not.
- *Affordability indicators:* they indicate whether the infrastructure can be afforded by people.

1.7. The manual contains detail description of statistics classified under each of the five indicators. It also describes the concepts and definitions of these statistics as followed by the data collecting departments.

PURPOSE OF THE MANUAL

1.8. The manual has been prepared with the objective to provide guidance to state level statistics offices to compile statistical publication for infrastructure for their respective states with uniform concepts, definitions and classification. The infrastructure statistics are although available in dispersed manner, there is a need to compile these statistics in a consolidated and comprehensive way that can be

useful for the policy makers and researchers. Infrastructure being a broad term, there is always a debate on what is included and what is excluded from infrastructure. This manual will provide guidance on this aspect and summarise the events that have taken place in the effort to harmonise the concept of infrastructure and identification of sub sectors that can be considered as infrastructure. The parameters used to identify the infrastructure sub sectors have been explained in detail.

1.9. To compile infrastructure statistics in a meaningful way the statistics have been categorised into five indicators viz. Accessibility, quality, fiscal, affordability and utilization. The definition of terms used in the manual are provided for standardisation of statistics. Lastly data gaps that need to be filled up for a comprehensive statistical publication on infrastructure are also given.

CHAPTER 2

HARMONISATION OF DEFINITION AND COVERAGE OF INFRASTRUCTURE SECTOR

2.1. Although infrastructure and the services provided by it have always been with us, the word itself is relatively new. The American Heritage Dictionary of the English Language writes that "the term infrastructure has been used since 1927 to refer collectively to […] roads, bridges, rail lines, and similar public works". However, in The English dictionary the term did not find any mention until 1950s. In late 80s and 90s the word became very prominent and was discussed in almost every forum. However, in spite of being extensively discussed, there is no standard definition of infrastructure. Although it is now well recognised that infrastructure impacts the economic growth of a country, there is no unique concept in scientific literature for defining infrastructure and determining its components. It is usually considered as basic public infrastructure that facilitates the economy and society to operate. World Bank report (2004) mentions infrastructure as an umbrella term for many activities. Due to various descriptions it becomes difficult to analyse infrastructure in a comparable way and draw meaningful conclusions. Economists and urban planners distinguish two types of infrastructure: economic infrastructure and social infrastructure. Economic infrastructure is defined as the infrastructure that promotes economic activity, such as roads, highways, railroads, airports, sea ports, electricity, telecommunications, water supply and sanitation. Social infrastructure (such as schools, libraries, universities, clinics, hospitals, courts, museums, theatres, playgrounds, parks, fountains and statues) is defined as the infrastructure that

promotes the health, education and cultural standards of the population – activities that have both direct and indirect impact on the welfare.

2.2. In India the notion of infrastructure was discussed extensively by the Rangarajan Commission while examining the statistical system of India. Infrastructure is important in determining the availability of inputs that are crucial to a wide variety of productive activities. Its non-availability will act as a severe constraint on the productive capacities of the economy. The Rangarajan Commission in its report submitted in 2001 stated that infrastructure is an important input for industrial and overall economic development of a country. However, there is no clear cut definition of infrastructure nor its characteristics defined which can differentiate infrastructure sector from other sectors. Based on the necessity of infrastructure activities like power, transport, telecommunication, water, sanitation, disposal of waste etc. which are central to the activities of household and economic production, one could view these activities as essential inputs to the economic system.

2.3. Infrastructure, according to Rangarajan Commission, tends not to be user or user specific and typically have long-lived engineering structures. It indicated six pertinent characteristics for identification of infrastructure sub-sectors, viz. (a) natural monopoly; (b) non-tradability of output; (c) bestowing externalities on society; (d) high-sunk costs or asset specificity; (e) non-rivalness (up to congestion limits) in consumption; and, (f) possibility of price exclusion; and, suggested that the following sub-sectors had all six characteristics:

- Railway tracks, signalling system, stations
- Roads, bridges
- Runaways and other airport facilities
- Transmission and distribution of electricity
- Telephone lines, telecommunications network
- Pipelines for water, crude oil, slurry, etc.
- Waterways, port facilities
- Canal networks for irrigation
- Sanitation or sewerage.

2.4. Initially, the above-listed infrastructure facilities may be taken up for data collection. Thereafter, considering characteristics (d) high-sunk costs or asset specificity, (e) Non-rivalness in consumption, and (f) Possibility of price exclusion only, the above list of infrastructure facilities may be extended to include the following in an extended list closely corresponding with existing notion of infrastructure:

- Rolling stock on railways
- Vehicles
- Aircrafts
- Power generating plants
- Production of crude oil, purification of water
- Ships and other vessels.

2.5. The Commission emphasized the need for a strong statistical database on this sector due to its increasing importance in the economy. Statistics relating to various types of infrastructure as well as its geographic distribution will be important for policy and planning purposes, as well as in guiding investment decisions. Data relating to infrastructure should be complete, accurate and up to date.

2.6. ***Cabinet Committee on Infrastructure (CCI)***, under the chairmanship of the Prime Minister was constituted on July 6, 2009. It substituted the Committee on Infrastructure which was set up on 31st August, 2004 under the Chairmanship of Prime Minister. The CCI approves and reviews policies and monitors implementation of programmes and projects across infrastructure sectors. The Secretariat for infrastructure in the Planning Commission is involved in initiating policies that would ensure time bound creation of world class infrastructure delivering services matching international standards, developing structures that maximize the role of public private partnership and monitoring of key infrastructure projects to ensure that established targets are realized. With this objective, the secretariat felt the need to define infrastructure for the purpose of policy formulation, setting of sectoral targets and monitoring projects. It emphasized the need to clearly define 'Infrastructure' and its coverage to ensure consistency and comparability in the data collected and reported by various agencies over time. For this purpose it studied the

definition of infrastructure as applied by various organisations like Rangarajan Commission, RBI, Income Tax Department, Dr. Rakesh Mohan Committee Report (1996), Insurance Regulatory and Development Authority (IRDA), Economic Survey, and World Bank. Thus, the Empowered Sub-Committee of the Committee on Infrastructure, headed by Deputy Chairman, Planning Commission identified a list of sectors to be included under infrastructure. These are:

i. electricity (including generation, transmission and distribution) and R&M of Power stations;
ii. non-conventional energy (including wind energy and solar energy);
iii. water supply and sanitation (including solid waste management, drainage and sewerage) and street lighting
iv. telecommunications
v. road and bridges
vi. ports
vii. inland waterways
viii. airports
ix. railways (including rolling stock and mass transit system)
x. irrigation (including watershed development)
xi. storage
xii. oil and gas pipeline networks

2.7. ***Ministry of Finance, Department of Economic Affairs,*** on the directions of Prime Minister's office, to resolve the issue of uniform definition of infrastructure, has prepared a concept paper to guide the selection of sub sectors to be classified as infrastructure. This concept paper has defined "Infrastructure" as an essential input to the economic system. To draw an indicative set of infrastructure sub sectors, the broad framework developed by Rangarajan Commission has been employed. The list of sub sectors identified earlier by Rangarajan Commission has been further extended by including sectors that merit inclusion on account of their importance to the scheme of economic development or their ability to contribute to human capital or the specific circumstances under which these are developed in India. To finalize

this list opinion of concerned Ministries/ Departments, Regulatory bodies like RBI, SEBI, IRDA , PFRDA and other stakeholders like Confederation of Indian Industry (CII) and Federation of Indian Chamber of Commerce and Industry (FICCI) was also obtained. The identified infrastructure sub-sectors have been classified, for the sake of convenience, under five broad categories. These are: Transport; Energy; Water and Sanitation; Communication; Social and Commercial Infrastructure.

2.8. It is recommended that any sub-sector which may be identified as an infrastructure sub-sector in future will fall under one of these categories. For example, agro-industries will be classified under social/commercial infrastructure category. Similarly, watershed will be classified under water and sanitation category, if included in future. The dynamic nature of the characteristics used for defining infrastructure is also emphasized and is therefore recommended that the list be periodically updated through a formal institutional mechanism.

2.9. The list of infrastructure sector , thus recommended is given in the table below:

S.No	Category	Infrastructure sub-sectors
1.	Transport	• Roads and bridges • Ports • Inland waterways • Airports • Railway Track, tunnels. viaducts, bridges • Urban Public Transport(except rolling stock in case of urban road transport)
2.	Energy	• Electricity Generation • Electricity Transmission • Electricity Distribution • Oil pipelines • Oil/Gas/Liquefied Natural Gas(LNG) storage facility • Gas pipelines
3.	Water & Sanitation	• Solid Waste Management • Water supply pipelines • Water treatment plants

		• Sewage collection, treatment and disposal system • Irrigation(dams, channels, embankments etc) • Storm Water Drainage System
4.	Communication	• Telecommunication(Fixed network) • Telecommunication towers
5.	Social and Commercial Infrastructure	• Education Institutions(capital stock) • Hospitals(capital stock) • Three-star or higher category classified hotels located outside cities with population of more than 1 million • Common infrastructure for industrial parks, SEZ, tourism facilities and agriculture markets. • Fertilizer(Capital investment) • Post harvest storage infrastructure for agriculture and horticultural produce including cold storage • Terminal markets • Soil-testing laboratories • Cold chain

2.10. ***Standing Committee on Infrastructure Statistics (SCINS):*** To implement the recommendations of Rangarajan Commission, a Standing Committee on Infrastructure Statistics (SCINS) was constituted by Central Statistics Office under the Chairmanship of DG, CSO and representatives from the Secretariat of the Cabinet Committee on Infrastructure of the Planning Commission (CCoI), M/o Finance, Reserve Bank of India (RBI), Department of Industrial Policy and Promotion (DIPP) and other subject matter Ministries. The terms of references of the Standing Committee are:

i. To standardize concepts, definitions and methodology for compilation of Infrastructure statistics.

ii. To define the scope and coverage of infrastructure statistics and suggest changes in the same from time to time.

iii. To suggest improvements in Infrastructure statistics in view of international practices, recommendations made by other expert bodies and to satisfy the domestic requirements of planners and policy makers at different levels.

2.10. The Standing Committee has finalized the coverage of sectors and sub sectors under infrastructure as given in the table below:

Infrastructure Sector	**Sub-sector**	**Coverage as proposed by SCINS**
Transport	**Road transport**	Roads and bridges, Tunnels, Motor vehicles
	Rail transport	Railways, Signalling, communications systems, Rail yards, Stations. Rolling stock
	Inland water transport	Inland waterways Inland water vessels.
	Sea and coastal transport	Seaports Ships and other vessels
	Air transport	Airports Air crafts
Energy/ power	**Electricity (Thermal, Hydro, Nuclear)**	Generation plants, wind mills, transmission and distribution lines, electric substations Coal Reserves, Coal fields/mines, Coal washeries

	Petroleum and Natural gas	Oil and gas pipeline networks Distribution terminals, Gas fields/wells, refineries
Drinking water supply, sanitation	**Drinking water supply**	Water supply pipelines, filtration and treatment plants
	Sanitation	Sewage treatment plants, Drainage pipelines, On site sanitation facilities, Landfills, Incinerators
Irrigation	**Irrigation**	Major and minor irrigation structures, Command area, Irrigation canals, Reservoirs, Water shed development
Communication	**Telecommunication** **Postal communication**	Telephone network (landlines, mobile), Internet servers, Communication satellites, Cable television network Postal network, Courier mail service
Storage	**Storage**	Food grain Storages, Cold Storages, Warehouses

2.11. The statistics for various sectors constituting infrastructure were although available with the concerned Ministries, it was recommended by Rangarajan Commission to consolidate these statistics in one place under one broad sector named as "Infrastructure". It was felt that infrastructure being the backbone of all productive processes; the statistics on this sector would become a necessity sooner or later. The availability of statistics on these subsectors has been discussed extensively in the report submitted by the Commission and data gaps identified thereof. It has further been recommended to fill these data gaps by coordinating with these Ministries and work out the modalities to design adequate system for collection of required statistics.

To consolidate infrastructure statistics at one place, as recommended by Rangarajan Commission, a publication “Infrastructure Statistics, 2010” (First Issue) was prepared and placed on the website of the Ministry.

The publication covers all statistics available with different data sources. However, as approved by the SCINS, only economic infrastructure is covered in this publication. All the infrastructure items have been arranged in six broad sectors viz. Transport, Energy, Drinking Water Supply and Sanitation, Irrigation, Communication and Storage. Under each category statistics have been compiled on infrastructure items and other related items which are important for giving a clear idea about the status and major constraints of the sector. For example the capacity for power generation does not only depend on number of power plants, but also on capacity of coal, petroleum and natural gas production. Since thermal power has 79% share in the power production, separate chapters have been kept on mining and quarrying, and petroleum and natural gas extraction sectors.

The data included in this publication have been compiled from the secondary data generated as official by-product and available in a dispersed fashion in the functional Ministries/departments. The list of the basic statistics and derived indicators compiled for each sub-sector of infrastructure and incorporated in the publication are grouped under the following heads:

i. Access indicators
ii. Quality indicators
iii. Fiscal costs & revenue indicators
iv. Utilization indicators.
v. Affordability indicators.

The classification of infrastructure statistics under these five indicators as explained in this manual has been adopted from the publication “Infrastructure Statistics 2010”. The six parameters for identification of infrastructure sector and the five indicators used for classification of infrastructure statistics are described in the next chapter.

CHAPTER 3

CONCEPTS, DEFINITIONS AND CLASSIFICATION OF INFRASTRUCTURE STATISTICS

CHARACTERISTICS OF INFRASTRUCTURE SUBSECTORS

3.1. To identify infrastructure subsectors six parameters identified are as follows:

Natural Monopoly

Natural monopoly refers to a situation where one firm can supply a market's entire demand for a goods or service at a price lower than two or more firms can. Many infrastructure facilities have a significant component characterized by declining cost associated with increasing output throughout the range of the possible demand. This leads to the situation of natural monopoly. However, this situation can change due to technical or structural developments. Telecom sector is the classic example of a sector which has swung from a monopoly situation, when it was necessary to have a wire line network to a state of competition mainly due to technology advancements in the field of wireless telephony.

High sunk costs or asset specificity

Sunk costs are investment costs which cannot be immediately recovered by the possible sale of the assets that were invested in. Sunk costs represent both barriers to exit from the sector and barriers to entry into the sector. High sunk cost makes an investment irreversible which impacts the level of investment by industry. Longer periods of gestation and very large investment in activity specific assets that cannot

be deployed elsewhere, such as road-tupical of infrastructure projects, result into higher sunk cost. Many infrastructure services are designed to be delivered through a dedicated network. Common examples are piped water, electric power, telecommunication towers, sewerage and rail services. All of these industries involve networks which distribute products or services over geographic space, and in most cases the networks are capital intensive and the investments are durable and immobile. High sunk costs imply that the service is prone to be a natural monopoly. If investments are durable and immobile a firm cannot exit market without losing its investments.

Non tradability

A tradable goods or service can be sold in another location distant from where it was produced. Different goods have different levels of tradability; the higher the cost of and time taken for Transportation and the shorter the shelf life, the less tradable goods is. Most infrastructure services are non-tradable in nature. In some cases carriage may not be tradable but the content may. A common example is power Transmission system which is non-tradable even though electric power itself may be tradable. Non-tradability implies that the stock of infrastructure services cannot be readily augmented through imports.

Non rivalness in consumption

Public good is normally characterized by two factors – non-rivalness and non excludable. This means that consumption of the good by an individual does not reduce availability of the good for consumption by others and that no one can be effectively excluded from using the good. The characteristic of non-rivalness implies zero marginal cost of providing benefit of a public good (infrastructure service in this case) to an additional consumer, usually up to a certain capacity or congestion limit.

Possibility of price exclusion

Most infrastructure services however have one characteristic that is absent in the case of pure public goods, namely, price exclusion whereby enjoyment of benefits is

contingent on payment of charges. Price exclusion is a characteristic of 'private goods'. Efficiency requires that the price be set at marginal cost. However, in this case, it will not be possible to recover the cost of provision (except through taxes). Besides as capacity limits are reached there are positive marginal costs of providing additional capacity. The pricing of infrastructure is thus not easily amenable to market principles.

Presence of Externalities

Many infrastructure services are also characterized by the presence of externalities. The canonical example is that of improvement in public health from better water and sewerage infrastructure. An absence of public hygiene will hurt even those who are individually hygienic. Similarly a road could lead to an increase in the value of adjoining land. In this sense, infrastructure creates external benefits or positive externalities. These externalities are not remunerated. Naturally if private players do not reap all the benefits of a public good which they have produced, their incentive to produce it voluntarily might be insufficient and market may fail to produce efficient results.

3.2. Based on these parameters, six sectors have been identified as infrastructure subsectors by SCINS. These are:

i. Transport
ii. Energy
iii. Communication
iv. Drinking water supply and sanitation
v. Irrigation
vi. Storage

CLASSIFICATION OF INFRASTRUCTURE STATISTICS

3.3. The infrastructure statistics are classified into five indicator groups as given below :

Access indicators

Access indicators measure the extent to which people can make use of or take advantage of infrastructure services—it does not necessarily mean they use the

service. Geographically, it captures how far the next access point is. Time wise, it measures how frequently the service is provided or how long does it take to be connected. Socially, it measures if all citizens have access to services, or if services are limited to specific groups (e.g. special tariffs, families, elderly, etc.)

Quality indicators

Quality indicators encompass both qualitative and quantitative measures. The former are perceived quality indicators collected by asking qualitative questions (like rank from 1 to 7 the quality of the service). The latter are technical quality indicators with a low degree of discretion involved; usually reported by the utilities or providers. Examples are electric outages or reported phone faults.

Fiscal and revenue indicators

These indicators provide information about the government / private budget allocated to the infrastructure. It also provides information about the utilization of these financial resources. Further, the revenue generated through this infrastructure is also measured by some statistics given under these heads.

Utilization indicators

These indicators give the extent up to which the infrastructure is being utilized for the purpose for which it has been provided. It includes statistics like passengers carried, freight carried etc.

Affordability indicators

Affordability indicators give a sense of the extent to which infrastructure services are provided at a reasonable price. Ideally, measures of this outcome tell the extent to which the price of a standard consumption bundle is consistent with the ability to pay of the users. Ideally also, these measures should be gathered from household surveys—e.g. surveys specifying the percentage of the household income or household expenditure allocated to a specific service for different income classes. In practice, the only information not too difficult to collect is the average or sometimes the nominal price and occasionally, the tariff structure.

3.4. The classification of infrastructure statistics into five indicator groups for each of the six infrastructure subsectors along with concepts and definitions of related terms is given in the following sections namely, sections A to F at pages 25 to 122.

SECTION A: TRANSPORT INFRASTRUCTURE

Transport infrastructure facilitates the transportation of people and goods and provides them access to markets, employment and investment opportunities. Transport infrastructure is thus an essential component of the economy. An efficient transportation system can have a multiplier effect on the economy whereas a deficient transportation system can result in economic loss.

For efficient transport system, an adequate infrastructure is very important. With growing population there is a need to provide matching transport infrastructure to avoid overcrowding, overloading and poor maintenance of the available infrastructure.

Transportation can be provided by various modes depending on the surface over which one has to travel – land (road, rail, and pipelines), water (shipping) and air.

Road transportation: road transportation is large consumer of space and has high maintenance costs, both for vehicles and infrastructures. They are mainly linked to light industries where small batches of freight are required to be transported. They are useful for everyday movement of people to their workplaces or to meet everyday needs. For efficient road transportation we need good quality roads with proper signage and traffic regulation.

Rail transportation: although expensive to build rail transportation provides movement of people and heavy loads to long distances. Heavy industries are linked by Rail transportation.

Pipelines: pipelines can be built on land as well as under water. Pipeline construction costs vary according to the diameter, distance and viscosity of the fluid (from gas, low viscosity to oil, high viscosity). Pipelines are used for transporting gas, oil, petrol etc.

Maritime transportation: maritime transportation is the most effective mode to move large quantities of cargo over long distances. Main maritime routes are composed of oceans, coasts, seas, lakes, rivers and channels. Maritime transportation has high terminal costs, since port infrastructure are among the most expensive to build and maintain. They are mainly linked to heavy industries like steel, petrochemical facilities adjacent to port sites.

Air transportation: air transportation has unlimited routes but are constrained by site for landing and takeoff of planes, climate, fog and aerial currents. Air transportation is especially useful in long distance mobility of people and has been one of the most important factors in the globalisation.

Transport infrastructure consists of the fixed installations necessary for transport like roads, railways, airways, waterways, canals, pipelines and terminals such as airports, railway stations, bus stations, warehouses, trucking terminals, refuelling depots seaports etc. Vehicles travelling on these networks may include automobiles, bicycles, buses, trains, trucks, people, helicopters and aircrafts.

For compilation of infrastructure statistics, transport sector has been divided into four sub sectors viz. Roads, Railways, Inland Waterways, Sea & Coastal Transport and Airways. The classification of statistics and relevant definitions for each sub sector are explained in the following sections.

