

PREFACE

In a bid to standardize higher education in the country, the University Grants Commission (UGC) has introduced Choice Based Credit System (CBCS) based on five types of courses viz. *core, discipline specific, generic elective, ability and skill enhancement* for graduate students of all programmes at Honours level. This brings in the semester pattern, which finds efficacy in sync with credit system, credit transfer, comprehensive continuous assessments and a graded pattern of evaluation. The objective is to offer learners ample flexibility to choose from a wide gamut of courses, as also to provide them lateral mobility between various educational institutions in the country where they can carry their acquired credits. I am happy to note that the university has been recently accredited by National Assessment and Accreditation Council of India (NAAC) with grade ‘‘A’’.

UGC (Open and Distance Learning Programmes and Online Programmes) Regulations, 2020 have mandated compliance with CBCS for UG programmes for all the HEIs in this mode. Welcoming this paradigm shift in higher education, Netaji Subhas Open University (NSOU) has resolved to adopt CBCS from the academic session 2021-22 at the Under Graduate Degree Programme level. The present syllabus, framed in the spirit of syllabi recommended by UGC, lays due stress on all aspects envisaged in the curricular framework of the apex body on higher education. It will be imparted to learners over the six semesters of the Programme.

Self Learning Materials (SLMs) are the mainstay of Student Support Services (SSS) of an Open University. From a logistic point of view, NSOU has embarked upon CBCS presently with SLMs in English / Bengali. Eventually, the English version SLMs will be translated into Bengali too, for the benefit of learners. As always, all of our teaching faculties contributed in this process. In addition to this we have also requisitioned the services of best academics in each domain in preparation of the new SLMs. I am sure they will be of commendable academic support. We look forward to proactive feedback from all stakeholders who will participate in the teaching-learning based on these study materials. It has been a very challenging task well executed, and I congratulate all concerned in the preparation of these SLMs.

I wish the venture a grand success.

Professor (Dr.) Subha Sankar Sarkar
Vice-Chancellor

Netaji Subhas Open University
Under Graduate Degree Programme
Choice Based Credit System (CBCS)
Subject : Honours in Geography (HGR)
Course : Economic Geography
Course Code : CC-GR-10

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**Netaji Subhas
Open University**

**UG : Geography
(HGR)**

**Course : Economic Geography
Course Code : CC-GR-10**

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Module - I

Unit I □ Meaning and Approches to Economic Geography, New Economic Geography

Structure

1.0 Objective

1.1 Introduction

1.2 Meaning of Economic Geography

1.3 Approches to Economic Geography

1.4 New Economic Geography

1.5 Summary

1.6 Suggested Reading

1.0 Objective

The objective of this unit is to deliver the learners. The meaning and approaches of Economic Geography and the concept of New economic geography.

1.1 Introduction

Geography analyses and explains variations in activities over space and time. Economic Geography is the study of the spatial and temporal variation of activities related to production, exchange and consumption of goods and services. Whenever possible the goal is to develop generalizations and theories to account for these spatial variations. This definition was given jointly by Hartshorne and Alexander.

1.2 Meaning of Economic Geography

Prof E.W. Zimmermann pointed out that “Economic Geography deals with the economic life of man with relation to environment.”

Dudley Stamp, explained that “Economic Geography involves consideration of the geographical and other factors which influence man’s productivity, but only in limited depths, so far as they are connected with production and trade”.

The economic geography relates to the location. Map provides the answer to the question “where”. If no such map exists, the Geographers will have to construct one because maps are basic tools and are essential in understanding of real relationship.

The idea of pattern or distribution may facilitate the concept of location. A pattern is arrangement of an element over the surface of the earth, The world pattern of population, for example, reveals some densely populated areas in China and India, some areas of less density in the U.S.A. and Russia and some sparsely settled areas in North Africa and central Australia.

Another significant characteristic of any economic activity is its spatial description. For example, one may ask, what are the characteristics of tea plantation that distinguish the regions devoted to it? How many areas do the plantation farms occupy? What kind of buildings are there on them? How much tea is produced? In what respects are these regions different from rice or wheat growing areas? Careful observation of the various aspects will enable a geographer to distinguish the tea producing regions both from regions of contrasting activities and from other regions of tea production. Then in terms of these characteristics a geographer finally decides where to draw the boundary of the distinctive region on his map.

It is also necessary to carry out an analysis of cause and effect. Some geographers concentrate on relationship with physical and cultural phenomena. An alternative approach is to consider relationship within a region and those between regions. Finally, some geographers prefer to study relationship in terms of co-relationship.

1.3 Approaches To Economic Geography

Among the several methods of studying Economic Geography, the four most important approaches are as follows :

- a) Regional Approach
- b) Systematic or Community Approach
- c) Activity Approach
- d) Principal Approach

Regional Approach: In considering this popular approach, the world, a continent or even a country or a state may be divided into geographic regions. The basic advantage of this approach is that it gives a better and comprehensive knowledge of the different parts of unit, their relationship to each other and to the units as a whole.

Systematic or Community Approach: This approach provides a systematic description and interpretation of the distributional pattern of individual resources or

commodity (e.g. wheat, rice, tea) or an industry (e.g. Iron and steel industry, cotton textile). As observed by W. Smith “it analyses the whole sequence of their development and catches them on their march to progression or retrogression.”

Activity Approach: This approach aims at dividing man’s basic economic activities into three categories- Primary, Secondary and Tertiary. Primary activity is connected with nature and includes agriculture, forestry, fishing, hunting etc. Secondary activity depends on the process of converting the primary products into more usable ones like all branches of manufacturing industries. Tertiary activity sets up a link between primary and secondary activities such as though trade and transportation.

Principal Approach: In this approach generalizations are made about man and his environment on the basis of analysis of facts at a specific time point. Generalizations like “plains invite occupancy, mountains repel settlement” are made. This approach enhances the clarity of reasoning and depth of analysis. All these approaches have their own merits and limitations. Any single approach is, therefore, incompetent to give a complete picture of the economy of a country or a region.

1.4 New Economic Geography

Different types of economic activities like primary, secondary, tertiary, quaternary and quinary are included in this subject. Beside these, detailed study on different industrial activities, locational theories such as Von Thunen (1783-1850), Smith (1966), Weber (1909), Hoover (1948), Lösch (1954) Isard (1956) etc. as well as developmental policies are further dealt with. Transport and communication, trade and commerce emphasize on economic development of a country. Now studies on multi-dimensional aspect like economic inequality or disparity, unemployment, poverty, urbanization related with industrialization etc. also enter into periphery of economic geography. It emphasizes on spatial interaction among places of production and consumption. Understanding economy requires that the fundamental economic activities of production, consumption and distribution be treated as integrated parts of a system. Economic geography, as a field of study, focuses on the flows in the economic activities of distribution, while here Economics appear to be interested in the aggregates, such as national totals as well as supply and demand for goods or services in market. Government policy can affect the economic characteristics of a place or region or it can directly modify patterns of spatial interaction. Innovation may be defined by technological upliftment and theoretical advancement as well.

A review of research in Economic geography and planning would be incomplete without the consideration of recent developments in research techniques and tools employed by regional planners. There is a strong case for experimenting with the application of techniques like multiple factors analysis, grouping techniques such as nearest neighbor techniques, cluster analysis to problems in spatial planning.

Economic Geography of the world changed a lot in the last 25 years. During this period, the World economy mushroomed in size and complexity. At the same time, greater independence among nations added new dimensions to the World system. Major new work forms emerged as the post-industrial economy revolutionized the job market. The propelling force in economic growth became information and technology in the place of traditional raw materials and smokestack industries. New forms of management and organization developed to shape and lean these changes. The World becomes particularly aware of Japanese business practices in the 1980s. The most visible and influential institution associated with business activity remained the multinational corporation, much larger than before. Governments became more actively involved in promoting economic development.

Several newly influential groups of countries became important in the global market place. These included the Organization of Petroleum Exporting Countries (OPEC) block, the Newly Industrializing Countries (NICs), the Organization of Economic Cooperation and Development (OECD) group and the European Economic Community (EEC).

World trade became a crucial factor in the development process. More and more goods were 'international' in the sense that complex combinations of management, raw materials, technology, and semi processed goods, from many countries interacted to create them. As the less developed countries climbed the technology ladder, they began producing products at home to substitute for previously imported items and eventually began exporting more sophisticated products. In turn, the more developed nations moved to knowledge-intensive activities such as electronics, integrated circuits, robots, aerospace, telecommunications and biogenetics.

The comprehensive measures called for in the NIEO (New International Economic Order) will dominate the agenda of economic geographers in developing countries throughout the world. The measures of NIEO are grouped under the five headings in the UN resolution viz. international trade, transfer of real resources, science and technology, industrialization and food and agriculture.

1.5 Summary

The concern of economic geography in the 1990s and beyond must also include the heartland problems at a hierarchy of scales from local to global. The way in which economic geographers perceive these problems of growth and distribution reflects the development of the discipline over the country. Although a history of the subject is of interest for its own scale, it is also important if we are to understand the context in which economic geographers view the issues of current global concern.

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Unit 2 □ Concept in Economic Geography: Goods and Services, Production, Exchange and Consumption

Structure

2.0 Objective

2.1 Introduction

2.2 Goods and Services

2.3 Production

2.4 Exchange

2.5 Consumption

2.6 Summary

2.0 Objective

The learners will learn about the goods and services, production and exchange in the economy and their consumption patterns.

2.1 Introduction

Economic geography analyses variations in activities over space. It is the study of the spatial variation of activities related to production, exchange and consumption of goods and services. The goal is to develop generalizations and theories to account for these spatial variations. In this content, basic concept of the activities like goods and services, production, exchange and consumption is described.

2.2 Goods and Services

Goods are material things which can be seen or touched. Services are non-material things which cannot be seen or touched, only their effects are felt. Forest resources, fishes, lands, minerals etc. are examples of goods. These goods can fulfill human needs in their life.

However, studying in a school or a college or a university, medical facility, legal consultation, business and financial management etc. are called services performed by teachers, professors, doctors, advocates and concerned institutional managers etc. Hence, all the human wants can be satisfied by goods and services.

Goods and services are of many types, viz.

- Free Goods and Economic goods:

Few goods have unlimited supply and provided from nature. The goods which are not man-made do not have to be paid anything to get them. These goods are known as 'Free Goods'. For example, air, sea, water, sunlight, sand in the desert and coastal areas etc. On the other hand, goods like vegetables, grains, minerals, fruits, fishes etc. which are neither man-made nor unlimited in supply from nature are known as 'Economic Goods'. All these goods are sold and purchased in the market only.

- Free Services and Economic Services:

Services which cannot be bought in the market and which are only rendered out of love, affection etc. are known as 'Free Services'. For example, all services given by the parents to their children are free services. However, all the services that can be bought in the market are 'Economic Services'. Services rendered by doctors, teachers, lawyers, barbers, cobblers etc. are the example of economic services.

- Consumer Goods and Capital Goods:

The goods which are directly used by the consumer for the purposes of consumption are known as 'Consumer Goods'. Example of consumer goods are biscuit, butter, rice, fish, egg, shoes, fan, book, pen, cooking gas etc. On the other hand, all the goods which are not directly used to satisfy consumption but which are used in further production are called 'Producer Goods' or 'Capital Goods'. The examples are seeds, fertilizers, tools, machines, raw materials etc.

- Consumer Services and Producer Services:

Services that are used directly by consumers to satisfy their wants are called 'Consumer Service'. When services are used by producers to produce other goods and services, they are called 'Producer Services'. When the tailor stitches our shirt, it is a consumer service. However when the tailor stitches a shirt for a readymade garments shop, the service rendered by him is a producer service.

- Single Use and Durable Use Goods:

Goods (both consumer goods and producer goods) which are only used or consumed for one time are called 'Single Use Goods'. Bread, milk, fruits, vegetables etc. are the example of single use consumer goods. On the other hand, seeds, fertilizers, raw materials etc. are the example of single use producer goods.

Some goods (both consumer goods and producer goods) can be used for a considerable period, that is, they can be used again and again. They are called 'Durable Use Goods.' For example, table, chair, clothes, shoes etc. are the durable use consumer goods. On the other hand, tube wells, tractors, pump-sets etc. are the example of durable use producer goods,

- Private Goods and Public Goods:

The goods which are owned by private bodies are called 'Private Goods'. For example, a car, a house, a mobile phone, books, a television set etc. are private goods.

There are large number of goods which are collectively owned by the society, the public or the government. These are called 'Public Goods or Government Goods. For example, roads, bridges, hospitals, government schools etc. are the public goods or the social goods or the government goods.

2.3 Production

Production is a process of combining various material inputs, processing and outputs. Economic development is a production process, meaning all economic activities that aim directly or indirectly to satisfy human wants and needs. In production process there are two important features improving quality-price-ratio of goods and services and increasing income from growing and more efficient market production.

The most important forms of production are market production, public production and household production.

Economic development also increases due to the growth of income that are gained from the 1 growing and more efficient market production. Market production is the only production form which creates and distributes income to stakeholders. Public production and household production are financed by the incomes generated in market production. Thus market production has a double role in creating development, i.e. the role of producing goods and services and the role of creating income.

Production is involved with three stakeholders such as customers, suppliers, producers.

Customers

The customers of a company are typically consumers. There are several other market producers or producers in the public sector. Each of them has its own individual production functions. Due to competition, the price-quality-ratio of commodities tend to improve and this brings the benefits of better productivity to customers. Customers get more for less. In households and the public sector this means that more satisfaction is achieved at less cost. For this reason the productivity of customers can increase over time even though their income remain unchanged.

Suppliers

The suppliers of companies are typically producers of materials, energy, capital, and services. They all have their individual production functions. The changes in prices or qualities of supplied commodities have an effect on both actors' (company and suppliers) production functions. Hence, the production functions of a company and its suppliers are in a state of continuous change.

Producer community

The incomes are generated for those participating in production, i.e., the labour force, society and owners. These stakeholders are referred to here as producer communities or, in shorter form, as producers. The producer communities have a common interest in maximizing their incomes. These parties that contribute to production receive increased incomes from the growing and developing production.

Types of production

Production is undertaken by firms, also known as enterprises, or businesses. There are three stages of production:\

- Primary production, which involves the extraction of resources from the earth, such as agriculture, fishing, and mining. Land and natural resources are the main resources used in primary production.
- Secondary production which involves the manufacture of semi-finished and finished consumer goods, such as computers, motor vehicles, and clothing. Labour and capital are the main resources used in the secondary sector.

- Tertiary production involves the distribution of products and the creation of services, such as road construction, financial services, healthcare etc. Human capital is usually the most essential resources used in tertiary production. The tertiary sector is sometimes sub-divided into tertiary, quaternary and quinary sectors. The quaternary sector of an economy includes the infrastructure of information technology and knowledge that enables an economy to produce successfully. The quinary sector is defined as the aspect of the economic, political and social infrastructure which supports economic activity, including universities, charities and government activity. Sophisticated quaternary and quinary sectors are commonly viewed as essential to economic development in a globalised economy.

2.4 Exchange

Exchange is communication between buyers and sellers with negotiate prices. Economic behaviour involves the exchange of one scarce resource for another. When people engage in paid work, they exchange their scarce time, effort, and skill for income, and, when people make purchases, they exchange their scarce income for scarce goods and services. Economic activity is driven by the need to exchange.

At the beginning of any marketing course or programme it is important to appreciate how exchange processes work. An exchange process is simply when an individual or an organisation decides to satisfy a need or want by offering some money or goods or services in exchange. It's that simple, and you enter into exchange relationships all the time.

The exchange process extends into relationship marketing. With relationship marketing we purposefully look at the long-term relationship with our target audience, and aim to grow our business. By delivering value to our customers we consistently nurture the relationship with customers. Later in your studies you will come across relationship marketing and customer relationship management, which encompass the traits of a basic marketing exchange process and take it much further.

2.5 Consumption

The process of satisfying needs and wants is called consumption. Individuals need to exchange their skill and effort, or their enterprise, land or capital, for an income.

They can exchange this income for the scarce products which they need or want. Exchange and consumption fulfill a process of production.

Consumption is the use of goods and services by households. Consumption is distinct from consumption expenditure, which is the purchase of goods and services for use by households. Consumption differs from consumption expenditure primarily because durable goods, such as automobiles, generate expenditure mainly in the period when they are purchased, but they generate “consumption services” for example, an automobile provides transportation services until they are replaced or scrapped.

Neoclassical economists generally consider consumption to be the final purpose of economic activity, and thus the level of consumption per person is viewed as a central measure of an economy’s productive success.

The study of consumption behaviour plays a central role in both macroeconomics and microeconomics. Macroeconomists are interested in aggregate consumption for two distinct reasons. First, aggregate consumption determines aggregate saving, because saving is defined as the portion of income that is not consumed. Because aggregate saving feeds through the financial system to create the national supply of capital, it follows that aggregate consumption and saving behaviour has a powerful influence on an economy’s long-term productive capacity. Second, since consumption expenditure accounts for most of national output, understanding the dynamics of aggregate consumption expenditure is essential to understanding macroeconomic fluctuations in the business cycle.

Microeconomists have studied consumption behaviour for many different reasons, using consumption data to measure poverty, to examine households preparedness for retirement, or to test theories of competition in retail industries. A rich variety of household level data sources allows economists to examine household spending behaviour in detail, and micro economists have also utilized these data to examine interactions between consumption and other microeconomic behaviour such as job seeking or educational attainment.

2.6 Summary

Thus goods and services, production, exchange and consumption an important and integral part of the economy of the country. The nature of change of their behaviour is indeed essential to the study.

Unit 3 □ Concept of Economic Man

Structure

3.0 Objective

3.1 Introduction

3.2 Concept of Economic Man

3.2.1 Economic decisions

3.4 Summary

3.0 Objective

The objective of this unit is to give the learners an idea about economic man and the economic decisions taking here to.

3.1 Introduction

For over a century now the foundation stone of economics, theoretical and applied, has been a generalized account of the behaviour of economic agents in which they are depicted as self-regarding, rational, and, with qualifications, well-informed in the calculated choices required by their rationality. Economic Man postulates defining him for the starting point of any economic analysis as the distinguishing mark of professionalism.

3.2 Concept of Economic Man

Economic Man will act in the most rational way possible in order to maximize his utility. Rational thinking means they should be logical, not emotional and calculative for profit maximization or low risk in their enterprises. This type of behaviour is also called economic behaviour. The economic behaviours of human beings determine under the specific social circumstance. Economic man can participate in the process of decision making. Such kind of human resources also defined as having advanced managerial skill.

3.2.1 Economic decisions

Economic decisions are consciously taken and have conscious experience as their immediate or ultimate objective. Economic situations, whether of individuals,

enterprises, markets, industries or whole economies, are characteristically changing; private economic decisions, even when themselves referring only to events a moment or so ahead, are always interdependent with decisions made with long-term matters in mind; all public economic decisions take time.

Few Postulates may be considered for defining Economic man:

- A postulate of uniformity: One interpersonal variation is required for economic decision.
- A postulate of intelligence: They are highly intelligent. They know their own wants, abilities, and attitudes, the facts of the markets around them, the legal framework, the technology available, etc. Their foresight about matters relevant to their economic decisions is imperfect only in relation to the dates of their own deaths and illnesses and those of their immediate relatives and the eventual outcome of long-term investments; though about all those matters they act on knowledge of well-based probability distributions.
- A postulate of self-interest: Self-interest can promote to take challenges at any kind of problems of enterprise.
- A postulate of competitiveness: Economic man takes part in buying or selling the same productive service or finished goods to obtain a better price.

3.3 Summary

The presence of economic man is an assumption of many economic models. The economic man is completely rational. It states how a manager should behave in the process of decision making. This approach, besides rational, is also idealistic because it cannot be fully applied to a practical situations.

Unit 4 □ Economic Distance and Transport Cost

Structure

4.1 Objective

4.2 Introduction

4.3 Economic Distance

4.4 Transport Cost

4.5 Concept And Classification of Economic Activities

4.6 Summary

4.1 Objective

The learners will come to know about the economic distance and transport cost.

4.2 Introduction

A distance is very often referred to as the physical distance. In statistical meaning, the distance determines the level of dissimilarity between patterns, objects or units. The economic distance defines a dissimilarity level between objects functioning in the economic space. It is one of the most important issues of spatial econometrics. However, its measurement is difficult due to the definition, description and estimation problems.

4.3 Economic Distance

In general, the economic distance identifies a dissimilarity level between managing entities like companies, households, self-government units etc. They offer products or services such as cars, computer programs, credits etc. The development of spatial statistics and econometrics makes the economic distance one of the most important issues in examining the relations between territorial units, e.g. regions, cities, metropolises, countries. In the era of globalization, technological progress and other socio-economic changes, the economic distance affects relations between territorial units much more than geographical distance. International trade is considerably more determined by transport costs and economic dissimilarities between countries than by the physical distance between them. Migration decisions are made by comparing the socio-economic situation like economic situations of enterprises, labour demand and supply, the costs of living, offered services etc. of a destination region against an origin residence.

4.4 Transport Cost

In dealing with transport costs distinction must be made between private costs and social costs. Private costs are the costs incurred by the individual or transport operator in providing a particular service. Social costs are the costs imposed on society as a whole through an individual making a trip or transport operator providing a service. These costs are not paid for by the user-social costs are incurred as a result of external effects of transport activity.

Private transport costs are made up of three elements-

- **Track Costs** - Providing and maintaining a surface cove, which transport services can operate.
- **Running Costs** - the cost of purchasing, maintaining and operating a vehicle to run on the track surface.
- **Interchange Costs** - the cost of providing facilities at the beginning and completion of a journey.

