Unit III- Infrastructure

Infrastructure- Meaning and Types

Objectives

After going through this lesson, you shall be able to understand the following concepts.

• Meaning of infrastructure

• Economic infrastructure and social infrastructure

• Relationship between economic infrastructure and social infrastructure

Meaning of Infrastructure

In everyday life, we use various kinds of services and structures; for example, power, communication, transport, hospital, banking, schools, bridges, dams, etc. It seems impossible to imagine a life without these. Such services and structures form an integral part of one's daily life. In economics, such services and structures are collectively termed as "infrastructure".

Every activity in a country, be it production, distribution, etc., requires the presence of infrastructure. The availability of infrastructure ensures the smooth and prosperous functioning of the economy. In other words, it acts as a core support system that enables the economy to grow and develop. To live in the absence of infrastructure is akin to living in the primitive age.

Infrastructure enables the economy to break the shackles of traditional and primitive social structures and customs. In fact, the difference between a developed country and an underdeveloped country can be mainly attributed to the lack of sufficient and technically advanced infrastructure in the latter. Formally, ***infrastructure is defined as the underlying tangible and organisational structures essential for the smooth and prosperous functioning of an economy***.

Infrastructure has ***two-fold benefits***. On the one hand, it serves as the ***basic input*** for various economic activities such as production and investment. On the other hand, it acts as a ***support system***.

As an input, infrastructure facilitates the production process. The presence of sound infrastructure is essential for a smooth and efficient production in all the sectors of an economy. It is a necessary condition for higher production and higher productivity. For example, if agriculture is devoid of infrastructure such as irrigation facilities, then it would depend entirely on rains, which may hamper its production and productivity. Similarly, in the absence of proper means of transportation, industrial production would

be adversely affected due to delays in the movement of raw materials, capital goods and finished goods.

Besides serving as an input, infrastructure also acts as a *support system*. It helps develop the quality of human capital. For example, quality educational institutes and good health-care facilities enhance the productivity of a population and, thereby, help in increasing the production of goods and services.

Categories of Infrastructure

Infrastructure is broadly classified under the following two categories.

i. Economic infrastructure

ii. Social infrastructure

Economic Infrastructure

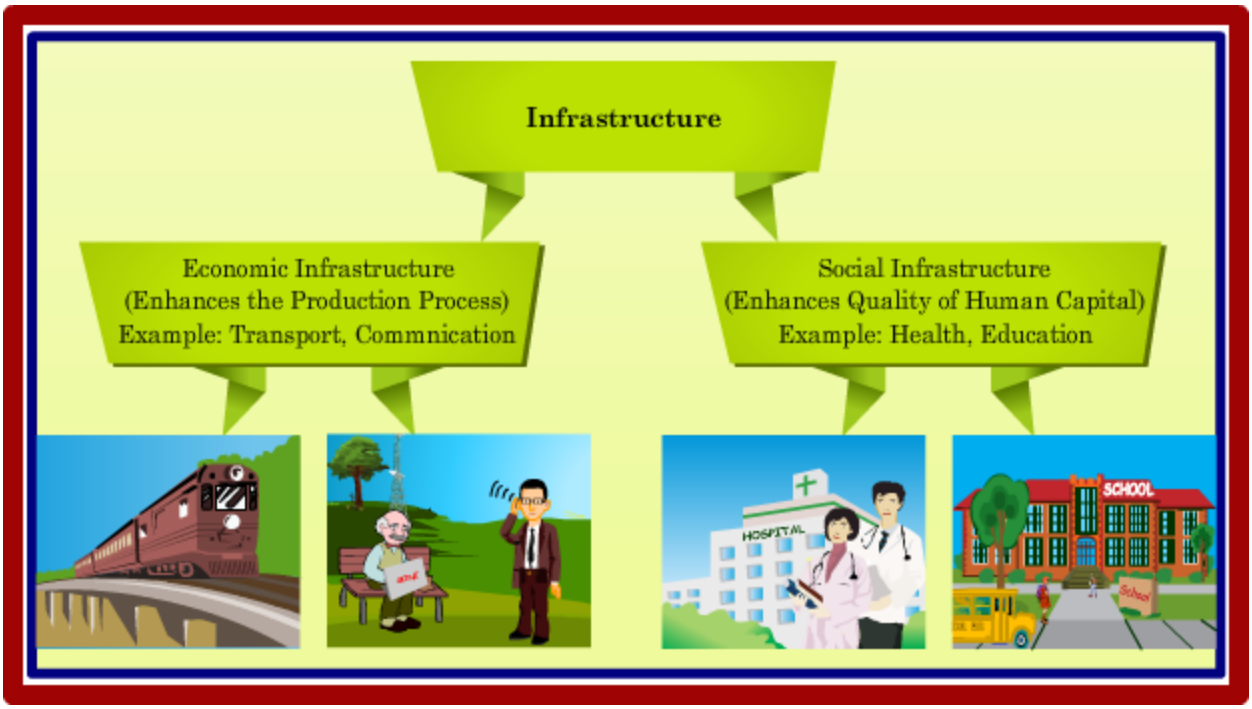
This includes the elements of economic change that aid in the process of production and distribution. In other words, it refers to the infrastructure that is essential to the production process. Such infrastructure directly enhances the production process. Energy, transportation, communication, banking and financial institutions are some of the major examples of economic infrastructure.

This form of infrastructure improves the quality of economic resources and, thereby, raises the productivity of the economy as a whole. In this way, it serves as a support system to economic growth. The greater the economic infrastructure, the greater will be the production; the greater the production, the greater will be the generation of employment opportunities. Thus, economic growth necessitates the expenditure incurred on economic infrastructure.

Social Infrastructure

This includesall those facilities and institutions that enhance the quality of human capital. Educational institutions, hospitals, nursing homes, housing facilities, etc. are some examples of social infrastructure. Unlike economic infrastructure, it indirectly accelerates the production of goods and services by increasing productivity.

For example, availability of better health-care and medical facilities enables a continual supply of a healthy workforce. This, in turn, is reflected in the form of increased levels of production. Social infrastructure raises human productivity and, thereby, improves the standard of living.