A.1 ROAD TRANSPORT

CLASSIFICATION OF ROAD INFRASTRUCTURE STATISTICS

Access indicators		Units		Categories
Road length		1000 Kms.	Total	
				Rural Roads
				Urban Roads
				Project Roads
				Highways
				National Highway
				State Highway
				Municipal roads
				Railway roads
				Major port roads
				Others
Road density				
	Land	Km/1000sq.Km.	Total	
				Urban
				Rural
	Population	Km/1000 people	Total	
				Urban
				Rural
Registered Motor Vehicles		Number	Total	
				Two wheelers
				Cars, jeeps and taxis
				Buses
				Goods vehicles
				Others
		Per 1000 population		

Quality indicator	Units	Categories
Surfaced roads	km	Total
		Highways
		Rural Roads
		Urban Roads
		Project Roads
	Percentage to total roads	Total
		Highways
		Rural Roads
		Urban Roads
		Project Roads
Accidents	Number	Total
		Persons injured
		Casualties
	per 1000 vehicles	Total
		Casualties
	per 1000 km road	Total
		Casualties
	per 1000 regd. motor vehicles	Casualties
	per lakh population	Casualties
	per 1000 road accidents	Casualties
	percentage	Persons killed to total causalities
	percentage	Persons injured to total causalities
Vehicle density	Percentage vehicle/km	

Utilization indicator	Units	Categories
Registered vehicles	Numbers	By cars, trucks, buses, motorcycles etc.
Ownership	Vehicles/owner	By cars, trucks, buses, motorcycles etc.
Freight Transport	Tonne-km/yr	
Fiscal Cost and revenue indicator	**Units**	**Categories**
Road Transport Outlay and Expenditure	Rs. in crores	Outlay Expenditure
	percentage	Utilisation
Revenue Realised	Rs. in lakhs	Total Motor Vehicle Tax Commercial Vehicle Tax Passenger Tax Goods Tax Fines
Government spending	Rs. in Crores	Centre and State
Private sector spending	Rs. in Crores	
Affordability indicator	**Units**	**Categories**
Average annual price of fuel	Rs/litre	Petrol Diesel Others
Spending on Transport	Percentage of total expenditure	

CONCEPTS AND DEFINITIONS OF ROAD INFRASTRUCTURE STATISTICS

Term	Definition
Road	A way on land with a right of way for the public
Village Roads	These roads serve as the feeder roads as well as the roads for inter village movements. They pass through rural areas connecting the village to one another and to the nearest road of higher category viz. District Roads, State highways and National highways etc.
District Roads	The branch roads of the State and National Highways to serve as the main roads for intra-district movements. They traverse the length and breadth of a district to connect the areas of production and marketing in the district to one another and to the national highways.
Major District Roads	District Roads for which higher specifications are prescribed.
Other District Roads	District Roads for which lower specifications are prescribed.
Rural Roads	Other District Roads plus village Roads for which the specifications prescribed are lower.
Urban Road	A road within the limits of the area of Municipality, Military Cantonment, Port or Railway Authority
Project Road	A road within the limits of the area of a development project of a public authority for the exploitation of resources such as forest, irrigation, electricity, coal, sugarcane, steel etc.
Highway	It is a main road for travel by the public between important destinations, such as cities and states
National Highways	The arterial roads of the country for inter-State movement of goods and passengers. They traverse the length and width of the country connecting the national and State capitals, major ports and rail junctions and link up with border roads and foreign highways.

State Highways	The arterial roads in a State for inter-district movements. They traverse the length and width of a state connecting the state capital, district headquarters and important towns and cities and link up with the national Highways and adjacent state highways.
Below Standard single Lane	Surfaced roads having clear carriageway width of below 3.75 M.
Standard Single Lane	Surfaced roads having clear carriage way width between 3.75 M to below 7.0 M.
Standard Double Lane	Surfaced roads having clear carriageway width between 7.0 and below 10.5 M
Standard Multi Lane	Surfaced roads having clear carriageway width of 10.5 M and above
Road Density Land	Road Length/ Geographical Area
Road Density Population	Road Length/ Population
Surfaced Road	The surface of roads made with bitumen as a binder.
Registered Vehicles	Vehicle registration is usually the compulsory registration of a vehicle with a government authority. Vehicle registration's purpose is to facilitate government regulation, punishment, or taxation of motorists or vehicle owners. Vehicles are often uniquely identified by a vehicle identification number. Registered vehicles typically display a vehicle registration plate. Registration of vehicles in India is done by the local Regional Transport Offices (RTO) of that state. Commercial vehicles registered in one state cannot enter another state without a permit, which usually costs a lot. Passenger vehicles registered in one state, are allowed to pass through other state, but are not allowed to stay in another state for longer than 30 days.

Multi-axled/ Articulated Vehicles	A multi-axle bus is a bus or coach that has more than the standard two axles, usually three (tri-axle bus) or more rarely, four. An articulated vehicle is a vehicle which has a permanent or semi-permanent pivoting joint in its construction, allowing the vehicle to turn more sharply. There are many kinds of articulated vehicles, from heavy equipment to buses, trams and trains. Steam locomotives were sometimes articulated in that the driving wheels could pivot around turns. Buses are articulated to allow for a much longer bus which can still navigate within the turning radius of a normal bus. In a broader sense, any vehicle towing a trailer could be described as articulated (the word articulated comes from the Latin *articulus* : small joint)
Light Motor Vehicle	Light Motor Vehicle means a transport vehicle or omnibus the gross vehicle weight of either of which or a motor car or tractor or road roller the unladen weight of any of which does not exceed 6000 Kilograms
Heavy Goods Vehicle	Heavy Goods Vehicle means any goods carriage the gross-vehicle weight of which or a tractor or a road roller the unladen weight of either of which exceeds 12,000 Kilograms
Heavy Passenger Motor Vehicle	Heavy Passenger Motor Vehicle means any public service vehicle or private service vehicle or educational institution bus or omnibus the gross vehicle weight of any of which, or a motor car the unladen weight of which, exceed 12,000 kilograms
Gross Vehicle Weight	Gross vehicle Weight means in respect of any vehicle the total weight of the vehicle and load certified and registered by the registering authority as permissible for that vehicle.
Medium Goods Vehicle	Medium goods vehicle means any goods carriage other than a Light Motor vehicle or a Heavy goods Vehicle
Medium Passenger Motor Vehicle	Medium Passenger Motor vehicle means any public service vehicle or private service vehicle, or educational institutional bus other than a motor cycle, invalid carriage, Light Motor Vehicle or Heavy Passenger Motor Vehicle.

Contract Carriage	Contract carriage means motor vehicle which carries a passenger or passengers for hire or reward and is engaged under a contract, whether expressed or implied, to the use of such vehicle or any person authorized by him in this behalf on fixed or an agreed rate of sum. a) On a time basis, whether or not with reference to any route or distance; or b) From one point to another, and in either case, without stopping to pick up or set down passengers not included in the contract any where during the journey, and includes:- i) a maxi-cab; and ii) a motor-cab not withstanding that separate fares are charged for its passengers.
Educational Institution Bus	Educational Institution Bus means an omini bus, which is owned by a college, school or other educational institution and used solely for the purpose of transporting students or staff or the educational institution in connection with any of its activities
Goods	Goods includes Livestock, and anything (other than equipment ordinarily used with the vehicle) carried by a vehicle except living persons, but does not include luggage or personal effects carried in motor car or in a trailer attached to a motor car or the personal luggage of passengers travelling in the vehicle.
Goods Carriage	Goods carriage means any motor vehicle contracted or adopted for use solely for the carriage of goods or any motor vehicle not so constructed or adapted when used for the carriage of goods.
Invalid Carriage	Invalid Carriage means a motor vehicle specially designed and constructed and not merely adapted for the use of a person suffering from some physical defect or disability and used solely by or for such a person.
Private Service Vehicle	Private service vehicle means a motor vehicle constructed or adapted to carry more than six persons excluding the driver and ordinarily used by or on behalf of the owner of such vehicle for the purpose of carrying

	persons for or in connection with his trade or business otherwise than for hire or reward but does not include a motor vehicle used for public purpose.
Public Service Vehicle	Public Service Vehicle means any motor vehicle used or adapted to be used for the carriage of passengers for hire or reward and includes a maxi cab a motor cab, contract carriage, and stage carriage.
Registered Axle weight	Registered Axle Weight means in respect of the axle of any vehicle the axle weight certified and registered by the registering authority as permissible for that axle.
Stage Carriage	Stage carriage means a motor vehicle constructed or adapted to carry more than six passengers excluding the driver for hire or reward at separate fares paid by or for individual passengers, either for the whole journey or for stages of the journey.
Tourist vehicle	Tourist vehicle means a contract carriage constructed or adapted and equipped and maintained in accordance with such specification as may be prescribed in this behalf.
Transport Vehicle	Transport Vehicle means a public service vehicle or a goods vehicle.
Motor Vehicle	Motor Vehicle means any mechanically propelled vehicle adapted for use upon road whether the power of propulsion is transmitted there to from an external or internal source and includes a chassis to which a body has not been attached and a trailer; but does not include a vehicle running upon fixed rails or a vehicle of a special type adapted for use only in a factory (or in any other enclosed premises) or a vehicle having less than four wheels fitted with engine capacity of not exceeding thirty five cubic centimeters.
Maxi Cab	Maxi cab means any motor vehicle constructed or adapted to carry more than six passengers, but not more than twelve passengers excluding the driver for hire or reward.
Motor Cab	Motor Cab means any motor vehicle constructed or adapted to carry not more than six passengers excluding the driver for hire or reward.

Motor Car	Motor car means any motor vehicle other than transport vehicle, omnibus road roller, tractor, motorcycle or invalid carriage.
Motor Cycle	Motor cycle means a two wheeled motor vehicle inclusive of any detachable side car having an extra wheel attached to the motor vehicle.
Omnibus	Omnibus means any motor vehicle constructed or adapted to carry more than six persons excluding the driver.
Semi Trailer	Semi trailer means a trailer drawn by a motor vehicle and so constructed that a part of it is super imposed on a part of its weight is borne by the drawing vehicle.
Tractor	Tractor means a motor vehicle which is not itself constructed to carry any load (other than equipment used for the purpose of propulsion) but excludes a road roller.
Average Carrying Capacity	The Average carrying capacity is calculated as follows Total Seating & Standing for all vehicles on roads --- Total Number of vehicles on road
Average Route Distance	Total route kilometres of all the routes --- Total Number of routes
Weight	Weight means the total weight transmitted for the time being by the wheels of a vehicle to the surface on which the vehicle rests.
Axle weight	Axle weight means in relating to an axle of a vehicle the total weight transmitted by the several wheels attached to that axle to the surface on which the vehicle rests.
Unladen Weight	Unladen Weight means the weight of a vehicle or trailer include all equipment ordinarily used with the vehicle or trailer when working but excluding the weight of a driver or attendant and where alternative parts or bodies are used, the unladen weight of the vehicle means the weight of the vehicle with the heaviest such alternative part or body.
Certification of Registration	Certificate of registration means the certificate issued by a competent authority to the effect that a motor vehicle has been duly registered in

	accordance with the provision of Motor Vehicle Act, 1988.
Conductor	Conductor in relation to a stage carriage, means a person engaged in collecting fares from passengers, regulating their entrance into, or exit from the stage carriage and performing such other functions as may be prescribed.
Conductor's licence	Conductor's Licence means the Licence issued by a competent authority authorising the person specified to act as a conductor.
Fares	Fares include sums payable for season ticket or in respect of the hire of a contract carriage.
Learner's Licence	Learner's Licence means the licence issued by a competent authority under Chapter II authorising the person specified therein to drive as a learner a motor vehicle or a motor vehicle of any specified class or description.
Owner	Owner means a person in whose name a motor vehicle stands registered and where such person is a minor the guardian of such minor and in relation to a motor vehicle which is the subject of a hire purchase agreement, or an agreement of lease or an agreement of hypothecation the persons in possession of the vehicle under that agreement.
Permit	Permit means a permit issued by a state or regional transport authority or an authority prescribed in this behalf authorising the use of a motor vehicle as a transport vehicle.
Administrative Staff	Includes all the staff working in the Depots and Divisions, other than those in traffic Staff, Workshop and Maintenance Staff.
Route	Route means a line of travel which specifies the highway which may be traversed by a motor vehicle between one terminus and another.
Public Place	Public place means a road, street way or other place, whether a thoroughfare or not to which the public have a right of access and includes any place or stand at which passengers are picked up or set down by a stage carriage.
Traffic signs	Traffic signs include all signals, warning sign posts, direction posts, marking on the road or other devices for the information, guidance or

direction of drivers of motor vehicles.

State Transport Undertaking

State Transport Undertaking means any undertaking providing road transport service, where such undertaking is carried on by:

(i) the Central Government or a State Government

(ii) any road Transport Corporation established under section 3 of the Road Transport Corporation Act, 1950

(iii) Any municipality or any corporation or company owned or controlled by the Central Government or one or more State Governments, or by the Central Government and one or more State Government.

A.2 RAIL TRANSPORT

CLASSIFICATION OF RAIL INFRASTRUCTURE STATISTICS

Access indicators	Units	Categories
Route kilometer	1000 kms.	Total
		By Gauge
		Broad gauge
		Narrow gauge
		Metre gauge
Rail Density	Per 1000 km^2	By Area
	Per 1000 population	By population
Track Kilometre	Kms	Total
Fleet Strength	Numbers	Total
		Passenger Trains
		Goods Trains
Carrying capacity Passenger	Number	
Carrying capacity Freight	Tones	
Railway coaches	Numbers	
Railway Wagons	Numbers	
Quality indicators	**Units**	**Categories**
Track Electrification	Percentage	Route kilometre
		Track kilometre
Average number of passenger trains running per day	Numbers	
Average number of passengers carried per day	In million	
Train Accidents	per million train km	
Passenger casualties	Numbers	Injured
		Killed

Signaling System and telecom installations	Numbers	
Staff	Numbers	Total
		Total (Female)
		Administration
		Accounts
		Engineering
		Signal and telecom communication
		Transportation
		Commercial
		Mechanical Engineering
		Stores
		Electrical
		Medical
		Railway Protection Force
		Railway Board and other Railway offices
Stations	Numbers	Broad Gauge
		Meter Gauge
		Narrow Gauge
Railway Employee productivity	Output/employee	
Railway Traffic Density	Traffic units/ Railway Km	
Average Speed	km/hr	Passenger Train
		Goods Train
Fiscal Costs and revenue indicators	**Units**	**Categories**
Gross Revenue	In crores (Rs.)	Total
		Passenger Revenue
		Freight Revenue
		Other Income
Working Expenses	In crores (Rs.)	Total
		Government Railways
		Production Units and Projects

			Metropolitan Transport Projects
	Gross Expenditure	In crores (Rs.)	Total
			Government Railways
			Metropolitan Transport Projects
	Capital Outlay	In crores (Rs.)	Total
			Government Railways
			Production Units and Industrial Projects
			Metropolitan Transport Projects
	Plan Head-wise allocation and expenditure		
Utilization indicators		**Units**	**Categories**
	Passenger Traffic	In millions	Numbers carried
	Freight Traffic	In millions In million tonnes In million tonne kilometre	Kilometres carried
Affordability indicators		**Units**	**Categories**
	Average Rail tariff(freight)	Rs. Per tonne km	
Average Rail tariff(passengers)		Rs. Per passenger km	

CONCEPTS AND DEFINITIONS OF RAIL INFRASTRUCTURE STATISTICS

Term	Definition
Route Kilometres	This represents the length of the railway routes open for traffic at the end of each year. In calculating the length of the route, double or more than double lines are counted only once.
Track kilometer	Distance of each gauge owned by a railway including its worked lines treated as a single line and the extra distance due to double, treble, etc, tracks as also the length of sidings, etc.
Running track kilometer	In addition to the route kilometrage the extra distance of multiple tracks i.e. double treble etc, tracks shall be treated as two or three or more tracks but shall exclude the tracks in sidings yards and crossings at stations.
Train Kilometres	This represents the kilometres run by trains carrying passengers or goods or both as well as the kilometres run by empty trains. No deduction is made for departmental trains.
Seat kilometer	Unit of measuring the carrying capacity of a passenger vehicle which is equivalent to the movement of one seat available in a coach or motor vehicle over a distance of one kilometer.
Tone kilometer	Unit of measure which represents the movement of one tone over a distance of one kilometre.
Tonnes terminating	Include tones of all traffic terminating on the gauge whether they originated on the home line or on other railways.
Tonnes originating	This includes tones of all traffic originating on each gauge whether it terminates on the gauge itself or on some other gauge of the home line or on other railways.
Transhipment	Transfer of goods from one vehicle to another of the same or different gauges.
Turn round of a wagon	Interval of time between two successive loadings of a wagon.

Engine available for use

The daily average number of engines employed on each class of work i.e. service during the month can be simply and readily worked out. From the totals of these figures, the following important results can be worked out:

(i) Engine kilometres per passenger, goods, etc., engine per day

(ii) Engine kilometres per day per engine in use

(iii) Engine kilometres per day per engine on line.

With the help of such figures, it is possible to ensure that as much use as possible is being made of the engines available for use and to see the effect of any improved methods introduced. It is also advisable to analyse at fixed intervals exactly how an engine spends each hour of the 24 hours in a day. In case, there is a wide variation between items (ii) and (iii) above, further analysis is necessary to find out if a railway/division has stocked more engines than its requirement and also the engines actually employed in service are being utilized to the full.In making comparisons between railways on the basis of engine kilometres per engine per day, allowance must be made for such factors as :

Extent of local or short distance goods service;

Extent of suburban service/through goods and van and shunting good services, Extent of business offering; Average length of haul, Gradients and curvature, Proportion of single line

Net tonne kilometres per goods locomotive day

This result is arrived at by dividing the net tonne kilometres of revenue earning and non revenue traffic (less the net tonne kilometres of traffic carried in departmental trains other than coal) by the product of the number of goods locomotives during the year and the number of days in that year.

A decrease in the figure of net tonne kilometres per goods locomotive day may be due to :

(i) less traffic offering;

(ii) shunting hours not being cut down in proportion to the decrease in traffic offering;

(iii)increase in departmental, assisting required, assisting not required and light engine kilometres;

(iv)decrease in the amount of work obtained from an engine daily either in the number of kilometres or run per day

(v)increase in the number of engines under or awaiting repairs

over a series of years, this figure should show a steady increase due to improvements in the design of engines and a consequent increase in the tractive effort. This figure is also valuable for comparing the work obtained from engines during two busy periods.

Wagon kilometres per wagon day

The numerator is wagon kilometres and the denominator is wagon days.

The term wagon includes both covered and open goods wagons.

The wagon kilometrage includes the kilometrage made during the month by loaded and empty wagons run on goods and mixed trains but excludes empty brake wagons and empty departmental oil tanks, gas holders, water trucks and inspection carriages, etc.

Wagon days are arrived at by multiplying the daily average number of wagons on the line, in terms of 4-wheelers by the number of days in the month.

This figure is much lower during the slack season than during the busy season owing to the fact that wagons are more fully used during the latter period. The difference between these two figures is generally the measure of the stock lying idle on the line during the slack season. This unit will give an idea of the efficient and economical use of the wagon stock available.

A decrease in the wagon kilometres per wagon day may be due to :

i. delays in marshalling yards;
ii. delays at stations when loading or unloading;
iii. decrease in the average speed of goods trains;

iv. increase in the number of wagons under or awaiting repairs; and

v. less traffic offering

Net tonne kilometres per wagon day

This unit is one of efficiency in wagon user. This result is the product of mobility and loading. A decrease in the net tonne kilometres per wagon day may be due to any of the causes which affect the figure of wagon kilometres per wagon day. This figure also takes into consideration the proportion of loaded to total wagon kilometrage, the average load of a loaded wagon and the relative proportion of heavy and light merchandise carried.

Loads of goods trains

The load of a goods train is measured in :

(i) net or freight tonnes

(ii) gross tonnes including the weight of engine; and

(iii) gross tonnes excluding the weight of engine

A decrease in the net or freight load may be due to

(i) less traffic offering

(ii) a decrease in the average starting wagon load

(iii) a decrease in the wagon loads of wagons received at junctions

(iv) unbalanced traffic and the necessity for working back at large number of empties; and

(v) bad working

Gross tonne kilometres per engine hour

A figure of gross tonne kilometres per engine hour is more suitable for judging departmental efficiency than a figure of net tonne kilometres per engine hour, as sometimes the net tonne kilometres go down with no decrease in gross tonne kilometres due to such causes as an increase in the proportion of unbalanced traffic and so an increased running of empties.

Gross tonne kilometres per train engine hour

A figure of gross tonne kilometres per train engine hour is valuable as a check on the efficiency of the running of goods trains. A decrease in the gross tonne kilometres per train engine hour may be due to a

decrease in either the gross loads or the speeds of trains. A figure of gross tonne kilometres per train engine hour is better than either the train load or the speed separately but gives an undue importance to speed. The aim of transportation officers is to get as high a figure of gross tonne kilometres per train engine hour as possible and this can be done by either increasing the load or increasing the speed. The final check is the cost per tonne kilometre and it is necessary to avoid increases in the gross tonne kilometres per train engine hour if they involve an increase in the cost of working one tonne one kilometre.

Net tonne kilometres per engine hour

A figure of net tonne kilometres per engine hour is probably the best individual figure to take for watching the efficiency of freight working on a division. Net tonne kilometres indicate the amount of revenue earning work done while engine hours measure the cost of doing it. A decrease in net tonne kilometres per engine hour may be due to :-

(i) less traffic offering;

(ii) shunting engine hours not being cut down in proportion to the decrease in traffic offering;

(iii) increase in departmental, assisting required, assisting not required and light engine running;

(iv) decrease in the average load or the average speed of goods trains;

(v) decrease in the average starting wagon load or in the wagon loads of wagons received from other divisions; and

(vi) increase in proportion of unbalanced traffic

Gauge

Indian Railways uses four rail gauges: 1,676 mm (5 ft 6 in) Broad Gauge (BG) (Indian gauge), 1,000 mm (3 ft 3 3⁄8 in) Metre Gauge (MG) and two Narrow Gauges, 762 mm (2 ft 6 in) & 610 mm (2 ft).

Project Unigauge seeks to standardise the rail gauges in India by converting most of metre gauge tracks and narrow gauges tracks to broad gauge track. Some narrow gauge tracks on which heritage trains run in hilly regions (Simla, Darjeeling, Ooty, Kangra and Matheran) will not be converted.

