
CHAPTER II

LITERATURE SURVEY

SOURCES AVAILABLE IN INDIA

The following points highlight the two important sources of energy in India. They are:

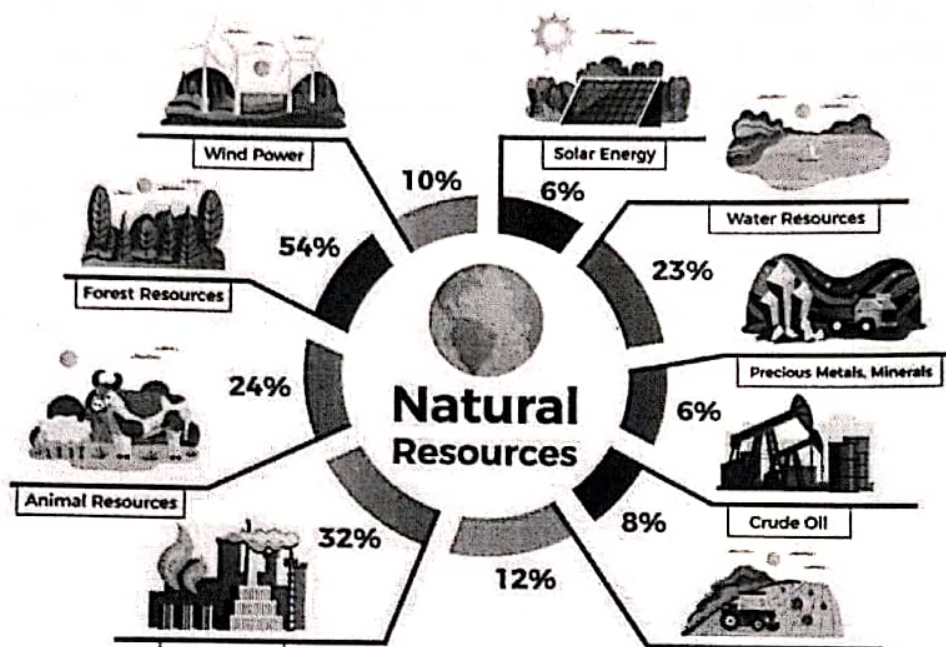


Figure 1: Natural Resources in India

A. Conventional Sources of Energy:

Conventional sources of energy are as follows

1. Coal:

Coal is one of the most important sources of energy and is being used for various purposes such as heating of houses, as fuel for boilers and steam engines and for generation of electricity by thermal plants. Coal has also become a precious source of production of chemicals of industrial importance. Coal is and will continue to be the mainstay of power generation in India. It constitutes about 70% of total commercial energy consumed in the country. Coal was formed around 255-350 million years ago, during the Carboniferous age, in hot damp regions of

the earth. The plants and animals that occurred during this period, along the banks of rivers and swamps, got buried alive or after their death into the soil and due to heat accompanied by pressures gradually got converted into peat and coal over a millions of years of period. Partially decomposed vegetation deeply buried in sedimentary environments slowly transformed into solid, brittle, carbonaceous rocks commonly known as coal. The coal is mainly of three types: anthracite (hard coal), bituminous (soft coal) and lignite (brown coal). There properties are discussed in Table -1

Type of Coal	% of Carbon	% of Oxygen	% of Volatiles	% of Moisture	Calorific values
Lignite	60-70	16-18	45	35	5000-6000
Sub-bituminous	75-83	14-15	40	17	6100-6500
bituminous	78-90	9-10	20	06	6600-7500
Anthracite	92-98	02-03	5	1	7500-8100