Categories of transport cost:

Fixed costs : These costs are incurred before any traffic at all passes. They include the costs (i) of providing the infrastructure (i.e. the road, the port, or the railway line); (ii) of providing, equipping and staffing the terminal facilities (i.e. bus depots, railway stations or airport); (iii) of providing marginal, administrative and maintenance staff and their offices and workshops. These costs are inescapable because they cannot be avoided except by abandoning the whole operation. They also do not vary with the level of traffic, but remain independent of it. A railway signal-box must be manned (and thus incurs wage costs) whether there is one train or six trains per hour over the line.

Variable costs: These are costs incurred by the actual movement of traffic and they vary with the level of the traffic passing. They include the costs of fuel, crew wages and the maintenance of vehicles, for example, routine inspection of an aircraft after a flight. They are escapable because they may be avoided or escaped by not running a particular train, suspending a particular flight or a private motorist leaving his car in the garage and walking to the office/shops.

Terminal cost: Terminal costs are those associated with loading and unloading the commodities and the accompanying paperwork. The terminal costs are both fixed and variable. The proportion of terminal costs in the total costs varies between modes. In road haulage the terminal costs can be negligible. On the other hand, to send goods by rail may entail conveying them by lorry or truck

from factory to goods depot, loading them into wagons and receiving the process at the other end.

Marginal and Average Costs: Marginal cost is the additional cost incurred in order to produce one more unit of output. Marginal cost may be incurred by carrying extra passenger on a bus with seats to spare or another tonne of goods on a half empty lorry or of a wagon on a freight train. It even means allowing 25 trains in a day instead of 20.

Marginal costs are therefore time linked and it may be of short run or long run nature. It does not represent constant additional total costs. Upto the capacity of the transport unit transport mode (bus, aircraft, train, ship), any further increase in traffic incurs negligible marginal costs. Then there is sharp increase at the point, where a second unit becomes necessary. Marginal costs do vary between modes of transport.

Average costs are obtained by dividing the total costs of the operation by the work done, expressed in terms of passenger-km, tonne-km or transport-unit-km, Average costs will of course vary with output, for greater the product the more fixed costs can be spread.

Comparative cost advantage:

Two factors influence the rate difference for alternative transport modes; terminal costs and line haul (or over-the- road) costs. These costs of course vary with the type of commodity being moved. But it is also possible to generalize about the level of terminal costs by mode of transportation. Over a short distance, truck transportation of commodities is cheap, and this is reflected in the prices offered to the customer. For longer distance, however, railway transportation comes into its own. In a sense, therefore, the cost structure preserves certain complementarities among the different media, with the trucking companies feeding goods over short distances to railheads where they will be transferred over longer distances for possible oceanic shipment overseas or to another point in the nation.

Line-haul costs, in contrast to terminal cost, vary with distance; and they are not linearly related to mileage. Water movement is invariably the least expensive whereas over-the-road operating costs are highest for truck. Once again, rail transport falls in between. Looking at the distance at which each of the three modes are most competitive, it is seen that truck transportation, owing to low terminal costs, is the lowest cost mode at short distances. Beyond certain distances, water is the most economical form of transport and it is, of course, the dominant mode in world trade.

The freight rate is only one factor in choosing among alternative transport modes. Another equally important factor is service. Transportation service implies great many things, including speed of delivery, scheduling convenience, avoidance of damage and reliability.

4.5 Concept and Classification of Economic Activities

The economic activities include several sectors that evolved in successive phases. These involve production, distribution and consumption of goods and services at all levels within a society which are called economic activities. Gross domestic product or GDP is one way of assessing economic activity. The degree of current economic activity and forecasts for its future level have significant impact on economy.

Primary:

The primary sector of the economy extracts or harvests products from the earth. This sector includes the production of raw material and basic foods. The primary sector activities include agriculture (both subsistence and commercial), mining, forestry, farming, grazing, hunting, fishing and quarrying. The packaging and processing of the raw material associated with this sector is also considered to be part of this sector. In developed and developing countries, a decreasing proportion of workers are involved in the primary sector. This sector of employee is called '*red collar*' workers.

Secondary:

The secondary sector of the economy includes industries that produce a finished, usable product or are involved in construction. This sector generally takes the output of the primary sector and manufactures finished goods. The activities of secondary sector are related to businesses, export, sale or domestic consumers. This sector is often divided into light industry and heavy industry. Many of these industries consume large quantities of energy and require factories and machinery to convert raw materials into goods and products. They also produce waste materials and waste heat that may cause environmental problems or cause pollution. The secondary sector supports both the primary and tertiary sector. This field is an important source for engineering job opportunities. Among developed countries, it is an important source of well-paying jobs for the middle class to facilitate greater social mobility for successive generations on the economy. This sector worker is called '*blue-collar*' workers.

Tertiary:

Tertiary sector includes all the services other than primary and secondary activities. Tertiary production involves the service sector rather than tangible goods. This work refers to a range of personal and business services involving a rapidly growing share of the labour force in highly developed countries. Rental clerks, barbers, beauticians and secretaries all fall into the personal and business service categories as a group and they have been described as '*pink-collar*' workers.

Quaternary:

Services represent a special type of service work, focusing on professional and administrative services including financial and health service work, information processing, teaching and government service and entertainment activity. Specialized technical, communication and motivation and leadership skills provide the common thread linking these activities. Practically quaternary activity occurs in office building environment or specialized environment provided by schools, theaters, hotels and hospitals. This group has been termed as the '*white-collar*' work force.

Quinary:

Quinary activities, the upper most one in hierarchy, remain more restrict in size compared to other groups of activities. The most visible persons in this group include chief executive officers and other top-management executive in both government and private service. Research scientist, legal authorities, financial advisers and professional consultants who provide strategic planning and problem-solving services belong to this group. Most of these high order analytical and managerial activities occur in larger urban centres or in close proximity to large university/medical or research centres. An appropriate level for this group is the '*gold-collar*' workers. Quinary activities are viewed from two broad aspect. High-level managerial and executive administrative positions (public and private), and Scientific research and development services.

4.6 Summary

Distance is commonly the most basic condition affecting transport costs.

Transport costs are a monetary measure of what the transport provider must pay to produce transportation services. The impacts of geography mainly involve distance and accessibility. Our decisions are often controlled by our financial condition. Thus the study of economic distance and transport cost are highly interrelated.

Module - II

Unit 5 □ Factors Affecting Location of Economic Activity with Special Reference to Agriculture (Von Thunen) and Industry (Weber)

Structure

5.1 Objective

5.2 Introduction

5.3 World agricultural system: Von Thunen's model and its relevance to Industrial Location: Theory of least cost approach- Weber's Model

5.4 Industrial Location

5.5 Summary

5.1 Objective

The objective of this study primarily concerned about the spatial variation of economic activities and the knowledge of locational theory.

5.2 Introduction

The distribution of economic activity over the world varies from each other on the basis of land use and land cover pattern, raw materials, the process of manufacturing, the resultant product and the markets. So, the locational preference will also differ.

5.3 World Agricultural System : Von Thunen's Model and its Relevance

The very first attempt to devise a scientific theory explaining the location of an economic activity can be credited to J. H. Von Thunen (1783-1850) of Germany. Both a scholar and a farm operator, Yon Thunen formulated his famous theory on the basis of 40 years experience in managing an agricultural estate near the city of Rostock in Mecklenburg on the Baltic coast of Germany.



Von Thunen

His theory tries to account for the types of agriculture that will prosper around an urban market. The theory rests upon several assumptions:-

- There is an isolated area considering of just one city and its agricultural hinterland. Such an area could be called “an isolated state”.
- The city is the market for surplus products from the hinterland and receives products from no other area.
- The hinterland ships its surpluses to no other market except its city.
- The hinterland has a homogeneous physical environment favourable to the production of mid-latitude plants and animals.
- The hinterland is inhabited by the farmers desiring to maximize their profits and capable of adjusting their type of farming to the demands of the market.
- The hinterland is traversed by only one means of land transportation. In Von Thunen’s day this was the horse and wagon.
- Transportation costs are directly proportional to distance and are borne entirely by the farmers who ship all food fresh.

Given the above premises, different types of agriculture would develop around the city in discrete rings. The greatest distance from the city at which any given type of farming could be conducted depended on selling price at the market, production cost on the farm, and transport cost between the two. Any profit a farmer realized depended on the relationship of these three variables, as expressed in the formula.

$$P = V - (E+T)$$

where, P= Profit; V= the value of commodities sold; E= Production expenses (labour, equipment and supplies); T= Transportation cost.

Two principal themes of his theory are-

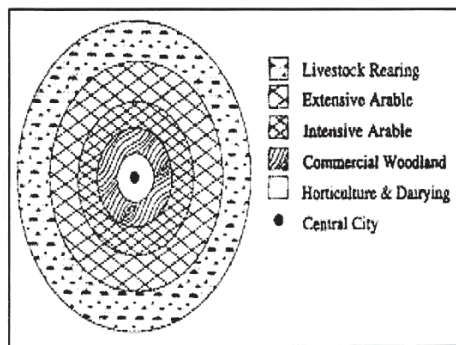
- (i) The number of profitable options decreases with distance from the city market,
- (ii) There is a minimum distance within which a farmer would not choose to produce a given commodity because some other commodity yielded a greater profit.

From these two principles, Von Thunen postulated that six concentric zones of agriculture would develop around the market city on an isolated state A in the diagram.

Zone- I The land nearest to the market would be used to produce perishable items like milk and vegetables. These activities would be concentrated in the inner zone because of the slowness of transportation and the absence of food- preserving techniques.

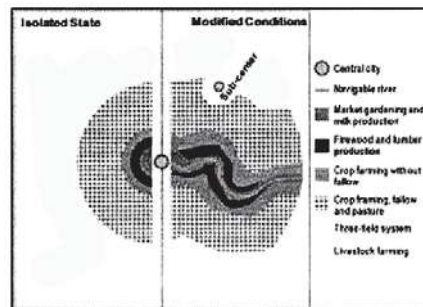
Zone- II This zone would be specialized in producing wood, with firewood in much greater demand than lumber. According to Yon Thunen, forestry yielded greater returns to the farmer near the city than did any other type of production except milk and vegetables.

Zone- III, IV, and V these areas would tend to be devoted to grains and other crops. With distance from the city the intensity of cultivation would decrease. This is indicated in the proportion of fallow land zero in zone III; 14 percent in zone IV and 33 percent in zone V.



Von Thunen Model (Land use pattern)

Zone- VI this would be the region of livestock farming. Marketed products would be of two types: Livestock which could be driven to market, hence cutting transport costs almost to zero and cheese, which is not highly perishable and which is valuable enough to be able to stand higher transport costs.



Modified Theory of Von Thunen Model

Modified Theory : This theory would be modified by the presence of a navigable river and a smaller market city. Along the river land use pattern should be located in parallel way and small town created a micro business region.

Relevance: The highly empirical contents of Von Thunen's classical model can be understood in terms of the early years of his life and their influence on his location ideas about agricultural activities. His model drew heavily for econometric analysis upon his farm accounts and many of the assumptions. His model has demonstrated certain properties of the agricultural landscape and provided a framework for location theorist like Weber (1909), Hoover (1936 and 1948), Losch (1954), Dunn (1954) and Griffin (1973). Von Thunen's analysis is concerned with movement minimization in terms of cost, time and energy. Although the basic forces Von Thunen tried to explain in his theory are still operative, it is difficult to find examples today.

The ring model has been radically modified by changes in transportation characteristics, new technology's achievements (refrigeration) and the replacement of fire wood by certain substitutes (coal, gas, electricity etc.). Many of the needs of his time now seem obsolete. With improvement in transportation and reduction in transport cost, the radii of land use zones have become larger, but the concentric zones may still be recognized on a continental scale. At the small scale of farmstead and village, the ring effect still persists. Hence the movement continues to be measured in terms of time and man-days rather than freight costs.

In the less developed and underdeveloped countries the conditions may still be similar to those of Von Thunen's isolated estate and there are several cases cited in geographical location where land use around a settlement is directly related to distance from the settlement. Moreover, the adoption of green revolution technology at all size classes, particularly in the intensively irrigated areas has disturbed the application of Von Thunen model in Indian context. His precondition was fully valid right up to the early decades of the 20th century. With changed conditions, the distance from the market is now only a cost factor. So, the classic Thunian agro-spatial model is no longer operative in its original format.

5.4 Industrial Location : Theory of Least Cost Approach- Weber's Model

In order to explain the underlying influences on location as applied to all industries, Alfred Weber, a German economist put forward general theory of industrial location in his

book “Theory of the Industrial Location” in 1909. It was translated into English in 1929 and has since become a standard reference on the subject. His overall objective was to determine the minimum cost location for a manufacturing plant. Weber tried to explain the location of industrial activity in terms of three economic factors viz. transport costs, labour costs and agglomeration economies. His explanation is based on the least-cost location for industrial production.



(A. Weber)

Assumptions and Principles :

Weber made three explicit assumptions which were retained throughout his analysis.

- There is an uneven distribution of natural resources on the plain. Thus the raw materials, fuel and water needed for industrial productions may be found only in given locations.
- The size and location of centre of consumption of the industrial products are given. The markets are thus points on the plain.
- There are several fixed location of labour where given wage rates operate. Labour is immobile and unlimited at these locations.

There are other assumptions which are implied in his work.

- The area has a uniform culture, race climate and political and economic system.
- The entrepreneurs seek to minimize the total cost of production.
- Conditions of perfect competition are assumed, whereby resources and markets are unlimited at their given location and no firm may obtain a monopolistic advantage from its choice of location.
- Costs of land, building, equipment, interest and depreciation of fixed capital do not vary regionally.
- There is a uniform system of transport over a flat surface.

Several terms introduced by Weber need to be defined. Ubiquities are material available everywhere; example-water, sand, gravels etc. Localized materials are available only at specific locations; i.e. coal, iron-ore, bauxites etc. Weber also made a distinction between pure materials and weight losing materials. Pure raw materials lose no weight in processing, i.e. cotton, whereas weight losing materials lose weight in the finished product i.e. iron and steel.

Weber maintains that there are three regional factors which affect the costs of production. These are the cost of raw materials and the cost of transporting raw materials and finished products, and the cost of labour. The cost of materials varies, for example, according to the nature of the deposits and the difficulty of mining them. He suggests that this variation should be reflected within the cost of transport of the materials. So, his general regional factors affecting production are two, viz. transport costs and labour costs. He identifies another local factor called agglomeration or de-glomeration economics. The first are the savings to the individuals' plants that result from their opening in the same location. This is possible through the common use of auxiliary industries, financial services and public utilities. In a single firm location, these processes and services have to be borne by the firm at greater cost. Agglomeration economies also include linkages between firms, flows of goods between the plants, development of a specialist labour force, and savings owing to the bulk purchasing of materials and large scale marketing of products. Weber suggests that many of these economies may be gained by the increased scale of production of one firm as well as by the clustering of several. De-glomeration economics involve the weakening of the agglomeration economies and specially, the increase in the cost of land owing to such a clustering of firms.

His analysis is divided into two major sections:

- (1) The identification of the point of the minimum transport costs.
- (2) A discussion of the circumstances under which production will be attracted away from this point owing to advantages gained from cheaper labour or agglomeration.

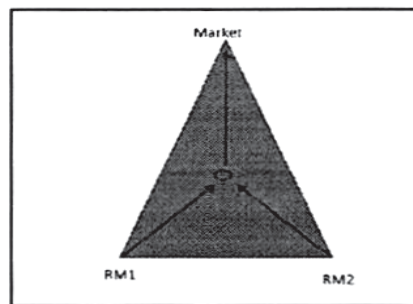
Transport costs: Following Weber, the cost of transportation will be considered under two simplified conditions: (A) One market and one source of material supply and (B) One market and two sources of material supply and involve Weber's classic location triangle.

(A) **One market and one source:** If the material is ubiquitous, the processing would take place at the market. If the material is pure, processing may occur at the market, the

material site or any place in between. An intermediate location would entail an unnecessary additional handling cost. If the material is weight losing, the process will locate at the material sources to avoid transporting waste materials.

(B) One market and two sources: In the first example of the location triangle, SI and S2 are the two material sources and M is the market location. Because distance and costs between these three points are identical, we may assign each of the three distances a cost of, say \$1.00. The processing will occur at the market; because two needed materials can be supplied there at a total unit cost of \$2.00. If processing were to locate at SI, there would be cost of shipping one unit from S2 to SI (\$ 1.00), the cost of shipping that same unit, now processed, on to the market (\$1.00, and the cost of shipping one unit of the material from SI, also now processed, to the market (\$1.00). Thus, the total transport cost, if processing were to locate at SI or S2 is \$3.00 versus \$2.00 per unit at the market.

The situation is different when we have two weight losing materials to be brought together in the processing centre. Let us assume that there is a 50 percent weight loss for each of the two materials. Let the cost of transporting one unit of the weight losing material be \$2. If a market location is selected, one would have to ship one of material from both SI and S2 at total cost of \$4.00. If SI is selected for processing, the cost of obtaining the material from S2 would be \$2.00. No transport cost would be changed to get the material from SI and the cost to transport the product to market with the 50 percent weight loss would be \$2.00. The market SI or S2 would have the same total transport cost.

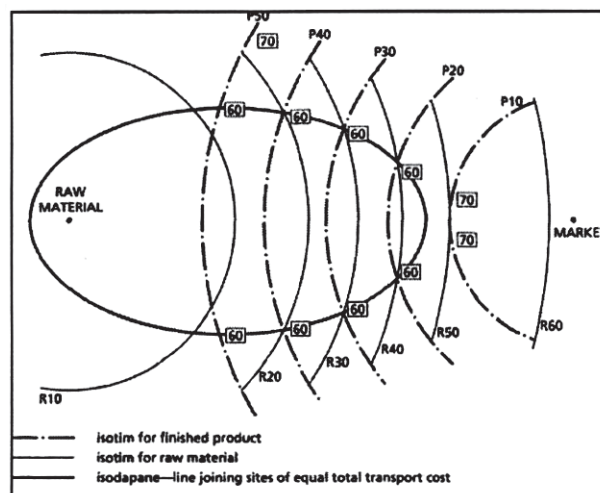


Locational triangle (two raw materials and one market)

Weber was concerned with selecting the least-cost or optimum location. An intermediate location at P would be optimum, rather than M, S 1 or S2, where the transport cost at P would be less than \$ 4.00. Besides, if one material had a greater weight-loss ratio than the other, the intermediate location for processing would be pulled towards the site of the greatest weight loss.

Labour Cost : The geographic variation in the cost of labour was viewed by Weber as a distortion of the basic transport pattern. An area handicapped by high transport cost might be attractive to industry because of expensive labour. According to Weber, an industry would select the location that has the least combined cost when transport and labour are considered together.

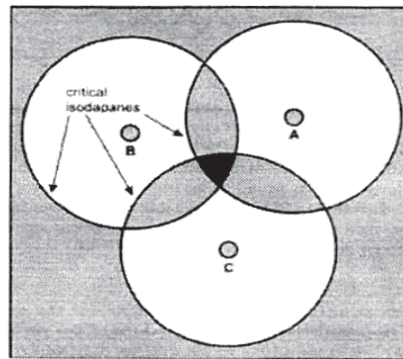
To determine this location, Weber introduced two concepts- Isotim and Isodapane. Isotim is a line of equal transport cost for any material or product. In the diagram the Isotim are given in \$1.00 interval. The cost of shipping the finished products is shown by single line isotim. If one is located for processing at the material supply site (M), there would be a \$4.00 transport charge to send the finished product to the market. The isotims for the material are shown by double lines. The cost of transporting the material to the market is only \$2.00, with the market being the least cost location. The cost of moving the material is thus half that of shipping the finished product. So, the total transport cost at location X would be \$2.00 to ship the product to market plus \$1.00 to obtain the material from the sources i.e. \$3.00.



Isotim and Isodapane

The isodapane is a line of total transport cost. The isodapane is found by summing the isotims at a location. Once the isodapanes are determined, one is able to identify the point of least total transport cost, then the variation in labour costs can be considered in combination with the isodapanes. The reason for using isodapanes is to introduce the labour component into Weber's location theory. In the diagram, the construction of isodapanes and the optimum location points are shown.

Agglomeration: Weber recognized that agglomeration may operate as a distinct location factor. He viewed agglomeration as the dollar savings per unit that would accrue to a plant from locating within a cluster of the other plants. Weber saw agglomeration not as producing internal-scale economies, but rather external economics including urbanization economics. The figure illustrates the cost of three manufacturing plants, A, B, C which have independently located at their least cost point. Around each plant is drawn a critical isodapane. If each of these three plants could locate together, the agglomeration advantages would be just matched along these lines by the higher transport costs. Thus, all plants would benefit from agglomeration savings if they were to locate within the shaded triangle.



Critical Isodapane and Urban agglomeration point

(A, B, & C denote as three different urban centres, most dark point indicate point of agglomeration)

Criticism: Weber's purpose was to provide a general theory of industrial location and in this regard his contribution has proved most valuable. His work however, has a number of shortcomings that limit its application in explaining fully actual manufacturing location. His theory is a model hypothesis based on several premises which are possible only in the exceptional cases. So, the theory is an exception rather than rule. The difference between the capitalistic and socialistic economy, institutional factors and entrepreneurial decisions were not taken seriously by Weber. He did not effectively and realistically take into account geographic variation in market demand. He over emphasized on the role of transport cost. The transport cost is not proportional to distance and weight. Moreover, the intermediate locations necessitate added terminal charges. The advantage of the "break of bulk" location was also ignored by him. Labour is normally mobile and is not always available in unlimited quantity at any location. Many manufacturing

plants obtain a very large number of material inputs and produce a wide range of products for many diverse markets; Weber's theory does not apply to such circumstances. In his agglomeration concept, Weber failed to consider the space problem, energy crisis and problems of civic amenities. The assumption of perfect competition in the concept of Weber's theory is an ideal condition. In the long run it is very difficult to sustain perfect competition in the region. Competition and price fluctuation in the economy is a natural phenomenon. Weber failed to recognize that.