	Delhi Metro Rail Corporation has constructed 1,435 mm (4 ft 8 1⁄2 in) Standard Gauge in Delhi and started running metro trains in Delhi city in 2010. Delhi Metro is a separate urban mass rapid transit system not owned by Indian Railways.
Number of Passengers and Metric Tonnes carried	The figures represent the number of passengers and weight in metric tonne of goods, originating on all Railways, treating passengers travelling or goods carried over two or more Railways as single journey.
Passenger Kilometres and Net Tonne Kilometres	These figures represent the real indices of the volume of passengers and goods traffic handled. These are arrived at by multiplying the total number of passengers carried and the total tonnage of goods carried by the respective number of kilometres, over which they are moved.
Gross tonne kilometre	Gross tonnage comprising of payload and tare weight hauled by a train.
Gross tonne kilometre (excluding weight of engine)	Unit of measure of work which corresponds to the movement over a distance of one kilometre of one tonne of vehicle and contents excluding the weight of the motive unit.
Gross tonne kilometre (including weight of engine)	Unit of measure of work which corresponds to the movement, over a distance of one kilometre of one tonne including the weight of the motive unit vehicle and contents.
Engine kilometre	An engine kilometre is the movement of an engine under its own power, over a distance of 1 kilometre.
Equated tract kilometres	Kilometrage of track equated to a standard unit by giving weightage for factors of traffic density, gradient, formation of soil, alignment (curves), rainfall and track connections and layouts.
Mean kilometrage	The length of the railway, calculated according to the definition of route kilometrage allowing for changes in the kilometrage during the period covered. Thus, the mean kilometrage worked during a year

	which has had an addition/closing during the year will be as follows:- (a) Route kilometrage at commencement of a year (plus/minus); (b) (Number of days the new section/section closed was in use during the year) multiplied by (the length of the new section/section closed) and divided by (the number of days in the year).
Wagon	Railway vehicle used for the carriage of goods.
Wagon, covered	Wagon of a watertight nature by virtue of the construction of the vehicle (completely covered on roof and sides), also characterized by the security of transport (possibility of locking and/or sealing the wagon).
Wagon loaded	Refers to a wagon loaded with goods traffic.
Wagon open	Wagon not fitted with a roof. It may be either high sides, low sided or without sides.
Wagons owned	Includes total number of wagons owned by a railway whether against authorized stock or stock which has been replaced but still running.
Vehicle/wagon day	Unit of measure of the potential use of vehicle/wagons, which corresponds to one vehicle/wagon being present on the system during one day.
Vehicle/wagon effective	A Vehicle/wagon effective, is one in serviceable condition available on a railway and is either in traffic or available for traffic use.
Vehicle/wagon kilometre	Unit of measure of distance which corresponds to movement of a vehicle/wagon over a distance of 1 kilometre.
Vehicle/wagon under or awaiting repairs	Is one being repaired in a shop or sick lines or awaiting entrance into a shop for repairs.
Authorised stock-locomotives/ vehicles/ wagons	This is the sanctioned allotment of stock for a railway and includes stock ordered for or under construction but not handed over to traffic. Stock sold or broken up but not replaced or removed from

	authorized stock is included. Stock replaced but still running is not included.
Average haul or lead of traffic	Represents the average distance each passenger or tonne of goods is transported.
Density	The volume of traffic moving between any two points on the railway system. It is expressed in terms of passenger kilometres or net tonne kilometres and train kilometres per running track kilometre or route kilometre.
Empty running	The running of vehicles empty i.e. without being loaded.
Engine (effective)	An engine effective is one, stored or not stored, in condition for use.
Engine failures	An engine is considered to have failed when it is unable to work its booked train within the prescribed load from start to destination or causes a delay in arrival at destination of a specified period, namely 30 minutes or more in case of passenger trains hauled by diesel electric and electric engines and 60 minutes or more in all other cases due to defective design or material or bad workmanship in shed/workshop of mismanagement by crew or bad water/fuel.
Engine –under or awaitin repairs	Is one being repaired in shop or running shed or in running shed awaiting workshop repairs or in transit to and from shed/workshop and also moved dead to and from shed/workshop on mechanical and electrical account.
Length of electrified lines	Length of lines provided with an overhead trolley wire or with a conductor rail.
Carrying Capacity of a vehicle or wagon Passenger	The extent to which the vehicle can normally be loaded as shown by the wagon or van marking. The capacity is expressed for passenger stock in the number of seats/berths available .
Carrying Capacity of a vehicle or wagon Freight	The extent to which the vehicle can normally be loaded as shown by the wagon or van marking. The capacity is expressed for parcel and goods stock in tonnes.

Local traffic	The expression 'Local traffic' when used with reference to a railway means traffic originating and terminating at stations within the limits of that railway without passing over any other railway.
Locomotives	Rail vehicle either with prime-mover and motor or with motor only (electric locomotive) used for hauling other vehicles. A distinction is made between steam locomotives, electric locomotives, diesel locomotives, etc., according to the type of motive power used.
Locomotive, steam	A locomotive, steam is one propelled by power supplied from a steam engine
Locomotive, diesel-electric	A locomotive, diesel-electric, is one propelled by electricity supplied from diesel electric type internal combustion prime mover and irrespective of the number of units used
Locomotive, diesel hydraulic and mechanical	A diesel hydraulic and mechanical locomotive is one propelled by hydraulic transmission where engine torque is multiplied by a hydraulic torque convertor irrespective of the number of units used
Locomotive, electric	A locomotive electric is one propelled by electricity supplied from an external conductor regardless of whether storage batteries are used as an auxiliary source of power and irrespective of the number of units used.
Rail cars internal combustion engine propelled	Are self propelled vehicles the prime movers of which are internal combustion engines.
Net load, net tonnage	The weight of passengers, baggage or goods conveyed by a vehicle (coach wagon etc.), or by a group of vehicles (trains).
Rolling stock	All railway tractive and transport vehicles including travelling cranes
Rolling stock locomotive/ vehicle/ wagon- on line	It is one which is actually on the track of the reporting railway system. Stock owned by it but absent on other railways are excluded and those of other railways running on its line are included. Coaching vehicles of other railways running on the line temporarily

	as forming part of through trains are however excluded from coaching vehicles on line. They are included by the owning railway.
Van	Railway vehicle attached to a passenger or goods train and used by the train staff and or for the conveyance of any baggage, parcels, etc.
Vehicle, Passenger (passenger carriages)	Railway vehicle used for the carriage of persons
Running power	Refers to the arrangement by which a railway runs its trains on lines owned by another railway.
Shunting	Operation of moving a vehicle or rake of vehicles inside a station marshalling yard or other railway installation (depot, workshops etc.)which are not considered as a train movement.
Siding	Commercial sidings are to show assisted sidings built for private individual's local requirements sidings in the coal fields leading to a particular colliery, etc. Transportation sidings are to show crossings, loops at stations, relief sidings, sidings in the coal fields not used solely for a particular colliery etc.
Smalls	Goods consignments whose weight and dimensions do not require the exclusive use of a wagon. Several smalls consignments may consequently be loaded in the same wagon.
Staff	All employees paid directly by the railway administration (except casual labour).
Stores	Supplies of materials or parts whether purchased externally or manufactured in railway workshops required for working the railway.
Suburban traffic	Passenger traffic moving in metropolitan areas (at present in Bombay, Calcutta and Madras) where special concessional rates for season tickets are applicable is termed as suburban traffic.

Through traffic

This expression refers to transport of interchange traffic beyond the limits of a single railway system.

Tonnes carried

This represents the quantum of goods originating on each railway as well as the quantum of goods received from other railways/gauges and also those crossing the railway.

Average speed of passenger and goods trains

The average speed of trains train kilometres per train engine hour is not the average running speed but the average time taken over the division or section including all stops at stations.

If the average speed of trains on a section is low, the running of trains should be carefully analysed and it will generally be found that the low average is due to delays on certain block sections or at one or more stations and that it is possible to increase the average speed by:-

(i) changing the timings of the trains; and /or

(ii) providing extra loops or other facilities

The stations at which the heaviest delays take place should be dealt with first until by a process of elimination there is no specially bad stations.

Average haul

A knowledge of the average distance hauled is of great importance in all questions of the stock of wagons required, the rates charged and the cost of working. With a short average haul, a lower average number of kilometres per day is generally obtained out of each wagon, as the shunting necessary is greater and it is not possible to arrange for the running of long distance through trains. This results in increased coal consumption and increased cost of working.

Operating ratio

The ratio of working expenses (excluding suspense but including Appropriation to Depreciation Reserve Fund and Pension Fund) to gross earnings.

Gross Earnings and Working Expenses

This represents total earnings and expenses of Railways in an accounting period irrespective of whether or not the earnings have been realized or expenses paid. Gross earnings include all earnings

	from passenger traffic, goods traffic, parcels, luggage and other miscellaneous sources of revenue, while working expenses include all expenses incurred for maintenance of structural works, supply of loco power, carriage and wagon stock, ferry steamers and harbors as well as the expenses of traffic departments, general electric service departments and other miscellaneous expenses.
Capital-at-charge	Book value of the capital assets of the Railways.
Capital outlay	Expenditure of capital nature incurred during the period with the object of increasing concrete assets of a material character.
Depreciation reserve fund	This fund provides for the cost of renewals and replacements of assets as and when they become necessary.
Pension fund	This fund was created with effect from 1st April, 1964 to even out the charges and to provide not only for the current payments to retired pension opting staff but also to provide from Revenue/Capital each year the accumulated liability for the pension benefits earned by each pension opting staff for each year of service in the same way as provision is made for depreciation Reserve Fund.
Development fund	This fund was instituted with effect from 1st April, 1950 and is intended to finance expenditure on : (a) amenities for all 'user of railway transport'; (b) labour welfare works costing individually above the new minor works limit; (c) expenditure on unremunerative operating improvement works; and (d) cost of construction of quarters for class III staff
Gross earnings	The true earnings in an accounting period whether actually realized or not.
Gross receipts	Earnings actually realized during an accounting period.
Suspense	Difference between true earnings/working expenses in an accounting period whether or not actually realized/disbursed and

	earnings/working expenses actually realized/disbursed during an accounting period.
Net earnings	The difference between the gross earnings and the working expenses, excluding suspense but including appropriation to Depreciation Reserve Fund and Pension Fund.
Net revenue	Difference between the gross earnings and the working expenses after the payment of dividend to General Revenues, payment to worked lines and other net miscellaneous expenditure.
Non revenue traffic	Traffic conveyed by rail for the working of the railway and for which commercial tariffs are not charged.
On cost	Expenditure incurred on jobs which cannot be charged direct to the cost of articles manufactured or work done.
Revenue earning traffic	Traffic conveyed by rail and for which commercial tariffs are applied for transportation of which the railway is paid by either the consignor or the consignee.
Revenue reserve fund	This Fund consists of appropriation out of the surplus of net revenue receipts of railways and is utilized primarily for maintaining the agreed payments to generate revenues and for making up any deficit in the working of the railways.
Revenue tonne kilometer	Unit of measure of public goods traffic which represents the transport of a quantity of goods charged for as one tone over a distance counted in the tariff as one kilometre.
Working expenses	Expenditure incurred in connection with the administration, operation maintenance and repairs of lines opened for traffic. This also includes appropriation to Pension Fund and the contribution made to the Depreciation Reserve Fund to meet the cost of replacements and renewals.
Passengers carried	Refers to the number of passengers originating on each railway as well as the number of passengers received from other railways and also those crossing the railway.
Passenger	Unit of measure of passenger traffic corresponding to the

kilometer	conveyance of a passenger over a distance of one kilometre.
Passengers originating	Means number of passengers booked from each gauge of the railway.
Fare	Money realized by the railways from transportation of persons.
Rate	Price fixed by the tariff for the conveyance of a unit of parcels, luggage and goods.

A.3 INLAND, SEA AND COASTAL TRANSPORT

CLASSIFICATION OF INLAND, SEA AND COASTAL INFRASTRUCTURE STATISTICS

Inland Transport		
Access indicators	**Units**	**Categories**
Length of water ways	Kilometres	Total
		Navigable
Size of vessels that can be accomodated	Tonne	Dead Weight Tonnage (DWT)
	Metre	Dimension
	Number	Number of berths
Inland Water Vessels	Number	State
		Company
Quality indicators	**Units**	**Categories**
Accidents	Number	Total
	Number	Persons killed
Fiscal Cost and revenue indicators	**Units**	**Categories**
Plan Outlay	Rs.(in lakh)	
Expenditure	Rs.(in lakh)	
Freight Collected	Rs.(in lakh)	

Utilization indicators	Units	Categories
Cargo Movement	Tonnes	Cargo Weight
	Tonne kilometer	Total Cargo Distance
Passengers carried by inland water vessels	Number	State wise
	Number	Company wise
Cargo carried by inland water vessels	In tonnes	State wise
	In tonnes (cargo)	Company wise
Affordability indicators	**Units**	**Categories**
Average freight collected per tonne km	In Rs.	

SEA AND COASTAL TRANSPORT

Access indicators	Units	Categories
Ports	Number	Total (by state)
		Major
		Non Major
Quality indicators	**Units**	**Categories**
Vessels sailed from port	Number	Total for all vessels and by type of Vessel
		Dry Bulk
		Liquid Bulk
		Break Bulk
		Container Vessels
Average pre berthing waiting time	Days	Total for all vessels and by type of Vessel
		Dry Bulk

		Liquid Bulk Break Bulk Container Vessels
Average Turn Round Time	Days	Total for all vessels and by type of Vessel Dry Bulk Liquid Bulk Break Bulk Container Vessels
Percentage of Idle Time at Berth to Working Time at Berth	Percentage	Total for all vessels and by type of Vessel Dry Bulk Liquid Bulk Break Bulk Container Vessels
Output per Ship Berth Day	In tonnes	Total for all vessels and by type of Vessel Dry Bulk Liquid Bulk Break Bulk Container Vessels
Employment	Number	Major ports Non Major ports
Fiscal Cost and revenue indicators	**Units**	**Categories**
Capital Employed	Rs.(in crore)	By port
Operating Expenditure	Rs.(in crore)	By port
Operating Income	Rs.(in crore)	By port
Plan Schemes Outlay (Port Sector)	Rs. (In crore)	
Expenditure (Port Sector)	Rs. (In crore)	

Utilization indicator	Units	Categories
Cargo Traffic Handled	In thousand tones	Total
		Major Port
		Non Major Port
	In thousand tones	Overseas
		Major Port
		Non Major Port
	In thousand tones	Coastal
		Major Port
		Non Major Port
Container Traffic Handled	TEUs	Total (Container Cargo)
		Loaded
		Unloaded
Passenger Traffic Handled	In thousand numbers	Total (Major Ports)
		Embarked
		Disembarked
		Overseas
		Embarked
		Disembarked
		Coastal
		Embarked
		Disembarked
	In hundred numbers	Total (Non Major Ports)
		Embarked
		Disembarked
Affordability indicators	**Units**	**Categories**
Operating Income per Tone of cargo handled	In Rs.	
Operating Expenditure per Tone of cargo handled	In Rs.	

CONCEPTS AND DEFINITIONS OF INLAND, SEA AND COASTAL INFRASTRUCTURE STATISTICS

Terms	Definition
Port	A sheltered harbour where marine terminal facilities are provided, consisting of piers or wharves at which ships berth/dock while loading or unloading cargo, transit sheds and other storage areas where ships may discharge incoming cargo, and warehouses where goods may be stored for longer periods while awaiting distribution or sailing.
Major Port and Non Major Port	The Major Ports are ports which are under the administrative purview of the Union Government while the Non-major Ports are under the administrative jurisdiction of the respective State Governments/UTs.
Navigable Inland Waterways	A stretch of water, not part of the sea, over which craft of a carrying capacity not less than 50 tonnes can navigate when normally loaded. This term covers both navigable rivers and lakes (natural water courses, whether or not they have been improved for navigation purposes) and canals (water ways constructed primarily for the purpose of navigation).
Length of Waterways	The length of rivers and canals is measured in mid channel and length of lakes, as well as lagoons, is counted as the length between the most distant points between which the transport is performed.
Inland Waterways	An inland waterway forming a common frontier between two countries is reported by both.
Inland Water Transport (IWT) Craft	Craft having a minimum carrying capacity of 20 tonnes designed for the carriage of goods by inland waterways.
National Waterways	National Waterways means an Inland Waterway of India designated as a National Waterway by the Government.
Vessels	Vessel includes any ship or boat or any description of a vessel or boat,

	or any artificial contivance used or capable of being used as a means of transportation on water.
Sailing Vessel	Any description of vessel provided with sufficient sail area for navigation under sails alone – whether or not fitted with mechanical means of propulsion and would include rowing boat or crane but does not include a pleasure craft.
Fishing Vessel	A ship fitted with mechanical means of propulsion which is exclusively engaged in sea fishing for profit.
Sea-going Vessel	A vessel proceeding to sea beyond inland water or beyond waters declared to be smooth or partially smooth by the Central Government by notification in the official gazette.
Survey Vessel	Mechanically propelled sea-going vessel specially built and equipped to carry out hydrographic and other nautical surveys in coastal waters and on the high seas. Surveying vessels are in most instances Government owned.
Mooring Vessel	A vessel which is secured by moorings.
Steam Vessel	Every description of vessel propelled wholly or in part by the agency of steam.
Reefer	A vessel with refrigerating facilities.
Inland Steam Vessel	A steam vessel which ordinarily plies on inland water.
Freight	It denotes goods which are in the process of being transported from one place to another.
Freighter	A ship designed to carry general cargo (with a limited passenger accommodation) operating on fixed routes with fixed sailing schedules and serving a group of ports.
Tanker	A cargo ship constructed or adopted for carriage in bulk of liquid cargoes of an inflammable nature.

Dumb Tanker	Dumb barge intended for the bulk transport of liquids or gases. Tankers for the transport in bulk of powdered products such as cement, flour, plaster, etc. are to be excluded, and to be counted among dumb barges.
Self Propelled Tanker	Self propelled barge intended for the bulk transport of liquids or gases. Tankers for the transport in bulk of powdered products such as cement, flour, plaster etc. are to be excluded and to be counted among self-propelled barges.
Barge	A term applied to a flag officer's boat in naval usage, or to an elegantly fitted boat, or craft or ceremony propelled mechanically or by oars and reserved for the use of high officials when transported in State. In a legal sense a barrage is usually held to be a boat or vessel and hence it is within the letter of the laws relating to such craft.
Dumb Barge	IWT craft designed for being towed and not having its own means of mechanical propulsion. A dumb barge even fitted with an auxiliary engine does not change its nature.
Self-Propelled Barge	IWT craft having its own means of mechanical propulsion, dumb barges, pushed barges and pushed-towed barges with only an auxiliary engine should be regarded as dumb, pushed or pushed-towed barges as the case may be. The fact that a self propelled barge can be used for towing does not change its nature.
Hopper Barge	A steel or wooden barge with hopper doors employed in harbours used for the disposal of mud, gravel, sand etc., taken from a dredger and then conveyed to a dumping ground where the cargo is discharged through the bottom; also called 'dump scow'.
Ballast	Any material intended to provide stability to the ship when it is otherwise empty.
Bunker	Ship-space for storing fuel (Coal, Oil etc.)
Passenger Ship	A ship carrying more than twelve passengers.

Unberthed Passenger Ship	A ship carrying more than thirty unberthed passengers.
Cargo Ship	A ship which is not a passenger ship.
Liner Ship	A ship that plies on a regular scheduled services between groups of ports. The ships of a liner company are common carriers, offering cargo space or passenger accommodation to all shippers and passengers who require them. A liner company is generally engaged on trade-routes where large volume of cargo or passenger traffic is available.
Coasting Ship	A ship exclusively employed in trading between any port or place in India and any other port or place in the continent of India or between ports or places in India and port or places in Sri Lanka, Bangladesh or Myanmar.
Home trade Ship	A ship not exceeding three thousand tons gross which is employed in trading between any port or place in India and any other port or place in the continent of India or between ports or places in India and ports or places in Sri Lanka, Maldive Islands, Federation of Malaysia, Singapore, Bangladesh or Myanmar.
Foreign Going ship	A ship not being a home trade ship employed in trading between any port or place in India and any other port or place or between ports or places outside India.
Passenger Liner	A ship or vessel employed in carrying passengers, mail and goods at stated intervals between regular ports.
Tramp	A cargo ship operating in all ports of the world without a fixed route and sailing schedule in search of primarily bulk cargo carried generally in ship-loads.
Ore/Oil and Bulk Carriers	A bulk cargo ship designed to carry ore and oil enabling it thereby to be loaded in both directions.

Collier	Generally a coastal ship designed to carry coal.
Craft	A term in marine parlance applied to every kind of vessels but more especially to small vessels when referred to collectively. For marine insurance purposes, a craft is any barge, lighter, river trades or any other boat or vessel employed in carrying, shipping or discharging the goods insured.
Tug	Powdered craft developing not less than 37 KW and designed for the towing of dumb barges, pushed towed barges, rafts, but not for the carriage of goods.
Pusher Tug	Powdered craft developing not less than 37 KW and designed or fitted for the towing of dumb barges, pushed-towed barges or rafts, and for the pushing pushed and pushed-towed barges but not for the carriage of goods.
Tug Boat	A mechanically propelled vessel of small tonnage with little or no cargo capacity, used for towing or assisting vessels at sea, in or out of harbour, rivers and docks also for coastal or harbour towage of barges, lighters and other small craft; also called tow boat, tug.
Launch	A large heavy and beamy ship's boat with flat floors and rather shallow draft, formerly used and designed for carrying stores and men.
Trawler	A sail or mechanically propelled vessel engaged in sea fisheries with a drag net, the most modern development of which is the otter trawl; also called dragger.
Bollard	Single or double cast steel post secured to a wharf or pier and used for mooring vessels by means of lines extending from the vessel and fastened to the wharf or pier.
Bollard Pull	The amount of pull exerted on a bollard of a ship.
Pusher Craft	Powered craft developing not less than 37 KW and designed or fitted for the pushing of pushed or pushed-towed barges but not for the carriage of goods.