The following table distinguishes between the two types of infrastructure.

Basis of Difference	Economic Infrastructure	Social Infrastructure
Meaning	It refers to the elements of economic change that enhance the process of production and distribution.	It refers to the facilities and institutions that enhance the quality of human capital.
Impact on Production	Such infrastructure directly enhance the production process.	Such infrastructure indirectly accelerate the production process.
Impact of Expenditure	Expenditure on economic infrastructure raises the stock of tangible structures (physical capital) in the economy	Expenditure on social infrastructure raises the stock of intangible structures (human capital) in the economy
Example	Energy, transport, communication.	Educational institutes, housing facilities, hospitals.

Relationship Between Economic and Social Infrastructure

The two types of infrastructure (economic and social) are interdependent on and complementary to each other. While economic infrastructure fosters economic growth, social infrastructure enhances the standard of living. It is only the combined effect of

higher economic growth and higher standard of living which leads to the welfare of an economy as a whole. In other words, the economic growth attained with the help of economic infrastructure is imperfect without human development, which is attained by means of social infrastructure. Thus, the presence of both the forms of infrastructure is necessary for economic prosperity.

Role of Infrastructure in Economic Development

Objective

After going through this lesson, you shall be able to understand the role of infrastructure in the economic development of a country.

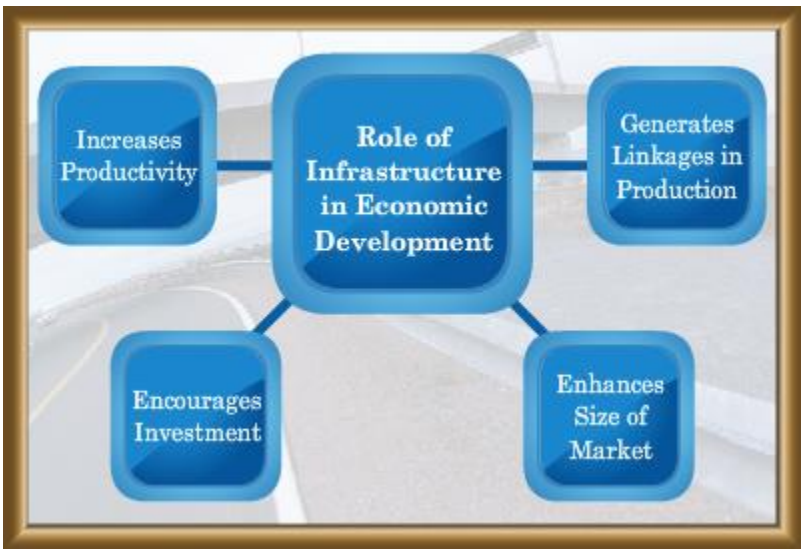
Role of Infrastructure in Economic Development

There are some countries that experience fast growth and development; there are some that lag in terms of economic progress; and there are certain others that are still underdeveloped. So, we have rich and developed countries on the one hand, and developing and underdeveloped countries on the other.

The presence of a sound infrastructure is one of the factors that put developed nations far ahead of developing and underdeveloped ones. Infrastructure is the backbone of the process of growth and development of a country. It acts as a core support system that enables the economy to grow and develop.

It helps the economy to overcome the shackles of customs and traditions, and move on the path of development. We can say that the overall development and prosperity of a country is not possible without the development of economic and social infrastructure. For instance, the production process in a country cannot be smooth and efficient in the absence of proper economic infrastructure such as roads, transport, communication and banking. Similarly, the productivity of a population cannot be at a high level in the absence of proper social infrastructure such as health and education. Low level of productivity, in turn, adversely affects the production process.

The given figure provides an overview of the role of infrastructure in economic development.



1. *Increases productivity*: Infrastructure facilitates the process of production. The availability of quality infrastructure guarantees increase in production and productivity. In the absence of infrastructure, the production process cannot be smooth and efficient. In every sector of the economy, production depends to a great extent on the presence of quality infrastructure.

Infrastructure acts as an input as well as a support system for production. For example, if the industrial sector is lacking in infrastructure such as transportation and communication, then there may be delays in the movement of raw materials and finished goods from one place to another.

Consequently, the process of production is hampered. The process of distribution is also adversely affected in the absence of sound transportation. A similar situation can be seen in the agricultural sector. If this sector lacks infrastructure such as irrigation facilities, then it may have to depend entirely on rains.

This may hamper its production and productivity. Social infrastructure such as health and education helps accelerate the production process by increasing productivity. A healthy and educated workforce is of great value in the production process. Thus, we can say that infrastructure helps pace the production process and productivity.

2. *Encourages investment*: Investment plays an important role in stimulating the growth process of a country. Infrastructure builds an environment conducive to investment. Regions that have sound infrastructure exhibit fast growth and development. This is because the presence of quality infrastructure attracts investors to these regions. The presence of infrastructure such as transport, communication, banking and power in a region facilitates the establishment of production units and

industries in that region.

Infrastructure makes a region profit viable by eliminating the bottlenecks in the production process and by improving productivity. Consequently, investors are compelled to invest in such a region. Similarly, a country that has sound infrastructural facilities is able to attract investments from foreign countries. However, a country that lacks in such facilities finds it hard to attract foreign investments.

3. *Generates linkages in production*: Linkage refers to a situation wherein growth in one production sector propels growth in another sector. The presence of such linkages enhances the development process. Infrastructure promotes economic development by way of two types of linkages: forward linkages and backward linkages.

In other words, infrastructure provides the scope for the expansion of one industry due to the expansion of another, by way of forward and backward linkages. For example, if irrigation facilities boost agricultural production, then industries that depend on agriculture for the supply of raw materials will simultaneously experience increased production.

Similarly, an increased production in the manufacturing sector will boost the distribution and services sectors. Thus, economic growth becomes a dynamic process in the presence of sufficient infrastructural facilities.

4. ***Enhances size of the market***: Infrastructure such as transport and communication widens the size of the market. It makes the movement of raw materials and finished goods fast and cost-effective. Goods can be transported in bulk and in less time from one place to another. This enables a producer to offer his products across the country and even across international boundaries.