5.5 Summary

From the above analysis it can be said that these theories on economic activities are space related and changes according to the market conditions.

Unit 6 □ Primary Activities: Subsistence and Commercial Agriculture, Forestry, Fishing and Mining

Structure

- 6.1 Objective**
- 6.2 Introduction**
- 6.3 Subsistence Farming**
- 6.4 Commercial Farming**
- 6.5 Forestry**
- 6.6 Fishing**
- 6.7 Mining**
- 6.8 Summary**

6.1 Objective

The objective of this unit is to make the learners aware of the primary activities of the economy to make them understand that economic activities are directly dependent on environment as they use the earth resources. It thus includes hunting, gathering, fishing, forestry, agriculture, mining and quarrying.

6.2 Introduction

The primary sector of the economy extracts or harvests products from the earth. The primary sector includes the production of raw material and basic foods. Activities associated with the primary sector include agriculture (both subsistence and commercial), mining, forestry, farming, grazing, hunting and gathering, fishing, and quarrying. The packaging and processing of the raw material associated with this sector is also considered to be part of this sector.

6.3 Subsistence Farming

The word 'subsistence' means self-supporting or providing sustenance. In this farming the producer lives directly on what he produces. So basically it is consumption oriented farming with little or no influence of market. Subsistence farming system becomes very important in those areas where population density is high; economic development is at a low level and a gainful employment opportunity in the non-agricultural sector is limited. Important regions of concentration are South-East Asia and tropical Africa.

Major Characteristics :

- Subsistence farming is mainly found in tropical climatic region in the world.
- Subsistence farm economy is more commonly associated with intensive type of farming.
- As the farming is for self-consumption, influence of market on production pattern is insignificant.
- Where growth of non-agricultural sector is poor and population growth is high, increasing pressure of man on agricultural land causes low per capita output and declining marginal returns from the land.
- Since the farming is neither profit motivated, nor market dependent, there is not much effort to make the farming cost-efficient.
- Subsistence farming is dominated by small and marginal farmers and in many cases the farm sizes are below the limits of economic viability.
- Primary emphasis is given on the product of cereals like rice or wheat. Coarse grains are cultivated in those areas where conditions are not suitable for the cultivation of these two crops.
- Although technology is predominantly traditional, in some areas modern technology is being introduced to increase the return from agricultural land.

6.4 Commercial Farming

Farming is identified as commercial when the crops are cultivated with the main objectives of selling those crops in the market and earning profit. So, commercial farming is always market oriented and profit-motivated. Consumption of the products by the farmers, if at all takes place, is an increasing proportion of the total production. Demand patterns and price structure are the major determinants of production in this farming system. Farming is organized and an effort towards excessive production is deliberately avoided to maintain price stability because more supply as compared to demand may bring down the price.

Commercial farming is important in North America, Europe and Oceania. It is also significant in Argentina, Chile and portions of Brazil in South America. In recent years, commercial farming is gaining significance in the countries of East and South-East Asia.

Major Characteristics:

- Temperate climatic areas are favourable for commercial farming.
- Population fed by commercial farming is normally non-farm population who lives in urban areas and engaged in non-agricultural activities.
- Commercial farming is more commonly extensive type and as a result most of the commercial farms are large and the trend is toward even larger farms.
- Minimization of the cost and maximization of per capita output are the two most important objectives in this farming and to fulfill these objectives machinery, fertilizer and high yielding varieties of seeds are used extensively.
- Commercial farming is integrated with other allied activities and these include storage, processing, canning or packing, wholesaling and retailing of the products etc. All these activities generate employment and boost up the economy.
- Monoculture (using the farm land for only one crop) may be associated with commercial farming. This has the advantages of increasing efficiency and quality of produce (by means of specialist techniques, scientific innovation and labour specialization) while at the same time reducing the costs.
- Labour input in commercial farming of the developed countries is low resulting into a low man-land ratio. This is primarily for the purpose of cost reduction and obtaining high per capita output.

6.5 Forestry

Forestry is the science and craft of creating, managing, using, conserving, and repairing forests and associated resources for human and environmental benefits. Forestry is practiced in plantations and natural stands. The science of forestry has elements that belong to the biological, physical, social, political and managerial sciences. Modern forestry generally embraces a broad range of concerns, in what is known as multiple-use management. including the provision of timber, fuel wood, wildlife habitat, natural water quality management, recreation, landscape and community protection, employment. aesthetically appealing landscapes, biodiversity management, watershed management, erosion control, and preserving forests as “sinks” for atmospheric carbon dioxide. Forest ecosystems have come to be seen as the most important component of the biosphere and forestry has emerged as a vital applied science, craft, and technology. Forestry is an important economic segment in various industrial countries. For example, in Germany, forests cover nearly a third of the

land area, wood is the most important renewable resource, and forestry supports more than a million jobs in a country.

6.6 Fishing

Fishing is the activity of trying to catch fish. Fish are normally caught from ocean and inland water bodies. Techniques for catching fish include spearing, netting, angling and trapping. Inland fishing is generally small in Scale. Subsistence fishing is practiced in ponds, lakes, rivers etc. using traditional techniques such as rod and tackle, arrows and harpoons throw nets and drag nets, etc. Commercial fishing is the capture of fish for commercial purposes. Commercial fishermen harvest almost all aquatic from tuna, cod and salmon to shrimp, krill, lobster, clams, squid and crab. Commercial fishing methods have become very efficient using large nets and sea-going processing factories. Individual fishing quotas and international treaties seek to control the species and quantities caught.

Commercial fishing gear includes weights, seine nets, trawls, dredges, hooks and line (long line and hand line), lift nets, gillnets, entangling nets and traps. Among the total production, over 90% is marine and less than 10% is inland.

6.7 Mining

Mining is the extraction of valuable minerals or other geological materials from the earth, usually from an ore body, lode, vein, seam, reef or placer deposit. These deposits form a mineralized package that is of economic interest to the miner. Ores recovered by mining include metals, coal, oil shale, gemstones, limestone, chalk, dimension stone, rock salt, potash, gravel, and clay. Mining is required to obtain any material that cannot be grown through agricultural processes, or feasibly created artificially in a laboratory or factory. Mining in a wider sense includes extraction of any non-renewable resource such as petroleum, natural gas, or even water. Mining of stones and metal has been a human activity since pre-historic times. Modern mining processes involve prospecting for ore bodies, analysis of the profit potential of a proposed mine, extraction of the desired materials, and final reclamation of the land after the mine is closed.

Mining operations usually create a negative environmental impact, both during the mining activity and after the mine has closed. Hence, most of the world's nations have passed regulations to decrease the impact. Work safety has long been a concern as

well, and modern practices have significantly improved safety in mines.

Levels of metals recycling are generally low. Unless future end-of-life recycling rates are stepped up, some rare metals may become unavailable for use in a variety of consumer products. Due to the low recycling rates, some landfills now contain higher concentrations of metal than mines themselves.

6.8 Summary

Primary activities are vital not only for the economy but also for the sustenance of the human race. One can say that primary economic activities form the 'building block' of other economic activities.

Unit 7 □ Secondary Activities: Manufacturing (Cotton Textile, Iron and Steel). Concept of Manufacturing Regions, Special Economic Zones and Technology Parks

Structure

7.1 Objective

7.2 Introduction

7.3 Manufacturing Industry: Cotton Textile

7.4 Manufacturing Industry: Iron and Steel

7.5 Concept of Manufacturing Regions

7.6 Special Economic Zones

7.7 Technology Parks

7.8 Summary

7.1 Objective

The students will learn about the secondary activities that lead to secondary production after manufacturing, processing and construction.

7.2 Introduction

Manufacturing sector known as secondary sector. sometimes as production sector, includes all branches of human activities that transform raw materials into products or goods. The secondary sector includes secondary processing of raw materials, food manufacturing, textile manufacturing and other industrial activities.

7.3 Manufacturing Industry: Cotton Textile Industry

The textile industry is primarily concerned with the design, production and distribution of yarn, cloth and clothing. The raw material is cotton. Cotton is the world's most important natural fiber. In the year 2007, the global yield was 25 million tons from 35 million hectares cultivated in more than 50 countries. There are three stages of textile processing i.e. Spinning - giving yarn, Weaving - giving fabrics and Finishing - giving textiles.

The major cotton textile belts are discussed below:

United States :

The United States of America is one of the front-runners among the textile manufacturing countries. Though the industry had to overcome several hurdles from the very early period of growth, the country maintained her lead position in textile production. The first cotton mill was established within Rhode Island in 1790. Since then, numerous industries were set up in the USA.

The development of the US textile industry had gone through two distinct phases. The first phase of development had experienced the ascendancy of New England areas as a seat of cotton textile industry and the second phase was the tragic downfall of New England and rise of the southern states as textile producer. This shift of location was an unique event in the manufacturing history of the world.

Development during First Phase:

In the late 18th century, New England and adjacent areas were developed at a very rapid pace. The areas bounded by the Merrimac River and Fall River grew at a faster pace. The adjacent areas of the Massachusetts, Providence attracted a large number of cotton mills within its territory.

Several factors proved advantageous for this massive growth of New England at that period.**These were:**

- Development of water power from small, turbulent streams.
- The skilled labourers were available in the vicinity. They had the traditional expertise of spinning and weaving. The local inhabitants collected and gained the knowledge from the emigrants of Great Britain.
- The facilities of export and import of materials through the ports of Boston and Providence.
- The humid climate of New England. The climate of New England was most suitable for spinning.
- Large financial help from the local urban tycoons.
- Cheap female worker from the surrounding regions.

- Despite all these advantages, New England region gradually lost all of its glory. The industry started growing in the southern part of the country.

Development during Second Phase:

At the early quarter of 20th century, the New England region literally experienced a textile boom. The textile industry attained such a high degree of development that it was regarded as the 'textile capital' of the world. At that time, more or less 90 per cent of the textile goods was produced by New England.

The cotton was then largely brought from the southern cotton growing districts. In south, the absence of the advantages enjoyed by New England was liable for the poor growth of textile industry. But the supremacy of the New England area did not last long. The initial advantages of low price of land, cheap labour and port advantages lost their significance with the passage of time.

The machines became obsolete, cost-benefit ratio became unfavorable due to low productivity, the increasing rent of the land, high wage rate, housing problem, switch over to electric power from traditional water power and above all dearth of raw material supply posed obstacles to the New England textile mills.

The decline of the New England mills and rise of the southern textile industry were closely related. The humidity factor which was regarded as the major obstacle for the development of textile mills in the south had no meaning when air-conditioning system was introduced.

From the very early periods, the southern Piedmont planes of Georgia, Florida, Carolina, Alabama, Virginia, Tennessee and Kentucky were the producers of most of raw cotton in the country. To ensure the steady supply, textile mills gradually shifted towards cotton-growing regions.

The major reasons for growing importance of the textile mills in the southern states are as follows:

- o Easy access to abundant raw cotton within reach.
- o Relative advantage of transport facilities, due to proximity and assured availability.
- o Relative advantage of labour cost played a vital role in the development of the southern textile mills. The surplus agricultural labours were absorbed in the

industry at a much cheaper rate than New England.

- o Development of electric power in the southern states also played a vital role in shifting the industry.
- o The new textile mills in the south adopted latest technology and sophisticated machines for the production. Therefore, quality of the product was superior than the New England counterpart.
- o The low trade union activity.

At present, the southern textile centres have a distinct superiority in the textile production. The textile plants in the Georgia and both the Carolinas are dominating the US textile industry. Even in the case of synthetic fiber production, this region has an edge in production over other textile producing centres.

Present Position:

In spite of the overall growth of the US industry, in recent years it is facing keen competition from the upcoming textile producing countries like Japan, Taiwan, Korea and India. The low production cost gives these countries a distinct advantage over the US textile industry.

CIS:

The first textile plant in the former Soviet Union was established in Ivanovo, near Moscow. Since then, the industry has undergone a sea-change in production. After the first quarter of the 19th century, after meeting the domestic requirement, the country started to export some of her surplus product.

After the downfall of the Tsarist period, sound policy of the Communist regime, large domestic market and excellent productivity rate per worker enabled the country to increase the existing capacity many more times. The decentralization policy of the new rulers forced the industry to disperse in the interior region from its former Moscow-Tula-Ivanovo-Oblast location.

The increased cotton production in the Ukraine, Caucasus, Kazakh Upland and Crimea attracted a number of industries. The old industries were modernized and uneconomic plants were closed down. The age-old Moscow-Tula textile centres started to produce quality goods instead of large-scale production.

Apart from the old Ivanovo-Leningrad regions, new centres have developed near Tashkent, Stalinabad, Askabad, Kirovabad and Georgia. At present, there are 1.3 million looms working in the CIS with an annual production of more than 8,000 million square metre cloths.

Japan:

Prior to the industrial boom after Second World War, cotton textile industry was the fore-runner among the various industries. Despite the loss of relative importance, textile industry still constitutes more than 12 per cent of the value of total industrial production of Japan.

Unlike the large textile mills of other countries, Japanese textile producing centres are still very small. Most of the yarn production comes from innumerable small centres, scattered all over the Japanese archipelago. The beginning of textile industry in Japan dates back to 1867, when the first textile mill took its birth in the vicinity of S. Kyushu.

Till the outbreak of Second World War, Japanese textile industry grew at a much faster rate. The growth rate was so high that soon it surpassed the production of Britain. During the initial period, Chinese yarn market imported bulk of the Japanese product. At the middle of 20th century, Japan became one of the largest cotton textile producing nations. The importance of textile in her economy was very significant as it contributed more than 30 per cent of the export value.

After Sino-Japanese war and two subsequent World Wars, Japan lost much of her Chinese yarn trade. Due to shrinkage of international demand of Japanese textile product, the industry had no other options left but to look towards home market. Due to massive industrialization in Japan, purchasing power of the people decreased considerably.

Gradually Japanese textile industry became more and more dependent on national market. Due to rise of workers, wage rate, high production cost, average price of Japanese textile products have gone up and Japan concentrated more on the manufacturing of quality products.

Japan has to import almost all of the raw materials needed in textile industry. The pioneer attempts to set up industries were made around cotton growing tracts of Nobi and Kanto regions. Now the major textile centres are located at Chukyo,

Hanshin, Toyama, Kyushu and Keihin and also at Osaka and Nagoya. Spatially, majority of the cotton mills are located within the northern half of Japan.

The bulk of the textile goods are produced in following regions:

- The Kwanto Plain,
- Nagowa,
- The Kinki Plain, and
- Along the Northern Coast.

As a whole, Japanese textile industry had undergone a complete metamorphosis from that of 17th century. After the complete destruction of the industry during Second World War, it took only fifteen years for complete revival of the industry. In fact, within 1960, the textile export increased in such a rate that Japan itself was forced to curb the export. Later on, it had to face restrictions on export in several countries.

As the industry became more and more export-oriented, textile establishment gradually shifted towards coasts. At the beginning of the decade of 1990s, old obsolete mills closed down their productions. The new mills with updated machineries came into the same.

Most of the Japanese textile mills are now using the latest technologies. The priority was given to reduce the cost of production. Soon, Japan became the exporter of not only textile products but also the textile machines. At present, a healthy competition is discernible between small scale sectors and the big industrial estates of textile industry.

China:

This is one of the oldest type of manufacturing industry in China. It provides employment to a large section of working force. Since very old days, weaving and spinning were normal practices of village weavers. Most of the output was contributed by cottage industries. The overall development of cotton textile industry in China is indeed a recent phenomenon.

Till the end of Second World War, production of textile goods in China was insignificant and China was considered as the largest single textile market in the world. After the takeover of Communists, proper efforts were taken to develop national textile industry.

In the Five Year Plan period from 1953, priorities were laid down to achieve self-sufficiency in the production of textile goods. Even today, one quarter of the production

is contributed by the village households. The communes introduced independent co-operatives for the development of textile goods.

Distribution:

The textile mills are distributed throughout China. The dominant centres are Shanghai, Manchuria, Tangshan, Beijing, Chuang, Nanchang and Lanchow.

Shanghai is the oldest centre. At its initial stage of development, foreign capital, technology and management were responsible for the growth. This centre was primarily constructed for the manufacturing of coarse variety goods.

The Manchuria textile units were mostly developed by the colonial Japanese. During Second World War and Communist Movement, most of these mills were destroyed. During Five Year Plan period, stress was given for the development of smaller units. Several units were developed within Yangtze river valley.

At present, more than 55 per cent of the mills are concentrated within the rectangle formed by Tientsin, Shantung, Shanghai and Kaiteng. In the southern Hwangho river valley, Honanfu is the major textile centre, where quality goods are produced. In the Yangtze river valley, textile mills are concentrated within Chungking and Hankow.

Tientsin was one of the oldest textile producing centres of China. The textile mills and woolen factories, however, lost their pre-eminence after the initiation of Communist rule. The Beijing-Hankow industrial conurbation including the smaller towns of Paoting, Singtai, Chengchow, emerged as leading textile centres. Even today, these mills are operative. Tsingtao became famous for carpet production.

Of course, among all the textile-producing centres, Shanghai was most important. At one stage, this region produced more than 70 per cent of the Chinese textile production. The emergence of different textile centres lowered the relative importance of Shanghai, but it still maintains dominating role in textile industry.

The adjacent Hankow region now produces huge amount of textile products. The Wushan integrated textile plants contribute significant amount of cotton products. The Canton textile units were set up very recently. As the plants are modern, output of textile goods per worker is very high in this region.

The United Kingdom:

The Industrial Revolution in the 18th century gave the impetus to the development of cotton textile industry in Great Britain. The subsequent invention of spinning machines encouraged the growth. The humid climate and local skilled labour helped a lot during the initial period of development.

The cotton textile industry in the United Kingdom attained such a high fame that at end of 19th century the country became the undisputed leader of the cotton textile industry. The early centres were developed around Scottish lowlands, Nottingham, Ireland and Lancashire.

Gradually, Lancashire became the most developed textile centre in the world. Gradually, the other centres became insignificant and Lancashire earned world-wide fame in the production of high quality products. Several factors were responsible for the development of Lancashire in its early phase.

The factors were:

- o The optimum climatic condition of Lancashire with mild humid climate.
- o Skilled local labours and cheaper wage rate.
- o Abundant water resource in the proximity and the softness of water.
- o Presence of coal within Pennine hill range.
- o Low development of other industries.
- o Cheap price of the land.
- o Undulating rolling plain land and low development of agriculture.

All these factors helped immensely for the early growth of textiles in Lancashire region. Lancashire region alone contributed 50 per cent of the world's production till First World War. Since then, the relative position of Lancashire textile industry decreased considerably.

The overall decrease of consumption of cotton goods in UK, loss of overseas market and emergence of new textile-producing nations like China, Japan, India and worn out condition of the mills were the principal reasons for the large-scale decline of Lancashire cotton industry.

The growing trade union activities, low productivity of the labour, out-dated machines and use of substitute materials gave severe blow to Lancashire industry.

Since Second World War, the industry was able to revive some of its lost ground though the early dominance was gone for-ever. At present, United Kingdom is not considered a major textile-producing nation. At least 15 other countries produce more textile goods than United Kingdom.

Germany:

Germany is one of the leading producers of cotton textile. It is the seventh largest producer of textile goods. The history of cotton textile industry in Germany is quite old. Initially, the industry was set up depending upon imported cotton. Most of the industries were developed along the Rhine river valley. The Rurh industrial region soon became a leading textile centre.

Unlike Great Britain, German textile centres were dispersed in nature and smaller in scale. Apart from Westphalia, Rurh, the other textile centres are situated within the urban markets of Frankfurt, Munich, Bremen, Zwickaw, Chemnitz, Hamburg and Wupper river valley.

Countries	Total Production in Million MT
China	284
India	226
USA	158
Pakistan	115
Indonesia	75
Bazil	40
Turkey	40
Korea	23
Italy	20

Source: Statistical Year Book-2018

Other Producing Countries:

Among the other producing countries, Italy, France, Switzerland, Belgium, Poland, Spain in Europe, Brazil, Mexico in American continents and Hong Kong, Egypt, Bangladesh, Pakistan in Afro-Asian continents are important.

The French cotton textile industry had a long history. From the beginning, France was deficient in raw cotton production. The textile industry in France was developed on imported cotton, particularly from USA. The industry is concentrated in the north-eastern industrial re-gions. The major textile-producing centres are Belford, Kolman, Nansi etc. France is self-sufficient in the production of textile goods.

Italy is the other major textile-producing country in Europe. Italian industry was basically market-oriented. Ample cheap labour and sufficient hydro-electricity helped the industry to grow. The major textile centres are Naples, Milan, Bergamo etc.

In Switzerland, northern part of the country possesses some noted cotton textile centres. The most important centre is Saint Galen. In South America, Brazil is the most important textile-producing nation. Most of the textile factories are new. It is the major supplier of cotton piece goods in entire Latin America.

The textile mills are located around the urban centres of Rio De Janeiro, Sao Paulo, Rio Grande and Minas Gerais. Mexico is the other cotton textile manufacturing country. Larger textile units are concentrated around Mexico City and Orizaba.

India:**Growth and Development of Cotton Textile Industry:**

India held world monopoly in the manufacturing of cotton textiles for about 3,000 years from about B.C. 1500 to AD. 1500. In the middle ages, Indian cotton textile products were in great demand in the Eastern and European markets.

The muslins of Dhaka, chintzes of Masulipatnam, calicos of Calicut, baftas of Cam bay and gold-wrought cotton piece goods of Burhanpur, Surat and Vadodara acquired a worldwide celebrity by virtue of their quality and design.

The first modern cotton textile mill was set up in 1818 at Fort Glaster near Kolkata. But this mill could not survive and had to be closed down. The first successful modern cotton textile mill was established in Mumbai in 1854 by a local Parsi entrepreneur C.N. Dewar. Shahpur mill in 1861 and Calico mill in 1863 at Ahmedabad were other landmarks in the development of Indian cotton textile industry.