Self Propelled Craft for River-Sea Navigation	Craft having a Dead Weight capacity of at least 20 tonnes, designed for the transport of goods by river and by Sea and equipped with their own means of propulsion developing at least 37 KW.
Dredgers	It is a ship or boat equipped with a dredge; a device for scraping or sucking the seabed.
Cellular Container	A container comprising of one or more parallel and modular rows of cells capable of housing and supporting fragile products.
Roll on/Roll Off	It is frequently called a vehicle FEERY. It is designed for the conveyance of road vehicles and private cars. At each terminal port, a tramp or linkspan is provided enabling the vehicles to drive on or off the vessels, thereby eliminating carnage and cargo handling (and also pilferage) and permitting a quick turn round of the ship.
Breaking Bulk	The commencing of discharging of cargo from ship.
Power (KW)	Mechanical force developed by the motive power installation in craft. This power should be measured in effective kilowatts (power transmitted to the propeller).
Load Line	The outer line on the body of a ship upto which she submerges in water with safety. It varies according to the seasons and waters in which she plies.
Draft	The depth necessary to submerge a ship to her load line.
Displacement Light	The weight of a ship without stores, bunker fuel, cargo, passengers and crew.
Displacement Loaded	The weight of a ship plus stores, bunker fuel, cargo passengers and crew.
Dead Weight tonnage (DWT)	Deadweight tonnage (often abbreviated as DWT for deadweight tonnes) is the displacement at any loaded condition minus the lightship weight. It includes the crew, passengers, cargo, fuel, water,

	and stores. Like Displacement, it is often expressed in long tons or in metric tons. This presents the actual carrying capacity of a ship. Lightship or Lightweight measures the actual weight of the ship with no fuel, passengers, cargo, water, etc. on board.
Gross Registered Tonnage (GRT)	It applies to the vessel and not to cargo. It is the weight of the volume occupied by the closed in space of a ship taking 100 cubic feet of such closed-in-spaces as equivalent to one vessel ton. It thus refers to the cubic capacity of the vessels.
Net Registered Tonnage (NRT)	It refers to the earning space capacity of a ship, available for the storage of cargo and accommodation of passengers. It is obtained by deducting from GRT the cubic capacity space (taking 100 cu, feet. = 1 ton)occupied by stores, fuel, machinery crew etc.
Cargo Tonnage/Freight Ton	It refers to the earnings cargo carried by a ship and is expressed as either a weight or measurement. In the British countries the long tons of 2240 pounds for 40 cubic feet and under the metric system as in India, the metric tonne of 1000 Kg. for a cubic metre.
Cargo	Cargo is the goods or produce transported generally for commercial gain by ship or any other mode of transport.
Cargo Handled	Cargo handled at the port is the key data of the port as it reflects the nature of port activity. It comprises cargo loaded, cargo unloaded and Trans-shipment.
Cargo loaded	Goods placed on a merchant ship for transport by sea .
Cargo unloaded	Goods taken off a merchant ship.
Trans-shipment	Cargo handled by a port, which is destined for some other port, by unloading this cargo from a merchant ship and loading it on to another to complete journey is termed as Trans-shipment Cargo**.** The cargo may even have dwell time ashore before its outward journey.
Break Bulk Cargo	The cargo is handled in units, packages, crates, bags and the like.

Dry Bulk Cargo	Homogeneous dry cargo (solid or pulverized) that is unpacked or undivided into parts and handled in mass.
Liquid Bulk Cargo	Homogeneous Liquid cargo (including gas) that is unpacked or undivided into parts and handled in mass.
Containerised Cargo	Cargo packed in containers for easy handling and transporting of the same as a unit.
Overseas traffic	The traffic between ports in two different countries, with the inward movement of goods termed 'Imports' and outward movements termed 'exports', both movements comprising the country's foreign trade.
Coastal Traffic	The traffic between different ports of the same country.
Transit Traffic	The traffic physically passing through a port in one country (without entering into that country's foreign trade) having originated in a second foreign country, and being consigned to a third country. The transit traffic may leave the country by sea or any other mode of transport (rail, canal, road, pipeline or air).
Turn Round Time	The total time spent by a vessel at the port from its arrival at reporting station till its departure from the reporting station. It thus includes pre-berthing waiting time, navigation time (inward movement and outward movement time), stay at working and non-working berths and shifting time'. However, the detention/idle time due to litigation, fire, repair/dry docking, delay in the decision regarding dismantling, etc. is not to be included.
Pre-Berthing Waiting Time	This is the time taken by a ship from its arrival at the anchorage and reported to the reporting station till it arrives at the operational berth excluding time taken for inward movement. The average pre-berthing waiting time can be obtained by dividing the total pre-berthing waiting time of all cargo vessels sailed from the port during a period by the number of cargo vessels sailed during that period.
Inward Movement	This is the navigation time taken by a ship for moving from anchorage

	or reporting station to an operational Jetty/Berth/Mooring as the case may be. In case the navigation is first to non-working berth, Inward Movement will be the time taken from anchorage point to non-working berth and time taken for shifting from non-working berth to operational berth/jetty/mooring.
Stay at Working / Non-working Berth	This is the total time spent by a cargo ship at one or more berths in one voyage. Thus, it is the sum of stay at each berth including anchorage, holding points, mid-stream, etc. However, the detention / idle time due to litigation, fire, repair/dry docking, delay in the decision regarding dismantling, etc. may be deducted since this does not form a part of the TRT. The berthing time of a cargo ship comprises two components i.e. Stay at Working Berth and Stay at Non-working berth. The Stay at Working Berth comprises working time and non-working time. The non-working time spent at working berth (Idle Time) is the time for which cargo operations are not carried out owing to various reasons including reasons not attributable to the port.
Shifting Time	This is the navigation time taken by a ship for moving from one working / non-working berth/anchorage to another working / non-working berth/anchorage.
Outward Movement	This is the navigation time taken by a ship from the time of unberthing from the last berth till the vessel reaches reporting station.
Average Stay at Working Berth	$\frac{\text{Total Stay at Working Berth of Vessels sailed}}{\text{Total Number of Vessels sailed}}$
Average Pre-Berthing Waiting Time	$\frac{\text{Total Pre-Berthing Time of Vessels sailed}}{\text{Total Number of Vessels sailed}}$
Average Non-working time	$\frac{\text{Total Non-working time at Working \& Non-working berths}}{\text{Total Number of Vessels sailed}}$
Percentage of Non-working Time at Working Berth	$\frac{\text{Non-working time at Working Berth}}{\text{Total Stay at Working Berth}} \times 100$

Average Parcel Size	Total Cargo handled by Vessels sailed Total Number of Vessels sailed
Berth-Day	A day of occupation of berth (quay or mooring) by a ship.
Percentage of Non-working Time at Working Berth	Non-working time at Working Berth X 100 Total Stay at Working Berth
Average Ship Berth-Day Output	Total Cargo handled by Vessels sailed Total Stay at Working Berth
Voyage and Time Charter Rates	A voyage charger is a contract for a specific voyage while a time charter is one for a period of time which may cover several voyages. A voyage charter rate is thus a short term rate and the time charter rate a long term one.

A.4 AIR TRANSPORT

CLASSIFICATION OF AIR TRANSPORT INFRASTRUCTURE STATISTICS

Access indicators	Units	Categories
Fleet Strength	Number	By Airline
		Number of aircrafts
		Passenger seating capacity per aircraft
Airports	Number	Total
		Domestic
		International
Quality indicator	**Units**	**Categories**
Airport Congestion	Number	Domestic
		International
Average number of flights handled per day	Number	Domestic
		International
Average number of passengers handled per day	Number	Domestic
		International
Average cargo handled per day	In tones	Domestic
		International
Air Accidents	Number	Total
		Number of casualties
		Cause of accident
Staff strength		Total
		Pilot

		Cabin crew
		Other technical staff
Fiscal Cost and revenue indicators	**Units**	**Categories**
Revenue	Rs.(in crore)	Airport Authority of India
		Scheduled Airlines
Expenditure	Rs.(in crore)	Airport Authority of India
		Scheduled Airlines
Government capital	Rs.(in crore)	Airport Authority of India
		Scheduled Airlines
Utilization indicators	**Units**	**Categories**
Domestic Traffic		
Passenger Traffic	In thousand numbers	Scheduled
		Non-scheduled
Cargo carried	In thousand tonnes	Scheduled
		Non-scheduled
International Traffic		
Passenger Traffic	In thousand numbers	Scheduled
		Non-scheduled
Cargo carried	In thousand tonnes	Scheduled
		Non-scheduled
Weight Load Factor	Percentage	
Affordability indicator	**Units**	**Categories**
Operating revenue	per passenger km (in Rs.)	National Carriers
		Private scheduled Domestic Airlines

CONCEPTS AND DEFINITIONS OF AIR TRANSPORT INFRASTRUCTURE STATISTICS

Term	Definition
Traffic	For air transport purposes, traffic means the carriage of passengers, freight and mail.
Seat Kilometres available	Seat kilometer is available when a seat is flown one kilometer. Seat kilometres available are equal to the sum of products obtained by multiplying the number of passenger seats available for sale on each flight stage by the stage distance. 177 seats not actually available for the carriage of passengers because of the weight of fuel or other load should be excluded in the calculations.
Tonne-kilometres available	A metric tonne of available payload space flown one kilometer. Tonne-kilometres available equals the sum of the products obtained by multiplying the number of tonnes available for the carriage of revenue load (passengers, freight and mail) on each flight stage by the stage distance.
Freight (or mail) tonne-kilometres (performed)	A metric tonne of freight or mail carried one kilometre. Freight tonne-kilometres equal the sum of products obtained by multiplying the number of tonnes of freight, express, diplomatic bags carried on each flight stage by the stage distance. Cargo and freight includes express and diplomatic bags but not passenger's baggage. Mail tonne- kilometres are computed in the same way as freight tonne kilometres.
Freight (or mail) tonne carried (performed)	The number of tonnes of freight carried is obtained by counting each tonne of freight on a particular flight (with one flight number) once only and not repeatedly on each individual stage of that flight. The only exception to this is for freight flown on both the international and domestic stages of the same flight, which is considered in computation both as a domestic and an international shipment or dispatch. The same principle should be used in calculating mail tonnes carried. International traffic (of airports): For airport traffic purposes,

	international traffic means: a) Passengers, freight and mail disembarked at an airport located in a country other than of the airport of embarkation, or vice versa; and b) Movements on flight of national or foreign aircraft whose origin or destination is located in the territory of a State other than that in which the airport under consideration is located.
Operating expenses per traffic-unit	This is a type of financial measurement, which relates the traffic or capacity applicable to the operating expenses. It is computed by dividing the operating expenses by the tonne-kilometres performed or by the tonne-kilometres available.
Operating revenue per traffic-unit	This is a type of financial measurement, which relates the traffic or capacity applicable to the operating revenues. It is computed by dividing the 176 operating revenues by the tonne-kilometres performed or by the tonne-kilometres available.
Passengers kilometres performed	A passenger's kilometre is performed when a passenger is carried one kilometre. Calculation of passenger-kilometres equals the sum of the products obtained by multiplying the number of revenue passengers carried on each flight stage by the stage distance. The resultant figure is equal to the number of kilometres travelled by all passengers.
Passenger load factor	Passenger-kilometres performed expressed as a percentage of seat kilometres available.
Passengers carried	The number of passengers carried is obtained by counting each passenger on particular flight (with one flight number) once only and not repeatedly on each individual stage of that flight, with a single exception that a passenger flying on both the international and domestic stages of the same flight should be counted as both a domestic and international passenger.
Passenger revenue per traffic unit	This is a type of financial measurement, which relates the passenger traffic applicable to the passenger revenues. It is computed by dividing the passenger revenue by the passenger kilometres performed/available.
Passenger weight	For converting aircraft passenger load into weight load, the number of

	passengers is multiplied usually by 90 kilograms, which allows for the weight of the passenger plus both free and excess baggage. However, in reporting the conversion is left to the discretion of the operator and conversion factors other than 90 kilograms may be used.
Revenue passenger	Refers to passengers paying 25% or more of the normal applicable fare.
Scheduled airline/air carrier	An air transport enterprise offering any schedule air service.
Scheduled services	Services provided by flights scheduled and performed for remuneration according to a published timetable, or so regular or frequent as to constitute a recognizably systematic series, which are open to use by members of the public; extra revenue flights occasioned by overflow of traffic on scheduled flights; and preliminary revenue flights on planned new air services.
Speed flown per aircraft	This is an average per aircraft measure computed by dividing the aircraft kilometres flown by the related aircraft hours.
Tonne-kilometres performed	A metric tonne of revenue load carried one kilometer. Tonne-kilometres performed equals the sum of the product obtained by multiplying the number of tonnes of revenue load carried on each flight stage by the stage distance.
Weight load factor	Tonne kilometres performed expressed as a percentage of tonne kilometres available.
Aircraft kilometres performed	Aircraft kilometres equal to the sum of products obtained by multiplying the number of flights performed on each flight stage by the stage distance.
Flight Stage	The operation of an aircraft from take off point to its next landing point.

SECTION B: ENERGY INFRASTRUCTURE

Energy is an important factor of economic development of a nation as it is required to meet the demands of industry, commerce and domestic users. Growing economies like India need to have stable and sustainable sources of energy supply as it is an important input in the production process. Indirectly, it also affects the health and education system of the country. Affordable energy directly contributes to reducing poverty, increasing productivity and improving quality of life.

An efficient energy system provides better opportunities for industries and production processes. A World Bank study indicates that countries with underperforming energy systems may lose up to 1-2 per cent of growth potential annually as a result of electric power outages, over-investment in backup electricity generators, energy subsidies and losses, and inefficient use of scarce energy resources.

A number of energy sources are used in India. In rural India, the main source is biomass. Most electricity supplies are generated by fossil fuels.

Coal is the most important and abundant fossil fuel in India. It accounts for 55% of the country's energy need. Considering the limited reserve potentiality of petroleum and natural gas, eco- conservation restriction on hydel project and geo-political perception of nuclear power, coal will continue to occupy centre-stage of India's energy scenario.

Natural gas is fast emerging as an alternative source of energy. For petroleum India is mainly dependent on imports.

For transportation of oil and petroleum products, cross country pipeline networks play a key role to meet the country's demand of energy. These pipelines transport crude oil from import terminals as well as domestic sources to inland refineries and finished products from refineries to major consumption centres.

The most visible form of energy, which is often identified with progress in modern civilization, is power, commonly called electricity. It is a critical component of infrastructure that determines the economic development of a country. To increase the availability of electricity, India has adopted a blend of thermal, hydel and nuclear resources. Out of these coal based thermal power plants and in some regions hydro power plants have been the mainstay of electricity generation.

Energy infrastructure normally includes:

- The physical infrastructure required for the exploration, development and production of energy.
- Transformation of energy, such as electric power generation and oil refining.
- Transmission and distribution of energy, such as electric power transmission lines, oil and gas pipelines.
- Storage of energy products.

Considering these aspects the infrastructure statistics for energy is classified under three subsectors viz. Coal, Petroleum & Natural gas and Electricity. The detailed classification of statistics along with definitions of important terms is explained in the following sections.

B.1 COAL MINING AND QUARRYING

CLASSIFICATION OF COAL MINING AND QUARRYING STATISTICS

Access indicators	Units	Categories
Reserves	In million tonnes	Total
		Grade wise reserves of coal
		Prime Coking
		Proved
		Indicated
		Inferred
		Medium Coking
		Blendable/Semi Coking
		Non coking
		Lignite
		Proved
		Indicated
		Inferred
Types of Mines	Number	Coal
		Total
		Opencast
		Public
		Captive
		Non Captive
		Private
		Captive
		Non Captive
		Underground
		Public
		Captive
		Non Captive
		Private
		Captive
		Non Captive
		Mixed
		Public

		Captive
		Non Captive
		Private
		Captive
		Non Captive
		Lignite
		Total
		Opencast
		Public
		Captive
		Non Captive
		Private
		Captive
		Non Captive
		Underground
		Public
		Captive
		Non Captive
		Private
		Captive
		Non Captive
		Mixed
		Public
		Captive
		Non Captive
		Private
		Captive
		Non Captive

Quality indicators	**Units**	**Categories**
Accidents in Coal Mining	Number	Fatal Accidents
		Fatalities
Average Fatality Rate	Number per production in	
	Million Tonnes	
Coking coal washery	In thousand tonnes	Washed Coal Production

performance	Percentage	Capacity Utilisation
	Percentage	Yield washed coal
Non Coaking coal washery	In thousand tonnes	Production
performance	Percentage	Capacity Utilisation
	Percentage	Yield
Employment	Number	
Fiscal Cost and revenue indicators	**Units**	**Categories**
Capital Outlay	Rs. (in crore)	Coal India Limited
		BE
		Actual
		Singareni Collieries Company Limited
		BE
		Actual
		Neyveli Lignite Corporation Limited
		BE
		Actual
Utilization indicators	**Units**	**Categories**
Output per Man shift	In tonnes	Coal India Limited
		Singareni Collieries Company Limited
		Neyveli Lignite Corporation Limited
Coal Production	Million Tonnes	Total
		Public
		Private
Affordability indicators	**Units**	**Categories**
Prices of selected grades of coal	Rs/tonne	Steam coal for industry
		Steam coal for electricity generation
		Coking coal for industry

CONCEPTS AND DEFINITIONS OF COAL MINING AND QUARRYING STATISTICS

Term	Definition
Coking Coal	Coking coals are those varieties of coal which on heating in the absence of air (process known as **Carbonisation**) undergo transformation into plastic state, swell and then re-solidify to give a Cake. On quenching the cake results in a strong and porous mass called coke.
Primary Coking Coal	Coal having low ash , low volatile and high coking property.
Medium Coking Coal	Coal having low ash, medium volatile, low caking index.
Blendable/ Semi/Weak Coking Coal	Coal having low ash, high volatile, very low caking index.
Non Coking Coal	These are coals with relatively lower ash and higher fixed carbon and of poor coking properties i.e. does not soften and form cake like coking coal during carbonization in the coke oven.
Proved Reserves	A 'Proven Mineral Reserve' is the economically mineable part of a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction is justified.
Indicated Reserves	An 'Indicated Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics, can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and

	testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed.
Inferred Reserves	An 'Inferred Mineral Resource' is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. Due to the uncertainty that may be attached to Inferred Mineral Resources, it cannot be assumed that all or any part of an Inferred Mineral Resource will be upgraded to an Indicated or Measured Mineral Resource as a result of continued exploration. Confidence in the estimate is insufficient to allow the meaningful application of technical and economic parameters or to enable an evaluation of economic viability worthy of public disclosure. Inferred Mineral Resources must be excluded from estimates forming the basis of feasibility or other economic studies.
Coal Washery	A Coal Washery or Coal Preparation Plant is a plant which removes ash from the coal to improve its quality as a commercial product.
Coal Reserve	The economically mineable part of the coal resource, as defined in the JORC Code. It includes diluting materials and allowances for losses.
Coal Resource	Coal in the ground with reasonable prospects for eventual economic extraction, as defined in the JORC Code.
Coal Sizing Plant	Plant used to size, crush or screen coal to market specifications.
Opencast	Open excavation made when extracting coal from the surface.
Coke	The solid product obtained from carbonization of coal or lignite at high temperature.
Coal Grades	The gradation of non-coking coal is based on Useful Heat Value (UHV), the gradation of coking coal is based on ash content and for semi coking /

weakly coking coal it is based on ash plus moisture content , as in vogue as per notification.

Grades of Coking Coal

Grade	Ash Content
Steel Grade –I	Not exceeding 15%
Steel Grade -II	Exceeding 15% but not exceeding 18%
Washery Grade -I	Exceeding 18% but not exceeding 21%
Washery Grade -II	Exceeding 21% but not exceeding 24%
Washery Grade -III	Exceeding 24% but not exceeding 28%
Washery Grade -IV	Exceeding 28% but not exceeding 35%

Grades of Semi-coking and Weakly Coking Coal

Grade	Ash + Moisture Content
Semi coking grade –I	Not exceeding 19%
Semi coking grade –II	Exceeding 19% but not exceeding 24%

Grades of Non-coking Coal

Grade	Useful Heat Value (UHV) (Kcal/Kg) UHV= 8900-138(A+M)	Corresponding Ash% +Moisture % at (60% RH & 40O C)	Gross Calorific Value GCV (Kcal/ Kg) (at 5% moisture level)
A	Exceeding 6200	Not exceeding 19.5	Exceeding 6454
B	Exceeding 5600 but not exceeding 6200	19.6 to 23.8	Exceeding 6049 but not exceeding 6454
C	Exceeding 4940 but not exceeding 5600	23.9 to 28.6	Exceeding 5597 but not exceeding 6049
D	Exceeding 4200 but not exceeding 4940	28.7 to 34.0	Exceeding 5089 but not exceeding 5597
E	Exceeding 3360 but not exceeding 4200	34.1 to 40.0	Exceeding 4324 but not exceeding 5089
F	Exceeding 2400 but	40.1 to 47.0	Exceeding 3865

	not exceeding 3360		but not exceeding 4324
G	Exceeding 1300 but not exceeding 2400	47.1 to 55.0	Exceeding 3113 but not exceeding 3865

Lignite Often referred to as Brown coal is a soft brown coal with a low degree of coalification (process of formation of coal from vegetal matter). It's gross calorific value is 5,700 Kilo calorie/kilogram or less on an ash-free but moist basis.

Yield Rate of an Item 100 x (Quantity of the item produced/Raw Coal feed).

Fatality Rate It is equal to the number of fatalities divided by production of coal in million tones.

Output per man-shift (OMS) It is an indicator of labour productivity. It is defined as the average output per employee engaged for a normal work-shift. It is computed as the total output divided by total number of shifts worked by all the employees.

MTA Million tonnes per annum.

CIL Coal India Limited.

SCCL Singareni collieries Company Ltd.

NLC Neyveli Lignite Corporation Limited.