To conclude, we can say that infrastructure plays a vital role in the economic development of a country. Without sound infrastructure, a country will find it difficult to achieve the heights of growth and development.

Energy- Sources and Types of Energy in India, Challenges Ahead

Objective

In this lesson, you will go through the following topics.

• Energy: Meaning and importance

• Sources of energy

Energy

Various human activities in daily life are dependent on the use of energy. For instance, we need power or electricity to operate different gadgets and equipment. The computer on which you are reading this lesson is also power-operated. We need fuels such as LPG to cook food. We also need fuels such petrol and diesel to operate different vehicles. The buses, cars and scooters you see on the road are all fuel-driven.

Similarly, power and fuel are essential to the industries. Production of industrial goods cannot take place without the use of power and fuel. It is the energy derived from these that runs the machines. This same energy is used in the agricultural sector to operate modern agricultural equipment such as tractors and threshers. So, whether it is consumption or production, all economic activities in a country involve the use of energy derived from power and fuel.

Not even a single day can be imagined without the use of energy. We can say that all economic activities in country will come to a standstill if it does not have access to different sources of energy. Thus, energy is the most important component of the economic infrastructure of a country. It is vital for a country's growth and development.

The importance of energy can be gauged from the fact that per capita use of energy is often seen as an index of economic development. It is assumed that higher per capita consumption of energy will lead to higher productive activities and, thereby, to higher per capita income and consumption.

Sources of Energy

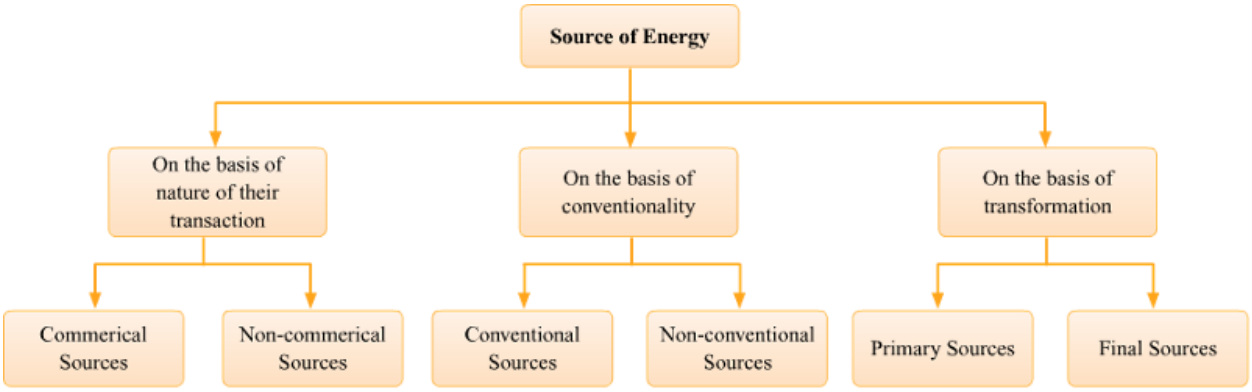
Sources of energy can be divided on three bases.

i. On the basis of the nature of transaction

ii. On the basis of conventionality

iii. On the basis of transformation

The given figure provides an overview of the different sources of energy.



On the basis of the nature of transaction

1*. Commercial sources*: These sources of energy are available to users at some price. The energy derived from these sources is generally used for commercial productive purposes. Coal, petroleum, natural gas, electricity and hydropower are examples of commercial sources of energy. Other than hydropower, all the others are exhaustible sources of energy.

2*. Non-commercial sources*: These sources of energy are generally available free of cost to users. Such sources of energy do not have any recognised market. The energy derived from these sources is used for domestic consumption purposes. Firewood, agricultural waste and animal waste (like cow dung) are examples of non-commercial sources of energy.

Basis of Difference	**Commercial Sources of Energy**	**Non-Commercial Sources of Energy**
Price	These sources of energy are available to users at some price.	These sources of energy are usually available free of cost to users.
Purpose	This form of energy is used for commercial productive purposes.	This form of energy is used for domestic consumption.
Market	These sources of energy have an organised market for their sale and purchase.	These sources of energy do not have an organised market and are not bought and sold.
Examples	Coal, petroleum, natural gas, electricity	Firewood, agricultural waste, animal waste

On the basis of conventionality

1. Conventional sources: These sources of energy have been known and used by us for a long time. The important conventional sources of energy are given below.

i. ***Coal***: It is the most important conventional source of energy in India. It contributes to over 65% of the total energy production in the country. Coal India Limited and Singrani Coal Company are the two main coal producers in India. Coal is used by thermal power stations, steel plants, railways, fertiliser factories, cement factories, etc.Although coal production in India takes place at a large scale, the produced coal is of such quality that it generates very little heat and leaves a lot of ash.

ii. ***Petroleum***: It is a basic input in the transportation and manufacturing sectors. India is not rich in oil and petroleum reserves. A large portion of the demand for petroleum is fulfilled by imports from other countries, particularly the Gulf States.

iii. ***Natural gas***: In India, natural gas reserves are found in Mumbai, Gujarat, Tripura, Andhra Pradesh, Tamil Nadu and Rajasthan. It is a basic input in the fertiliser and petroleum-products industries. Besides, it is also widely used in households as cooking gas in the form of LPG. Nowadays, natural gas in the form of CNG and LPG is also being used as fuels for vehicles.

iv. ***Electricity***: It is the most useful source of energy in India. The three basic sources of generating electricity or power are thermal energy, hydroelectric energy and nuclear energy. The respective shares of thermal, hydroelectric and nuclear power plants in the power generation capacity in India are 70%, 28% and 2% respectively.