The real expansion of cotton textile industry took place in 1870's. By 1875-76 the number of mills rose to 47 of which over 60 per cent were located in Mumbai city alone. The industry continued to progress till the outbreak of the First World War in 1914. The total number of mills reached 271 providing employment to about 2.6 lakh persons.

The First World War, the Swadeshi Movement and the grant of fiscal protection favoured the growth of this industry at a rapid pace. Demand for cloth during the Second World War led to further progress of the industry. Consequently, the number of mills increased from 334 in 1926 to 389 in 1939 and 417 in 1945. Production of cloth also increased from 4,012 million yards in 1939-40 to 4,726 million yards in 1945-46.

The industry suffered a serious setback in 1947 when most of the long staple cotton growing areas went to Pakistan as a result of partition. However, most of the cotton mills remained in India. Under such circumstances, India faced a severe crisis of obtaining raw cotton.

The country had, therefore, to resort to large-scale imports of long staple cotton which was an extremely difficult task in view of the limited foreign exchange reserves. The only solution to this problem was to increase hectare-age and production of long staple cotton within the country. This goal was achieved to a great extent in the post partition era.

Present Position:

At present, cotton textile industry is largest organized modern industry of India. There has been a phenomenal growth of this industry during the last four decades. About 16 per cent of the industrial capital and over 20 per cent of the industrial labour of the country is engaged in this industry. The total employment in this industry is well over 15 million workers.

There are at present 1,719 textile mills in the country, out of which 188 mills are in public sector, 147 in cooperative sector and 1,384 in private sector. About three-fourths were spinning mills and the remaining one-fourth composite mills. Apart from the mill sector, there are several thousand small factories comprising of 10 looms.

Some of them have just one loom. These are based on conventional hand loom in the form of cottage industry and comprise decentralized sector of this industry. The constitution of decentralized sector is much more than the organized sector.

It has increased rapidly from a mere 19.31 per cent in 1950-51 to 58.96 per cent in 1980-81 and made a sudden jump to 87.95 per cent in 1990-91. It gradually improved during the first half of 1990s and stood at 94.63 per cent in 2003-04.

Production:

Cotton cloth is produced in three different sectors viz., 1. Mills, 2. Power-looms and 3. Handlooms.

Mills:

The mill sector played a dominant role in cotton textile industry at the initial stage. But its importance was reduced drastically with the growth of power looms and handloom. The share of mill sector in cotton cloth production came down from 80.69 per cent in 1950-51 to only.

Power looms:

The decentralized power loom sector plays a pivotal role in meeting the clothing needs of the country. The production of cloth as well as generation of employment has been rapidly increasing in power loom sector. This sector not only contributes significantly to the cloth production in the country but also provides employment to millions of people.

The power loom industry produces a wide variety of cloth with intricate designs. The power loom sector accounts for about 63 per cent of the total cloth production in the country and contributes significantly to the export earnings.

The production of cloth as well as employment has been increasing in the power loom sector. During 2002-03, the production of cloth in the decentralized power loom sector was 18,281 million sq. meters while the employment generation was 4.23 million. The corresponding figures estimate for 2003-04 were 17,071 million sq meter and 4.18 million respectively.

Handlooms:

The handloom sector provides employment to over 65 lakh persons engaged in weaving and allied activities. The production of handloom fabrics registered more than fifteen fold increase from 500 million sq metres in 1950-51 to 7,585 million sq metres in 2001-02.

This sector constitutes nearly 14 per cent of the total cloth produced in the country and also contributes substantially to the export earnings.

Table 27.4 shows that the production of spun yarn and cotton cloth has increased considerably during the 53 years from 1950-51 to 2003-04. The production of spun yarn registered more than fourfold increase from 533 million kg in 1950-51 to 2,121 million kg in 2003-04.

Although the total production of cotton cloth increased considerably, the share of mill sector has been drastically reduced. This is an indication of our efforts to decentralize the industry and create greater employment opportunities.

There are about 40 lakh handlooms and about 5 lakh power looms in the decentralized sector. Although they are widely distributed throughout the country, states of Tamil Nadu, Uttar Pradesh, Assam and Manipur account for nearly 50 per cent of the production capacity.

The rest are scattered in Nagaland, West Bengal, Madhya Pradesh, Andhra Pradesh, Maharashtra, Kerala, Rajasthan, Haryana and Jammu and Kashmir. Power looms contribute an overwhelmingly large percentage of production of fabrics.

Production of Cotton Cloth (Mill Cloth) in India, 2002-03 :

State/Union Territory	Production Mtr	in Sq Percentage of all India production
1. Maharashtra	3,82,257	39.38
2. Gujarat	3,21,775	33.14
3. Tamil Nadu	64544	6.69
4. Punjab	55,784	5.75
5. Madhya Pradesh	47305	4.87
6. Uttar Pradesh	32386	3.34
7. Rajasthan	28384	2.92
8. Pondicherry	24357	2.51
9. Karnataka	7,222	0.74
10. Kerala	6342	0.66

Locational Factors:

Several factors, like availability of raw cotton, market, transport, etc. play a key role in the localization of cotton textile industry. The significance of raw cotton is evident from the fact that 80 per cent of the industry is coterminous with the cotton growing tracts of the country.

Some of the important centers such as Ahmedabad, Solapur, Nagpur, Coimbatore and Indore are located in the areas of large scale cotton cultivation.

Mumbai is also not far away from the cotton producing areas of Maharashtra and Gujarat which have contributed a good deal in the localization and growth of cotton textile industry here. It is equally important to note that cotton is a pure raw material, in the sense that it does not lose much of its weight in the process of manufacturing and the slight loss in weight is more than compensated by the use of sizing materials.

There is not much of difference between the cost of transporting raw cotton and finished cloth. Both can be transported with equal ease and without adding much to the total cost of production. Hence, this industry normally tends to be located at such centers which have favourable transport facilities with respect to market. In other words, it is primarily a market oriented industry.

With tropical and sub-tropical climate, all parts of India provide vast market potential for cotton textile industry. West Bengal, Bihar, Uttar Pradesh, Kerala and Orissa do not grow cotton and still have large number of big centers where cotton textile industry has flourished well.

Thus although in earlier stages of industrialization, cotton textile manufacturing was concentrated in Mumbai, it has witnessed great spatial spread and now covers almost the entire country. Since, it was a traditional cottage industry, cheap and skilled labour was readily available. The most notable feature of the distribution of the industry is that even within a state, the industry is localized within particular areas and regions, almost to the complete exclusion of others.

Dispersal of industry from the old nuclei started after 1921 with railway lines penetrating into the peninsular region. New centers like Coimbatore, Madurai, Bangalore, Nagpur, Indore, Solapur and Yadodara were favourably located in respect to raw material, market and labour than places of original locations. This industry also reached some places with some additional advantages, such as nearness to coal (Nagpur), financial facilities (Kanpur) and wide market with port facilities (Kolkata).

Dispersal of cotton textile industry was further boosted with the development of hydroelectricity. The growth of this industry in Coimbatore, Madurai and Tirunelveli is largely due to the availability of hydroelectricity from Pykara dam. The industry also tended to shift from areas of high labour cost to those with low labour cost. The labour cost factor played a crucial role in establishing this industry at Madurai, Tirunelveli, and Coimbatore.

Distribution:

Although cotton textile mills are located in over 80 towns and cities of India, yet its larger concentration is found in Maharashtra, Gujarat, West Bengal and Uttar Pradesh. The spatial distribution of cotton textile industry in India.



Cotton Textile Industry in India

Maharashtra :

Maharashtra excels all other states in the development of cotton textile industry. It produces 39.38 per cent mill cloth and 10.79 per cent yam of India. About three lakh workers are engaged in this industry in Maharashtra. Mumbai is the largest centre in India having 63 mills out of Maharashtra's total of 122 mills. Mumbai is rightly called the Cotton polis of India.

Mill Production of Cotton Yarn in India, 2002-03:

State/Union Territory	Production in kilograms	Percentage Million production	of all India
1. Tamil Nadu	968		44.46
2. Maharashtra	235		10.79
3. Punjab	203	9.32	
4. Gujarat	176	8.08	
5. Madhya Pradesh	98	4.51	
6. Haryana	98	4.51	
7. Andhra Pradesh	82	3.77	
8. Rajasthan	78	3.58	
9. Kamataka	66	3.03	
10. Uttar Pradesh	46	2.12	
11. H imachal Pradesh	43	1.97	
Others	84	3.86	
Total	2,177	100.00	

Following are the main reasons of phenomenal growth of cotton textile industry in and around Mumbai.

- Mumbai enjoys humid climate whsich is helpful for this industry because thread does not break so frequently.

- Mumbai is a very important port which helps in import of machinery and long staple cotton and export of cloth.
- Cheap hydro-electricity is readily available from the nearby areas.
- The black-cotton soil in the hinterland of Mumbai provides cotton as the basic raw material.
- Cheap labour can be drawn from the surrounding areas.
- There is ready market for Mumbai products both in India and abroad.
- Mumbai is well-connected by a network of roads and railways which help in easy transportation of raw material and finished goods.
- Facilities for washing and dyeing also exist here.
- There is no dearth of capital inputs.
- Mumbai has the advantage of an early start.

Apart from Mumbai, Solapur, Pune, Kolhapur, Satara, Wardha, Nagpur, Aurangabad, Amravati, Akola, Sangli, Chaligaon, Miraj, Matheran, Jalgaon, etc. are other centres of cotton textile industry in Maharashtra.

Gujarat :

Gujarat is the second largest producer of cotton textiles. This state accounts for over 33 per cent of the mill cloth and over 8 per cent of the yarn production of the country. Ahmedabad is the largest centre where 73 out of 118 mills of Gujarat are located. Ahmedabad is the second largest centre of cotton textile industry after Mumbai. Following facilities are available to Ahmedabad :

- Ahmedabad lies near the main cotton belt of India and there is no problem of obtaining raw cotton.
- Climate is humid and is suited to this industry.
- Cheap power is readily available.
- Cheap and skilled labour is drawn from the nearby areas.
- Ahmedabad is served by a network of railways and roadways.
- Land at Ahmedabad is much cheaper as compared to that in Mumbai.
- Most of Ahmedabad mills produce cheap cloth which finds a ready market among the poor masses of India.

The other important centres of Gujarat are Vadodara, Bharach, Surat, Rajkot, Porbandar, Maurvi, Bhavnagar, Viramgam, Sidhpur, Kelot, Kadi, etc.

Madhya Pradesh :

Cotton is locally grown. Coal provides necessary energy. Abundant cheap labour is available due to backward economy of the masses. Gwalior, Ujjain, Indore, Dewas, Ratlam, Jabalpur, Bhopal, etc. are important centers.

Tamil Nadu :

Among the southern states, Tamil Nadu is an important cotton textile producer. Although Tamil Nadu produces only about 6 per cent of the mill cloth of India, the state excels all other states in the production of yarn and accounts for over 44% of the total yarn production of the country.

Coimbatore is the most important centre having 200 mills out of Tamil Nadu's 439 mills and is known as Manchester of South India. But Tamil Nadu's mills are of smaller size and give comparatively less production. Other important centers are Chennai (10 mills), Madurai, Tirunelveli, Tiruchchirappalli, Salem, Perambur, Tuticorin, etc.

West Bengal :

Kolkata is the most important centre of Cotton textile industry in West Bengal. It enjoys facilities of a port, humid climate, coal from Raniganj, local labour high density of population (for demand) and dyeing and washing facilities. But Kolkata suffers from the disadvantage of being away from the main cotton- producing arks of India. The other important centres are Haora, Murshidabad, Hugli and Sirampur etc.

Uttar Pradesh :

Most of cotton textile industry has developed in the western part of Uttar Pradesh. Kanpur is the largest centre and is known as Manchester of Uttar Pradesh. This city has 10 out of 52 cotton textile mills of the state. Other important centers are Moradabad, Varanasi, Agra, Bareilly, Aligarh, Modinagar, Saharanpur, Rampur, Etawah, Lucknow, Mirzapur, etc.

Other cotton textile producing states are Andhra Pradesh, Kerala, Bihar, Rajasthan, Punjab, Harayana and Karnataka.

7.4 Iron and Steel Industry

The growth and development of iron and steel industry is a reflection of global economy. The iron and steel industry depicts a changing nature in its growth and production pattern. America, Western Europe and Japan accounted for nearly two-third of the world's steel production. But gradually the spatial pattern has changed and attention has now shifted to the developing regions. Towards the end of the last century, the growth of steel production in countries like China, South Korea, Brazil and India has changed the entire pattern of steel production in the world. Now main producers of iron and steel in the world are China, Japan, USA, Russia, Germany, South Korea, Brazil, Ukraine, India, France, Italy and Great Britain. The other steel-producing countries are South Africa, Australia, Austria, Netherlands, Czech Republic, Romania, Spain, Belgium, Sweden, etc. Table I 0.1 indicates the production of iron and steel in major countries of the world.

China is the leading producer of iron and steel in the world, which accounts for about 23.9 per cent production of pig iron and 17 per cent of crude steel of the world's production. Japan is the second largest producer with 14.7 per cent pig iron and 13.9 per cent crude steel production of the world. USA once the highest producer now ranks third in the world followed by Russia. India's position is 9th in the iron and steel production and its production of pig iron and crude steel accounts for 3.9 and 3.6 per cent respectively.

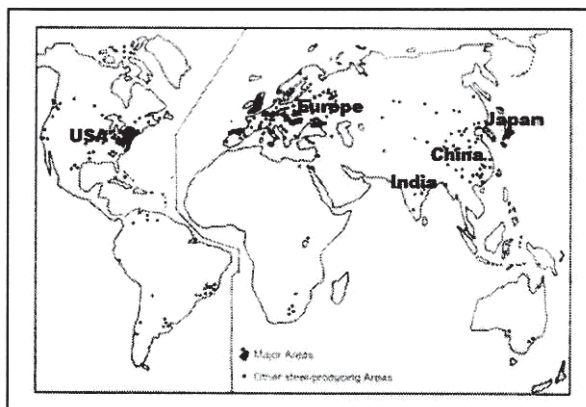
The spatial distribution pattern of iron and steel industry in major countries of the world is as follows:

China:

Since 1973, growth of steel production in China was spectacular and within a span of 15 years China was able to increase its production of crude steel to 217 percent. In that period consumption increased 300 per cent. This growth rate clearly reveals the rapid pace of industrialization that is now going on in China.

The iron and steel industry is concentrated in Anshan, Wuhan and Paotow triangle. The biggest iron and steel factory was established in the Chinese mainland at Anshan in Manchuria by Japanese, but was greatly expanded by the Chinese with Russian help. Other iron and steel production centres in Manchuria are Fushun, Penki, Shenyang, Harphin and Kirin.

For Wuhan plants, ore is obtained from Taylh, i.e., 130 km away, and coal from Pingtinghan to the north of Yangtze River. The Wuhan steel plant is also in process of expansion. Other less extensive new steel plants are being created in Siangtan (Hunan), Tientsin, Tangshan, Nanking, Shanghai, etc.



Major Iron and Steel Industry in World

At present, China has following important areas of iron-steel industry:

- Southern Manchuria is the largest steel plant of China at Anshan and other plants at Pensihu and Mukden.
- Shansi is also an old region of iron and steel production. In this region Taiyuan has been developed as a major steel centre.
- The Lower Yangtze Valley : In this region Hankow, Shanghai, Hanyang and Chungking are the main centres of iron and steel industry.
- Other centres are located at Paotow, Chinling Chen, Canton, Singtao and Huangsih.

Japan :

In spite of the shortage of raw material (iron and coal), Japan has become one of the leading steel producers of the world. After China, Japan is the second largest producer of pig iron and crude steel in the world.

Yawata, the first steel plant was built in 1901 by government. Yawata is a major centre of heavy industry with about one fifth of Japan's steel capacity. Kamaishi in Honshu and Muroran in Hokkaido are small tidewater plants.

The number of large-scale plants directly connected with regional mineral resources and those plants are only in Kamaishi, Kosaka, Osarizawa, Hassei (Akita), Hosokura (Miyagi) and Fujine (Iwate).

Over half of the Japan's steel capacity is concentrated near the major port cities of Himeji, Kobe-Osaka and Tokyo-Yokohama areas of South Central Honshu.

Almost all the iron and steel plants of Japan are situated near tidewater. These steel plants, at or near tidewater, are thus able to draw raw materials from many parts of the world and similarly to ship finished products.

In Japan, large-scale concentration of iron and steel industry has occurred in the following regions :

• **The Tokyo-Yokohama Region :**

It is having all facilities required for the growth of iron-steel industry. The reclamation of Tokyo Bay provided large, extensive plane land for steel manufacturing units. The Tokyo-China region is the main area in which steel industrial units have been developed at Hitachi and North Tokyo.

• **Nagoya Region :**

It contributes about 20 per cent of the Japanese steel production. This region had witnessed a massive growth of industries within the period 1950-60.

• **Osaka-Kobe Region :**

At the head of the Osaka Bay, a highly industrialised area known as the Kinki has developed. The port of Osaka is the main centre. Other centres of this region are Amagasaki, Kobe, Hemegi, Sakai and Wakayama.

• **Fukuoka-Yamaguchi Region :**

It is located in the extreme south of Japan within Kyushu and westernmost end of Honshu. The first government steel plant was established at Yawata in 1901. Kita-Kyushu is another notable iron and steel centre of this region.

• **Oka-Yamaha Region :**

It is a new industrial region situated in between Osaka-Kobe and Hiroshima.

• Hokkaido Region :

The main centre of this region is Muroran. A fairly big sized iron and steel industry has developed here depending upon local coal and iron ore.

The most striking feature in the locational pattern of Japan's steel plants is that they are situated either on the Bay-Coast or on some canal or river. This is because of the fact that most of the Japanese steel plants depend upon outside raw material. Another feature is that they are located in the heart of great industrial districts which provide ready market for finished steel. In fact, localisation of iron and steel industry in Japan is market-oriented.

United States of America :

Once USA was the highest producer of iron and steel but now its rank is third in the world, next to China and Japan. In the US first iron and steel plant was established in 1629 at Massachusetts. During last 380 years or so the US steel industry has undergone through several changes. This change has not only occurred in growth and production pattern but also in localization pattern. The major iron and steel regions in the USA are as follows:

• Appalachian or Pittsburgh Region :

The most important of all the regions is the northern Appalachian region of western Pennsylvania and eastern Ohio. This district contains about 42.5 per cent of the blast furnace capacity of the country and its centre, Pittsburgh, is the second greatest centre of steel industry in the world. The mills in this region are located almost exclusively in the narrow valleys of the headwater streams of the Ohio River, including the upper reaches of the Ohio itself.

The region, often known as the Pittsburg-Youngstown region, includes several districts. The Pittsburgh district consists of industries located in the valleys of the Ohio, Monongahela, and Allegheny, within 60 km of Pittsburgh.

The Youngstown or the 'valley' districts consist of industries in the valleys of the Shenango and the Mahoning rivers.

Wheeling, Johnstown, Stenhenville and Beaver Falls are other important steel-producing centres. The chief disadvantage of the region is its remoteness from the sources of iron ore supplies, which come from the Lake Superior region partly by rail and partly by water.

- **Lake Region :**

The lake region falls into :

- (a) The Lake Erie ports; Detroit Cleveland and Buffalo, etc.;
- (b) The centers near the head of Lake Michigan, Chicago-Gary or Calument district; and
- (c) The Lake Superior region, Duluth. These districts represent a somewhat different adjustment to the three factors in the localisation of the industry, coal, iron and market. The Lake Erie ports are nearer to the Appalachian coal, but farther from the iron ore than the Duluth region.

The Michigan region is midway between the two. One important advantage that all these districts enjoy over the Pittsburg region is that, owing to their location on the lake shores, one extra handling of iron ore is eliminated.

On the other hand, these centres are located a little away from the market. Duluth, for example, has in its immediate hinterland the forest, farm, and the ranching country, with little demand for iron and steel goods.

Detroit is the largest steel consuming centre in the USA particularly because of its automobile industry.

- **Atlantic Seaboard Region :**

On the Atlantic Seaboard, it is only the Middle Atlantic region 8', Jew York, Philadelphia and Baltimore, etc. are important. The chief advantage that this region enjoys is in respect of its location, both in relation to the tidewater, and the proximity to the large industrial centres of the East.

Its location near the centre of the great manufacturing region of the Atlantic Seaboard, the region of the densest population, and of the most intense industrial development in North America, is the most remarkable.

The Middle Atlantic region is the only major region in which the production of pig iron and steel is notably greater, in proportion, than the iron ore consumed, because of the relatively larger amount of scrap available in this highly industrialized region.

There are many steel mills in this region which operate without blast furnaces, depending both on scrap and pig iron imported from other areas, particularly the Northern Appalachian region.

- **South Appalachian :**

In the Southern Appalachians, in Alabama, however, large deposits of these raw materials are found in closer proximity than anywhere else in North America if not the world. While

the ore is of low grade and requires shaft mining, much of the rock is lime and the ores, therefore, self-fluxing.

The region lacks, however, large industrial centres in the neighborhood and has, therefore, a considerable amount of surplus pig iron which goes to the North.

- **Western Region:**

This region extends from Colorado in the interior to the California on the west. Among the steel regions in the USA, this is a new region. The first steel **mill**, although had been setup in 1882 at Pueblo. Later on steel industries were developed at Fontana in California and Provo at Utah. For these plants, iron ore is obtained from Wyoming and coal from Colorado.

Russia-Ukraine (erstwhile USSR) :

Prior to disintegration in 1991, USSR was the leading steel-producing country of the world. Now also Russia and Ukraine are important iron and steel producers of the world. Russia ranks 4th in the production of pig iron and crude steel, while Ukraine stands 8th in world ranking.