Table 1: Types of Coal

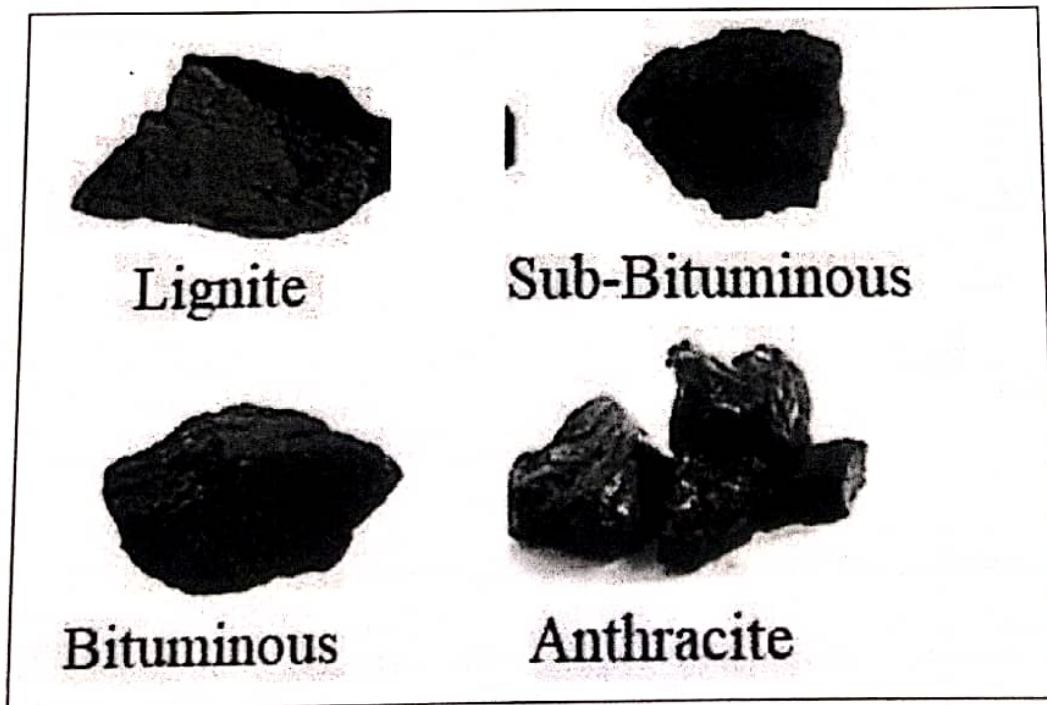


Fig 2 :Types of Coal

The coal is the most abundant fossil fuel with a total recoverable resource of about 6000 billion tones in the world. With present rate of consumption, the coal reserves are likely to last during next 200 years and if the use rate increase by 2 percent per year, then it will last within next 65 years. China is the leading producer of coal followed by USA. In India, coal occurs in rock sequences mainly of two geological ages, namely, Gondwana, little over 200 million years age and in Tertiary deposits which were found at a much later geological epoch (about 55 million years) ago. The major resources are located in central and eastern parts of the country. In India, the major coal fields are Raniganj, Jharia, Bokaro, Singrauli, Panch-Kanham (Tawa valley), Talchar, Chanda- Wardha and Godavari valley in states of Jharkhand, Orissa, West Bengal, Madhya Pradesh, Andhra Pradesh and Maharashtra. The proven coal reserves of the country as on January 1, 2005 is 247,847 million tones, the highest proven amount being 35417 million tones in Jharkhand. About 65 % of coal produced in India is used to produce electricity and rest in industries and for other purposes.

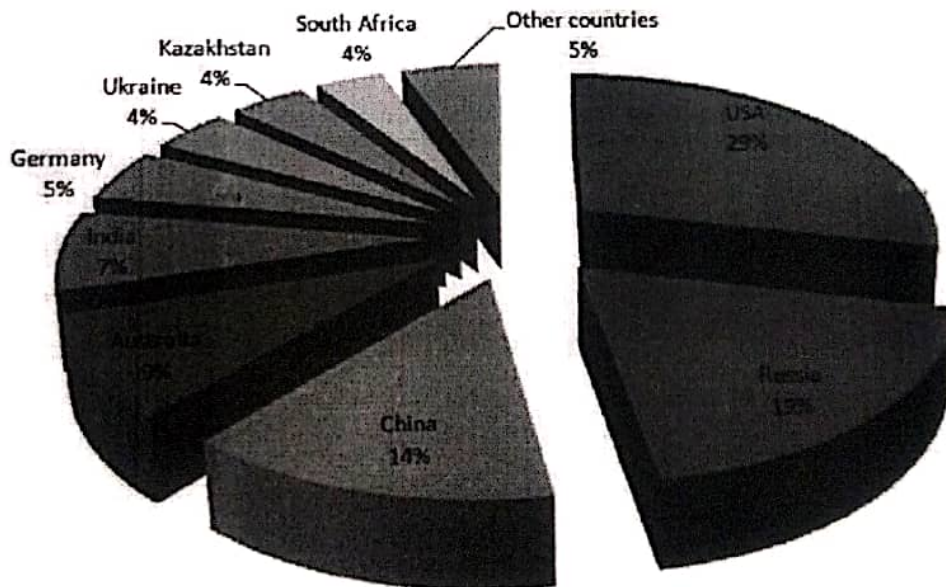


Fig 3: Percentage of Coal in India in comparison with other countries

On burning, coal produces heat which is converted into various forms of energy by different technologies. At the same time it produces several air pollutants including carbon dioxide which is a green house gas and causes global warming. Beside, there are many

problems with coal use. It has to be mined from underground or from the surface. Underground mines besides being dangerous, cause several damages to the environment and lung diseases in the miners. In addition, coal releases huge amount of radioactive particles into the atmosphere which are harmful to human beings.

Coal is the major source of energy. It provides employment to over 7 lakh workers. Its reserves are substantial. Coal has a favour over other fuels as it can be converted into other forms of energy.

Presently, it is the principal source of electricity in India. According to an estimate, coal and lignite account for about 60 percent of the country's commercial energy consumption.

In future, they are also expected to play more important role in the power generation. Besides this, coal is also an essential input in the steel and carbo-chemical industries. Coal's reserves are mainly clustered around a belt extending over the western part of West-Bengal, South Bihar, Orissa, North-Eastern and Central Madhya Pradesh, Eastern figure of Maharashtra and the northern extremity of Andhra Pradesh.

In Assam, there are also some scattered deposits. According to the latest estimates made by Geological Survey of India, the reserves of coal upto January 1990 are to the tune of 18604 crore tones seams of 0.5 metre and above thickness down to a depth of 1200 metre. Among these, 27 percent of reserves are of cooking variety and the remaining 73 percent are of non-cooking variety.

The current estimate of lignite reserves in India is about 629 crore tones, 80 percent occurring in Tamil Nadu. Smaller deposits exist in Gujarat, Rajasthan and Jammu & Kashmir. Neyveli area of Tamil Nadu contains about 330 crore tones -of which 200 crore tones fall in the proven category.

Neyveli lignite has much less ash content than the average Indian Coal and is consistent in quality. The growth of coal production after nationalisation of industries in 1972 was to the tune of 1.7 crore tones which in 1988-89 rose to the extent of 19.5 crore tones. This has placed India into fifth position on the global map.