2. Non-conventional sources: These sources of energy have been discovered in the recent past and their use is yet to gain popularity. The important non-conventional sources of energy are given below.

i. ***Solar energy***: This is the energy derived from the sun. Use of solar energy is slowly gaining popularity in India. Solar energy products such as solar lamps and solar water heaters are now being increasingly used. It is an environment friendly and clean source of energy.

ii. ***Wind energy***: This is the energy derived from moving air, or wind. Rural wind energy farms have been making use of this energy for many years. In recent years, wind energy has gained immense popularity worldwide. Efforts are being made to make wind power generators more efficient and practical.

iii. ***Bioenergy***: This is the energy derived from living organisms and organic matter. It comprises biogas and biomass energy. Biogas is obtained from gobar gas produced from cow dung. Biogas is an important source of energy and is used as a cooking fuel. Biomass is obtained from plants. An advantage of using biomass is that it encourages afforestation.

iv. ***Geothermal energy***: In the word “geothermal”, *geo* means “earth” and *thermal* means “heat”. So, this is the energy derived from the heat present inside the earth.

v. ***Tidal energy***: This is the energy derived from tides (i.e. the periodic rise and fall of the sea level under the gravitational pull of the moon).

Basis of Difference	**Conventional**	**Non-Conventional**

	Sources of Energy	Sources of Energy
Time Frame	These sources of energy have been in use for a long time.	These sources of energy have become known only in the recent past.
Environmental Impact	Generally, these sources of energy have adverse environmental impact.	These sources of energy are environment friendly.
Examples	Coal, petroleum, natural gas, electricity	Solar energy, wind energy, bioenergy, tidal energy

On the basis of transformation

1. Primary sources: These are natural sources of energy that need not be transformed into any other form before using them as inputs in the production process. Primary sources of energy can be further classified as renewable and non-renewable sources of energy.

i. ***Renewable sources***: These are sources of energy that can get renewed or replenished quickly. Renewable sources of energy are environment friendly. Solar energy and wind energy are renewable sources of energy.

ii. ***Non-renewable sources***: These are sources of energy that cannot get renewed or replenished quickly. Their replenishment can take millions of years.

Non-renewable sources of energy can adversely affect environment. Fossil fuels and coal are non-renewable sources of energy.

2. Final sources: These are sources of energy that are used as final products. For example, electricity is a final source of energy.

State of Energy in India and Challenges Ahead

Objective

In this lesson, you will go through the following topics.

• Consumption Pattern of Energy in India

• Power Sector and Its Sources

• Problems Faced by the Power Sector and the Measures to Overcome Challenges

Consumption Pattern of Energy in India

Over the years, with the growth and development in India, the demand for energy has considerably increased. Various sources of energy have been increasingly brought to use. However, with the increasing use, the pattern of energy consumption has undergone a considerable change.

That is, the percentage use of different sources of energy has changed overtime. As we know that different sources of energy such as coal, petroleum, natural gas, etc. are measured in different units. Thus, to analyse the change in the consumption pattern, we first need to convert the different sources of energy into a common unit. In India, this common unit is termed as MTOE (Million Tonnes of Oil Equivalent).

That is different sources of energy are first converted in MTOE and then their percentage use is observed. Analysis reveals that the use of non-commercial sources of energy has increased from 36 % to 76% during 1953-54 to 2004-05. Among the commercial sources of energy, the percentage of direct final consumption of coal has drastically reduced irrespective of the increase in the total consumption of coal.

Its consumption increased from 95 million tonnes in 1980-81 to 355 million tonnes in 2008-09. Also, the consumption of oil, for which our country was dependent upon Gulf countries, has increased. Analyses of consumption of electricity reveal that although the consumption in the agricultural sector has increased overtime, it remained the highest in the industrial sector as compared to other sectors.

Sector-wise Consumption Pattern of Energy in India

For the purpose of the analysis of sector-wise consumption pattern of energy, we identify four broad sectors, namely, industrial, agricultural, transport and household. Among the four sectors, the industrial sector leads the energy consumption with 37.8% of the total energy consumption. On the other hand, transport, agriculture and household sector consume 22%, 21.9%and 24.3% of the total consumption of energy. Low consumption of energy in the agricultural sector implies that the agricultural sector is dependent more on the traditional and conventional methods of farming that use more of manual labour and less modern techniques. Over the years the share of industrial sector and the transport have increased relative to the other sectors.

Power Sector and Its Sources

Power/electricity is the most widely used source of energy. Many of our day to day activities are dependent on electricity. It forms the backbone of the activities of all the sectors of the economy. All sectors such as industrial sector, households, transport, agricultural sector, communication are heavily dependent on power.

In India, there are three main sources of power generation. They are as follows.

1*. Thermal power*: Thermal power uses heat energy from coal and oil as its base for the production of electricity. In India, thermal power is the most important source of electricity generation. It accounts for nearly 70% of the total power generation capacity.

2*. Hydro-electric power*: Hydro-electric power involves production of electricity through the use of kinetic force of falling water. For generating hydro-electric power, India has constructed various dams on the fast flowing rivers. Some of the major dams that are used for the generation of the hydro-electric power are Bhakra Nangal, Hirakund and Damodar Valley. Hydro-electric power accounts for nearly 28 % of the total power generation capacity in the country.

3*. Nuclear power*: Nuclear power is still not much developed in India. It contributes a meagre 2 % of the total power generation. However, increasing efforts are being made to harness nuclear energy. India has set up nuclear power stations at Tarapur, Kota (Rajasthan), Kalapakam (Tamil Nadu) and Narora (Uttar Pradesh).

Problems Faced by the Power Sector in India

The power sector in India today faces some critical challenges. These are as follows.

1. *Insufficient capacity*: Over the years, with growth and development, the demand for power has increased considerably. However, the installed capacity of India to generate electricity is not sufficient enough to meet an annual economic growth of 7%. India is able to add only 20,000 MW annually to its capacity as against the required 1,00,000 MW. Insufficient power capacity results in various problems such as long power cuts, frequent fluctuations in voltage, low voltage, etc.