In the post-revolution period, the Soviet steel industry had achieved a remarkable expansion. During the Second World War, however, the Soviet iron and steel industry was affected badly.

Most of the large production centres were either destroyed or damaged. However, soon the country recovered and by 1975 became the largest producer of iron and steel in the world.

The four important iron- and steel-producing regions are:

- **Ural Region :**

It lies on both sides of the Urals. The major steel centres of this region are - Magnitogorsk, Chelyabinsk, Nizhnytagil, Sverdlovsk, Serov, Perm, Orsk, etc. Magnitogorsk is the largest steel-producing centre of Russia.

- **Kuznetsk or Kuzbas Region :**

It is located in the north of the Alai Mountains and south of Tomsk. This steel region is coal-based. The supply of iron ore is from the Ural region. Novokuznetsk is the leading steel centre of this region.

- **Moscow Region :**

Important centres of iron and steel in this region are Tula, Lipetsk, Cherepovetsk and Gorky.

• **Others :**

Other regions are isolated and developed in various parts. These are Baikal, St. Petersburg, Lower Amer valley and Pacific coastal region.

Ukraine :

Now, Ukraine has 8th position in world s production of iron and steel. In this region all the raw materials, i.e., iron ore, coal, limestone, manganese are available for steel production.

A dense network of railways and cheap water transport facilitate the growth and development of iron and steel industry, The main centres of iron and steel plants are Krivoirog, Kerch, Zhdanow, Tagarerog, Zaporozhye, Pittsburgh, Dniepropetrovsk, etc.

Other notable steel-producing centres are Tbilisi, Tashkent and Bogovat in Uzbekistan and Tamir Tan in Kazakhstan.

Countries	Production (in crore tons)	
	Pig iron	Crude steel
China	131.23	128.5
Japan	80.5	105.4
USA	47.9	102.0
Russia	43.3	55.5
Germany	27.3	41.7
South Korea	24.8	43.4
Brazil	27.7	27.8
Ukraine	25.7	31.7
India	21.3	26.9
France	13.6	20.0
Italy	10.9	26.6
Great Britain	10.9	16.1

Source : World Bureau of Metal Statistics-2018

Germany :

Before World War I, Germany was the second largest iron and steel producer in the world. It was the largest exporter of steel goods in the world. German iron and steel industry was handicapped since after the war of 1914 by the loss of ore, coal and productive capacity.

Germany, however, made a remarkable recovery within a few years, and in spite of her depleted resources she produced in 1939 more than the 1913 production of steel. In 1937 she had established the great Heimann Goering Steel Works at Salzgitter to utilise the grade ores in its Harz Mts.

The division of Germany was the main cause of lower status in terms of iron and steel production. But after re-unification of East and West Germany in 1990, the country is now one of the leading steel-producing countries in the world and ranks 5th in the world with an annual production of 27.3 crore tons of pig iron and 41.7 crore tons of crude steel.

The most important centre of iron and steel industry in Germany is the Rhenish-Westphalia, contributing more than 80 per cent of the steel produced in Germany, and 85 per cent of pig iron. It manufactures a wide variety of specialities.

Other regions of importance are the Siegerland Hessen-Nassau, Northern and Central Germany, Saxony, and South Germany. The greatest centre is Essen in the Ruhr valley where the world famous works of Krupp are situated.

South Korea :

South Korea is the 6th leading country of the world in iron and steel production. It is the third Asian country after China and Japan which produces high-grade steel. Its annual production is 24.8 crore tons of pig iron and 43.4 crore tons of crude steel.

Brazil :

Brazil is the 7th ranking country in iron and steel production in the world. Its annual production is 27.7 crore tons of pig iron and 27.8 crore tons of steel.

The development of the production of steel in Brazil has been spectacular. Since 1973, production of steel has witnessed more than 300 per cent increase. The consumption of steel within the country is very low.

Therefore, Brazil is able to export bulk of her steel production. Most of the steel industries are located around Sao-Paulo and Curumba.

Brazil possesses vast amount of iron ore. The largest of these deposits is located near Minas-Geraes. Another large steel plant is located at Santa Catarina. Most of the mills obtain energy from hydel-power plants.

India :

India has a long history of the use of iron and steel. However, it was only after the first decade of the 20th century that manufacture of iron and steel as a modern industry made a beginning in this country. It was in 1911 that India's first iron and steel plant - the Tata Iron and Steel Company Ltd. (TISCO) was set up in Jamshedpur in Bihar in private collaboration with a US firm. Nearly three and a half decades later another plant was launched at Burnpur in neighbouring Bengal - the Indian Iron and Steel Company Ltd. (IISCO) — with British participation.

At the commencement of Five-Year Plans (1951) there were three steel plants located at Jamshedpur, Asansol and Bhadravati. Not only capacity of these plants was increased but six integrated plants in public sector have been established at Durgapur, Rourkela, Bhilai, Bokaro, Vishakhapatnam and Salem, Apart from these more than 140 mini steel plants have also been set up to meet the growing internal demand. India contains largest iron ore deposits in the world and also has coal reserves, therefore, having very good prospects of further growth of iron and steel industry.

Some of the major Iron and Steel Plants of India are as follows :

Tata Iron and Steel Company (TISCO) :

This is the oldest iron and steel centre of India. It is a private sector enterprise. It was established in 1907 by Jamshedji Tata at Sakchi in Singhbhum district of Jharkhand. Later on, it was renamed as Jamshedpur after Jamshedji. It started producing pig iron in 1911 and steel in 1912.

The plant initially had capacity of producing 1.21 million tonnes of pig iron and 1.1 million tonnes of steel per annum. This capacity has been enhanced to 3.9 million tonnes of pig iron, 2 million tonnes of ingot steel and 3 million tonnes of saleable steel. Currently it produces about 3 million tonnes of saleable steel. Following facilities are available to this centre :

- High grade haematite iron ore is available from Noamundi mines of Singhbhum in Jharkhand and Gurumahisani mines of Mayurbhanj in Orissa. These mines are located at a distance of 75-100 km from Jamshedpur.
- Coal is available from Jharia and Raniganj. Coal mines are located at a distance of 160 to 200 km from Jamshedpur.
- Manganese comes from Joda mines of Kendujhar district in Orissa.
- Dolomite, limestone and fire clay used as flux material are available from Sundargarh district of Orissa.
- Kolkata, located at a distance of 250 km, provides port facilities and its industrialised hinterland provides market for the products.
- Sufficient water for cooling purposes is obtained from Subarnarekha River. In addition to this, the storage dam on Kharkai River also provides water.
- Jamshedpur is well connected with Kolkata, Mumbai and Chennai by road and rail and enjoys good transport facilities.
- Densely populated regions of Jharkhand, Bihar and Orissa provide cheap labour. Major part of labour is drawn from tribal areas of Chota Nagpur plateau.

Indian Iron and Steel Company (IISCO):

Three plants at Kulti, Hirapur and Bumpur in West Bengal were set up in 1864, 1908 and 1937 respectively. These plants have been merged together and are known as Indian Iron and Steel Company (IISCO).

It was brought under government control and management in July 1972. The three plants are linked by Kolkata-Asansol railway line. Hirapur plant produces pig iron which is sent to Kulti for making steel. The rolling mills are located at Bumpur. IISCO enjoys the following advantages :

- Iron ore is available from Guna mines in Singhbhum district of Jharkhand located at a distance of 285 km. Some iron ore is also obtained from Mayurbhanj area of Orissa.
- It used to receive coal from Jharia, located at a distance of 137 km but now the power from the Damodar Valley Corporation is extensively used.
- Dolomite and limestone are obtained from Sundargarh district of Orissa which is 327 km away. Limestone is also available from Gangpur and Paraghat areas of Orissa.

- Rail and road links connect it to Kolkata which is just 200 km away.
- Cheap labour is readily available from the neighbouring areas.
- IISCO has annual capacity of producing 10 lakh tonnes of steel. Currently it produces over 4 lakh tonnes of pig iron, more than 3.5 lakh tonnes of crude steel and around 3.8 lakh tonnes of saleable steel.

The Visweswaraya Iron and Steel Ltd :

It was established as Mysore Iron and Steel Company (MISCO) in 1923 by the erstwhile state of Mysore. It is located at Bhadravati on the banks of river Bhadravati in Shimoga district of Karnataka. This plant was brought under state control in 1962 and was renamed as Visveswaraya Iron and Steel Ltd. after the name of great engineer Dr. Yisweswaraya. This plant has got a capacity of 1.38 lakh tonnes of steel. There are plans to raise its capacity to two lakh tonnes. This centre enjoys the following advantages.

- Bhadravati valley is 13 km wide as a result of which enough land is available.
- High grade haematite iron ore is brought from Kemmangundi mines in Chikmagalur which is just 40 km away.
- At the time of the setting up of the plant in 1923 the charcoal obtained from the forest-wood was used for smelting because coal was not available. Now it uses hydroelectric power obtained from Sharavati Power Project.
- Limestone is available from Bhundiguda just 25 km away.
- Shimoga and Chitradurga supply manganese. These areas are just 50 km away.
- Dolomite and chromite are also available within a radius of 45-50 km.
- It lies on the main Birn-Shirnoga railway line and makes use of railway facilities.

In order to increase the production of iron and steel, the Government of India established The Hindustan Steel Limited in public sector. Consequently, three plants under the public sector, i.e. Bhilai, Rourkela and Durgapur came into operation during the Second Five Year Plan. Capacity of each plant was fixed at 10 lakh tonnes of steel which was expanded during the Third Five Year Plan and a proposal of setting up a steel plant at Bokaro was also made.

Bhilai :

Bhilai iron and steel centre was set up in Durg district of Chhattisgarh in 1957 with the technical and financial support of the then Soviet Union. It started production in 1959. Its initial capacity was 10 lakh tonnes which has been raised to 52 lakh tonnes.

Durg happens to be a backward area and the purpose of setting this plant was to bring prosperity to this area. This plant produced 41.87 lakh tonnes of crude steel, 38.32 lakh tonnes of saleable steel and 2.43 lakh tonnes of pig iron in 1996-97. It enjoys following geographical advantages:

- It procures rich haematite iron ore from Dalli-Rajhara range which is 80 km south of Bhilai.
- Coal is obtained from Korba and Kargali fields of Chhattisgarh located at 225 km away. Bokaro and Jharia (720 km) also supply coal.
- Limestone comes from Nandini mines hardly 24 km away.
- Bhandara of Maharashtra and Balaghat of Madhya Pradesh supply manganese.
- The Korba Thermal Power station is the main source of power.
- It is connected with Kolkata-Nagpur railway line.
- Dolomite comes from Bilaspur.
- Cheap labour is available from the nearby areas.

Rourkela :

Plant of Hindustan Steel Limited at Rourkela is situated in the Sundargarh district of Orissa. It was set up with the help of the then West German firm, Krupp and Demang, during the Second Five Year Plan (West Germany and East Germany have united to form one country now). It became operative in 1959. It produced 12.40 lakh tonnes of crude steel, 11.80 lakh tonnes of saleable steel and 0.54 lakh tonnes of pig iron in 1996-97. This plant has the following facilities for its successful operation:

- This plant uses iron ore obtained from Sundargarh and Keonjhar districts. These iron ore sources are located within a distance of 77 km from the site of the plant.

- Coal is obtained from Jharia coalfields located at a distance of 225 km and Talcher, located at a distance of 169 km.
- Hydro-electric power is obtained from Hirakud Power Project, located at a distance of 150km.
- The plant receives manganese from Barajmda, dolomite from Baradwar and limestone from Pumapani. These materials are located within a radius of 222 km in Orissa.
- It is located on the main Nagpur-Kolkata railway line and enjoys facilities of railway transport.
- Kolkata provides the port facilities and its hinterland serves as market.

Durgapur :

This plant of The Hindustan Steel Ltd. is located at Durgapur in Paschim Bardhaman district of West Bengal. It was set up in 1959 with the help of the United Kingdom. The production started in 1962. It has a total capacity of 35 lakh tonnes. It produced 12.45 lakh tonnes of crude steel, 1 0.93 lakh tonnes of saleable steel and 1.14 lakh tonnes of saleable pig iron in 1996-97.

The Alloy Steel Plant at Durgapur has a capacity to produce 1.6 lakh tonnes of ingot steel which has been expanded to 2. lakh tonnes of crude steel. The following geographical factors favour its location and growth.

- Iron ore comes from Boiani mines. Mayurbhanj also supplies iron ore. These areas are located within a radius of 320 km.
- Coal comes from Jharia and Raniganj.
- Limestone is obtained from Birmitrapur in Sundargarh and manganese from Keonjhar district of Orissa.
- Dolomite is supplied by Birmitrapur.
- Hydroelectricity is available from Damodar Valley Corporation.
- Plenty of water is available from Durgapur Barrage built across Damodar River.
- The Kolkata-Asansol railway line links it with other parts of the country.
- Cheap labour is readily available from the surrounding areas.

Bokaro :

A new public sector company, the Bokaro Steel Ltd. was formed in 1964 to erect a steel plant with the collaboration of the earthwhile Soviet Union at Bokaro near the confluence of the Bokaro and Damodar rivers in Hazaribagh district of Jharkhand. It is the second plant set up with the Soviet help. It started production in 1972. Its initial capacity was 10 lakh tonnes which was raised to 40 lakh tonnes.

There are plans to raise its capacity to 1 00 lakh tonnes making it the largest iron and steel making centre in India. It produced 36.44 lakh tonnes of crude steel, 30.46 lakh tonnes of saleable steel and 2.6 lakh tonnes of pig iron in 1996-97. This achievement has been made possible due to following few geographical factors:

- It receives iron ore from Kiriburu mine in Orissa.
- Coal is obtained from Jharia coalfields located at a distance of 65 km.
- Limestone comes from Palamu district of Jharkhand.
- Hydroelectricity is obtained from Damodar Valley Corporation.
- Kolkata is just 300 km from here and provides port facilities.

Three more steel plants were planned during the Fourth Five-Year Plan in order to meet the growing requirement of steel. These plants are located at Salem in Tamil Nadu, Vishakhapatnam in Andhra Pradesh and Vijayanagar in Karnataka.

The Salem Steel Plant:

The plant has been set up at Salem in the Salem district of Tamil Nadu. The plant has the advantage of rich iron ore and limestone, which is readily available in the adjoining areas. It also enjoys the facilities of cheap power, charcoal and vast market. The iron ore available here has low sulphur and phosphorus content and is suitable for producing special grade iron and steel.

The plant started commercial production in 1982. Its capacity was 32 thousand tonnes of stainless steel sheets in the beginning. This capacity was doubled in 1991 with the addition of another rolling mill. This capacity was further raised to 80 thousand tonnes of saleable steel in 1995-96.

Today the Salem Steel Plant is a major producer of world class stainless steel and is in a position to export stainless steel to some of the advanced countries such as the USA, Mexico, Australia and some countries of South-East Asia.

In order to cater to the growing demand for coinage of the Indian Government Mints, the management had also set up a blanking facility in 1993 with a capacity of 3,000 tonnes per annum. It also commissioned a hot rolling facility in November, 1995 which has state-of-the-art technology with high level of automation. This plant produced 48 thousand tonnes of saleable steel in 1995-96.

Vijayanagar Steel Plant :

This plant has been set up at Tomagal near Hospet in Bellary district of Karnataka. It has the installed capacity of 30 lakh tonnes. The production of mild steel will be its special feature. This plant enjoys the following facilities:

- Iron ore is obtained from Hospet region located in close proximity.
- Coal comes from Kanhan valley in Chhattisgarh and Singareni coal fields in Andhra Pradesh.
- Good quality limestone and dolomite is available at a distance of about 200 km.
- Water and power requirements are met by the Tungabhadra hydel project located at a distance of about 36 km from the plant.

Another steel plant at Paradwip is fast coming up.

Vishakhapatnam Steel Plant (VSP):

This integrated steel plant has a unique location on the sea port. In fact, it is the first shore based steel plant in the country. Although the foundation stone of the plant was laid in 1972, the construction work could not start in the real sense till February 1982 when Rashtriya Ispat Nigam Limited was incorporated as a public sector company to implement the construction of the plant.

The project has been completed in two stages: the first stage was completed by March 1992 and the second and final stage by July 1992. This is the most sophisticated modern integrated steel plant in the country. Though the production commenced in 1991-92, 1993-94 was the first full year of integrated operation.

In the year 1997-98, this plant produced 32.14 lakh tonnes of hot metal, 25.4 lakh tonnes of liquid steel, 22.5 lakh tonnes of saleable steel and 7.7 lakh tonnes of pig

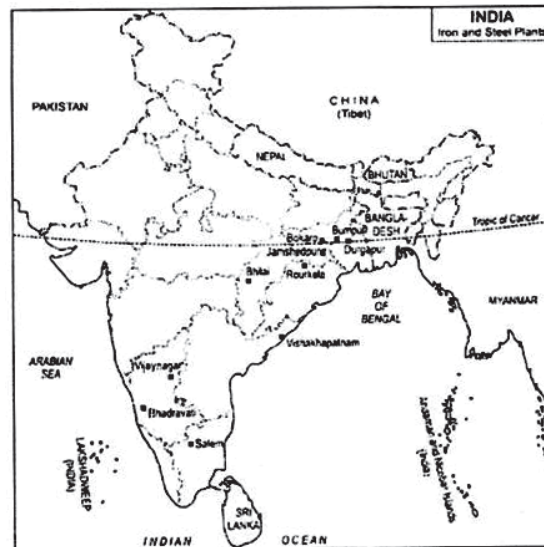
iron. It is a major export oriented steel plant and takes full advantage of its coastal location. In 1995-96, it exported 10.23 lakh tonnes of iron and steel worth Rs. 702 crore, mainly to China and south-east Asian countries.

Currently holding 67th rank among 80 largest steel makers on the globe, as certified by the Brussels- based International Iron and Steel Institute, VSP is smooth-sailing towards reaching its goal of turning into a ‘world class company in steel industry’; as a result of the effective turnaround strategy adopted by its management for the last couple of years.

Buoyed by such a strong performance the VSP now intends to accelerate on the expansion trajectory. Presently it is the second largest producer of iron and steel in the country and the present annual capacity of three million tonnes of liquid steel can be raised to 5 million by 2006-07 and to 10 million tonnes by 2010.

The plant management intends to go in for massive upgradation of technology and skill of its personnel which will be required if the natural gas from the Krishna-Godavari basin is to be utilised to cut down cost. Import of metallurgical coal from Australia can be reduced considerably if proper arrangements for utilising natural gas from Krishna- Godavari basin are made. The natural gas requirement is placed at one billion cubic metres (BCM) a year and negotiations are in progress with the Reliance Group in this connection. The plant has the following advantages :

- The coastal location facilitates for import of coal and export of iron and steel.
- It is well connected to coal fields of Damodar valley in Jharkhand. Metallurgical coal is imported from Australia which meets about 70 per cent power requirements.
- The plant has a bright future with respect to its energy requirements because there are plans to replace coal imported from Australia by natural gas from the Krishna-Godavari basin.
- High quality rich iron ore deposits are available in the Bailadila area of Chhattisgarh.
- Most of the requirements of limestone, dolomite and manganese are met by supplies from Chhattisgarh; Madhya Pradesh and Orissa.



Location of Iron and Steel Industry

7.5 Concept of Manufacturing Region

Industries are unevenly distributed in India because the factors affecting industrial location are not the same everywhere. Industries denote as manufacturing regions. Industries tend to concentrate in a few pockets because of certain favourable factors. The area or zones having concentration of industries are known as industrial region. Geographers and specialists in other allied fields have made several attempts to delineate industrial regions of India making use of different criteria. One of the first attempts was made by Trewartha and Brunet in 1944 using employment figures. R.L. Singh recognized ten regions based on empirical observation. They are (i) Hugli, (ii) Mumbai, (iii) Ahmedabad, (iv) The north-western extending from Ghaziabad to Amritsar, (v) Lucknow-Kanpur, (vi) Bangalore-Madras (vii) Quilon-Coimbatore, (viii) Madurai (ix) Dalmiapuram and (x) Digboi-Dibrugarh.

Dr. B.N. Sinha (1972) has classified industrial regions into following three categories :

- Major Industrial Region is identified on the basis of a minimum daily factory working force of 1.5 lakh.
- Minor Industrial Region must have minimum of 25,000 working labour force.

- Manufacturing District has a working labour force of less than 25,000.

A. Major Manufacturing Regions-India :

Following are the major industrial regions of India

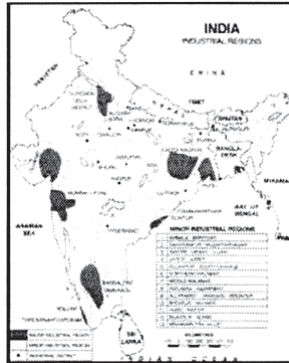
- Mumbai-Pune Industrial Region.
- Hugli Industrial Region.
- Bangalore-Tamil Nadu Industrial Region.
- Gujarat Industrial Region.
- Chotanagpur Industrial Region.
- Yishakhapatnam-Guntur Industrial Region.
- Gurgaon-Delhi-Meerut Industrial Region.
- Kollam-Thiruvananthapuram Industrial Region.

B. Minor Manufacturing Region:

- Ambala-Amritsar in Haryana-Punjab
- Saharanpur-Muzaffarnagar-Bijnaur in Uttar Pradesh.
- Indore-Dewas-Ujjain in Madhya Pradesh.
- Jaipur-Ajmer in rajasthan.
- Kholapur-South kannada in Maharashtra-Karnataka.
- Northen Malaber in Kerala.
- Middle Malabar in Kerala.
- Adilabad-Nizamabad in Andhra Pradesh.
- Allahabad-Yaranasi-Mirzapur in Uttar Pradesh.
- Bhojpur-Munger in Bihar.
- Durg-Raipur in Chhattisgarh.
- Bilaspur-Korba in Chhattisgarh.
- Brahmaputra valley in Assam.