B.2 PETROLEUM AND NATURAL GAS

CLASSIFICATION OF PETROLEUM AND NATURAL GAS STATISTICS

Access indicators	Units	Categories
Crude oil reserves	Million tonnes	
Natural Gas Reserves	Billion Cubic Metre	
Total refining capacity	Million Metric Tonnes	Public Sector Undertakings
		Private
Oil Wells	Number	
Gas Wells	Number	
Retail outlets	Number	
LPG distributors	Number	
LPG consumers	Number	
Oil Tanker Fleet		Total
		Coastal trade
	Number	No. of tankers
	In thousand tonnes	DWT (Dead weight tonnage)
		Overseas Trade
	Number	No. of tankers
	In thousand tonnes	DWT (Dead weight tonnage)
Length of pipelines	Kilometres	Crude pipelines
		On shore
		Off shore
		Gas pipelines
		On shore
		Off shore
		Product pipelines
		On shore
		Off shore
Production capacity	In million tonnes	Crude Oil
	In billion cubic metres	Natural Gas

Installed capacity of refineries of crude oil	Thousand tonnes per annum	Total
		Public sector refineries
		Private refineries
Oil and Gas Storage	Number	Total
and distribution terminals	In million tonnes	Capacity
Quality indicators	**Units**	**Categories**
Persons employed in petroleum industry	Number	Exploration and production
		Refining
		Marketing
		Pipelines
		R & D
		Others
Gas Flared	Billion Cubic Metres	
	Percentage	
Fiscal Cost and revenue indicators	**Units**	**Categories**
Plan Outlay (PSUs)	Rs. (in crore)	
Expenditure	Rs. (in crore)	
Percentage Utilization	Percentage	
Investment in	Rs. (in crore)	Total investment
Petroleum & Natural Gas		Public investment
		Private investment
Utilization indicators	**Units**	**Categories**
Crude oil production	Million Metric Tones	Total production
	Million Metric Tones	Off shore
	Million Metric Tones	On shore
	Million Metric Tones	Crude oil processed
	Percentage	Capacity Utilization
Natural Gas production	Billion Cubic Metres	Total production

		Off shore
		On shore
Affordability indicators	**Units**	**Categories**
Price of Natural gas	Rs per thousand cubic metre	Consumer prices
		Producer prices
Weighted average of crude oil price	Rs per Million Tonnes	Basic price
		Royalty
		Cess
		Sales Tax
Retail Selling prices	Rupees per litre	Motor spirit
	Rupees per litre	High speed diesel
	Rupees per litre	Superior kerosene oil
	Rupees per 14.2 kg cylinder	LPG

CONCEPTS AND DEFINITIONS OF PETROLEUM AND NATURAL GAS STATISTICS

Term	Definitions
Crude Oil (Crude petroleum)	Crude oil is a mineral oil consisting of a mixture of hydrocarbons of natural origin and associated impurities, such as sulphur. It exists in the liquid phase under normal surface temperature and pressure and its physical characteristics (density, viscosity, etc.) are highly variable.
Petroleum Products	Petroleum products are any oil based products which can be obtained by distillation and are normally used outside the refining industry. The exceptions to this are those finished products which are classified as refinery feedstocks.
Compressed natural gas (CNG)	CNG is natural gas for use in special CNG vehicles, where it is stored in high-pressure fuel cylinders. CNG's use stems in part from its clean burning properties, as it produces fewer exhaust and greenhouse gas emissions than motor gasoline or diesel oil. It is used most frequently in light-duty passenger vehicles and pickup trucks, medium-duty delivery trucks, and in transit and school buses.
Fuel oil	This covers all residual (heavy) fuel oils (including those obtained by blending). Kinematic viscosity is above 10 cSt at 80°C. The flash point is always above 50°C and density is always more than 0.90 kg/l. • Low sulphur content: heavy fuel oil with sulphur content lower than 1%. • High sulphur content: heavy fuel oil with sulphur content of 1% or higher.
Natural gas	It comprises gases, occurring in underground deposits, whether liquefied or gaseous, consisting mainly of methane. It includes both “non associated” gas originating from fields producing hydrocarbons only in gaseous form, and “associated” gas produced in association with crude oil as well as methane recovered from coal mines (colliery gas).
Liquefied natural	Natural gas cooled to approximately –160°C under atmospheric pressure

gas (LNG)	condenses to its liquid form called LNG. LNG is odourless, colourless, non-corrosive and non-toxic.
Liquefied petroleum gases (LPG)	LPG are light paraffinic hydrocarbons derived from the refinery processes, crude oil stabilisation and natural gas processing plants. They consist mainly of propane (C3H8) and butane (C4Hl0) or a combination of the two. They could also include propylene, butylene, isobutene and isobutylene. LPG is normally liquefied under pressure for transportation and storage.
Lubricants	Lubricants are hydrocarbons produced from distillate by-products; they are mainly used to reduce friction between bearing surfaces. This category includes all finished grades of lubricating oil, from spindle oil to cylinder oil, and those used in greases, including motor oils and all grades of lubricating oil base stocks.
Motor gasoline	Motor gasoline consists of a mixture of light hydrocarbons distilling between 35°C and 215°C. It is used as a fuel for land-based spark ignition engines. Motor gasoline may include additives, oxygenates and octane enhancers, including lead compounds such as TEL (Tetraethyl lead) and TML (tetramethyl lead). Motor gasoline can be divided into two groups: • *Unleaded motor gasoline:* motor gasoline where lead compounds have not been added to enhance octane rating. It may contain traces of organic lead. • *Leaded motor gasoline:* motor gasoline with TEL (tetraethyl lead) and/or TML (tetramethyl lead) added to enhance octane rating. This category includes motor gasoline blending components (excluding additives/oxygenates), *e.g.* alkylates, isomerate, reformate, cracked gasoline destined for use as finished motor gasoline.
Natural gas liquids (NGL)	Natural gas liquids are liquid or liquefied hydrocarbons recovered from natural gas in separation facilities or gas processing plants. Natural gas liquids include ethane, propane, butane (normal and iso-), (iso)pentane and pentanes plus (sometimes referred to as natural gasoline or plant

	condensate). The natural gas may be extracted with crude oil (associated gas) or from a gas field without crude oil. The NGL may be removed from the natural gas stream close to the well-head or transported to a distant gas processing plant. Where gas processing and crude oil production are both occurring, it is common for some of the condensate fraction of the NGL to be injected into the crude oil stream.
Petroleum coke	Petroleum coke is a black solid by-product, obtained mainly by cracking and carbonising petroleum-derived feedstock, vacuum bottoms, tar and pitches in processes such as delayed coking or fluid coking. It consists mainly of carbon (90% to 95%) and has a low ash content. It is used as a feedstock in coke ovens for the steel industry, for heating purposes, for electrode manufacture and for production of chemicals. The two most important qualities are “green coke” and “calcinated coke”. This category also includes “catalyst coke” deposited on the catalyst during refining processes; this coke is not recoverable and is usually burned as refinery fuel.
Oil Refinery	It converts crude oil into high-octane motor fuel (gasoline/petrol), diesel oil, liquefied petroleum gases (LPG), jet aircraft fuel, kerosene, heating fuel oils, lubricating oils, asphalt and petroleum coke etc.
Refinery gas (not liquefied)	Refinery gas includes a mixture of non-condensable gases mainly consisting of hydrogen, methane, ethane and olefins obtained during distillation of crude oil or treatment of oil products (*e.g.* cracking) in refineries. This also includes gases which are returned from the petrochemical industry.
Refinery feedstock	Refinery feedstock is product or a combination of products derived from crude oil and destined for further processing other than blending in the refining industry. It is transformed into one or more components and/or finished products.
Flared Gas	Flared Gas at oil production rigs and in refineries is gas burnt at the site. Its

	primary purpose is to act as a safety device to protect vessels or pipes from over-pressuring or due to insufficient capacity in the domestic market to absorb such gas, and there are few opportunities for its safe re-injection into reservoirs.
Percentage Gas flared	Gas flared as percentage of total output of gas, excluding re-injected gas.

B.3 ELECTRICITY

CLASSIFICATION OF ELECTRICITY INFRASTRUCTURE STATISTICS

Access indicators	Units	Categories
Installed Generating	Mega Watt	Utilities
Capacity		Hydro
		Thermal (including steam, gas, diesel)
		Nuclear
		RES
	Mega Watt	Non-Utilities
		Hydro
		Steam
		Diesel
		Gas
		Wind
Installed capacity of grid	Mega Watt	Total
interactive renewable		Bio power (woody biomass)
Power		Wind power
		Small Hydro Power
		Waste to Energy
		Solar Power
Power plants	Number	Hydro
		Thermal
		Nuclear
	Capacity in Mega Watt	Hydro
		Thermal
		Nuclear
Electricity consumption	Giga Watt hour	Electricity sales
		Domestic
		Commercial
		Industrial
		Traction

		Agriculture
		Others
Per capita consumption	Kilo Watt hour	
Length of transmission lines	Circuit Kilometre	
Transformers	Number	Step up
		Step down
Villages electrified	Number	
Sales of electricity	Giga Watt hour	Total
to ultimate consumers		Industry
by utilities		Agriculture
		Domestic
		Sectors Commercial
		Traction and Railways
		Public lighting
		Others
Quality indicators	**Units**	**Categories**
Share of source wise	Percentage	Hydro
energy in total production		Thermal(including steam, gas and diesel)
		Nuclear
		RES
Energy loss in transformation,	Percentage	
transmission and distribution		
and unaccounted for		
Peak Demand	Mega Watt	
Peak Met	Mega Watt	
Surplus/Deficit	Mega Watt	
Electrical Accidents	Number	
Fiscal Cost and revenue indicators	**Units**	**Categories**
Planwise outlay/Expenditure for power sector	Rs. (in crore)	Allocation
		Central sector
		States/Union Territories
	Rs. (in crore)	Expenditure
		Central sector

		States/Union Territories
	Percentage	Utilisation
		Central sector
		States/Union Territories
Utilization indicators	**Units**	**Categories**
Actual generation of electricity	Giga Watt hour (MU)	Utilities
		Hydro
		Thermal(including steam, gas and diesel)
		Nuclear
		RES
		Non Utilities
		Hydro
		Steam
		Diesel
		Gas
		Wind
Plant Load Factor	Percentage	Thermal
		Central sector
		State sector
		Private sector
		Nuclear
		Central sector
Affordability indicators	**Units**	**Categories**
Average cost of electricity supply	In paisa per unit	
Average realisation including agriculture	In paisa per unit	

CONCEPTS AND DEFINITIONS OF ELECTRICITY INFRASTRUCTURE STATISTICS

Term	Definition
Small Hydro Power	In India, hydro power projects with a station capacity of up to 25 megawatt(MW) each fall under the category of small hydro power (SHP). SHP projects are classified based on capacity as follows. • Micro hydro : up to 100 kW • Mini hydro : 101–1000 kW (i.e. 1 MW) • Small hydro : above 1 MW up to 25 MW
Hydropower	Potential and kinetic energy of water converted into electricity in hydroelectric plants. Pumped storage should be included. Detailed plant sizes should be reported net of pumped storage.
Cogeneration	CHP (also combined heat and power, CHP) is the use of a heat engine or a power station to simultaneously generate both electricity and useful heat.
Waste to Energy	The National Bio-energy Board (NBB), Ministry of New and Renewable Energy, is developing a National Master Plan (NMP) for waste-to-energy as one of the activities. The primary objective of NMP is to provide additional power generation capacity in a decentralized manner through projects for energy recovery from urban and industrial wastes in a cost effective and proven manner.
Geothermal Energy	It is the energy available as heat emitted from within the earth's crust, usually in the form of hot water or steam.
Tidal Energy/ Tidal power	It is a form of hydropower that converts the energy of tides into electricity or other useful forms of power. Although not yet widely used, tidal power has potential for future electricity generation. Tides are more predictable than wind energy and solar power.
Solar energy	Solar radiation exploited for hot water production and electricity generation, by: • Flat plate collectors, mainly of the thermosyphon type, for domestic hot water or for the seasonal heating of swimming pools • Photovoltaic cells. • Solar thermal electric plants

Solid biomass	Covers organic, non-fossil material of biological origin which may be used as fuel for heat production or electricity generation. It comprises: • *Charcoal:* Covers the solid residue of the destructive distillation and pyrolysis of wood and other vegetal material. • *Wood, wood wastes, other solid wastes:* Covers purpose-grown energy crops (poplar, willow, etc.), a multitude of woody materials generated by an industrial process (wood/paper industry in particular) or provided directly by forestry and agriculture (firewood, wood chips, bark, sawdust, shavings, chips, black liquor, etc.) as well as wastes such as straw, rice husks, nut shells, poultry litter, crushed grape dregs, etc. Combustion is the preferred technology for these solid wastes. The quantity of fuel used should be reported on a net calorific value basis.
Tide/wave/ocean energy	Mechanical energy derived from tidal movement or wave motion and exploited for electricity generation.
Wind energy	Kinetic energy of wind exploited for electricity generation in wind turbines.
Utilities	A public utility (usually just utility) is an organization that maintains the infrastructure for a public service (often also providing a service using that infrastructure).
Mega Unit (MU)	MU is one million units of electricity where one unit is equal to one Kilowatt hour.
RES	Hydro stations with capacity of up to and including 25 MW are covered under RES and greater than 25 MW capacity are covered in conventional hydro power.
Plant Load Factor	Plant load Factor is a measure of the output of a power plant compared to the maximum output it could produce.

SECTION C: COMMUNICATION INFRASTRUCTURE

Communication is an important part of economic development. It facilitates exchange of commercial activities and integrates the nation economically and socially. Communication system connects a place to rest of the world and provides facilities to trade both nationally and internationally. Telecommunication and posts are the two main constituents of communication system.

Postal communication: Postal communication system had been the main method of communication in India for nearly a century and half. It is viewed as the most dependable means of written communication. Postal services have provided other services as well in addition to delivery of letters. These are:

- Delivery of letter and other mail
- Savings Bank operations
- Money transfer
- Provision of Life Insurance

It is used as the most reliable means of sending money through money orders and for delivering articles of value. The banking services provided by Post Offices attract a large number of people both from rural and urban areas due to easy accessibility and wide network of post offices. India has the largest postal network in the world, with one post office serving 7,160 people and covering an area of approximately 21.2 sq. Kms.

Telecommunication: Telecommunication is one of the prime support services needed for rapid growth and modernization of various sectors of the economy. Telecommunication has helped to build global business empires. This is self-evident in the case of online retailer Amazon.com. In cities throughout the world, home owners use their telephones to organize many home services ranging from pizza deliveries to electricians. Information tools such as telephones, personal computers, and the internet are increasingly critical to economic success and personal advancement. All these help to encourage economic growth. Furthermore, a reliable telecommunications network can improve the productivity and efficiency of other sectors of the economy and enhance the quality of life.

Access to information infrastructure has been seen as a prerequisite not just to a robust IT industry but also to broad based growth and competitiveness in all other services and industries.

C.1 TELECOMMUNICATION

CLASSIFICATION OF TELECOMMUNICATION INFRASTRUCTURE STATISTICS

Access indicators	Unit	Categories
Telecom Exchanges	Number	Total
		Rural
Switching Capacity	In lakh	Public
		BSNL
		MTNL
Direct (Fixed) Exchange	In lakh	Public
		BSNL
		MTNL
Rural DELS	In lakh	
Trunk Auto Exchange Lines	In lakh	
Microwave System	Route kilometre	
Optical Fiber Cable	Route kilometre	
Wireline Connections	In lakh	Total
		Public
		Private
Wireless Subscribers	In lakh	Total
		Public
		Private
Tele Density	Per thousand population	Total
		Fixed
		Mobile
Village Public Telephones	In lakh	Total
		Public
		Private
PCOs	In lakh	Public
Internet Connections	In million	
Broadband Connections	In million	
Wireless Internet	In million	

Fiscal Cost indicators	Unit	Categories
Financial Outlays in Telecom	Rupees (in crore)	Total
RE		
Actual Expenditure		
Utilization	Percentage	
Internal and Extra Budgetary Resources	Rupees (in crore)	Total
RE		
Share of IEBR in total outlay	Percentage	
Actual Expenditure		
Utilization	Percentage	
Gross Budgetary Support	Rupees (in crore)	Total
RE		
Actual Expenditure		
Utilization	Percentage	
Utilization indicators	**Unit**	**Categories**
Traffic	Minutes Of Use per subscriber per month	Wireless
		GSM
		CDMA
	Minutes Of Use per subscriber per month	Dial-up Internet
Affordability indicators	**Unit**	**Categories**
Average Revenue per user	Rupees per subscriber	Wireless
(ARPU)	per month	GSM
		CDMA
	Rupees per subscriber	Dial-up Internet
	per month	

C.2 POSTAL COMMUNICATION

CLASSIFICATION OF POSTAL COMMUNICATION INFRASTRUCTURE STATISTICS

Access indicators	Unit	Categories
Post Offices	Number	Total
		Urban
		Rural
Mukhya Dak Ghar	Number	Total
		Urban
		Rural
Letter Boxes	Number	Total
		Urban
		Rural
Post Boxes rented by public	Number	
Post Bags rented by public	Number	
Post Boxes cum bags rented by public	Number	
Inland Speed Post Service Centres	Number	
International Speed Post Service	Number	
Merchandise and Documents		
Panchayat Sanchar Sewa Kendra	Number	
Average number of persons served by	Number	Total
post offices		Urban
		Rural
Average Area served by a post office	In kilometer^2	

Quality indicators	Unit	Categories
Postal Employees	Number	Total

		Gramin Dak Sewak
Postal Complaints	Number	
Computerised Post Offices	Number	
Modernaised Post Offices	Number	
(Improving Ergonomics)		
High Speed Automated	Number	
Mail Processing System		
Fiscal Cost and revenue indicators	**Unit**	**Categories**
Revenue earned	Rupees (in crore)	Total
		Sale of Stamps
		Postage realised in cash
		Commission on M.Os and IPOs
		Others
Net Expenditure	Rupees (in crore)	Total
		General Admn.
		Operation
		Agency Services
		Others
Utilization indicators	**Unit**	**Categories**
Mail Traffic	In crore Numbers	Registered P&T service
		Insured Letters
		Insured Parcels
		Registered Letters
		Registered Parcels
		Registered Book Pattern & Sample Packets
		Registered Packet containing Printed Books
		& Periodicals
		Other than P&T service
		Insured Letters

		Insured Parcels
		V.P. Letters
		V.P. Parcels
		Registered Letters
		Registered Parcels
		Registered Book Pattern & Sample Packets
		Registered Packet containing Printed Books
		Registered Packet containing Periodicals
		V.P Packet containing Book Pattern
		& Sample Packets
		V.P Packet containing Printed Books
		V.P Packet containing Periodicals
		Unregistered P&T service
		Letters
		Post Cards/ Ackd.
		Packets
		Parcels
		Other than P&T service
		Letters
		Postcards
		Printed Postcards
		Meghdoot Postcards
		Competition Postcards
		Letter Cards
		Registered Newspapers
		Unregistered Packets
		Unregistered Parcels
		Acknowledgements
Air Mail	Lakh kilogram	Total weighht of Air Mail carried
		Domestic
		Foreign
		Inward
		Outward
	In thousand Numbers	Foreign Parcels

		Outward Parcels handled
		Registered Articles
		Unregistered Articles
		Inward Parcels handled
		Registered Articles
		Unregistered Articles
		Transit Parcels handled
Surface Mail	In thousand Numbers	Registered Articles
		Unregistered Articles
Inland Money Order	In lakh Numbers	
Premium Product Services-Traffic	In lakh Numbers	Total
		Speed Post
		Express Post
		Business Post
		Satellite Post
		Retail Post
		Media Post
		Bill Mail
		e-Bill Post
		Greetings
		Others
Volume of International Speed Post Traffic (Outward)	In lakh Numbers	

Affordability indicators	**Unit**	**Categories**
Inland Postal Rates	In Rupees	Postcard
		Competition Postcard
		Letter Card
		Unregistered Envelope
		Book Pattern & Sample Packets
		Book Packets containing Printed Books
		Book Packet containing Periodicals
		Parcels
		Registered Newspaper
		Registrations
		Acknowledgements

		Money Orders
		Indian Postal Orders
		Insurance
		V.P. Fee
		V.P. Inquiry Fee
		Postal Identity Cards
		Business reply permit fee
		Warehousing Charges on VP Articles
		for detention beyond 7 days
		Certificate of Posting
		Air Mail fee
		Late fee
		Fee for obtaining copy of original receipt
		signed by addresses
		Supplementary charge for issue of a
		foreign money order telegraphed under
		Rule-172 of Indian Post Office Rules
		Fee for recall of Postal articles
		Rent for Boxes/Bags
		Money orders form

CONCEPTS AND DEFINITIONS OF COMMUNICATION INFRASTRUCTURE STATISTICS

Term	Definition
Fixed telephone lines	A fixed telephone line (previously called main telephone line in operation) is an active line (Active lines are those that have registered an activity in the past three months) connecting the subscriber's terminal equipment to the Public Switched Telephone Network (PSTN) and which has a dedicated port in the telephone exchange equipment. This term is synonymous with the terms *main station* or *Direct Exchange Line (DEL)* that are commonly used in telecommunication documents. It may not be the same as an access line or a subscriber. This should include the active number of analog fixed telephone lines, ISDN channels, fixed wireless (WLL), public payphones and VoIP subscriptions . If not included, specify in a note.
Total capacity of local public switching exchanges	The total capacity of public switching exchanges corresponds to the maximum number of fixed telephone lines that can be connected. This number includes, therefore, fixed telephone lines already connected and fixed lines available for future connection, including those used for the technical operation of the exchange (test numbers). The measure should be the actual capacity of the system, rather than the theoretical potential when the system is upgraded or if compression technology is employed. This should exclude capacity of fixed telephone lines from mobile cellular network.
Percent of fixed telephone lines connected to digital exchanges	This percentage is obtained by dividing the number of active fixed telephone lines connected to digital telephone exchanges by the total number of fixed telephone lines. This indicator does not measure the percentage of exchanges which are digital, the percentage of inter-exchange lines which are digital or the percentage of digital network termination points. Respondents should indicate whether the fixed telephone lines included in the definition represent only those in operation or the total capacity.
Percent of fixed telephone lines	This percentage is obtained by dividing the number of active fixed lines

which are residential	serving households (i.e., lines which are not used for business, government or other professional purposes or as public telephone stations) by the total number of fixed telephone lines. A household consists of one or more people, who may or may not be related to each other who share accommodation; and who make common provision for food. If definition of household differs, please indicate in a note and the source of this definition. Active subscriptions mean those that are in operation for the past three months.
Percent of fixed telephone lines in urban areas	This percentage is obtained by dividing the number of fixed telephone lines in urban areas by the total number of fixed telephone lines in the country. The definition of urban used by the country should be supplied.
Percentage of localities with telephone service	This indicator reflects the percentage of localities that have telephone service, fixed or mobile or both. To enhance usefulness, the total number of localities should be provided as well as the population of localities covered by telephone service. A locality is defined as a distinct population cluster, that is, the population living in neighbouring buildings which either: (a) form a continuous built-up area with a clearly recognizable street formation; or (b) though not part of such a built-up area, form a group to which a locally recognized place name is uniquely attached; or (c) though not coming within either of the above two requirements constitute a group, none of which is separated from its nearest neighbour by more than 200 metres.
Public payphones	Total number of all types of public telephones, including coin- and card-operated and public telephones in call offices. Publicly available phones installed in private places should also be included, as should mobile public telephones. All public telephones regardless of capability (e.g., local calls or national only) should be counted. If the national definition of "payphone" differs from that above (e.g., by excluding pay phones in private places), then respondents should indicate their own definition.