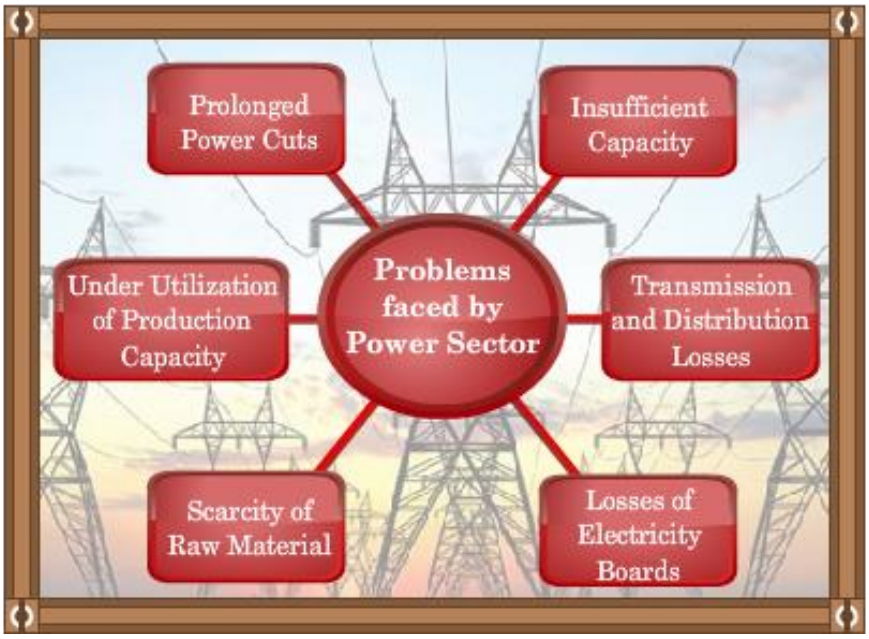
2*. Transmission and distribution losses*: In addition to the low power generation capacity, the availability of power is further reduced due to the transmission and distribution losses. Transmission and distribution losses refer to the losses that occur in transmission between the sources of supply and points of distribution. In other words, the loss of power that arises due to the inherent resistance and transformation inefficiencies in the electrical conductors and distribution transformers respectively, are called transmission and distribution losses. Such losses account for almost 50% of the total power generation in India. In other words, approximately half of the power produced is wasted/lost due to the transmission and distribution losses.

3*. Loss suffered by electricity boards*: In India, the electricity is distributed by the State Electricity Boards (SEBs). Lately, they have suffered huge losses on account of transmission and distribution losses, wrong pricing and theft. In India, electricity is supplied at subsidised rates to the agricultural sector. However, the SEB is not able to recover the difference between the actual price of power and the subsidised price. Thus, it suffers losses. It was found that (SEBs) suffered a great loss of more than Rs 500 billion.

4. *Scarcity of raw materials*: The thermal power station that contributes nearly 70% of the total power generation suffers inefficiencies due to shortage of coal and other raw material.

5*. Under-utilisation of production capacity*: Utilisation of production capacity as measured by the Plant Load Factor (PLF) is very low in India. In 2004-05 only 74.8% of the total plant capacity was utiilised.

6. ***Prolonged power cuts***: Long electricity cuts, particularly in the summer season are a common sight in many regions. This results in a situation of unrest among the public.



Measures to Overcome Power Challenges

To combat the problem faced by the power sector, the government has initiated various reforms. Some of the reforms initiated by the government to meet the power crises are as follows.

1*. Privatisation in power generation sector*: One of the important measures to overcome the power crisis is to encourage privatisation in the power generation. In India, earlier the government had the monopoly in the generation and distribution of electricity. Now, private sector has also been given the rights to generate power. Private sector along with the government can help in augmenting the production capacity.

2*. Privatisation in power transmission*: Similar to the privatisation in the power generation, privatisation should also be encouraged in the power transmission. Private sector will help reduce the transmission and distribution of losses more efficiently. The

Indian Government has approved Tata Power and Powergrid Corporation of India for constructing transmission networks in joint venture.

3*. POWER for ALL by 2012*: The Ministry of Power has set up an objective of 'POWER for ALL by 2012' to achieve the target of 1000 KwHr (Units) of per capita consumption of electricity in India. This objective is aligned with the objective to achieve an economic growth of 8% p.a. The prime objective of this target is to improve the quality of power and commercial viability of power industries.

4*. Setting up regulatory mechanism*: The Central Electricity Regulatory Commission (CERC) along with State Electricity Regulatory Commissions (SERC) has been established in 19 states under the Electricity Regulatory Commissions Act, 1998. These commissions and authorities regulate tariff, promote efficiency and competition in power sector.

5*. Encouraging FDI*: In order to achieve the target of POWER for ALL by 2012, the ministry of power aimed at attracting US $ 250 billion of Investment (FDI and Domestic Investment Combined) into the power sector.

6. *Accelerated power development and reform programme (APDRP)*: APDRP was initiated in the year 2000-01 with the motive of improving financial viability, reducing transmission and distribution losses and promoting transparency through computerisation.

7. *Awareness*: The government is encouraging people to increase the use of renewable resources. Various measures are being adopted to create awareness among the people to reduce the consumption of conventional sources of energy. During the Eighth Five-Year Plan, the government has set up National Energy Efficiency Programme (NEEP) that aimed at conservation of petroleum products.

8. *Improving productivity*: The Indian Government has been emphasising on the measures to improve the productivity of the existing power generating industries.

9*. Checking transmission and distribution losses*: The government should work towards reducing the transmission and distribution losses. For this, improved technology of transmission and distribution should be adopted. Also, electricity distribution network should be privatised. This will infuse efficiency, thereby, helping in eliminating wastages. Besides, measures should also be taken to handle the cases of theft of electricity. Such cases should be handled strictly by trustworthy employees. Strict imposition of fines and penalties should be imposed on any illegal activity.

Health- Meaning and Its Importance, Indicators of Health, State of Health in India

Objective

In this lesson, you will go through the following topics.

• Health- Meaning and importance

• Indicators of health and state of health in India

• Public health and health infrastructure in India

• Private sector health infrastructure in India

Health: Meaning

The saying “Health is wealth” is well-known to us. Often people wish one another a healthy and long life. What do “health” and “healthy” actually mean? You might say that health is the absence of diseases or that being healthy is being free from diseases. But is it just that? Can a physically fit but mentally depressed person be called healthy? No. To be healthy, individuals need to be physically, mentally and socially well. In other words, health implies a sound physical and mental state. So, ***health is not only the absence of diseases but also a state of complete physical, mental and social well-being.***

Importance of Health

A healthy person is more productive than an unhealthy person, both physically and mentally. In other words, a healthy person can contribute more efficiently towards the production process. Health improves the overall quality of life of a person.