C. Manufacturing Districts:

1. Kanpur, 2. Hyderabad, 3. Agra, 4. Agra, 5. Gwalior, 6. Bhopal, 7. Lucknow,
8. Jalpaiguri, 9. Cuttack, 10. Gorakhpur, 11. Aligarh, 12. Kota, 13. Purnia, 14. Jabalpur, 15. Bareilly.



Industrial regions of India

7.6 Special Economic Zones (SEZs)

The Special Economic Zones Policy was announced in April 2000 with the objective of making the Special Economic Zone, an engine for economic growth, supported by quality infrastructure and an attractive fiscal package both at the Central and State level with a single window clearance. The SEZ concept recognizes the issues related to holistic economic development and provides for development of self-sustaining Industrial Townships so that the increased economic activity does not create pressure on the existing infrastructure.

A special economic zone (SEZ) is an area in which the business and trade laws are different from the rest of the country. SEZs are located within a country's national borders, and their aims include increased trade balance, employment, increased investment, job creation and effective administration. To encourage businesses to set up in the zone, financial policies are introduced. These policies typically encompass investing, taxation, trading, quotas, customs and labour regulations. Additionally, companies may be offered tax holidays, whereupon establishing themselves in a zone, they are granted a period of lower taxation.

The creation of special economic zones by the host country may be motivated by the desire to attract foreign direct investment (FDI). The benefits a company gains by being in a special economic zone may mean that it can produce and trade goods at a lower price, aimed at being globally competitive.

Asia's first EPZ (Export Promotion Zone) was set up in Kandla in 1965. Seven more zones were set up thereafter. However, the zones were not able to emerge as effective infrastructure for export promotion on account of the multiplicity of controls and clearances, the absence of world-class infrastructure and an unstable fiscal regime. While correcting the shortcomings of the EPZ model, some new features were incorporated in the Special Economic Zones (SEZs) Policy announced in April 2000.

To install confidence in investors and signal the Government's commitment to a stable SEZ policy regime and with a view to impart stability to the SEZ regime and thereby generating greater economic activity and employment through the establishment of SEZs, a comprehensive Special Economic Zones Act, 2005, was passed by in May, 2005 and received Presidential assent on the 23rd of June, 2005. The SEZ Act, 2005, supported by SEZ Rules, came into effect on 10th February, 2006, providing simplification of procedures and single window clearance on matters relating to Central and State governments. As a result of this Act and Rules coming into force, it was envisaged that the SEZs would attract a large flow of foreign and domestic investment in infrastructure and production capacity leading to generation of additional economic activity and creation of employment opportunities.

The main objectives of the SEZ Act are:

- generation of additional economic activity;
- promotion of exports of goods and services;
- promotion of investment from domestic and foreign sources;
- creation of employment opportunities; and
- development of infrastructure facilities.

Current status of approvals for setting up of Special Economic Zones:

Seven Export Processing Zones set up by the Central Government at Kandla (Gujarat), Santa Cruz (Maharashtra), Cochin (Kerala), Noida (U.P.), Chennai (Tamil Nadu), Falta (West Bengal) and Visakhapatnam (Andhra Pradesh), were converted to SEZs on announcement of the SEZ Policy. Another EPZ set up in the private sector in Surat was also converted to an SEZ. In addition to these, 11 more SEZs were set up by the State Governments/private sector during the period 2000-2005 in the States of West Bengal (2), Gujarat (1), Madhya Pradesh (1), Uttar Pradesh (1), Rajasthan (2) and Tamil Nadu (4) after the coming into force of the SEZ Act, 2005.

On 10th February 2006, 583 formal approvals have been granted for setting up of

Special Economic Zones, out of which 380 SEZs have been notified and are in various stages of operation. A total of 154 SEZs are exporting. There is some concentration in certain states, the fact that the approved SEZs are spread over 20 States and 3 Union Territories indicates that these are not confined to any particular region. State-wise distribution of SEZs as on 21.02.2012 is shown in the following table. The total land area involved in the formally approved SEZs including notified SEZs is around 44,966 Ha that is not more than 0.013% of the total land area of India.

The six major sectors of IT/ITES, Hardware etc., Textiles and Apparel (including Wool), Pharma and Chemicals, Biotech, Engineering and Multiproducts account for bulk (82%) of the SEZ formal approvals granted so far. IT/ITES/Electronic Hardware/Semiconductor is the single most important segment accounting for about 61% of the total formal approvals followed by Biotech and Engineering SEZs. More than half of the 583 formal approvals issued so far have reached the stage of notified SEZs. This ratio is the highest in Pharma/ Chemicals sector (90%) followed very closely by engineering sector (70%).

Sector-wise details of formal approval, in-principle approvals and notified SEZs as on 21.2.2012 is shown in the following table.

State-wise Distribution of approved Special Economic Zone (As on 21.02.2012)

State	Formal Approvals	In-principle approvals	Notified SEZs	Exporting SEZs
Andhra Pradesh	109	6	76	37
Chandigarh	2	0	2	2
Chhattisgarh	2	1	1	0
Delhi	3	0	0	0
Dadra & Nagar	2	0	1	0
Goa	7	0	3	0
Gujarat	47	6	30	16
Haryana	46	3	35	3
Jharkhand	1	0	1	0

State	Formal Approvals	In-principle approvals	Notified SEZs	Exporting SEZs
Kamataka	61	1	38	20
Kerala	28	0	20	6
Madhya	14	2	5	1
Maharashtra	103	14	63	18
Nagaland	2	0	1	0
Orissa	10	0	5	1
Pondicherry	1	1	0	0
Punjab	8	0	2	1
Rajasthan	10	1	9	4
Tamil Nadu	69	6	55	31
Uttarpradesh	34	1	21	8
Uttarakhand	2	0	1	0
West Bengal	22	3	11	6
Total	583	45	380	154

Source: Department of Commerce

Sector-wise Distribution of approved Special Economic Zone (As on 21.2.2012)

Sector	Formal Approvals	In-principle approvals	Notified SEZs	Exporting SEZs
Aviation/Aerospace/Copper	2	1	1	3
IT/ITES/EH/Semiconductor	354	1	233	88
Textiles/Apparel/Wool	18	1	12	5
Pharma/chemicals	23	3	20	8
Petrochemicals/perro.	4	1	2	0
Multi-Product	24	16	15	17
Building product/material	1	2	1	2

Sector	Formal Approvals	In-principle approvals	Notified SEZs	Exporting SEZs
Beach & mineral/metals	2	0	2	0
Bio-tech	31	0	20	2
Engineering	21	1	17	9
Multi-Services/Services	16	3	9	1
Metallurgical Engineering	1	0	0	1
Electronic prod/ind	3	0	3	1
Auto and related	3	1	1	1
Footwear/Leather	7	0	5	2
Gems and Jewellery	12	3	6	3
Power/Alternate energy/Solar	3	1	3	1
FTWZ	13	4	6	2
Metal/Stain. Steel/Alum/foundry	8	2	4	0
Food Processing	5	0	4	3
Non-Conventional Energy	6	0	4	2
Plastic Products	0	2	0	0
Handicrafts	5	0	3	2
Agro	6	2	5	0
Port-based multi-product	8	0	2	1
Airport based multi-product	4	0	0	0
Writing and Printing Paper Mills	2	0	1	0
Strategic Manufacturing	0	1	0	0
Granite Processing and Industries	1	0	1	0
Total	583	45	380	154

Source: Department of Commerce

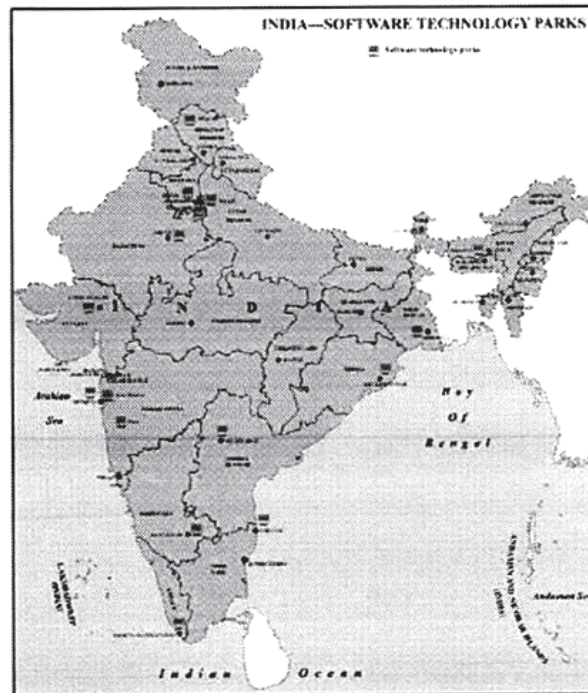
7.7 Technology Parks

A landscaped development usually comprising of high specification office space as well as residential and retail developments, designed to encourage localization of high technology companies such as information technology, software development etc., thereby giving each the benefit of economies of scale. Usually, technology parks are located outside the inner city areas as these are quite land intensive in nature.

Technology parks are designed to facilitate the production and commercialization of advanced technologies by forging synergies among research centers, education institutions, and technology-based companies. Tenants of technology parks are usually small companies at an early development stage pursuing an ambitious growth strategy based on the incubation of new ideas. To facilitate the successful adaptation and take-up of these ideas in the market place, the technology park provides:

- Cooperation in Research and Development with scientific research institutes and laboratories;
- Financial consulting and assistance in obtaining venture capital;
- Professional, technical, administrative and legal assistance;
- Information and telecommunications services;
- Supportive business infrastructure.

The Software Technology Parks (STP) Scheme is instituted by the Department of Electronics of the government of India as an autonomous organization (Software Technology Parks of India - STPI). Its objective is to promote export of computer software. The scheme provides for preferential export and import regime and includes approximately 450 software units operating in software technology parks. It is oriented to the development and export of computer software using data communication links or physical media and export of professional services. Many major cities of India including the cities of Bangalore, Chennai, Hyderabad, Trivandrum, Kanpur, Bhubaneswar, Kolkata, Mumbai, Nagpur, Warangal, Kakinada, Lucknow, Pune, Surat, Tirupati, Vijayawada and Yisakhapatnam have IT parks.



Map of Technology Parks in India

7.8 Summary

Thus in macroeconomics, the secondary sector of the economy describes the role of manufacturing. It encompasses industries that produce a finished, usable product or are involved in construction.

Unit 8 □ Tertiary Activities : Transport, Trade and Service

Structure

8.1 Objective

8.2 Introduction

8.3 Transportation

8.4 Trade

8.5 Service

8.6 Summary

8.1 Objective

The learner will learn about the tertiary activities in an economy in this unit and their importance.

8.2 Introduction

Tertiary activities include all the services other than primary and secondary activities. Tertiary production involves the service sector rather than tangible goods. This work refers to a range of personal and business services involving a rapidly growing share of the labour force in highly developed countries. Rental clerks, barbers, beauticians and secretaries all fall into the personal and business service categories as a group and they have been described as '*pink-collar*' workers.

Salient features of tertiary activities:

Intangibility: Services are intangible and insubstantial, they cannot be touched, gripped, handled, looked at, smelled, and tasted. Thus, there is neither potential nor need for transport, storage or stocking of services. Furthermore, a service can be (re)sold or owned by somebody, but it cannot be turned over from the service provider to the service consumer. Solely, the service delivery can be commissioned to a service provider who must generate and render the service at the distinct request of an authorized service consumer.

Inventory (Perishability): Tertiary activities have little or no tangible components and therefore cannot be stored for a future use. Services are produced and consumed during the same period of time.

Inseparability: The service provider is indispensable for service delivery as he

must promptly generate and render the service to the requesting service consumer. In many cases the service delivery is executed automatically but the service provider must preparatory assign resources and systems and actively keeps up appropriate service delivery readiness and capabilities. Additionally, the service consumer is inseparable from service delivery because he is involved in it from requesting it up to consuming the rendered benefits. Examples: The service consumer must sit in the hair dresser's shop & chair or in the plane & seat; correspondingly, the hair dresser or the pilot must be in the same shop or plane, respectively, for delivering the service.

Inconsistency (Variability): Each service is unique. It is one-time generated, rendered and consumed and can never be exactly repeated as the point in time, location, circumstances, conditions, current configurations and/or assigned resources are different for the next delivery, even if the same service consumer requests the same service. Many services are regarded as heterogeneous or lacking homogeneity and are typically modified for each service consumer or each new situation.

Involvement: One of the most important Characteristics of services is the participation of the client/customer in the service delivery process. A client/customer has the opportunity to get the services modified according to specific requirement.

Each of these characteristics is retractable and their inevitable coincidence complicates the consistent service conception and makes service delivery a challenge in each and every case. Proper service marketing requires creative visualization to effectively evoke a concrete image in the service consumer's mind. From the service consumer's point of view, these characteristics make it difficult, or even impossible, to evaluate or compare services prior to experiencing the service delivery.

Mass generation and delivery of services is very difficult. This can be seen as a problem of inconsistent service quality. Both inputs and outputs to the processes involved providing services are highly variable, as are the relationships between these processes, making it difficult to maintain consistent service quality. For many services there is labor intensity as services usually involve considerable human activity, rather than a precisely determined process; exceptions include utilities. Human resource management is important. The human factor is often the key success factor in service economies. It is difficult to achieve economies of scale or gain dominant market share. There are demand fluctuations and it can be difficult to forecast demand. Demand can vary by season, time of day, business cycle, etc. There is consumer involvement as most service provision requires a high degree of interaction between service consumer and service provider. There is a customer-based relationship for

creating long-term business relationships. Accountants, attorneys, and financial advisers maintain long-term relationships with their clients for decades. These repeat consumers refer friends and family, helping to create a client-based relationship.

8.3 Transportation

Modes of Transport:

Transportation is the movement of goods and people from place to place. Communication, the movement of ideas from place to place, is also a type of transportation. From the standpoint of value, there are two types of transportation. The first is economic transportation by which goods and people are carried for the purpose of economic profit. Such transportation is a change in place utility- the value of commodity is worth more after it has been transported from region of production to that of consumption. Transportation accounts for increase in value by moving commodities to location of demand. Non-transportation includes all movements which are carried on for some purpose other than economic profit. Recreational travel and military logistics are two examples.

The significance of transportation in economic geography cannot be overemphasizing. In its own right transportation is an important geographic element- a spatial variable by which regions can be delimited and their characteristics studied and in terms of which relationships can be analyzed, such as relationship among route location, traffic flow and other phenomena. In addition, organized transportation is a geographic factor- an influence on the location of other economic activities. Without means of transport there would be no commercial coal mining, no commercial surplus production and no commercial lumbering or fishing. In fact, without commercial transportation, the world's economy would remain at subsistence level and regional specialization yielding exchangeable surpluses would be impossible.

Transportation involves two aspects: (a) a vehicle or unit of conveyance and (b) a medium upon which to move. The form of one transport mode differs from that of another because of technological difference between them. The necessary requirements of any mode of transport are : (1) route, (2) vehicle, (3) motive power and (4) terminal.

Route: All modes of transport require some of route, the way, course or tract on which to operate. Both roads and railways, the basic forms of land transport cannot

take place without the construction of suitable routes ways. Rail transport requires a more specific route in the form of special tract and other operational infrastructure like signaling equipments etc. sea and air transport are free from construction of route ways and can be operated in a natural environment. The inland water transport requires the construction of canals. The construction of pipelines involves heavy initial investment and maintenance.

Vehicle : There is requirement for the conveyance of persons or goods by any means of transport. As a result of man's increased technological knowledge and expertise and his demand for increased speed and improved carrying capacity, there is an ever-increasing complexity in the character of vehicles. The animal driven vehicles are still popular, so is the bicycle. The auto vehicle has now become an internal part of our transport system. The railway locomotive, ships and aero-planes are the principal vehicles serving the entire world community. There is a variation in the carrying capacity of different vehicles.

Motive power : Motive power is necessary to drive the vehicle. There are two main sources of power for transport: coal and oil. The invention of steam engine and harnessing of stream power affect the forms of transport to a great extent. With this development transport became available on a mass basis. The air transport is exclusively based on oil products for their source of power. The use of electric driven engines in railways has enhanced the speed. The cost of motive power is a determining factor for the user. Air transport is the most expensive of all forms of transport.

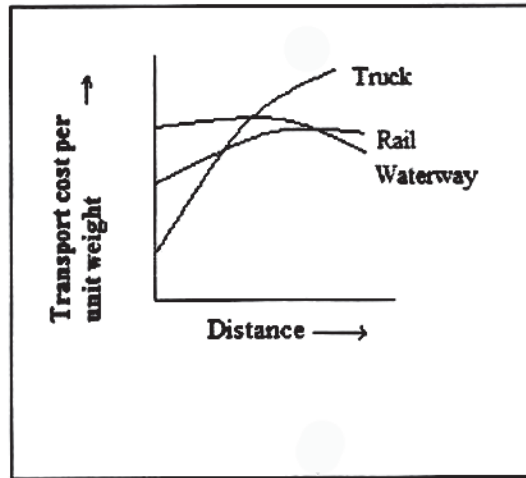
Terminal : The terminal provides access to the transport route or network. It is also a point to which motion ends. In rail transport, the terminus is the station at the end of the line. For bus, the bus stop is the terminal. The terminals are designed according to the mode of transport, their location, capacity and importance in relation to overall transport network. The sea terminals are very complex. There are ports with their docks, wharves, warehouse, customs offices etc. For air terminals, there are arrangements for the take off and landing of aircraft.

Means and modes of transport : Modes and means are interrelated and integral part of any transport system. Transportation can be classified on the basis of power, route and vehicle. On the basis of power, the significant categories are (i) man and animal power used as a force in transportation; (ii) mechanical power in the form of force driving automobiles, trains, ships, aeroplanes etc. and (iii) physical power like wind or running water facilitating movement of goods. The classification on the basis

of nature of routes are (i) the land routes including transportation by path or tract, road, rail and pipeline (ii) water routes including inland and oceanic routes and (iii) air routes. Similarly, according to mode of transport, it can be classified into (i) man and animal, (ii) wheeled vehicles driven either by man or animal, (iii) automobiles, (iv) railways and (v) ship or plane.

Roads: A road is a symbol of motion. In the reconstruction of a region, roads play a positive role. Roads are the veins and arteries of a country through which every improvement circulates. No other form of transport is able to provide such a comprehensive door-to-door or origin to-destination services nor does any other mode have such an extensive route network. Road transport also provides a feeder or connection with other modes. Road transport is important for its flexibility. Motor vehicle can supply services over public highways on even or uneven terrain or on poor roads. Traffic in “small” can be sent daily and easily be road service, for example milk, eggs, vegetables etc. Now every country of the world is having a dense network of roads. The efficiency of a road depends on maintaining a surface on which wheels will run without obstruction. The relative cost of road as compared with rail transport depends on - (i) the length of the haul, (ii) possibility of obtaining return loads, (iii) the liability of the goods carried to damage or pilferage, (iv) the case of commodity to be transported, (v) the volume of traffic offering and (vi) the service rendered. In the present state of economy, roads are most suitable means of transport.

Railways: Railways are a product of the industrial revolution and afterwards become a predominant mode of inland transport. Railways solved two important needs: (i) the economic carriage by land of materials in bulk and bulky commodities and (ii) the relatively rapid movement of large numbers of people and goods. The rails always revolve around its fixed tract. This provides guidance for the wheels and also enables very heavy loads to be carried. There are national and international railways. Some intercontinental railways are also in function. The trains are powered either by diesel oil or electricity. In recent years, in order to achieve increased speeds, a continuous welded tract has replaced the traditional rails. The design of carriage units has promoted a better ride for passengers. The main advantage of rail is the movement heavy, bulky goods, mineral ores etc. Because of heavy capital investment, the railway must be used up to capacity. Capacity depends on a combination of train load, average speed and the frequency of the service.



Transport cost curves for three transport modes

Ocean Transport : The Sea offers a ready-made carriage way for ships which requires no maintenance. Ships can travel within a limited number of constraints, because of floatability and reduced friction; ocean vessels are capable of carrying far greater loads and weights than can be handled by train. Ships try to keep certain lanes because of (i) physical conditions and (ii) economic considerations. The Suez and Panama canals have revolutionize the pattern of sea trade. The Red Sea-Suez-Mediterranean route has become the most important sea route in the world. Ocean shipping has now become a landmark in heavy load transportation between all parts of the world.

Inland Waterways : Inland movement by water is undertaken by either natural waterways (river) or artificial waterways (canals). Such movement is governed by depth, width and direction of waterways and by such physical impediments as rapids, waterfalls, swiftness of flow and seasonal freezing. The principal disadvantages of inland waterways are (i) rivers may involve devious journeys and may flow in the wrong direction; (ii) navigable rivers may be interrupted by falls or rapids; (iii) change in river levels and winter freezing may cause discontinued services; and (iv) canal construction involves heavy capital investment and regular maintenance. Six major navigable systems of inland waterways are - the rivers of the western and Central Europe, the Volga-Don system, the North American rivers, the Amazon system, the Panama-Paraguay system and Chinese waterways.

Airways : Air communication belongs to the twentieth century. Air routes are theoretical and aircrafts are not tied to the surface. All transport is controlled by terminals and prevailing weather conditions. Air routes are determined by: (i) adequate

ground facilities for operation; and (ii) availability of traffic for economic working. Air transport is still very costly and this limits its use. It is best suited for the carriage of commodities which are low in bulk but high in value. Air services are two main kinds: (i) short-distance services operating within a country, called domestic service; (ii) long-distance services like trans-continental and trans oceanic flights, called international services. There is a worldwide network of air routes providing very good and speedy transport services.