ISDN subscriptions	The number of subscriptions to the Integrated Services Digital Network (ISDN). This can be separated by basic rate interface service and primary rate.
Basic rate ISDN subscriptions	The number of subscriptions to the basic rate interface service.
Primary rate ISDN subscriptions	The number of subscriptions to the primary rate interface service.
Fixed numbers ported	Total fixed numbers ported within the year. Number portability is defined as the number of transactions (i.e. one number can be ported several times – transactions).
Mobile cellular telephone subscriptions (post-paid + prepaid)	It refers to the subscriptions to a public mobile telephone service and provides access to Public Switched Telephone Network (PSTN) using cellular technology, including number of pre-paid SIM cards active during the past three months. This includes both analogue and digital cellular systems (IMT-2000 (Third Generation, 3G) and 4G subscriptions, but excludes mobile broadband subscriptions via data cards or USB modems. Subscriptions to public mobile data services, private trunked mobile radio, tele point or radio paging, and telemetry services should also be excluded. This should include all mobile cellular subscriptions that offer voice communications.
Mobile cellular subscriptions: prepaid	Total number of mobile cellular subscriptions (a subscription refers to a line) that used prepaid refills. These are subscriptions that rather than paying a fixed monthly subscription fee, choose to purchase blocks of usage time. This includes both analogue and digital cellular systems (IMT-2000 (Third Generation, 3G) and 4G subscriptions. Only active prepaid subscriptions that have used the system (as shown by traffic or whether they have recharged the card) during the past three months should be included.
Percentage of the population covered by a mobile cellular telephone network	Mobile cellular coverage of population in percent. This indicator measures the percentage of inhabitants that are within range of a mobile cellular signal, irrespective of whether or not they are subscribers. This is calculated by dividing the number of inhabitants within range of a mobile cellular signal

	by the total population. Note that this is not the same as the mobile subscription density or penetration. When there are multiple operators offering the service, the maximum amount of population covered should be reported.
Ported mobile numbers	Total mobile numbers ported within the year. Number portability is defined as the number of transactions (i.e. one number can be ported several times – transactions).
Total fixed (wired) Internet subscriptions	The number of total Internet subscriptions with fixed (wired) Internet access, which includes dial-up and total fixed (wired) broadband subscriptions. Only active subscriptions that have used the system within the past 3 months should be included.
Dial-up Internet subscriptions	Number of Dial-up Internet subscriptions. Dial-up is a connection to the Internet via a modem and fixed telephone line, which requires that the modem dial a phone number when Internet access is needed. Only active subscriptions that used the system during the past three months should be included.
Estimated Internet users	The estimated number of Internet users out of total population. This includes those using the Internet from any device (including mobile phones) in the last 12 months. A growing number of countries are measuring this through household surveys. In countries where household surveys are available, this estimate should correspond to the estimated number derived from the percentage of Internet users collected. In situations where surveys are not available, an estimate can be derived based on the number of Internet subscriptions.
International Internet bandwidth (Mbit/s)	Total capacity of international Internet bandwidth in Mega Bits Per Second (Mbit/s). If capacity is asymmetric (i.e., more incoming than outgoing), the incoming capacity should be provided. This is measured as the sum of capacity of all Internet exchanges offering international bandwidth.
Domestic Internet bandwidth	Total capacity of domestic Internet bandwidth in Mega Bits Per Second (Mbit/s). If capacity is asymmetric (i.e., more download than upload), the download capacity should be provided.

Local fixed to fixed telephone traffic (minutes)	Local fixed telephone traffic consists of effective (completed) fixed telephone line voice traffic exchanged within the local charging area in which the calling station is situated. This is the area within which one subscriber can call another on payment of the local charge (if applicable). This indicator should be reported in the number of minutes. This should exclude minutes used for dial-up Internet access.
Internet Dial-up traffic (minutes)	The total volume in minutes of dial-up sessions over the public switched telephone network to access the Internet.
Domestic mobile telephone traffic (minutes)	Total number of minutes made by mobile subscribers within a country (including minutes to fixed telephone and minute to mobile phone subscribers).
Dial-up Internet connection charge	The initial, one-time charge for a new dial-up Internet connection. Refundable deposits should not be counted. Taxes should be included. If not included, it should be specified in a note.
Dial-up Internet monthly	The monthly subscription charge for dial-up Internet service. Taxes should be included. If not included, it should be specified in a note. The note should also specify the amount of free monthly hours included if applicable.
Dial-up Internet - price of per minute (off-peak) connection	Cost of per minute (off-peak) connection once the free Internet hours included in the dial-up subscription is used up. Taxes should be included. If not included, it should be specified in a note.
Fixed (Wired) broadband Internet connection charge	The initial, one-time charge for a new fixed (wired) broadband Internet connection. The tariffs should represent the cheapest fixed (wired) broadband entry plan. Refundable deposits should not be counted. Taxes should be included. If not included, it should be specified in a note including the applicable tax rate.
Fixed (Wired) broadband Internet	The monthly subscription charge for fixed (wired) broadband Internet service. Fixed (wired) broadband is considered any dedicated connection to

monthly subscription	the Internet at downstream speeds equal to, or greater than, 256 kbit/s, using DSL. Where several offers are available, preference should be given to the 256 kbit/s connection. Taxes should be included. If not included, it should be specified in a note including the applicable tax rate.
Waiting list for fixed lines	Un-met applications for connection to the Public Switched Telephone Network (PSTN) due to a lack of technical facilities (equipment, lines, etc.). The waitlist should reflect the total number reported by all PSTN service providers in the country.
Faults per 100 fixed lines per year	The total number of reported faults to fixed telephone lines for the year. Faults, which are not the direct responsibility of the public telecommunications operator, should be excluded. This is calculated by dividing the total number of reported telephone faults *for the year* by the total number of fixed lines in operation and multiplied by 100. The number of faults per 100 fixed lines per year should reflect the total reported by all PSTN service providers in the country.

SECTION D: IRRIGATION INFRASTRUCTURE

Irrigation is an essential component of agriculture in India as the rains occur only for three to four months. During rest of the year irrigation is the only source of water for agriculture. Access to good irrigation allows people to increase their productivity. They can also diversify to other crops. Irrigation reduces the vulnerability of farmers to unpredicted rains and other external shocks, thus enhancing their chances of higher productivity and better incomes.

Availability of irrigation facilities encourage farmers to switch from low value subsistence production to high valued market oriented production. They can substitute low yielding crops with high yielding and more profitable crops. The role of irrigation in enabling the adoption of green revolution technologies, including modern varieties of rice and wheat and their effects on income, employment, prices, food security and overall growth, are well documented in the development literature.

Irrigation through canals, wells and other sources is considered as a catalyst of economic development of a country. Numerous studies have confirmed on the role of irrigation in increasing crop productivity, intensity of cropping in India since the evolution of planning. However, it also helps in reducing instability in crop production, changes the cropping pattern in favour of high valued crops, and reduces inequality in income among various section farmers in the society.

Government of India has made massive investment in developing irrigation sources (major, medium and minor) in the country since independence. The Government gave high priority to the construction of major irrigation related infrastructure. These investments in turn have largely impacted the economic and social development of the country. Assured water supplies have consistently increased crop yields on irrigated land than yields from rain fed agriculture, thereby promoting national food security. Because of these created storage works it has now become possible to provide assured irrigation in the command area, to ensure supply for hydropower and thermal power plants located at different places and to meet requirement for various other uses. Flood moderation could be effected in flood prone basins, where storage has been provided. Besides, supply of drinking water in remote places throughout the year has become possible in different parts of the country.

Irrigation projects in India are classified into three categories –major medium & minor according to the area cultivated. The classification criteria are as follows:-

i. **Major irrigation projects**: projects which have a culturable command area (CCA) of more than 10,000 ha but more than 2,000 ha utilize mostly surface water resources.

ii. **Medium irrigation projects**: projects which have CCA less than 10,000 ha. But more than 2,000 ha utilizes mostly surface water resources.

iii. **Minor irrigation projects**: projects with CCA less than or equal to 2,000 ha. Utilizes both ground water and local surface water resources. Ground water development is primarily done through individual and cooperative effort of farmers with the help of institutional finance and their own savings.

iv. **Command Area Development Programme (CADP):** This scheme, sponsored by the central government was launched in 1974-75 with the objective of bridging the gap between irrigation potential created and that utilized for ensuring efficient utilization of created irrigation potential and increasing the agricultural productivity from irrigated lands on a sustainable basis. The programme envisages integrating various activities relating to irrigated agriculture through a multi-disciplinary team under an area development authority in a coordinated manner. The existing components of the CADP are as follows:-

    i. On farm development works, that is, development of field channels and field drains within the command of each outlet, land levelling on an outlet command basis; reclamation of water logged areas; enforcement of a proper system of rotational water supply and fair distribution of water to individual fields; realignment of field boundaries, wherever necessary supply of all inputs and service including credit; strengthening of extension services; and encouraging farmers for participatory irrigation management.

    ii. Selection and introduction of suitable cropping patterns.

    iii. Development of ground water to supplement surface irrigation (conjunctive use under minor irrigation sector)

    iv. Development and maintenance of the main and intermediate drainage system.

    v. Modernization, maintenance and efficient operation of the irrigation system up to the outlet of one cusec ($1ft^3$/sec) capacity.

CLASSIFICATION OF IRRIGATION INFRASTRUCTURE STATISTICS

Accessibility indicators	Unit	Categories
Storage Capacity	In Million Cubic Metres	Total
		Completed Project
		Project under construction
Large Dams	Number	Total
		Completed
		Under Construction
Irrigation Projects	Number	Total
		Completed
		Under Completion
		Major Projects
		Completed
		Under Completion
		Medium Projects
		Completed
		Under Completion
		Extension, Renovation and Modernisation Projects
		Completed
		Under Completion
Ultimate Irrigation Potential	Thousand hectares	Total (Major, Medium and Minor)
		Major and Medium Surface Water
		Minor Irrigation
		Surface Water
		Ground Water
Irrigation Potential created	Thousand hectares	Total (Major, Medium and Minor)
		Major and Medium Irrigation
	Thousand hectares	Surface Water
	Percentage	Share in Total Irrigation Potential created
		Minor irrigation
	Thousand hectares	Surface Water
	Percentage	Share in Total Irrigation Potential created
	Thousand hectares	Ground Water

	Percentage	Share in Total Irrigation Potential created
	Thousand hectares	Surface and Ground Water
	Percentage	Share in Total Irrigation Potential created
Physical Achievement of Field channels (under CAD programme)	Thousand hectares	
Physical Achievement of Field Drains (under CAD programme)	Thousand hectares	
Fiscal Cost and revenue indicators	**Unit**	**Categories**
Financial Expenditure on Irrigation	Rs. (in crore)	Major and Medium Irrigation
		Minor Irrigation
		State
		Institutional
		Command Area Development (CAD)
		Institutional
		Command Area Development (CAD)
Utilization indicators	**Unit**	**Categories**
Irrigation Potential Utilized		
Potential Utilized	Thousand hectares	Major and Medium Irrigation
		Surface Water
		Minor Irrigation
		Surface Water
		Ground Water
Percentage Utilized	Percentage	Major and Medium Irrigation
		Surface Water
		Minor Irrigation
		Surface Water
		Ground Water

CONCEPTS AND DEFINITIONS OF IRRIGATION INFRASTRUCTURE STATISTICS

Term	Definition
Irrigation Potential Created	The total gross area proposed to be irrigated under different crops during a year by a scheme. The area proposed to be irrigated under more than one crop during the same year is counted as many times as the number of crops grown and irrigated.
Irrigation Potential Utilised	The gross area actually irrigated during reference year out of the gross proposed area to be irrigated by the scheme during the year**.**
Minor Irrigation(M.I.) Scheme	A Scheme having CCA up to 2,000 hectares individually is classified as minor irrigation scheme.
Medium Irrigation Scheme	A scheme having CCA more than 2,000 hectares and up to 10,000 hectares individually is a medium irrigation scheme**.**
Major Irrigation Scheme	A scheme having CCA more than 10,000 hectares is a major irrigation scheme.
Dug Well	It covers ordinary open wells of varying dimension dug or sunk from the ground surface into water bearing stratum to extract water for irrigation purposes. These are broadly masonary wells, kuchcha wells and dug-cum-bore wells. All such schemes are of private nature belonging to individual cultivator**.**
Shallow Tubewells	It consists of a bore hole built into ground with the purpose of taping ground water from porus zone. In sedimentary formations depth of a shallow tube well does not exceed 60-70 metres. The tube wells are generally operated for 6 to 8 hours during irrigation season and give yield of 100-300 cubic metre per day, which is roughly 2 to 3 times that of a dug well.
Deep Tubewells	It usually extends to the depth of 100 metre and more and is designed to

give a discharge of 100 to 200 cubic metre per hour. These tube wells operate round the clock during the irrigation season, depending upon the availability of power. Their annual output is roughly 15 times that of an average shallow tube well and are usually constructed as public scheme which are owned and operated by government departments or corporations.

Surface Flow Scheme These schemes use rainwater for irrigation purposes either by storing it or by diverting it from a stream, nala or river. Sometimes permanent diversions are constructed for utilising the flowing water of a steam or river . Temporary diversions are also constructed in many areas which are usually washed away during the rainy season. The command areas of such schemes are 20 hectares or less. The large storage tanks whose command varies from 20 to 2000 hectares are generally constructed by government departments or local bodes. These are the biggest items of surface minor irrigation works**.**

Surface Lift Scheme In regions where the topography does not permit direct flow irrigation from rivers and streams, water has to be lifted into the irrigation channels. These works are similar to diversion schemes, but in addition pumps are installed and pump houses constructed**.**

Culturable Command Area (CCA) It is the area which can be physically irrigated from a scheme and is fit for cultivation.

Gross command area (GCA) The total area lying between drainage boundaries which can be commanded or irrigated by a canal system.

G.C.A = C.C.A + unculturable area

Water Tanks These are dug areas of lands for storing excess rain water.

Outlet This is a small structure which admits water from the distributing channel to a water course of field channel. Thus an outlet is a sort of head regulator for the field channel delivering water to the irrigation fields.

Ultimate irrigation potential The ultimate irrigation potential is the gross area that can be irrigated from a project in design year for the projected cropping pattern and assumed water allowance on its full development. The gross irrigated

area will be the aggregate of the areas irrigated on the different crop seasons, the areas under two seasonal and perennial crops being counted only once in a year.

The Ultimate irrigation potential of ground water may however, be taken as the total area that can be irrigated by utilizing the Annually Rechargeable Ground Water Resources available for irrigation considering the gross irrigation requirement of crops grown in an unit area.

Dam Any artificial barrier which impounds or diverts water. A dam is generally considered hydrologically significant if it is 1.25 feet (0.4 meter) or more in height from the natural bed of the stream and has a storage of at least 15 acre-feet or it has an impounding capacity of 50 acre-feet or more and is at least six feet (2 meters) above the natural bed of stream. A dam is called large if it has storage of 10 mem and above.

SECTION E: WATER SUPPLY AND SANITATION INFRASTRUCTURE

Water is a precious natural resource. Our connection to this invaluable resource is clear, without water a person could die of dehydration in a matter of days, even hours.

But it is its scarcity which is the cause of concern in today's time. It is the most basic need to sustain all forms of life on earth. Yet its denied access is the problem with which the world is grappling with.

Directly or indirectly, it affects the economic position of the country and hence an important barometer of a country's condition. Lack of improved sanitation facilities and unsafe drinking water sources kills and sickens thousands of children every day and leads to impoverished and diminished opportunities for thousand's more. Poor sanitation, water and hygiene have many other serious repercussions. Children and particularly girls are denied right to education because their schools lack private and decent sanitation facilities. Women are forced to spend large part of day fetching water, poor farmers and wage earners are less productive due to illness. And hence national economies are ultimate sufferers. Without WASH (water, sanitation and hygiene) sustainable development is impossible.

CLASSIFICATION OF WATER SUPPLY AND SANITATION INFRASTRUCTURE STATISTICS

WATER SUPPLY AND SANITATION		
Access indicators	**Unit**	**Categories**
Tap Water Facilities	Number of households	Urban
		Rural
Toilet Facility	Number of households	Urban
		Rural
Fiscal Cost and revenue indicators	**Unit**	**Categories**
Expenditure on water supply programmes	Rs.(in crore)	Accelerated Rural Water Supply Programme
		State share
Expenditure on sanitation programmes	Rs.(in crore)	Central Schemes
		State Schemes

CONCEPTS AND DEFINITIONS OF WATER SUPPLY AND SANITATION INFRASTRUCTURE STATISTICS

Term	Definition
Water Supply Coverage	This indicator is determined by the number of households connected directly to the piped water supply system and the total number of households in the area served by the water utility.
Per Capita supply of water	Per capita supply of water is measured as the total water supplied to the consumers by the population served per day. It is expressed as litres per capita per day.
Continuity of water supply	Continuity of supply is measured as the average number of hours of pressurized water supply per day.
Quality of water supply	It is measured as the percentage of water supplies that meet or exceed the specified potable water standards defined by the Central Public Health and Environmental Engineering Organisation.
Cost Recovery in Water supply services	It is measured as the ratio of total operating revenues over total operating expenses expressed in percentage.
Unit Production Cost	The unit production cost of per cubic metre of water is defined as total operation and maintenance cost of a utility for a year divided by total volume of water produced in a year.
Revenue Generated per metre cube	It is defined as total revenue generated annually divided by the total quantity of water produced in a year.
Coverage of toilets	It denotes the extent to which citizens have an access to a toilet in a service area.
Service Area	It implies a specific jurisdiction in which service is required to be provided.

SECTION F: STORAGE INFRASTRUCTURE

Storage of goods is of vital importance not only in the agriculture sector but also in the industrial sector. In the primary sector that is agriculture, storage is necessary at the farm and fields level; in the secondary sector that is industry, storage is essential at the processing and manufacturing level and in the tertiary level it is inevitable for the domestic, import and export trade.

The necessity for storage arises primarily because of lack of adjustment between the time and place of production of goods and time and place of their consumption.

Warehouses play a vital role in the flow of goods from producers to consumers. It helps in combating annual and seasonal fluctuation in production and prices.

Provision of facilities for food grains comes under the purview of Department of Food and Public Distribution. There are three agencies in the public sector which are engaged in building large scale storage/ warehousing capacity- Food Corporation of India (FCI), Central Warehousing Corporation (CWC) and 17 State Warehousing Corporations (SWCs).

In addition to food grains, storage also includes industrial warehousing, custom-bounded warehouses, container freight stations, inland clearance depots and air cargo complexes.

CLASSIFICATION OF STORAGE INFRASTRUCTURE STATISTICS

Access indicators	Units	Categories
Cold Storage of Central Warehousing	Number	Total
Corporation		Private Sector
		Public Sector
		Cooperative Sector
	Capacity (in million tonnes)	Total
		Private Sector
		Public Sector
		Cooperative Sector
Food grain Storage against total CWC	Capacity (in million tonnes)	
Capacity		
Warehouses	Number	
	Capacity (in million tonnes)	
Container Depots	Number	
	Capacity (number of containers	
	handled in '000 TEU's)	
Food Corporation of India (FCI)	Capacity (in million tonnes)	
Storage Facility available at Major Ports	Number	Covered Area
Dry Storage Accommodation		Open Area
		Container Yard
	Area per Capacity (m^2)	Covered Area
		Open Area
		Container Yard
Liquid Storage Tanks		
Capacity		Type of Cargo

Quality indicators	Units	Categories
Storage Capacity with FCI	Million Tonnes	Covered
		Owned
		Hired
	Million Tonnes	Cover and Plinth
		Owned
		Hired

CHAPTER 4

SOURCES AND SYSTEM OF COLLECTION OF INFRASTRUCTURE STATISTICS

4.1. The infrastructure statistics relate to various sub sectors identified as infrastructure. Each of these infrastructure sub sector is handled by a separate Ministry/ Department and the related statistics are collected by the concerned Ministry. The sources of these statistics and the system of their collection are described below:

4.2. Transport has four subsectors and data on each subsector is collected by different Ministries/ departments. The sector wise collection of statistics is described below:

4.2.1. ***Roads***: The Ministry of Road Transport and Highways provide comprehensive information on road network in India in their publication entitled "Basic Road Statistics (BRS) of India". The information pertains to road length under various categories of road along with nature of surface (like Water Bound Macadam, Black Top, Cement Concrete), Un-surfaced (Motor-able, Non-motor-able) and lane-wise information only in respect of National Highways, State Highways and other PWDs. Data presented in Basic Road Statistics in India are collected from about 280 source agencies spread across the Central, State and local levels. Some of the sources of data are State departments of Public Works, Forest, Irrigation, Electricity, Municipalities, Panchayati Raj & Rural Development, State Maritime Boards, Port Trusts, Sugarcane Authorities, Public Sector Undertakings in the Coal sector and Roads Wing of M/o Road Transport & Highways, Military Engineering Services, Zonal Offices of Indian Railways and Steel Authority of India. The periodicity of data is annual.