Consequently, the person contributes actively to the growth and development process. Thus, a nation needs to ensure that its manpower is healthy. Developing a sound health infrastructure is the way to ensure the same. Health infrastructure includes hospitals, doctors, dispensaries, nurses, medical technology, equipment, the pharmaceutical industry, paramedical professionals, etc. Along with developing a sound health infrastructure, a nation should also seek to make this infrastructure easily accessible to the massesealth infrastructure but also, that it is easily accessible by the masses.

Indicators of Health and State of Health in India

Various indicators have been developed to assess the performance of a nation on health grounds. Some of the important indicators of health are discussed below.

1*. Infant mortality rate*: This refers to the number of deaths of infants under the age of one per 1000 live births. As per the 2011 census, the infant mortality rate in India is 60. This implies that out of 1000 live births, 60 infants die before reaching the age of one.

2. Maternal mortality rate: This refers to the number of maternal deaths per 100000 live births. It is generally used as a measure of the quality of a health-care system. As per the CIA World Factbook, India reported 230 maternal deaths per 100000 live births in 2008.

3*. Life expectancy*: This refers to the total span of time an individual is expected to live. In 2010, as per the data released by the United Nations Statistical Division, the life expectancy at birth for India was approximately 65 years.

4*. Nutritional levels*: This is an indicator of the survival, growth and development of children and women. As per the National Family Health Survey (NFHS-3), 2005–06, Indian had the highest number of “low birth weight” babies in the world. The number of such babies was approximately 7.4 million.

5*. Death rate*: This refers to the average annual number of deaths per 1000 individuals. It is also known as “crude death rate”. As per the 2011 census, the crude death rate in India is 8.

6*. Incidence of deadly communicable and non-communicable diseases*: The frequency of occurrence of communicable diseases (such as malaria, tuberculosis, cholera and smallpox) and non-communicable diseases is also an indicator of the health of a nation. India does not perform too well on this indicator. In India, approximately 5 lakh children die annually due to waterborne diseases.

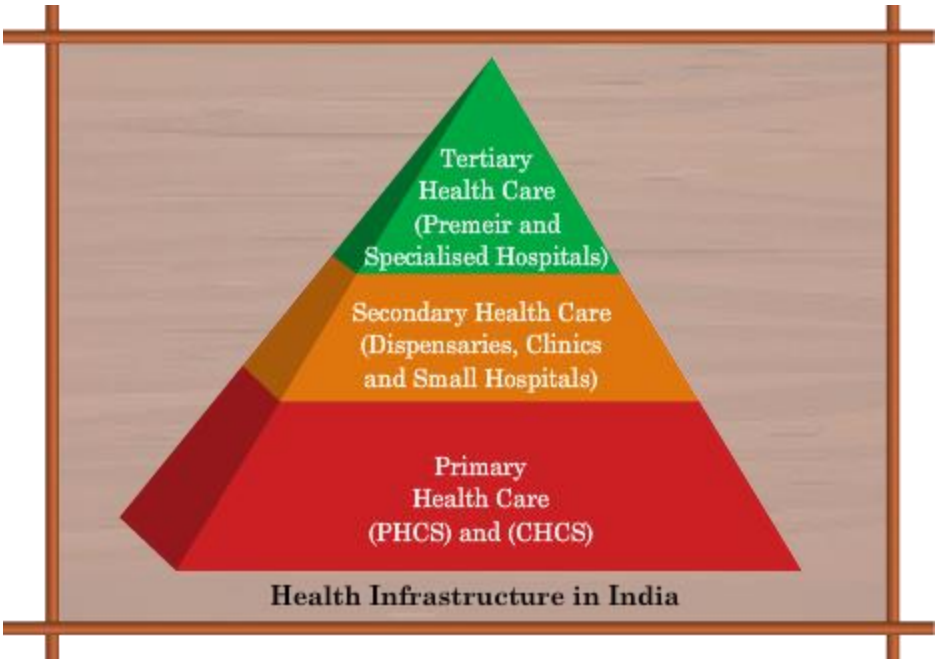
Global Burden of Diseases

An important indicator developed by experts to assess the health of a country is the global burden of disease (GBD). It measures the number of people dying prematurely due to major diseases. It also includes the number of years spent by the affected individuals in a state of disability due to the diseases. India bears a frightening 20% of GBD. Moreover, communicable diseases such as diarrhoea, malaria and tuberculosis account for more than half of GBD in India. This is indeed a cause for alarm for our country.

Public Health and Health Infrastructure in India

Public health refers to the act of protecting the health of the public through education, research and development and promotion of a healthy lifestyle. It aims at the overall improvement and well-being of the people. It focuses on the protection and improvement of the health of the entire population rather than an individual.

In India, for the provision of public health, health infrastructure is developed at three levels: primary, secondary and tertiary.



Under ***primary healthcare***, people are educated about the prevailing health issues in the country. Awareness is spread among the public regarding the methods of preventing and controlling different diseases. Further, people are made aware of the benefits of sanitation and hygiene.

The government seeks to provide adequate supply of clean and safe drinking water and other basic amenities. It also carries out various vaccination and immunisation programs (such as the Pulse Polio Program) to counter infectious diseases and injuries. In order to provide these services, the government has set up Primary Health Centres (PHCs) and Community Health Centres (CHCs) in villages.

These centres generally have very limited facilities with only one doctor, a small supporting staff and a few medicines.

The next level is ***secondary health care***. Unlike PHCs, hospitals under secondary health care are equipped with better and modern facilities such as surgery, X-ray and ECG. Whenever a PHC is not able to manage the condition of a patient, it refers the patient to secondary health centres. These centres are mostly located in big towns and cities.

The highest tier of health infrastructure in our country is ***tertiary health care***. It includes the premier medical institutes and hospitals. These institutes provide quality education and conduct research on various health issues. Moreover, these institutes also provide specialised medical facilities to the masses. Patients who cannot be managed by secondary health centres are referred to tertiary health centres.