Pipelines: A pipeline is a line or conduit of pipe of variable diameter and length and traditionally used for carrying liquid or gas from a point of supply to a point of consumption. The first successful pipeline made of cast iron was laid down in Pennsylvania (USA) in 1865. Total nearly half a million kilometers of oil pipeline exist in the world together with a small distance of natural gas pipeline. Pipelines require maintenance against external rusting and internal corrosion. Pipelines are used for transporting - (i) liquids and gases; (ii) solids in suspension; (iii) solids by pneumatic pressure and (iv) materials enclosed in capsules.

8.4 Trade

The positive impact of national and international trade on economic growth has been widely documented from both a theoretical and empirical point of view. To this respect, it has been argued that openness is important for growth because it generates channels for technology diffusion, which makes possible for less developed countries to import productivity gains from overseas. The literature on trade and growth has paid special attention to technological spillovers as channels of diffusion. Developing countries learn from imported technology and also from technological progress embodied in imported goods. This learning increases domestic stock of knowledge and, hence, domestic productivity and growth. Thus, one could argue that the greater the trade volume (imports and exports) is, the more knowledge can be potentially accumulated. However, the access to lower prices may also constitute a way of importing foreign productivity gains. Technological progress makes possible to produce goods of increasing quality at each time lower costs. Thus, there is also a trade benefit from having access to more productive intermediate and capital goods at a lower cost than their opportunity cost. Therefore, international trade can potentially play a crucial role in fueling economic growth of less developed countries. In other words, it can become one of the engines of growth for a country. But, going a step further might a stagnant economy import sustained growth by trading? An affirmative answer would be an argument in favour of views on trade as a way to escape from poverty. If this is the case, what are the

mechanisms through which trade could transmit sustained growth? The above discussion seems to suggest that trade could operate via trade volume and/or via prices, even in absence of diminishing returns in production and technological spillovers, trade leads to a stable world income distribution.

This is because countries that accumulate capital faster than the world average undergo declining terms of trade, which restrains incentives for further accumulation. At long-run, the terms of trade become constant and countries grow at the same rate. Though they were not directly interested with the transmission of sustained growth through trade, their model also has the implication that trade can emerge as an engine of growth for stagnant economies. Diewert and Morrison (1986) aimed at developing an empirical method for properly measuring the contribution of factor inputs to output growth of open economies. They proved, with an empirical model based on index numbers. As indicated at the beginning of this section, the causality going from trade to growth is a well-established empirical result. Ekholm and Sodersten (2002) emphasized the importance of considering income-terms of trade when analyzing the relationship between trade and growth. Regarding the second mechanism of transmission, the growth regressions by Barro (1991) showed that the economic growth is significantly positively related to the terms of trade.

8.5 Service

The service sector produces intangible goods, more precisely services instead of goods. It comprises various service industries including warehousing and truck transportation services, information sector services, commodities, securities and other investment services, professional, technical and scientific services, waste management services, health care and social assistance services, and arts, entertainment, and recreation services. Service sector are considered more advanced than industrial or agricultural economies.

The service sector, also known as the tertiary sector, is the third tier in the three sector economy. Instead of the product production, this sector produces services like advice, experience and discussion. Examples of service sector jobs include housekeeping, tours, nursing and teaching. By contrast, individuals employed in the industrial or manufacturing sectors produce tangible goods, such as cars, clothes or equipment.

Among the countries that place heavy emphasis on the service sector, the United States, the United Kingdom, Australia and China rank among the top. In the United States, the Institute for Supply Management (ISM) produces a monthly index that details the general state of business activity in the service sector. This index is regarded as a metric for the overall economic health of the country because approximately two-thirds of U.S. economic activity occurs in the service sector.

According to the International Monetary Fund (IMF) and the CIA World Factbook, the following countries are the largest by service or tertiary output as of 2016 :

Rank	Name of Country	Tertiary output
1	United States	\$14.76 billion
2	China	\$5.7 billion
3	Japan	\$3.5 billion
4	Germany	\$2.4 billion
5	United Kingdom	\$2.1 billion
6	France	\$1.9 billion
7	Italy	\$1.4 billion
8	Brazil	\$1.3 billion
9	Canada	\$1.1 billion
10	India	\$1.0 billion

Source : World Fact book, 2016

The service sector, though classified as the third economic sector, is responsible for the largest portion of the economy's business activity. Businesses in this sector are rapidly placing more focus on what is becoming known as the "knowledge economy," or the ability to surpass competitors by understanding what target customers want and need, and operate in a way that meets those wants and needs quickly with minimal cost.

Technology, specifically information technology systems, is shaping the way businesses in the service sector operate. In nearly all industries within the sector, businesses institute technology to bolster production, increase speed and efficiency and cut down on the number of employees required for operation. This cuts down on costs and improves incoming revenue streams.

The services sector is not only the dominant sector in India's GDP, but has also attracted significant foreign investment flows, contributed significantly to exports as well as provided large-scale employment. India's services sector covers a wide variety of activities such as trade, hotel and restaurants, transport, storage and communication, financing, insurance, real estate, business services, community, social and personal services, and services associated with construction.

8.6 Summary

In a nutshell, it can be said that the tertiary sector involves the provision of services to other businesses as well as to final consumers. The goods may be transformed in the process of providing the service. However, the focus is on people by interacting with them and serving the customers rather than transforming the physical goods.

Unit 9 □ Agricultural Systems: Case Studies of Tea Plantation in India and Mixed Farming in Europe

Structure

9.1 Objective

9.2 Introduction

9.3 Case studies of tea plantation in India

9.4 Case studies of mixed farming in Europe

9.5 Summary

9.1 Objective

- This unit will deal with the agricultural systems specially the tea plantation in India and mixed farming of Europe.
 - Role of tea industry in the national economy.
-

9.2 Introduction

Agricultural system is a resource management strategy to achieve economic and sustained agricultural production to meet diverse requirements of farm livelihood while preserving resource base and maintaining a high level of environment quality (Lal and Miller 1990). Agricultural system is a set of agro economic activities that are interrelated and interact with themselves in a particular agrarian setting. It is a mix of farm enterprises to which farm families allocate its resources in order to efficiently utilize the existing enterprises for increasing the productivity and profitability of the farm. These farm enterprises are crop, livestock, aquaculture, agro forestry and agri-horticulture (Sharma et al 1991).

9.3 Case Studies of Tea Plantation in India

Tea as a drink is unique; it cheers but does not inebriate. It is a favourite drink to all – rich or poor throughout the world. Its copper brown colour casts a hypnotic spell on its drinker who likes tea also for its excellent flavor.

The Asian countries- China, India, Japan, Ceylon and Indonesia are leading growers of tea while U.K, U.S.A, U.S.S.R., Canada and France are the leading importers.

Millions of people all over India are engaged in the tea trade in various ways-in

plantation, manufacturing, blending, packing, export of tea. A host of ancillary industries linked with the tea plantation and manufacturing again support millions of people.

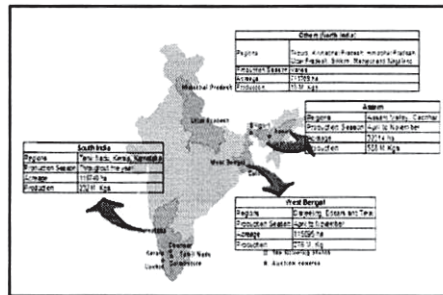
Tea Industry supports to employment generation, contribution of national income, development in infrastructure in and around tea estate area, influence to other industries like plywood, fertilizer.

Evolution of the Tea Industry in India :

India is considered as one of the native homes of the tea plant. The indigenous tea plant growing in a wild condition in Assam was first discovered about 1820. It is also said that the late Major Bruce was the first person who actually discovered the tea plant in India in 1823. The attention of the East India Company was directed to it and after some enquiries an experimental tea garden was started by the Company in 1835. After working it for five years. The East India Company made it over to the Assam Company - The first Indian tea company. There was very little progress in the tea industry during the next twelve years. China was the only supplier of tea to Europe up to the end of the eighteenth century. According to reports, cultivation of tea in India started after 1833 when the Chinese Government refused to renew the agreement granting the East India Company the rights or monopoly of British trades with China. It may be mentioned that the East India Company was granted a monopoly of British trade with China for a period of twenty years from 1813. A Committee was appointed by Lord William Bentinck, the Government General of India in 1834 to study a plan for the accomplishments of the introduction of tea culture in India and for the superintendence of its execution. The establishment of the tea industry in India was undoubtedly due to a great extent to the appointment of the committee. The committee which consisted of eleven Englishmen and two Indians issued a circular describing the conditions favourable for tea growing and suggested to the Government to collect relevant data regarding tea production wherever this might be available. In 1835 the Secretary to the Committee was sent to China to collect tea seeds. The Secretary despatched the seeds from China which reached Calcutta later in the same year. According to reports a person named Captain Jenkins had obtained same specimens of indigenous tea plants from Sadia, Assam. The seedlings from these weeds were identified at the Calcutta Botanical Garden as identical with the Chinese plants.

Having established a successful industry in Assam's Brahmaputra valley, the feasibility' of growing tea in the entire range of foot hills of the Himalayas and other parts of India was explored. By 1863, 78 plantations were established in Kumaon,

Dehra Dun, Garhwal, Kangra Valley and Kulu. After the transfer of the present Darjeeling district to the East India Company in 1835 and initial trials in the 1840s, commercial plantations were started in Darjeeling in the 1850s and by 1874, 113 gardens covering 18,888 acres of tea were opened and production touched 3.9 million pounds. In order to surmount the problems the industry was facing labour and law and order issues, communication, the need to expand markets and the packaging of tea the Indian Tea Association was formed in 1881 and the United Planters Association of Southern India (UPASI) was formed in 1895. In 1853, India exported 183.4 tons of tea. By 1870, that figure had increased to 6,700 tons and by 1885, it was 35,274 tons. Today, India is one of the world’s largest producers of tea with 13,000 gardens and a workforce of more than 2 million people involved in its production.



Major tea producing regions in India (Source: Tea Association of India)

Trends of tea production and export in India :

PRODUCTION * INDIAN TEA * DISTRICTWISE (M.Kg)(Source: Tea Board)								
District/State	During December		Upto December		(+) / (-) in 2018 over 2017		Jan - Dec	
	2018	2017	2018	2017	During	Upto	2017	2016
Assam Valley	13.57	25.94	628.20	627.98	-12.37	0.22	627.98	618.34
Cachar	2.01	3.11	48.78	47.19	-1.10	1.59	47.19	51.18
Total Assam	15.58	29.05	676.98	675.17	-13.47	1.81	675.17	669.52
Dooars	9.93	12.85	222.63	219.58	-2.92	3.05	219.58	204.47
Terai	7.95	11.60	155.52	161.72	-3.65	-6.20	161.72	143.70
Darjeeling	0.11	0.12	7.72	3.21	-0.01	4.51	3.21	8.13
Total WB	17.99	24.57	385.87	384.51	-6.58	1.36	384.51	356.30

Others	1.21	1.35	30.25	27.43	-0.14	2.82	27.43	28.69
Tamil Nadu	12.89	10.89	155.32	166.90	2.00	-11.58	166.90	146.04
Kerala	5.79	5.05	58.02	62.35	0.74	-4.33	62.35	61.40
Karnataka	0.50	0.48	5.19	5.40	0.02	-0.21	5.40	5.41
All India	53.96	71.39	1,311.63	1,321.76	-17.43	-10.13	1,321.76	1,267.36

INDIAN TEA EXPORTS

(Source: Tea Board)

		January-December				April Dec : 2018-19 / 2017-18		
		M Kg	Rs Cr	Rs/Kg	\$/Kg	M Kg	Rs Cr	Rs/Kg
	North	150.36	3515.88	233.83	3.41	109.00	2649.92	243.11
	South	98.75	1616.49	163.70	2.39	74.89	1235.13	164.93
2018	All India	249.11	5132.37	206.03	3.01	183.89	3885.05	211.27
	North	157.69	3480.93	220.75	3.38	119.26	2676.97	224.47
2017	South	94.20	1506.66	159.94	2.45	72.09	1140.59	158.22
	All India	251.89	4987.59	198.01	3.04	191.35	3817.56	199.51
Diff, 18-17	North	-7.33	34.95	13.09	0.03	-10.26	-27.05	18.6
	South	4.6	109.8	3.8	-0.1	2.80	94.54	6.7
	All India	-2.8	144.78	8.02	0.0	-7.46	67.49	11.76
Source: Indian Tea Association								

Exports of Tea

India is one of the leading exporters of tea in the world. 18.38 percent of India's tea is available for export while the rest is consumed in the country. With the progress of literacy, industrialization and urbanization the consumption of tea is increasing in the country. Due to the fast rising internal consumption and also because of lack of co-ordination among the various tea producing countries, in regard to their exports, it has not been

possible for India to export more than an average level of 241.11 m. kgs. in a year. Though tea may be sold by private treaty and forward contracts either in the countries of origin or consumption the majority of sales are affected in the established tea markets of the world by public auction.

Sales of tea : Indian tea is exported to Russia (45.07 M Kg), UK (15.34 M Kg), Kazakhstan (10.75 M Kg), UAE (20.94 M Kg), Iran (30.60 M Kg), Pakistan (15.83 M Kg) USA (I 0.46 M Kg) and more 16 countries in abroad. Russia is the biggest in\ternational centre for auction of tea outside the exporting countries.

DESTINATIONWISE TEA EXPORTS FROM INDIA (Calendar Year) (Source : Tea Board)										
Century	January to December									
	2018				2017				+/-	
	M Kg	Rs Crs	Rs/Kg	S/Kg	M Kg	Rs Crs	Rs/Kg	S/Kg	M Kg	Rs/Kg
Russia	45.07	704.48	156.31	2.29	47.56	767.19	161.31	2.47	-2.49	-5.00
Kazakhstan	10.75	200.63	186.63	2.73	11.00	201.70	183.36	2.78	-0.25	3.27
Ukraine	3.61	56.07	155.32	2.27	4.00	59.25	148.13	2.26	-0.39	7.19
TOTAL CIS	61.10	994.55	162.77	2.38	64.00	1056.95	165.15	2.52	-2.90	-2.37
UK	15.34	333.14	217.17	3.18	16.58	330.03	199.05	3.07	-1.24	18.12
Netherlands	3.76	134.55	357.85	5.23	4.15	94.63	228.02	3.54	-0.39	129.82
Germany	8.91	243.89	273.73	4.00	10.93	255.59	233.84	3.60	-2.02	39.88
Australia	2.19	82.82	378.17	5.53	2.91	104.94	360.62	5.55	-0.72	17.55
Island	2.13	96.83	454.60	6.65	2.55	98.04	384.47	6.03	-0.42	70.13
Poland	5.87	101.60	173.08	2.53	6.22	99.12	159.36	2.44	-0.35	13.73
USA	10.46	325.12	310.82	4.55	14.16	383.24	270.65	4.12	-3.70	49.17
UAE	20.94	424.22	202.59	2.96	19.38	388.34	200.38	3.08	1.56	2.21
Iran	30.60	781.19	255.29	3.73	29.57	749.99	253.63	3.92	1.03	1.66
Canada	1.62	53.51	330.31	4.83	2.53	70.37	278.14	4.30	-0.91	52.17
China	10.22	174.72	170.96	2.50	8.52	148.27	174.03	2.71	1.70	-3.07

Saudi Arabia	4.56	112.71	247.17	3.62	4.31	103.73	240.67	3.72	0.25	6.50
ARE	11.36	163.19	143.65	2.10	11.02	136.74	124.08	1.89	0.34	19.57
Bangladesh	3.20	41.90	130.94	1.92	2.41	29.58	122.74	1.89	0.79	8.20
Afghanistan	0.76	16.03	210.92	3.08	0.98	16.36	166.94	2.57	-0.22	43.98
Kenya	0.38	6.83	179.74	2.63	1.16	16.37	141.12	2.10	-0.78	38.62
Japan	3.52	144.48	410.45	6.00	3.63	145.24	400.11	6.27	-0.11	10.34
Srilanka	3.97	54.04	136.12	1.99	4.05	54.33	134.15	2.05	-0.08	1.97
Singapore	1.06	26.22	247.36	3.62	0.51	14.22	278.82	4.20	0.55	-31.47
Pakistan	15.83	154.71	97.73	1.43	14.73	142.44	96.70	1.51	1.10	1.03
Others	31.33	666.12	212.61	3.11	27.61	549.97	198.87	3.05	3.72	13.75
Total Exports	249.11	5132.37	206.03	3.01	251.91	4987.59	197.99	3.04	-2.80	8.04
North India	150.36	3815.88	233.83	3.41	157.69	3480.93	220.75	3.38	-7.33	13.09
South India	98.75	1616.5	163.70	2.39	94.2	1506.66	159.94	2.45	4.55	3.75

Source: Indian Tea Association

Problems and Suggestions :

A number of problems have to be tackled carefully for the reorganization and redevelopment of the Indian Tea Industry. They include: (i) increasing production and improvement in quality, (ii) marketing and (iii) labour among other.

Production :

Increase in production of tea considerably depends upon (i) extension of acreage under tea, (ii) and increase in yield. Extension in acreage would considerably depend upon clearing bushes and jungles which occupy vast tracts in tea plantations.

Production of tea can only be increased when the yield per acre is increased. Increase in yield will considerably depend upon provision of irrigation facilities, addition of fertilizers and replacement of old bushes by newer ones. Water has not only to be provided in some tea growing areas but the excess of water has also to be pumped out where necessary. Better quality seeds and clones improve the quality of the tea plant and the yield.

Marketing :

Methods of marketing affect the prices of tea. The primary marketing of tea should be regulated effectively in order to ensure fair price to producers. It may be

mentioned in this connection that the present system of bidding does not ensure best price to the producer. This age long system of selling tea should be discontinued.

The Tea Trading Corporation of India has been formed for making packet and instant teas both at home and abroad. Ineffective promotional efforts have been responsible for the steady decline of India's share in the Western markets. Indian blends should be launched in the international markets and as far as possible Indian teas should be sold to foreign buyers through the Tea Trading Corporation and not through auctions. Small gardens play important roles in the production of tea. This representation in various administrative and policy making bodies on tea trade and industry is considered desirable.

Labour Problems :

Productivity in tea plantations can only increase when tea production per labour is increased. Incentives have to be provided to individual workers for inducing them to be more efficient in their performances. Such incentives may be financial or non-financial. The need for providing better housing facilities is widely felt. The labourers in tea gardens have to be provided with approved types of houses. True, housing subsidies provided to labourers help them considerably to build their houses. Both the funds available for remodeling the older houses are inadequate.

Medical facilities provided to tea garden workers also include maternity benefits to the workers.

Other welfare measures that have been taken in some tea gardens in India include education, games and sports and library facilities. The big tea plantations can alone provide these facilities. The smaller plantations cannot provide such facilities for want of funds. Efforts have to be directed to extend such facilities for increasing the efficiency of labour in the tea plantations in India.

Wage problem in plantations also deserves careful consideration. Problems of wage have been tackled by different employers according to recommendations of the Wage Board. A uniform policy in task and wages for labour has yet to be evolved for better functioning of the tea plantations in India.

9.4 Mixed Farming in Europe

Mixed farming involves the cultivation of crops and rearing of animals in the same farming areas. Crops and animals occur in various combinations in different places, but the role of crops is particularly crucial in that they provide multiple roles as feed for animals, as cash crops and as food supplies for farm families. But the

main source of revenue is livestock, especially beef cattle and hogs. Mixed farming is an important type of commercial agriculture in USA, Canada, Ireland, Ukraine, Russia, South Africa, Argentina, Australia, and New Zealand.

Major Characteristics:

- Temperate as well as Mediterranean climate areas are suitable for mixed farming.
- A system of crop rotation is practiced in many places in which different crops are planted in successive years. Each type of crop adds different nutrients to the soil. The fields become more efficient and naturally replenish themselves with these nutrients.
- Crops are grown mainly to the internal demand of the farm. Fodder crops are more important than others. Different fodder crops are maize, oat and soyabean. Maize and soyabeans are also used as food crops. In USA, maize is known as corn and it is the most important crop under mixed farming. Corn is mainly used for fattening the beef cattle.
- Unlike commercial grain farming, mixed farming in North America and Western Europe primarily depends on the domestic market. High demand for livestock products (e.g. beef) in the big cities of these two continents is the motivating factor for the development mixed farming. But the mixed farming in Argentina, Australia and New Zealand is largely dependent on export.
- Modern method of farming are adopted to increase the productivity and to reduce the cost of production.
- Mixed farming in many places is developed in the sparsely populated areas. So, it is not a labour intensive farming. But skilled labourers are required for the livestock farming and these labourers are not always easily available.
- This farming generates the opportunities of employment both directly and indirectly. Indirect employment may include crop trading, meat processing and other allied activities.