Road transport in India is primarily the responsibility of the State Government and U.T. Administrations. The State Govt. and Union Territory Administrations regulate road transport under the provisions of the Central Motor Vehicles Act 1988 / rules in the respective states. Data collected from different source agencies is compiled and published by the Transport Research Wing of Ministry of Road Transport and High Ways. The major sources of such data are: Transport Commissioners of States and Union Territories, State Road Transport Undertakings, Society of Indian Automobile Manufacturers (SIAM), Transport Division of Planning Commission, periodic Follow-up Enterprise Surveys on the subject by the MoS&PI, Directorate of Data management, Customs, Central Excise & Service Tax and World Road Statistics of International Road Federation.

4.2.2. ***Railways:*** The statistics are collected by the Ministry of Railways from various Zonal railways, Production Units, Metropolitan Transport Projects etc. The organisation for compilation and interpretation of statistics in the Ministry of Railways is under the charge of the Director, Statistics and Economics, who works under the Financial Commissioner for railways. The statistical compilation work on individual railways is generally in the charge of a statistical officer assisted by a compilation officer functioning as a part of the financial adviser and chief accounts officer's organisation. The data from which statistics are compiled are taken from various initial documents sent by divisions, stations, sheds, and yards etc. to the Central Statistical (compilation) sections/divisions of different Railway administrations. Statistical reports and information received from different railways are consolidated and processed further for gauge-wise totals and averages, and for the grand totals for all railways. These are collated finally into the different statistical publications of the Railway Board.

Periodical

i. Tri-monthly Statement of approximate gross earnings of Indian Railways for every 10/11 day period (for circulation in Board's Office only).

Monthly/Quarterly/Half yearly

i. Monthly Statement of Revenue Earning goods traffic on Indian Railways.
ii. Monthly Railway Statistics presenting the principal statistical results of Indian Railways relating to earnings and traffic, commercial statistics, operating statistics and rolling stock performance, etc.
iii. Supplement of Monthly Railway Statistics containing residual information of the Railway performance.
iv. Monthly Statistics of Passenger and Freight Traffic.
v. Monthly Digest of current trends in Economic conditions and Rail transport
vi. Quarterly Review of Accident Statistics
vii. Half yearly Operating Statistics of Marshalling Yards. Terminal goods Stations and Break of Gauge Transhipment Points.

Annual

i. Indian Railways Annual Report and Accounts
ii. Indian Railways Year Book.
iii. Indian Railways Annual Statistics Statements.
iv. Goods Revenue Statistics of Government Railways
v. Accidents Statistics of Indian Railways
vi. Locomotive, Carriage and Waon Workshop Repairs Statistics.
vii. Passenger Zone Statistics, i.e. distance zone-wise data of passenger traffic
viii. Goods Zonal Statistics, i.e. distance zone-wise data of goods traffic.

4.2.3 ***Inland water, sea and coastal statistics***: Ministry of Shipping is responsible for formulating policies and programmes for shipping and port sectors which also include shipbuilding and ship repair, major ports and inland water transport. The Directorate General of Shipping is entrusted with the responsibility of administering the Indian Merchant Shipping Act, 1958 on all matters relating to shipping policy and legislation, implementations of International conventions relating to safety, prevention of pollution and other mandatory regulations of International Maritime Organisations, promotion of maritime Education and training, examination and certification. Indian ports comprise 13 Major ports

including Port Blair Trust declared as Major Port on 01-06-2010 and 176 Non-major ports along the coast and islands. The Major Ports are under the Union List (Schedule VII) while the Non-major ports are under the Concurrent List (Schedule VII). The major ports are administered by the Union Government (M/o Shipping) while Non-major Ports are administered by the State Governments/UTs within their respective coast lines.

Development and Regulation of inland waterways for the purpose of shipping and navigation is the responsibility of Inland Waterways Authority of India. Transport Research Wing, the main source agency for collection, compilation and analysis of data on maritime/water borne transport sector obtains information/data from Major Ports, State Maritime Boards, Directorate General of Shipping, Shipping Corporation of India, Ship Building companies, Inland Waterways Authority of India and Central Inland Water Transport Corporation and individual companies operating Ships and inland water transport operations etc. The data on Inland Water, sea and coastal statistics can be divided into 3 main sectors namely shipping and Ship Building, ports and Inland waterways. The data on these sectors is disseminated through the following publications:

A. **Indian Shipping Statistics**: The publication contains information on:

i. Indian fleet – by type, size & age of vessels
ii. Overseas fleet - by type, size & age of vessels
iii. Coastal fleet - by type, size & age of vessels
iv. Net addition to Indian Coastal / Overseas fleet
v. Prices of Fuel for vessels plying on International run
vi. Fleet owned by Shipping Corporation of India (SCI)- by type, size & age of vessels
vii. Performance indicators and Financial Performance of SCI
viii. Source of finance, profitability & Gross value of Fleet of Indian Shipping Companies
ix. Merchant Fleet of the World – By Country of Registration & nationality of Owner.

The main source agencies for this publication are The Directorate General of Shipping, Shipping Corporation of India, different shipping companies in the Public and Private Sector and World Fleet Statistics – Lloyd's Register Fairplay.

B. **Statistics of India's Ship- Building & Ship Repairing Industry** The statistics given in the publication contains the following information:

i. Ship building & ship- repairing capacity - company-wise by type and size

ii. Different types of ships ordered and ships delivered (No.) – company-wise

iii. Ship Repairing Capacity by types of vessel-company –wise

iv. Ship Repairing Facilities-company-wise

v. Number of ships repaired and earnings – company –wise

vi. Dry-dock, ship repairing facilities and equipments available at major ports.

vii. Employment in shipbuilding/ship repairing companies.

viii. Financial position of ship building / ship repairing companies

ix. Ships on order by major types and country of build

x. World merchant ships completed- by principal types

The main source of the data is the various shipyards in the public and private sector.

C. **Basic Port Statistics (Annual)** – It gives information on major ports and non-major ports in respect of cargo traffic – volume of cargo and its composition, performance indicators, port capacity and its utilization, employment and financial performance. The primary source of data on Major Ports is concerned Port Trusts and their Administrative reports. Data on Non-major ports are obtained from State/UT Directorate of ports.

D. **Update on Indian Port Sector (Biannual)** – This publication provides comprehensive information on latest developments in Indian Port sector in the backdrop of macro-economic developments having a bearing on maritime cargo traffic. Besides, the publication covers state-wise analysis of the developments in the area of sea-borne traffic for maritime States/UTs

particularly in respect of cargo traffic, efficiency Indicators and projects under implementation.

E. **Statistics of Inland Water Transport (Annual)** - The publication contains information on:

   i. Navigable waterways of the country and infrastructure facilities available on National/ State Waterways.
   ii. Details of cargo movement on various waterways
   iii. Commodity-wise, route-wise cargo carried, freight earned, income and expenditure of CIWTC
   iv. Number of IWT vessels owned by State Governments/private IWT companies and cargo/passengers carried
   v. Plan outlay and expenditure for IWT sector
   vi. Inland waterways transport accidents

F. **Inland waterways in select countries:** The main source of data are Inland Waterways Authority of India (IWAI) for National Waterways, Central Inland Water Transport Corporation (CIWTC), State Governments and Public & Private Companies engaged in Inland Water Transport. The latest publication is for 2009-10.

4.2.4. **Air Transport statistics:** Statistical Division of the Director General of Civil Aviation is responsible for maintaining civil aviation traffic statistics. This Division collects data pertaining to Civil Aviation from various sources viz. Air India, Indian Airlines, Private Operators, Foreign Airlines and various airports managed by Airports Authority of India. The data thus collected are compiled and are then published annually in a publication entitled " India Air Transport Statistics." The main objective of this publication is to provide a clear picture of the performance of air traffic in India and to study trends thereof. The publication includes traffic statistics in respect of scheduled and non-scheduled air services of domestic as well as foreign carriers; detailed information on fleet strength, aircraft utilization, staff strength, financial results of Air India, Indian Airlines and Airport statistics for both international and domestic airports. Further, it includes statistics in respect of international traffic to/from India to various

countries, domestic traffic carried by scheduled, non-scheduled and air taxi operators and traffic carried on tourist charter flights and flights operated under Open Sky Policy for all-cargo services. Some graphic charts are also given along with the tables. The data on passengers, freight & mail in this publication relates to revenue traffic only.

4.3. **Energy infrastructure statistics**: Statistics related to energy infrastructure are collected by Ministries/Departments concerned with the respective infrastructure. Statistics related to coal are compiled by the Ministry of coal, those related to petroleum and natural gas are compiled by Ministry of petroleum and natural gas and related to electricity are compiled by the Central Electricity Authority.

4.3.1. **Coal statistics**: The Coal Controller being the Statistics Authority of coal statistics, the publication of the Organisation is perhaps the lone authentic source of coal statistics in the country. The organisation collects, compiles and analyses coal statistics periodically to cater to the need of various Government Departments, national and international bodies, research organisations etc. who require such data. A compendium entitled "Coal Directory of India" is prepared after restructuring and remodelling of the earlier publication in order to present it as an integrated and exhaustive data bank and has received wide appreciation from the users. As the Coal Directory requires a longer time period for publication, "Provisional Coal Statistics" is also brought out by the organisation within a month of expiry of the financial year giving provisional statistics of some of the major parameters required by various organisations and departments.

4.3.2. **Petroleum and natural gas statistics:**

Ministry of Petroleum has an Economic and Statistics Division headed by Economic Adviser. The Division provides economic inputs to the Divisions of the Ministry after detailed analysis of the plan and programmes. An exhaustive data base is maintained on production and trade of crude oil, natural gas, petroleum products and stages of capacity creation by the petroleum industry. The Economic and Statistics Division is involved in the plan formulation exercise of the public sector enterprises associated with petroleum exploration, production, refining and marketing. Also, all issues pertaining to

foreign investment policy in the petroleum sector and issues relating to Double Taxation Avoidance Agreement (DTAA) on Income & Capital etc. are handled in the Division.

Data Collected: Production of Crude Oil, all Petroleum Products, Natural Gas, LNG, Imports/Exports of Oil & Petroleum products, Consumption of Petroleum Products and Refinery intake etc. on monthly basis and apart from these data other related data for publication of "Basic Statistics on Indian Petroleum & Natural Gas Products" and "Indian Petroleum & Natural Gas Statistics" being collected annually.

Monthly & Quarterly Reports on Petroleum Statistics: Collection, compilation and submission of Reports on:

i. Production of Crude Oil, Natural Gas and Petroleum Products
ii. Quarterly report on Production Performance
iii. Import/Export of Crude Oil and Petroleum Products
iv. Joint Oil Data Initiative Statistics

Annual Publications

i. Publication of Annual Basic Statistics on Petroleum & Natural Gas Products and
ii. Annual Indian Petroleum & Natural Gas Statistics
iii. Publication of Annual Basic Petroleum & Natural Gas Products and Statistics on
iv. Annual Indian Petroleum & Natural Gas Statistics

4.3.3. **Electricity statistics:** Central Electricity Authority collects Statistics concerning the generation, transmission, trading, distribution & utilization of electricity as per the provisions of the Electricity Act, 2003. The publication "General Review" contains All India Statistics pertaining to generation and consumption of electricity by different sectors in the country. A new chapter on Power Trading has been added in the present publication showing data on energy trading.

The data for "General Review" are collected from Utilities & Non-utilities of the Indian Electricity Sector and specific categories of electricity consumers.

4.4. **Communication infrastructure:** The statistics related to telecommunication is compiled by Department of telecommunication and Telecom Regulatory Authority of India (TRAI). The statistics related to postal communication are compiled by the Department of Post.

4.4.1. **Telecommunication**: the statistics relating to telecom network i.e. exchanges, switching capacity, direct exchange lines, rural DELs, Tax, VPTs, Microwave and OFC is being obtained only from Public Operators. Subscriber data in respect of Public Operators is collected from BSNL and MTNL and that of Private operators is obtained from Association of Unified Telecom Service Providers of India (AUSPI) and Cellular Operators Association of India (COAI). Financial outlay in telecom comprising of internal and extra budgetary and gross budgetary support is being compiled in budget division of DOT (HQ).

4.4.2. **Postal communication**: the department of Post compiles information on various parameters of postal communication. Information on post offices, post boxes etc. is obtained from concerned postal circles and compiled into a publication named "Book of Information" available on the website of the Department www.indiapost.gov.in.

4.5. **Irrigation Infrastructure Statistics**

The Central Water Commission (CWC) which is the nodal agency for water resource development in the country is responsible for statistics of water resources pertaining to major and medium irrigation projects. The River Management Wing of CWC is engaged in hydrological data collection relating to all the important river systems in the country with the help of as many as 877 hydrological observation sites. The Information System Organisation (ISO) in the CWC is involved in planning, implementing, monitoring and coordinating all aspects of activities associated with information-gathering activities, analytical studies and computerisation.

Groundwater is the principal source for minor irrigation and the Central Ground Water Board (CGWB) is responsible for generation and dissemination of statistics on ground water which *inter-alia* include statistics on minor irrigation. The Minor Irrigation Division of the Ministry of Water Resources also compiles information on

minor irrigation at the national level on the basis of statistics furnished by nodal offices designated for the purpose in individual States. The Command Area Development Division of the Ministry compiles and disseminates data on Command Area Development Programme (CADP) furnished by State Command Area Development Authorities (CADAs).

4.6. Drinking water supply and sanitation infrastructure statistics

Central Ground Water Board (CGWB), a subordinate office of the Ministry of Water Resources, Government of India, is the National Apex Agency entrusted with the responsibilities of providing scientific inputs for management, exploration, monitoring, assessment, augmentation and regulation of ground water resources of the country. The Board has 18 Regional offices, each headed by a Regional Director, supported by 17 Engineering Divisions and 11 State Unit Offices for undertaking various field activities. Various activities related to regulation of ground water development in the country are being looked after by the Central Ground Water Authority (CGWA), constituted under the Environmental (Protection) Act, 1986.

Major activities being taken up by Central Ground Water Board include macro/micro-level ground water management studies, exploratory drilling programme, monitoring of ground water levels and water quality through a network of ground water observation wells comprising both large diameter open wells and purpose-built bore/tube wells (piezometers), implementation of demonstrative schemes for artificial recharge and rainwater harvesting for recharge augmentation. Periodic assessment of replenishable ground water resources of the country is carried out by the Board jointly with the concerned State Government agencies. Geophysical studies, remote sensing & GIS studies and ground water modelling studies are taken up to supplement these activities. The Board also takes up special studies on various aspects of ground water sector such as ground water depletion, sea water ingress, ground water contamination, conjunctive use of surface & ground water, water balance etc. It also organizes various capacity building activities for personnel of its own as well as Central/State Government

organizations engaged in various activities in ground water sector as well as mass awareness campaigns on the importance of water conservation and judicious ground water management. The data generated from various studies taken up by CGWB provide a scientific base for water resource planning by stakeholders.

The Board regularly publishes scientific reports based on the data generated through various investigations for dissemination to the stakeholders. These include State and District hydro geological reports, ground water year books and Atlases, ground water user maps and guides/manuals/pamphlets on various aspects of ground water management.

4.7. **Storage Infrastructure Statistics: S**torage infrastructure are compiled by FCI, CWCs, Agricultural Marketing Information Network (AGMARKET) and Transport Research Wing (TRW) of the Ministry of Shipping. The relevant statistics are available on the website of each of these organisations.

Annexure I

Data Gaps

For a comprehensive statistical publication on Infrastructure, a number of statistics need to be compiled through the statistical system in the country. Some of these statistics were identified by the Rangarajan Commission and recommended to be compiled for which appropriate statistical set up need to be put in place at centre as well as State Statistics Offices. Below is a list of such variables, sector wise, on which data needs to be collected:

i. Transport Sector

Roads

- Data on vehicle population is available in terms of registration rather than "vehicles in use". However, internationally it is the data on 'vehicles in use' that is used for the purpose of analysis, comparisons and policy formulation. *Vehicle in use* is a more accurate indicator of the number of vehicles plying on road as compared to total registered vehicles which provides data on the cumulative total of vehicles registered without accounting for decommissioned/scrapped vehicles.
- No data on movement of people, goods & vehicles. Hence lack of data on volume & geographic flow of traffic.
- Passenger & freight flows measured in a variety of ways
    - Vehicle Km/miles of travel (passenger and freight)
    - Passenger Km : (Distance traveled x No. of passengers carried)
    - Freight flows: Tonne Km (movement of tonnes of cargo over Kms)
- Other data that needs to be compiled are:
    - Ownership patterns of freight carriers;

- Fleet utilization of trucks and buses (number of Kms/day/month/year);
- Age profile of vehicles;
- Vehicle productivity;
- Fuel efficiency;
- Cost of operation (Rs/tonne Km); and
- Volume of passenger traffic (passenger Km) and
- Freight tariff (tonne Km and type of good).

Railways

- Value of infrastructure assets, that is, rail network;
- Non-availability of data separately for each traction and for each zone of the railways
- Data on the movements of various goods by traction , inter and intra-State movement of traffic by rail (Data on inter-State movement of goods by different modes including rail are published by the Directorate General of Commercial Intelligence and Statistics);
- Revenue earnings by type of freight carried, by traction and by zone;
- Efficiency indicators such as average lead, turnaround time of rolling stock., on-time arrivals, extent of delays, etc. by traction and by zone; and

Inland, Sea & Coastal Transport

- Apart from the non-availability of timely data on inland water statistics, particularly from states, there are data gaps in IWT statistics :
    i. IWAI is providing Cargo statistics for vessels which are registered and are availing the facilities of IWAI on National Waterways. There are several small unregistered vessels/ boats (country crafts) which carry cargo and do not avail facilities of IWAI infrastructure. The cargo carried by those vessels/boats is not at all being captured. There is a need to carry out

periodic survey (may be once in five years) to assess the Cargo Carried by such vessels on National Waterways.

ii. Many of the State Governments are unable to maintain the data/information on Inland Water Transport due to lack of scheduled/systematic records on Freight/Passenger operations on their waterways. Consequently, the data on

iii. The data also need to be collected on number of people trained by States to operate mechanised vessels.

- The following data gaps in Shipping and Port's statistics exist:

i. Financial performance indicators of private shipping companies.

ii. Operational indicators (voyages, cargo, capacity or space utilization).

iii. Freight rates for selected Indian Import and export commodities for all shipping companies.

iv. Safety Statistics.

v. Environment pollution caused by shipping Industry

vi. Data on country-wise break-up of Origin and destination-wise of cargo is frequently asked by researchers. Shipping lines/companies generally provide information on the port of country from where the cargo is loaded or to where the cargo is to be discharged and not the actual country from where the cargo originated or is destined to.

vii. Container cargo is fastest growing traffic at Major ports. However, the commodity-wise data handled in containers is not being maintained by major ports.

Air Transport

- Quantity of infrastructure facilities, such as length of runaways and air traffic controlling systems. Such information needs to be available on a zonal or State-level basis.
- Fuel and other efficiency indicators by airlines.
- Share of international and domestic passenger traffic by zone and by airlines.

- Operating details of aircrafts including age.

ii. Energy Infrastructure

- Value of capital assets in each Sector.

iii. Communication Infrastructure

Telecommunication

- Indicators of physical and financial efficiency of all telecom providers across zones and States.
- Penetration of computers including number of personal computers, number of cyber cafes, number of users of computers at cyber cafes.
- Information on Internet Service Providers, such as number of subscribers, subscription rates.

Postal Communication

- Origin-destination of postal traffic.
- Timeliness of delivery.

Annexure II

No. M-13015/01/07-ESD
Ministry of Statistics & Programme Implementation
Central Statistical Organisation
(Economic Statistics Division)

Jeevan Prakash Building, 8th Floor
25, K.G. Marg, New Delhi-110001

14 January, 2010

ORDER

In pursuance of the decisions taken in the 16th Conference of Central and State Statistical Organisation (COCSSO), it has been decided to constitute a Task Force for preparation of a Manual on Infrastructure Statistics. The composition and Terms of Reference of the Task Force will be as under:-

I. Composition of the Task Force

1. DG,CSO	Chairman
2. Representative of Secretariat for Committee on Infrastructure, Planning Commission	Member
3. Representative of Infrastructure Division, Deptt. Of Economic affairs, Ministry of Finance	Member
4. Representative of Deptt. Of Statistical Analysis and Computer Services, RBI	Member
5. Representative of NAD,CSO	Member
6. Representative of SDRD, NSSO	Member
7. Representatives of Govt. of Maharashtra	Member
8. Representatives of Govt. of Tamil Nadu	Member

9. Representatives of Govt. of West Bengal	Member
10. Representatives of Govt. of NCT of Delhi	Member
11. Additional director General ESD, CSO	Member Secretary

II. **Terms of Reference**

To evolve an outline of the manual on Infrastructure statistics specifying its various chapters.

i. To examine chapters drafted by sector specific Ministries/ departments giving existing concepts and methods.

ii. To standardise sector-wise concepts, definitions and methodology for compilation of Infrastructure statistics.

a. The Task Force may co-opt any officers or experts with experience in Infrastructure Statistics as may be deemed necessary to formulate its views.

b. TA/DA of official members shall be borne by their respective Ministries /Departments / Organisations. The non-official members would paid TA/DA/taxi fare for meetings of the Task Force, as per rules. The expenditure of the Task force would be borne by Ministry of Statistics & Programme Implementation under the head 3454(Major Head), 0.2.204 Central Statistical Organisation. (Minor head).

c. This issues with the concurrence of IFD vide Dy. No. 04/FA/F dated 05/01/10.

d. The Task Force may complete its work within one year of its constitution.