Some of the premier tertiary health-care institutes in India are All India Institute of

Medical Sciences (AIIMS), Jawaharlal Institute of Post Graduate Medical Education and Research, and National Institute of Mental Health and Neuro Sciences.

Since independence, India has made great strides in developing its health infrastructure. Besides the state-run health centres, a number of private players and voluntary agencies have also entered the field of health care. Owing to this, there has been a significant expansion in health-care services in India. Hospitals are managed by professionals trained in medical, pharmacy and nursing colleges.

Between the years 1950 and 2000, the number of hospitals and dispensaries has increased from 9300 to 43300. The number of hospital beds has increased greatly from 1.3 million to 9.2 million. India has also witnessed a significant rise in the number of allopathic doctors from 0.62 lakh to 5 lakh. India has also succeeded in eradicating smallpox, polio and guinea-worm disease

Private Sector Health Infrastructure in India

In recent times, the private sector has emerged as a dominant player in the field of health care in India. Today, we can find private hospitals, clinics and dispensaries in almost every region and locality. Nearly 70% of the hospitals are owned and managed by the private sector. Also, nearly two-fifths of the hospital beds are controlled by the private sector. A large section of the population throngs private hospitals and clinics for treatment of various diseases.

Private hospitals, dispensaries and clinics treat approximately 46% of inpatients (i.e. individuals admitted to a hospital for treatment) and 80% of outpatients (i.e. individuals who are treated without being hospitalised). The private sector also has a significant presence in the pharmaceutical industry, medical technology and diagnostics.

The private sector is also playing a leading role in providing medical education and training in India. Many private medical colleges and institutes have come up in recent times. In 2001–02, there were 13 lakh private medical enterprises that employed 22 lakh personnel. Clearly, the private sector has played a vital role in the development of health infrastructure in India.

To conclude, we can say that the active participation of the public and private sectors in health care has resulted in a significant improvement in the state of health and health infrastructure in India. Nevertheless, our country still lags in areas such as infant mortality and maternal mortality. A large section of the population continues to be deprived of proper health-care facilities. Thus, a lot more needs to be done to improve the overall well-being of the people.

Indian Medical System and Some Health Related Facts

Objectives

In this lesson, you will go through the following topics.

• The Indian System of Medicine

• Medical Tourism

• Women's Health

• Urban-rural and Rich-poor Divide in Health Infrastructure

The Indian System of Medicine

The Indian System of Medicine (ISM) can be traced back to the ancient times. It constitutes the following six systems of medicine.

a. Ayurveda

b. Yoga

c. Siddha

d. Naturopathy

e. Unani

f.
Homeopathy

Ayurveda is one of the traditional systems of medicine that is still used in India. It is a holistic way to achieve health through body, mind and spirit. The *ayurvedic* practitioners recommend diet and lifestyle changes along with drug therapy. They have identified a number of medicinal preparations and surgical procedures for curing various ailments and diseases. Moreover, the methods of this system such as massage and applying herbs can also be used along with other systems.

Yoga as an art originated and was practised in India from thousands of years. It has references in '*Upanishads*' and '*Puranas*' composed by Indian Aryans in the Vedic period. The main credit for systematising yoga goes to *Patanjali* who wrote '*Yoga Sutra*', two thousand years ago. *Yoga Sutra* is the most important basic text on Yoga. It is through this means that the essential message of yoga is spread throughout the world. It is defined as an art of righteous living or an integrated system for the benefit of the body, mind and inner spirit.

Siddha comes from the word '*Siddhi'* which means an object to attain perfection or heaven. This is the oldest among the Indian Medical Systems namely Ayurveda and Unani. It is also known as Siddha Vaidya. As nowadays, people's preference to natural health remedies and herbal health remedies is increasing, Siddha has emerged as an important and unique system of Indian medicine when compared to other traditional medical systems in existence.

Naturopathy deals with the healing power of nature. It assumes that all healing powers lie within the human body. This means that within every human there is a healing energy. Naturopathy regards that when we go against nature only then we fall ill. 'Fasting' has been described as Nature's way to recover. A thorough rest that includes fasting is the most favorable condition in which an ailing body can purify and recover itself.

Unani has a long and impressive record in India. It was introduced in India around 10th century A.D. with the spread of Islamic civilisation. Now *Unanipathy* has become an important part of Indian Systems of Medicine. India is one of the leading countries in terms of its popularity. It is very much similar to our *Ayurveda*. *Unani* established that disease is a natural process and that the symptoms are the reactions of the body to the disease.

Homeopathy consists of two words 'Homeo' meaning similar and 'Pathos' meaning suffering or treatment. In this system, a drug and a disease that produce similar symptoms cancel each other. It is popular among the people due to its remarkable healing capacity. Also, its remedies are free from any side effects.

Medical Tourism

Medical Tourism refers to the patients from other countries of the world visiting a country for medical treatment. In the recent years, India has become a popular destination for medical tourism. An increasing number of patients from many foreign countries come to India every year for surgeries, liver transplants, dental and cosmetic care, etc.

Foreigners are able to avail good medical services at a much cheaper rate than in their own countries. Health sector in India provides modern health care facilities with latest technology at an affordable price. In the year 2004-05, approximately 1.5 lakh foreigners visited India for various medical treatments. It is projected that this is likely to increase further by 15% annually.

Women's Health

We know that approximately half of the total population in India constitutes women. Thus, the health of women holds prime importance. Women in India are lagging behind in education, health care, and economic participation as compared to men. The child sex ratio has declined from 945 in 1991 to 927 in 2011. This shows the growing incidents of female foeticide in the country.

Moreover, the women in India are married at a very early age. Close to 3,00,000 girls below the age of 15 years are married and have already given birth to atleast one child. In addition, about 50 % of the married women between the age of 15 and 49 suffer from anemia. This resulted in 19 % of the maternal deaths. Another factor that requires attention is the maternal morbidity and mortality caused due to abortions. Thus, it can be said that women's health is a matter of great concern in India.

Urban-rural and Rich-poor Divide in Health Infrastructure

In India, although 70% of the total population lives in rural areas, these areas are left behind in terms of medical facilities as compared to the urban areas. The urban-rural divide in terms of health care facilities can be assessed from the following points.