Addl. Director General (ESD)

Annexure III

Minutes of the First Meeting of the Task Force to prepare a Manual on Infrastructure Statistics held on 12.01.2011

The First meeting of the Task Force was held on 12th January, 2011 at 12.00 noon in the committee room of Sardar Patel Bhavan, New Delhi under the chairmanship of Sh. S.K.Das, DG, CSO. The list of participants is enclosed. Chairman welcomed the members and to begin with he expressed his concern on the thin attendance in the meeting and advised that larger participation be ensured in the subsequent meetings. The Chairman explained the purpose with which the Task Force was constituted. It was recommended in the 17th COCSSO to prepare a manual on Infrastructure Statistics to provide guidance to state statistics offices for preparation of statistical publication on Infrastructure. To implement this recommendation a Task Force was constituted by CSO with following terms of references:

i. To evolve an outline of the manual on Infrastructure statistics specifying its various chapters.
ii. To examine chapters drafted by sector specific Ministries/ departments giving existing concepts and methods.
iii. To standardise sector-wise concepts, definitions and methodology for compilation of Infrastructure statistics.

Thereafter, Shri H.K.Sharma, ADG, ESD informed that the manual on infrastructure statistics is mainly required to provide guidance to the State Governments in the preparation of a similar statistical publication at State level like the one ESD, CSO has compiled on Infrastructure Statistics. The manual will contain the standardised concept, definitions and methodology to be uniformly followed by State Governments for the compilation of relevant statistics.

Dr. Sunita Chitkara, DDG, ESD, CSO was requested to present further details. In the meeting an outline of the manual and a roadmap to achieve the same were presented by her.

The proposed manual would have ten chapters in all of which first two chapters will give a brief introduction of Infrastructure Sector, its coverage, its importance, harmonisation of the definitions and coverage as emanated at several forum. The last two chapters will be on the

presentation and dissemination of infrastructure statistics and bibliography / annexure respectively. The remaining six chapters will be devoted to one on each of the sub sectors of Infrastructure. Each chapter will highlight the importance of sub sector as a infrastructure and how it satisfies the characteristics of being infrastructure and the statistics required to be compiled under four indicators/parameters viz. Accessibility, Affordability, Quality, Fiscal and Revenue indicators. After crystallising the statistics under each indicator, definitions of related terms will be explained in the manual. Finally suitable formats in which the data could be presented in a meaningful manner will be prescribed in the said document.

The Chairman DG (CSO) appreciated the efforts of Economic Statistics Division in the preparation of outline of the manual. ADG(ESD) pointed out that the tenure of Task Force was only for one year. He mentioned that the tenure needed to be extended at least by an year. It was agreed to extend the tenure for another one year and reconstitute the Task Force so that representatives from concerned sectoral Departments/Ministries are also included in the Task Force so as to involve them fully as they are custodian of basic data. After reconstitution of the Task Force another meeting may be held immediately. Sh. G.C.Manna , DDG(ESD) said that a background note be prepared for the benefit of members of Task Force before the next meeting is held. It was agreed that the chapters on introduction and characteristics of infrastructure will be prepared by ESD. For sector specific chapters, the introductory part for each sector will be prepared by ESD; the statistics required to be included under each indicator will be decided by the Task Force. The related definitions and concepts will be prepared in consultation with the concerned Sectoral Ministries. The chapters will also highlight the availability and non availability of statistics relating to the sub sectors. The formats for presentation of data will be drafted/prepared by ESD. Ms Rajeshwari, DDG(NAD) suggested to include steel, cement, fertilizers etc as done in Capsule Report on Infrastructure Performance prepared by the Ministry of Statistics & PI. It was, however, clarified by the Chairman that the coverage of Infrastructure sector has been finalised under the guidance of Standing Committee on Infrastructure Statistics(SCINS) constituted by CSO for the purpose of standardisation of concepts, coverage of Infrastructure sector and preparation of statistical publication on Infrastructure. Hence the same coverage will be followed by Task Force in the preparation of Manual also. Chairman further added that some of the sub sectors of infrastructure do not directly come under the purview of

states, only Centre administrates them, the data for such sectors may not be available with them, coal is an example. The Manual should clearly highlight this point and guide about the sectors for which data compilation has to be done by States.

The following decisions were taken in the meeting:

a. The manual on infrastructure statistics will contain concepts and definitions of terms related to various infrastructure sub sectors being dealt by the various sector specific Ministries/Departments. To accomplish this, participation of concerned ministries in the Task Force is required. It was therefore decided to reconstitute the Task Force to include representatives of various sectoral ministries concerned with infrastructure subsectors.
b. The draft outline of the Manual may be circulated to the reconstituted Task Force and a background note on the subject be circulated to the members of Task Force before its next meeting.
c. The tenure of the Task Force may be extended to one more year.
d. The Terms of Reference of the Task Force may be modified as the chapters are to be drafted by the secretariat of the Task Force i.e. ESD and Task Force will finalise them in consultation with concerned ministries.
e. For finalisation of sector specific chapters of the Manual, separate meetings with the concerned ministries will also be conducted.

The meeting ended with vote of Thanks to the chair.

Annexure IV

No. M-13015/01/11-ESD
Ministry of Statistics & Programme Implementation
Central Statistical Organisation
(Economic Statistics Division)

Jeevan Prakash Building, 8th Floor,
25, K.G.Marg, New Delhi-110001

9th March, 2011

ORDER

In continuation to Office Order M-13015/01/07-ESD dated 14th January, 2010 and in pursuance of a decision taken at the first meeting of the Task Force held on 12.1.2011, the Task Force for Preparation of Manual on Infrastructure Statistics is reconstituted comprising the following as members and Terms of reference as given below.

Further the tenure of Task Force for Preparation of Manual on Infrastructure Statistics is extended for a further period of one year from the date of issue of this order.

The Task Force is reconstituted with modified Terms of References as given below:

I. Composition of the Task Force

1.	DG, CSO	Chairman
2.	Shri Ashwani Tripathi Director, DSIM RBI, 6, Sansad Marg New Delhi -110001 Tel No. 9717695400 Fax 23710538 aktripathi@yahoo.co.in	Member
3.	Shri M.M.Hasija Adviser (Statistics) Ministry of Road Transport and Highways,	Member

	Jam Nagar House, New Delhi Tel. 23389017 Fax 23383251 mmhasija@yahoo.co.in	
4.	Shri Ajay Srivastav Dy. Economic Adviser Deptt. of Telecommunication New Delhi Tel. 9868136879 ajaysri@nic.in	Member
5.	Sh. Amarjeet Singh Chief Engineer (DMLF) Central Electricity Authority, R. K. Puram, New Delhi- 110066 Tel 26102069 Amerjeet-52@ radiffmail.com	Member
6.	Ms. Archana Mathur Economic Adviser Ministry of Petroleum and Natural Gas Paryavaran Bhawan 12th Floor, B-12 Wing, CGO complex Lodhi Road, New Delhi 110003 Tele. 24369261 archanamathur@nic.in	Member
7.	Shri Prabhat Mishra Director, Infrastructure and Investment Division Room No. 70 C, North Block Deptt. of Economic affairs Ministry of Finance New Delhi-110001 Tele. 2309454 nmpkm2004@yahoo.co.on	Member
8.	Dr. Buddhadeb Ghosh Associate Scientist Economic Research Unit ISI, 203 B.T. Road	Member

	Kolkata (033) 2652-2375 9433164711 buddhdeb-ghosh@yahoo.com ISEC@isical.ac.in	
9.	Shri R. Mittal Adviser(Infrastructure Division) Secretariat for the Committee on Infrastructure, Planning commission Sansad Marg, New Delhi-110001 23096704 9810922202	Member
10.	Shri B.N.Satpatty Economic Adviser Ministry of Communication and Information Technology Electronic Niketan 6 CGO Complex, New Delhi-110003 24301412 bsn@nit.gov.in	Member
11.	R.Savithri Director, DGCA Airport Authority of India Ministry of Civil Aviation Rajiv Gandhi Bhavan, Safdarjung Airport Delhi-110003	Member
12.	Sh. Vijay Kumar Additional Director General Ministry of Water Resources, 2nd floor, B Wing, Lok Nayak Bhawan, Khan market, New Delhi Tel 24647129 (o)/ 9413343363 (M)	
13.	Ms. T.Rajeshwari DDG, National Accounts Division Central Statistics Office Ministry of Statistics & PI	

	Sardar patel Bhavan New Delhi-110001	
14.	Dr. B.K.Sharma, Director Directorate of Economics & Statistics Govt. of National Capital Territory of Delhi, Old Secretariat, Room No.148 Delhi110054 Tel.23812841 Fax. 2382856	
15.	Smt. M.Sheela Priya,IAS Principal Secretary and Director of Economics & Statistics Govt. of Tamil Nadu, Block II, Administrative Office Building, 259, Annasalai, Teynampet Chennai-600006	
16	Dr. Ravendera Singh, Dy. Director General, PI Wing Ministry of Statistics & Programme Implementation Sardar Patel Bhawan New Delhi-110001	
17..	Additional Director General ESD	Member Secretary

II. Terms of Reference

i. To initially evolve an outline of the manual on Infrastructure Statistics specifying its various chapters, and finalise the Manual.

ii. To standardize sector-wise concepts, definitions and methodology for compilation of Infrastructure statistics taking into view the recommendations of the Standing Committee on Infrastructure Statistics.

iii. To identify data gaps for each sector and describe the process for filling of these data gaps.

iv. To prescribe the guidelines for compilation and preparation of statistical publications “Infrastructure Statistics” at state level.

III. The Task Force may co-opt any officers or experts with experience in Infrastructure Statistics as may be deemed necessary to formulate its views.

IV. TA/DA of official members shall be borne by their respective Ministries/Departments/Organisations. The non-official members would be paid TA/DA/taxi fare for meetings of the Task Force, as per rules. The expenditure of the Task Force would be borne by Ministry of Statistics & Programme Implementation under the head 3454 (Major Head), 0.2.204 Central Statistical Organisation (Minor Head).

V. This issues with the concurrence of IFD vide Dy. No. 121/AS&FA dated3/3/11.

VI. The Task Force may complete its work within one year of its constitution.

(Dr. Sunita Chitkara)

Deputy Director General

Annexure V

Minutes of the Second Meeting of Task Force for the preparation of a Manual on Infrastructure Statistics held on 06.09.2011.

The second meeting of the Task Force for the preparation of Manual on Infrastructure Statistics was held on 6th September, 2011 at 2.00pm in the Committee room of Sardar Patel Bhavan, New Delhi under the Chairmanship of Sh. S.K.Das, DG, CSO. The list of participants is enclosed.

Sh. H.K.Sharma, ADG, ESD welcomed the members. He highlighted the outcomes of the first meeting of the Task Force wherein the chapterisation of the manual was discussed. It was also decided to reconstitute the Task Force and extend its tenure to one more year. The Task Force was reconstituted in March, 2011. This meeting was the first meeting of the reconstituted Task Force.

He further informed the members that CSO has prepared a statistical publication on Infrastructure Statistics titled as "Infrastructure Statistics, 2010" which is available on the website of the ministry www.mospi.nic.in. The State Statistical Offices are also required to prepare a statistical publication on infrastructure statistics similar to the one that CSO has prepared. It was recommended in one of the Conferences of Central and State Statistical Organisations that CSO will prepare a manual on Infrastructure Statistics to provide guidance to State Statistical offices in preparation of such a publication. To accomplish this objective CSO constituted a Task Force under the chairmanship of DG, CSO and ADG, ESD as the member secretary. A draft manual was prepared by ESD which would be presented for the review of the members of the Task Force. He then requested Dr. Sunita Chitkara, DDG, ESD to present the draft manual.

In her presentation, Dr. Sunita Chitkara stated that the basic objective of the manual is to provide guidelines to the State Statistical Offices to prepare a statistical publication on Infrastructure Statistics similar to the one prepared by CSO. Therefore the scope of the

manual has been kept limited to the “Infrastructure Statistics, 2010”. The approach taken to draft the manual is as follows:

- Coverage of sectors: as prescribed by the Standing Committee on Infrastructure Statistics.
- Classification of statistics: statistics classified under five indicators- access, quality, fiscal & revenue, utilization and affordability. Only those statistics are considered for which data is available.
- Sources of definitions: statistical publications of subject ministries
- Data gaps: obtained by comparing data availability as given in the publication “Infrastructure Statistics, 2010” with the data requirements recommended by Rangarajan Commission in their report.

With this approach, following chapters for the manual are proposed:

- Chapter I – Need to measure Infrastructure, highlighting the importance of infrastructure sector in economic development and inclusive growth.
- Chapter II – Harmonisation of definition and Coverage of Infrastructure sector
- Chapter III – Concepts, Classification and Definitions of Infrastructure statistics. This chapter has six sections
    - Section A on Transport infrastructure
    - Section B on Energy infrastructure
    - Section C on Communication infrastructure
    - Section D on Irrigation infrastructure
    - Section E on Drinking water supply and sanitation infrastructure
    - Section F on storage
- Chapter IV - Sources and Systems of Collection of Infrastructure Statistics
- Chapter V – Guidelines for States

Thereafter the classification of statistics for each sub sector was presented and discussed with the concerned member of the Task Force representing the subject Ministry. Data gaps for each sector were also highlighted.

Smt. R. Savithri, Director, DGCA suggested that more statistics on Airports can be included which can be obtained from the Airport Authority of India.

Sh. Sukhvir Singh from Ministry of Petroleum and Natural Gas suggested that storage and distribution centres and private investment may be dropped from the petroleum and natural gas sector as data on these two parameters may not be available.

Sh. R.K.Pahwa, Director from Central Electricity Authority informed that their statistical publication contains most of the definitions that may be included in the manual. Sh. G.C.Manna, DDG, ESD stated that, for a uniform approach to be followed in respect of each state/UT, the definition of terms like number of villages electrified needs to be clearly mentioned in the manual to clarify that by electrification of how many households, the whole village is considered as electrified.

Smt. Sunita Yadav, Deputy Economic Adviser, Ministry of Telecommunication stated that due to change in technology, the role of fixed line telephones has lost much importance whereas the wireless and mobile phones have captured the market. Therefore, it is important that data on this aspect of telecommunication is adequately captured in the publication on infrastructure statistics. She stated that for this data we may contact TRAI.

Dr. Buddhadeb Ghosh, associate scientist, ISI, Kolkata stated that in addition to state wise variation in infrastructure status, it is more important to study variations at district level. Within a state the status of infrastructure varies greatly from district to district. For this purpose it is required to compile district level data for infrastructure.

The decisions of the Task Force were sought on following points:

- Chapterization of the manual, names/headings of chapters.
- Sub-topics included under each chapter and their contents.
- Data gaps – if included whether a separate chapter or along with the classification of statistics under chapter 3 or not to be included.
- Guidelines for states- sectors to be included in their publication.

The chapterisation names/ headings and sub-topics included under each chapter were agreed upon by the members of the Task Force.

It was suggested by Sh. Vijay Kumar, ADG, Ministry of Water Resources to include the data gaps in the manual so that their requirement is emphasized and efforts are made to plug them. However, instead of including them under the respective sector they may be given in the annexure of the manual. This suggestion was accepted by the members of the Task Force.

Concluding the meeting, ADG, ESD summarised the main points discussed in the meeting and requested the members to give their critical comments on the draft manual within a week's time. It was also recommended that the subject Ministries may be asked to list those statistics that need to be compiled at state level so that specific guidelines can be prepared for the State Statistical Offices. Further, feed back of the subject ministries on data gaps may also be taken. It was also decided to invite DDG(CWC) and representatives of TRAI and Ministry of Railways as special invitees in the future meetings.

The meeting ended with a vote of thanks from Sh. G.C.Manna, DDG,ESD.

List of participants

1. Sh. S.K. Das, D.G. CSO
2. Sh. H.K.Sharma, ADG, ESD
3. Sh. G.C. Manna, DDG, CSO
4. Dr. Sunita Chitkara, DDG, CSO
5. Dr. Buddhadeb Ghosh, Associate Scientist, ISI, Kolkata
6. Sh. Sukhvir Singh, Ministry of Petroleum and Natural Gas
7. Smt. T.Rajeshwari, DDG, NAD, CSO
8. Sh. R.K.Pahwa, Director, Central Electricity Authority
9. Sh. Vijay Kumar, ADG, Ministry of Water Resources
10. Sh. Ajay Saxena, PPP Expert, Government of Maharashtra, ADB
11. Sh. Ashwani Tripathi, Director, DSIM, RBI, New Delhi
12. Smt. Sunita Yadav, Deputy Economic Adviser, Ministry of Information and Technology
13. Smt. R.Savithri, Director, DGCA
14. Sh. M.M.Hasija, Adviser, Ministry of Road Transport and Highways
15. Sh. P.S.Narotra
16. Smt. Anna Roy, Director, Deptt. Of Economic Affairs, Ministry of Finance
17. Sh. A.H.Ramteke, Assistant Director, ESD

Annexure VI

Minutes of the Third Meeting of Task Force for the preparation of a Manual on Infrastructure Statistics held on 17.02.2012.

The third meeting of the Task Force for the preparation of Manual on Infrastructure Statistics was held on 17th February, 2012 at 3.00pm in the Committee room of Sardar Patel Bhavan, New Delhi under the Chairmanship of Sh. S.K.Das, DG, CSO. The list of participants is enclosed.

The Chairman welcomed the participants and briefed about the agenda of the meeting.

Thereafter, a presentation was made by Dr. Sunita Chitkara in which she highlighted the decisions taken during the second meeting of Task Force and revisions made in the manual based on them. The comments/ suggestions received from the members were discussed in detail as given below:

The Department of Telecommunications has agreed to the contents of the manual related to its sector. Remaining information pertaining to the sector was also made available in time.

The Ministry of Petroleum and Natural gas did not give any specific comments on the manual.

Reserve Bank of India opined that the state level infrastructure statistics would go a long way in strengthening infrastructure statistics of the country. It was suggested that housing statistics may also be collected at state level.

Sh. U.K.Sharma, Joint Adviser, Planning Commission stated that investment on infrastructure is an important aspect and data on it needs to be included in the publication on infrastructure statistics at state level. The information on plan expenditure and investment, outlay and expenditure for both public and private projects is available for all infrastructure sectors with Planning Commission and also available on the website www.pppindia.com.

Ministry of Water Resources suggested including three more definitions in the manual - Ultimate Irrigation Potential, CCA Culturable Command area and Large Dam. Sh. D.P. Mondal, Adviser, CWC suggested some changes in the definition of minor irrigation projects and indicators classified under Fiscal Cost and revenue.

Dr. Buddhadeb Ghosh, Associate Scientist, Economic Research Unit, ISI, Kolkata suggested to add a chapter on social infrastructure and also a chapter on Economic Infrastructure which should inter-alia include information on Per Capita Net State Domestic Product (PCNSDP), Monthly Per Capita Consumption Expenditure (MPCE) real, Head Count Ratio (HCR) or Poverty Ratio, banking, employment, governance, etc. He also underlined the need to collect infrastructure statistics at district level to study district level disparities, to include district wise industrial data (Number of industries, value added, employment, capital etc.) to indicate trade openers of the State/District, to include environment indicators and data on agricultural economy.

Central Electricity Authority (CEA) provided formats for the collection of infrastructure statistics relevant to its sector. Sh. R.K. Pahwa, Director, CEA clarified the definitions of consumption of electricity and per capita consumption and promised to provide the definition of "villages electrified" to be included in the manual.

Ministry of Transport supplied the required information and updated the portion of manual relevant to their sector.

Ms. Nandita Mishra, Director, Ministry of Urban Development suggested to add road based urban public transport, as approved by Committee of Secretaries in its meeting held on 17th January, 2012, to the list of infrastructure sectors.

Sh. Ashish Kumar, ADG,ESD informed the members that the scope of this manual is limited to the infrastructure sectors approved by the Standing Committee on Infrastructure Statistics (SCINS) and as included in the statistical publication "Infrastructure Statistics, 2010". The list of infrastructure sectors is not static; it may be further extended based on new developments and requirements. However, the recent additions to the list of infrastructure sectors may not be included in the manual until approved by Cabinet Committee on Infrastructure and SCINS. He further added that the publications at state level need to contain data for five years and be published on annual basis. Once the manual is finalized, a workshop may be held with State Statistics Offices to guide them in following the manual for the preparation of statistical publications on infrastructure statistics at state level.

Sh. G.C.Manna, DDG, ESD suggested that before definitional aspects of various terms are discussed in the manual it may be made clear that the classification of statistics given in the manual is same as that given in the publication “Infrastructure Statistics, 2010”.

With the modifications as suggested by members and mentioned above the electronic copy of the manual be uploaded on the website of the Ministry to enable the State Statistics Offices to prepare publications at state level.

The meeting ended with the vote of thanks to the Chairman and members of the Task Force for their contribution in the preparation of the manual.

List of Participants

S.N	Name	Designation & Organisation
1.	Sh. S.K.Das	Chairman, DG,CSO,MOSPI
Members		
2.	Sh. Ashish Kumar	ADG, NAD&ESD
3.	Sh. Vijay Kumar	ADG, Ministry of Water Resources
4.	Sh. G.C.Manna	DDG(ESD)
5.	Dr. Sunita Chitkara	DDG(ESD)
6.	Ms. T.Rajeshwari	DDG, NAD, MOSPI
7.	Sh. D.P.Mondal	Adviser, Central Water Commission
8.	Sh. M.M.Hasija	Adviser(Statistics),Ministry of Road Transport and Highways
9.	Sh. R.K.Pahwa	Director, Central Electricity Authority
10.	Sh. S.Arputhaswamy	Deputy Director, Department of Information & Technology
11.	Ms. Nandita Mishra	Director, Ministry of Urban Development
12.	Sh. S.N.Singh Tyagi	Assistant Adviser, RBI
13.	Sh. U.K.Sharma	Joint Adviser, Planning Commission
14.	Dr. P.G.S.Rao	Dy. Director, Deptt. of Economic Affairs
15.	Dr. Buddhadeb Ghosh	Associate Scientist, Economic Research Unit, Kolkata.

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