1*. Number of dispensaries and hospital beds*: Rural India has only half the total number of dispensaries as compared to the urban areas. Also, the number of beds available in rural areas is only 11% of the total number of hospital beds. As a result, people living in rural areas are deprived of even the basic medical facilities.

2*. Number of hospitals*: In rural areas, for every one lakh population there are only 0.36 hospitals. As a consequence, the people in rural areas often have to go to far-flung areas for medical treatment. This at times results in the delay in treatment of the patients leading to serious consequences. As compared to this, in urban areas there are 3.6 hospitals for every one lakh population.

3*. Access to modern and specialised medical care*: Villages in India lack specialised medical care such as gynaecology, paediatrics, anaesthesia, etc. This can be attributed to the fact that only a few of the medical graduates wish to serve in the rural areas. As a result, even with the increasing number of medical graduates every year, rural areas face a shortage of medical personnel.

4. *Increasing indebtedness of the poor for medical facilities*: Often the poor in both rural and urban areas are indebted for the expenditure on healthcare. It is estimated that poor spend nearly 12% of their income on health facilities. On the other hand, the rich spend only 2% of their total income on health services.

Emerging Challenges in Health sector in India

Objective

In this lesson, we will analyse the emerging challenges in health sector in India.

Introduction

Since its independence, India has taken significant steps towards the development of the health infrastructure. Health has been one of the major objectives of the five year plans. Various programmes and policies have been formulated to improve the health infrastructure and the health status of the country. As a result, India has shown *improvement* in the various health indicators.

1*. Eradication of diseases*: India has been successful in eradicating certain diseases such as polio, smallpox and leprosy. Certain other diseases such as cholera, tuberculosis and malaria have been brought under control.

2*. Fall in death rate*: Death rate has come down considerably from 27.4 per thousand in 1950 to just 8.37 per thousand in 2010–11.

3. *Rise in life expectancy*: As a result of the improvement in medical facilities, life expectancy in India has increased to 65.1 years in 2010–11.

4*. Fall in infant mortality rate*: Infant mortality rate has reduced significantly from 146 per thousand in 1951 to 60 per thousand in 2010–11.

Emerging Challenges in the Health Sector

Despite showing improvement in the health indicators, the health-care system in India still suffers from serious shortcomings. The following are some of the *major challenges* confronting the Indian health sector.

1*. Unequal distribution of health-care services*: Health-care services are unequally distributed between rural and urban areas. While 70% of the population lives in rural areas, only one-fifth of the hospitals are located in these regions. Further, the doctor–population ratio in rural areas is as worse as 1:2000.

This implies that there is only one doctor for every 2000 individuals in rural India. Most of the health-care facilities have been confined to urban areas, with only half of the dispensaries being set up in villages. Thus, there exists an urgent need to make basic health-care services equally accessible to all sections of society.

2*. Decentralisation*: Decentralisation of public health-care services is the key to improving the quality of health-care facilities in India and making them available for everybody. This implies that the power of providing medical services should be delegated from the central to the local authorities.

3*. Lack of control of communicable diseases*: Communicable diseases such as AIDS (acquired immune deficiency syndrome) and SARS (severe acute respiratory syndrome) have made their way into India. These deadly diseases need to be curbed as they pose a serious threat to the human capital reserve and, thereby, to economic growth.

4*. Improper management*: Health-care centres in rural areas lack sufficient number of trained and skilled personnel. Therefore, rural people often have to rush to urban health-care centres for medical aid. Absence of proper roads and cost-effective means of transportation makes things worse. Hence, it is important to improve the management of rural health-care facilities so that proper and timely medical aid can be made easily available to rural folk.

5*. Lack of advanced techniques and facilities*: Government health-care centres are found lacking not only in advanced medical techniques and facilities such as CT scan and sonography, but also in basic facilities such as blood tests and X-rays. People are forced to rely on private hospitals for these services, which in turn charge exorbitant fees. Poor people end up on the losing side as they cannot afford treatment in private hospitals. It is, thus, essential to bring government health-care centres at par with private hospitals in terms of the facilities provided.

6. *Privatisation*: The government has been unable to set up sufficient number of health-care centres that provide efficient and advanced medical aid. People, thus, prefer private hospitals. This failure of the government has resulted in inefficiencies in the health sector and privatisation is the key to removing them.

7*. Poor sanitation and hygiene*: Both rural and urban areas lack proper sanitation facilities. In this regard, India is far behind the international standards. Toilet facilities are absent from as high as 30% of the houses in urban areas. The situation in rural areas is worse. Rural folk do not have access to even 20% of the total sanitation facilities. Slums in urban areas are a cause for alarm. Slum dwellers live in a highly unhygienic and polluted environment. Such poor sanitation poses a serious threat to the health of the people.

8*. Women's health*: While women constitute approximately half of the Indian population, they lag in the area of health. Child sex ratio declined from 945 in 1991 to 927 in 2001. This shows the growing incidents of female foeticide in the country. Another alarming fact is that close to 3 lakh girls below the age of fifteen are married and have already given birth to at least one child. Also, about 50% of married women between the ages of fifteen and forty-nine suffer from anaemia. This resulted in 19% of maternal deaths. Another area of concern is the maternal morbidity and mortality caused due to abortions.

Effectiveness of Health Care Programmes in India

Health is a public good and a basic human right. Therefore, no person should be deprived of health-care facilities. Decentralisation is the need of the hour to ensure that health-care services are accessible to all. The urban–rural divide in terms of the availability of sufficient and proper health-care centres needs to be rectified. It is important to make quality medical facilities available at nominal costs.

This promotes their worthiness and popularity. Further, there must be some regulation to check the exorbitant fees charged by private medical centres. The effectiveness of various health-care programmes needs to be enhanced by increasing the number of hospitals, modernising medical facilities, developing infrastructure, improving the doctor–population ratio and increasing the number of medical colleges. Telecom and IT sectors should play their role in making health-care programmes more effective.

It is crucial to increase people's awareness about health and hygiene. The success of the health sector depends upon education, spread of knowledge, increased awareness and an efficient health infrastructure.