Study on Mixed farming in Europe:

European farming has been driven by the objective to increase food production. The global market, in particular the availability of cheap inputs (mineral fertilizers, animal feed), has introduced the logic of economies of scale. The intensification of farming systems was associated with specialization of farms and regions, leading to a

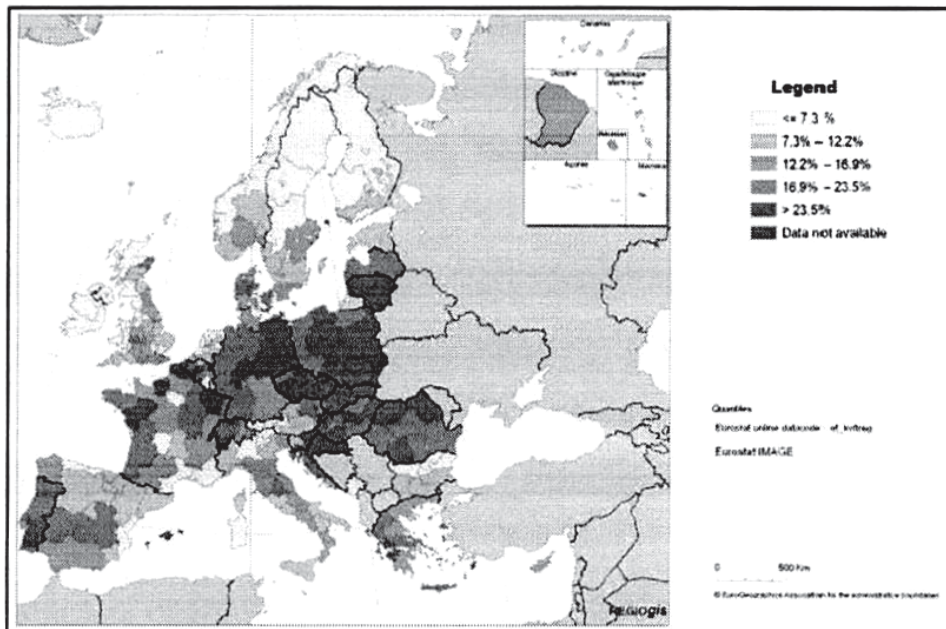
separation of livestock and cash crop production. Crops and livestock could optimize resource efficiency in Mixed Farming System (MFS) as a possible alternative to specialization. Using crops and grasslands for animal feeding and in return organic manure for fertilization, MFS could recycle nutrients more efficiently than specialized systems. It could thus theoretically limit negative environmental impacts while maintaining agricultural production and diversifying sources of incomes. From the 1950s and until the late 70s, the objective of producing more food drove European farming policy. Both global agricultural markets and agricultural policies enhanced efficiency in producing more of a same product, e.g. favouring economies of scale through intensification, enlargement and specialization. The availability of cheap mineral fertilizers and animal feed allowed farms to specialize either into cash crop or livestock production. Crop and livestock production have become increasingly decoupled both geographically and managerially resulting in many livestock units becoming heavily reliant on bought-in feedstuffs and straw and specialized arable units on purchased fertilizer. High prices and subsidies favoured cash crops where the soil-climatic conditions were favourable. The first pillar of the Common Agricultural Policy (CAP) helped investments to modernize agriculture such as irrigation and land management actions, which favoured the intensification and specialization of cash crop production in some European regions. The increased economic competition between production areas led to the regional concentration of livestock too, especially in the areas where the infrastructure and supply chain organization favoured agglomeration economy. The protectionist agricultural policies of the EU and the communist countries guaranteed stable product prices and incomes, reducing the economic risk of specialization. Although the EU farm policy evolved towards an open-market policy (e.g. removing price subsidies, market interventions and production quota systems), specialization is still enhanced. As a result of the logic of economies of scale and/or agglomeration, farm size increased all over the EU, whereas the agricultural workforce tended to decline. Among the causes that explain this evolution, literature points to the opportunity cost of labour as a main driver. Favourable opportunities for labour outside agriculture (and higher wages) increased abandonment; farm enlargement (of the remaining farms) favoured specialization and simplification of practices. Although specialization has obvious advantages for farmers, it also has a major downside. Due to the withdrawal of market intervention policies, market volatility has increased, causing high income risk for specialized farms. All over Europe, specialized crop farms have problems maintaining organic matter content and soil fertility. Straw has continued to be

transported from arable areas to intensive livestock production systems but manure has not been returned due to issues such as cost and transport. The use of inputs, such as fertilizers and pesticides, has helped to overcome the need for rotations to build fertility and control weeds, pests and diseases, but is now facing serious economic and environmental limits. At the same time, high livestock density regions are facing water pollution due to an excess of manure and a high reliance on inputs, in particular on protein for feed. These current challenges result in a renewed interest of research and policymakers in the MFS as a suitable alternative to specialization to limit environmental impacts of farming. Despite the renewed interest in MFS, these systems are facing a number of barriers and are still declining in Europe representing about 14% of agricultural systems all over EU. The share of MFS varies across European countries, with a larger share in Eastern countries of the EU. The level of specialization depends on economic context, labour availability and pedo-climatic conditions.

Mixed Farming System (MFS) and sustainability :

It is essential to recognize that “one size does not fit all” and that land capability plays an important role in the relative efficiency of MFS and specialized farming systems. On poorer lands, the management options are more limited, particularly because of issues such as slope and soil depth and climate. In such circumstances mixed farming may be able to provide self-sufficiency but a low conversion of inputs to outputs. In areas where the land is of good quality but is limited in availability for production, then very intensive specialized systems may be more efficient, at least in the short term. The infrastructures and services available in the area can also provide opportunities for MFS, for example, the presence of a specialist harvesting tractor would allow a farmer to experiment with diversified cropping without having to invest in new machinery. MFS potentially allow better use of resources (e.g. energy, nutrients, land) than specialized systems. They also show higher potential in adapting to climate variations. Technical efficiency is usually defined as the conversion of inputs into outputs, but here we acknowledge both the efficiency of use of purchased inputs and the use of natural resource (e.g. soil and water). Compared to specialized systems, in MFS improvements in efficiency are linked to the degree of synergy between components. The degree of synergies between crops and livestock depends on the skills and motivations of the farmer. Two main pillars for technical efficiency in MFS should be considered: i) diversifying crop rotations both for sale and animal feeding sources while limiting external inputs and; ii) recycling animal manure to fertilise crops. Considering these two pillars, a wide diversity of practices could be of interest. Integration between crops and livestock in MFS can produce direct benefits

such as using unharvested crop residues to provide grazing. The integration between components can also have indirect benefits such as maintaining habitat for biodiversity. Increases in technical efficiency and improved synergies between enterprises could lower reliance on external inputs. Compared to MFS, specialization shows benefits when there is low or no integration between components. It is important to consider technical efficiency separately from intensity. Any discussion about innovation and fail factors needs to take into account the overall aim of a sustainable MFS. A further challenge in any discussion of technical efficiency of MFS is the large number of potential combinations of crops and livestock and their interaction with the pedo-climatic conditions. Different crops covering the soils the whole year would limit soil erosion and nitrate leaching to water while providing organic matter. Some cover crops could be considered as double-purpose enabling some flexibility to the system. If needed, the cover crop could be dedicated to livestock feeding (being grazed or hayed). If not, the cover crops could be left on the soil to provide organic matter. Integrating alternative crops in the crop rotations, in particular legume-cereal crops or grazed legumes as main crops or in between two cash crops would be an adapted solution. Manure management practices could be explored to adapt the frequency of application and type of manure according to the local soil and climate and considering the crop rotation.



Agricultural Area under Mixed Farming in Europe

9.5 Summary

Tea is an evergreen perennial plant and they are natural hybrids of different races. It is cultivated in more than 56 countries of the world. Being an important plantation crop in India, the tea industry is one of the finest agro—based industries providing employment to million of people in the rural areas.

Mixed farming involving both growing of crops and raising of livestock is also an important agricultural system prevailing in the European countries.

Unit 10 □ Transnational Sea-routes, Railways, Highways with Reference to India

Structure

10.1 Objective

10.2 Introduction

10.3 Transnational Sea-routes in India

10.4 Railways in India

10.5 Highways in India

10.6 Summary

10.1 Objective

The learners will know about the different transnational sea-routes, highways, railways in India.

10.2 Introduction

Movement of the goods and services can be over three important domains of our earth i.e. land, water and air. Based on these, transport can also be classified into land, water and air transport. Today, the world has been converted into a large village with the help of efficient and fast moving transport. Transport has been able to achieve this with the help of equally developed communication system.

Today, India is well-linked with the rest of the world despite its vast size, diversity and linguistic and socio-cultural plurality. Railways, airways, water ways, newspapers, radio, television, cinema and internet, etc. have been contributing to its socio-economic progress in many ways. The trades from local to international levels have added to the vitality of its economy. It has enriched our life and add substantially to growing amenities and facilities for the comforts of life.

10.3 Transnational Sea-routes In India

Waterways are the cheapest means of transport. They are most suitable for carrying heavy and bulky goods. It is a fuel-efficient and environment friendly mode of transport, With a long coastline of 7,516.6 km, India is dotted with 12 major and 187 notified non-majors ports. These major ports along with their transitional sea-routes have been handling 95 per cent of India's foreign trade.

Kandla Port situated at the head of Gulf of Kutch has been developed as a major port to cater to the needs of western and north western parts of the country and also to reduce the pressure at Mumbai port. The port is specially designed to receive large quantities of petroleum and petroleum products and fertilizer. The offshore terminal at Vadinar has been developed to reduce the pressure at Kandla port. Demarcation of the boundary of the hinterland would be difficult as it is not fixed over space. In most of the cases, hinterland of one port may overlap with that of the other.

Mumbai is a natural harbour and the biggest port of the country. The port is situated closer to the general routes from the countries of Middle East, Mediterranean countries, North Africa, North America and Europe where the major share of country's overseas trade is carried out. The port is 20 km long and 6-10 km wide with 54 berths and has the country's largest oil terminal. M.P., Maharashtra, Gujarat, U.P. and parts of Rajasthan constitute the main hinterlands of Mumbai ports. The main transitional routes from the port are-

- a. Cape Town-Mumbai (2550 Nautical Miles)
- b. Zanzibar-Mumbai (2550 Nautical Miles)
- c. Aden-Mumbai (1660 Nautical Miles)
- d. Karachi-Mumbai (500 Nautical Miles)
- e. Colombo-Mumbai (1890 Nautical Miles)

Jawaharlal Nehru Port at Nhava Sheva was developed as a satellite port to relieve the pressure at the Mumbai port. It is the largest container port in India. Marmagao Port, situated at the entrance of the Zuari estuary, is a natural harbour in Goa. It gained significance after its remodelling in 1961 to handle iron-ore exports to Japan. Construction of Konkan railway has considerably extended the hinterland of this port. Karnataka, Goa, Southern Maharashtra constitute its hinterland.

New Mangalore Port is located in the state of Karnataka and caters to the needs of the export of iron-ore and iron-concentrates. It also handles fertilisers, petroleum products, edible oils, coffee, tea, wood pulp, yarn, granite stone, molasses, etc. Karnataka is the major hinterland for this port.

Kochchi Port situated at the head of Vembanad Kayal, popularly known as the "Queen of the Arabian Sea," is also a natural harbour. This port has an advantageous location being close to the Suez-Colombo route. It caters to the needs of Kerala, southern Karnataka and south western Tamil Nadu.

Kolkata Port is located on the Hugli river, 128 km inland from the Bay of Bengal. Like the Mumbai port, this port was also developed by the British. Kolkata had the initial advantage of being the capital of British India. The port has lost its significance considerably on account of the diversion of exports to the other ports such as

Vishakhapatnam. Transitional sea-routes from Kolkata port are-

- a. Kolkata-Yangon (790 Nautical Miles)
- b. Kolkata-Penang (1350 Nautical Miles)
- c. Kolkata-Colombo (1250 Nautical Miles)
- d. Kolkata- Chennai (780 Nautical Miles)

Paradwip and its satellite port, Haldia. Kolkata port is also confronted with the problem of silt accumulation in the Hugli river which provides a link to the sea. Its hinterland covers U.P., Bihar, Jharkhand, West Bengal, Sikkim and the north-eastern states. Apart from this, it also extends ports facilities to our neighbouring land-locked countries such as Nepal and Bhutan.

Haldia Port is located 105 km downstream from Kolkata. It has been constructed to reduce the congestion at Kolkata port. It handles bulk cargo like iron ore, coal, petroleum, petroleum products and fertilisers, jute, jute products, cotton and cotton yarn, etc.

Paradwip Port is situated in the Mahanadi delta, about 100 km from Cuttack. It has the deepest harbour specially suited to handle very large vessels. It has been developed mainly to handle large-scale export of iron-ore. Orissa, Chhattisgarh and Jharkhand are the parts of its hinterland.

Visakhapatnam Port in Andhra Pradesh is a land-locked harbour, connected to the sea by a channel cut through solid rock and sand. An outer harbour has been developed for handling iron-ore, petroleum and general cargo. Andhra Pradesh and Telangana are the main hinterland for this port.

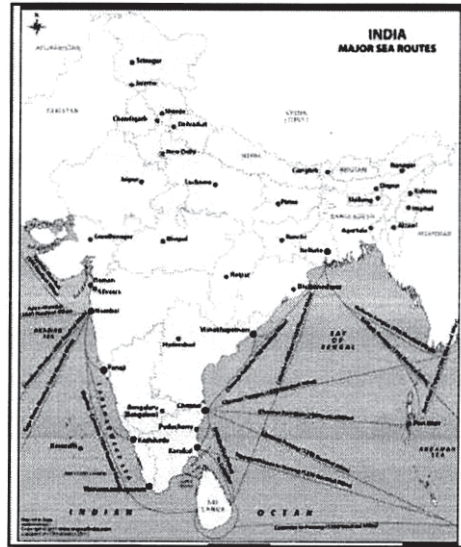
Chennai Port is one of the oldest ports on the eastern coast. It is an artificial harbour built in 1859. It is not much suitable for large ships because of the shallow waters near the coast. Tamil Nadu and Pondicherry are its hinterland. The major sea transitional routes from Chennai are-

- a. Chennai-Yangon (1020 Nautical Miles)
- b. Chennai-Port Blair (700 Nautical Miles)
- c. Chennai-Penang (1300 Nautical Miles)

Ennore, a newly developed port in Tamil Nadu, has been constructed 25 km north of Chennai to relieve the pressure at Chennai port.

Tuticorin Port was also developed to relieve the pressure of Chennai port. It deals with a variety of cargo including coal, salt, food grains, edible oils, sugar, chemicals and petroleum products.

Another two sea routes are Nagappattinam-Penang (1270 Nautical Miles) and Port Blair-Yangon (390 Nautical Miles)



Transitional Sea-Routes in India

10.4 Railways

Railways are the principal mode of transportation for freight and passengers in India. Railways also make it possible to conduct multifarious activities like business, sightseeing, pilgrimage along with transportation of goods over longer distances. Apart from an important means of transport the Indian Railways have been a great integrating force for more than 150 years. Railways in India bind the economic life of the country as well as accelerate the development of the industry and agriculture. Indian Railways (IR) is the fourth largest railway network in the world by size, with 67,368-kilometre (41,861 mi) route. The Indian Railway is now reorganized into 18 zones. The distribution pattern of the Railway network in the country has been largely influenced by physiographic, economic and administrative factors.

The northern plains with their vast level land, high population density and rich agricultural resources provided the most favourable condition for their growth. However, a large number of rivers requiring construction of bridges across their wide beds posed some obstacles. In the hilly terrains of the peninsular region, railway tracts are laid through low hills, gaps or tunnels. The Himalayan mountainous regions too are unfavourable for the construction of railway lines due to high relief, sparse population and lack of economic opportunities. Likewise, it was difficult to lay railway lines on the sandy plain of western Rajasthan, swamps of Gujarat, forested tracks of Madhya

Pradesh, Chhattisgarh, Odisha and Jharkhand. The contiguous stretch of Sahyadri could be crossed only through gaps or passes (Ghats). In recent times, the development of the Konkan railway along the west coast has facilitated the movement of passengers and goods in this most important economic region of India. It has also faced a number of problem such as sinking of track in some stretches and land Slides.

Today, the railways have become more important in our national economy than all other means of transport put together. Routes are electrified with 25 KV AC electric traction while thirty three percent of them are double or multi-tracked. In its runs more than 20,000 passenger trains daily, on both long-distance and suburban routes, from 7,349 stations across India. In the freight segment, run more than 9,200 trains daily. As of March 2017, IR's rolling stock consisted of 277,987 freight wagons, 70,937 passenger coaches and 11,452 locomotives. IR owns locomotive and coach-production facilities at several locations in India. The world's eighth-largest employer, it had 1.308 million employees as of March 2017. In the year ending March 2018, IR carried 8.26 billion passengers and transported 1.16 billion tonnes of freight. In the fiscal year 2017-18, IR is projected to have revenue of 1.874 trillion (US\$26 billion), consisting of 1.175 trillion (US\$16 billion) in freight revenue and 501.25 billion (US\$7.0 billion) in passenger revenue, with an operating ratio of 96.0 percent.

10.5 Roadways

India has a road network of over 5,903,293 kilometres (3,668,136 mi), the second largest road network in the world. At 1.70 km of roads per square kilometre of land, the quantitative density of India's road network is higher than that of Japan (0.91) and the United States (0.989888) to, and far higher than that of China (0.46), Brazil (0.18) or Russia (0.08). Adjusted for its large population, India has approximately 4.63 km of roads per 1000 people. However, qualitatively India's roads are a mix of modern highways and narrow, unpaved roads, and are being improved. The length of national highways in India has increased from 70,934 km in 2010-11 to 101,011 km in 2015-16.

India had completed and placed in use over 28,900 kilometres of recently built 4 or 6-lane highways connecting many of its major manufacturing centres, commercial and cultural centres. According to Ministry of Road Transport and Highways, as of March 2016, India had about 1,01,011 kilometers of national highways and expressways, plus another I, 76,166 kilometers of state highways. According to 2009 estimates by Goldman Sachs, India will need to invest US\$1.7 trillion on infrastructure

projects before 2020 to meet its economic needs, a part of which would be in upgrading India's road network. The investment in national highways increased from 14,095.87 crore (US\$2.0 billion) in 2005-06 to 98,988.06 crore (US\$ 14 billion) in 2015-16. During the same period the total investment in national highways was 476,589.37 crore (US\$66 billion). The Government of India is attempting to promote foreign investment in road projects. Foreign participation in Indian road network construction has attracted 45 international contractors and 40 design/engineering consultants, with Malaysia, South Korea, United Kingdom and United States being the largest players.

Golden Quadrilateral Super Highways :

The government has launched a major road development project linking Delhi-Kolkata-Chennai-Mumbai and Delhi by six-lane Super Highways. The North-South corridors linking Srinagar (Jammu & Kashmir) and Kanyakumari (Tamil Nadu), and East-West Corridor connecting Silcher (Assam) and Porbander (Gujarat) are part of this project.

The major objective of these Super Highways is to reduce the time and distance between the mega cities of India. These highway projects are being implemented by the National Highway Authority of India (NHAI).

National Highways:

National Highways link extreme parts of the country. These are the primary road systems and are laid and maintained by the Central Public Works Department (CPWD). A number of major National Highways run in North-South and East-West directions.

State Highways:

Roads linking a state capital with different district headquarters are known as State Highways. These roads are constructed and maintained by the State Public Works Department (PWD) in State and Union Territories.

District Roads:

These roads connect the district headquarters with other places of the district. These roads are maintained by the Zila Parishad.

Other Roads:

Rural roads, which link rural areas and villages with towns, are classified under this category. These roads received special impetus under the Pradhan Mantri Grameen



Highways in India

Sadak Yojana. Under this scheme special provisions are made so that every village in the country is linked to a major town in the country by an all season motorable road.

10.6 Summary

The transnational sea-routes railways etc provide an excellent network worldwide to cater to the movement of goods, vehicles, and people throughout the world. This has enriched the communication system worldwide.

Unit 11 □ International Agreements and Trade Blocks: GATT and OPEC

Structure

11.1 Objective

11.2 Introduction

11.3 International Agreements-GATT

11.4 Trade Blocks-OPEC

11.5 Summary

11.1 Objective

The learners will learn about the different types of international agreements and trade blocks.

11.2 Introduction

Export tax is common, which has effects that are symmetrical to those of an import tax. An export tax, in the face of a fixed world price, discourages exports and directs supplies back onto the home market, pushing down the domestic price. Exports are often subsidized. For example, governments use taxpayers' money to give low-interest loans to exporters, engage in advertising and export promotion on behalf of exporters and give tax relief based on the value of goods or services each firm exports. Lower prices of exports due to subsidy likely to benefit consumers and harm producers of importing countries; the governments of importing countries have a good reason to protect their producers from unfair competition. They do retaliate by imposing a tariff against exporters which is widely known as countervailing duties. Higher domestic prices of importing countries as a result of countervailing duties suppose to protect the domestic producers. GATT/WTO does proscribe export subsidies as "unfair competition" and allow importing countries to retaliate with protectionist countervailing duties. The net effect of the subsidy plus countervailing duty together determines the world welfare. Advocates of strategic trade policy support granting subsidies to strategic industries/firms. This form of subsidy is different from the infant industry argument for protection. Countries may predominate in the export of certain products because they had firms that were foremost in technology and able to attain first-mover advantages in industries that would support only a few firms because of substantial economies of scale. Government should use subsidies to support promising firms in emerging industries

and should provide this support until the domestic firms establish first-mover advantage in the world market. Both home market protection and export subsidies are advocated. For example the United States of America supports Boeing and a number of European countries support Airbus.

11.3 International Agreements- GATT

General Agreement on Tariffs and Trade (GATT) have been enormously successful over the last 50 years at reducing tariff and other trade barriers among an ever-increasing number of countries. This led to the establishment of the General Agreement on Tariffs and Trade (GATT) in 1948 a treaty whereby 23 member countries agreed to a set of rules to govern trade with one another and maintained reduced import tariffs for other members. The GATT treaty did not provide for a formal institution, but a small GATT Secretariat, with a limited institutional apparatus, was eventually headquartered in Geneva to administer various problems and complaints that might arise among members. Over the next 40 years, GATT grew in membership and in its success at reducing barriers to trade. GATT members regularly met in what came to be known as negotiating rounds. These rounds were primarily focused on negotiating further reductions in the maximum tariffs that countries could impose on imports from other GATT members. Several problems had surfaced with the GATT apparatus-

Firstly, the dispute resolution mechanism of GATT was not functioning as effectively as had been hoped. Countries with long standing disagreements were unable to reach any sort of resolution on a number of issues, ranging from government subsidies for exports to regulations regarding foreign direct investment.

Secondly, a number of commodities, most importantly, agricultural products and textiles, were widely exempt from GATT disciplines.

Thirdly, it was widely believed that certain forms of administered trade protection anti dumping duties, voluntary export restraints, and countervailing duties were restricting trade and distorting trade patterns in many important sectors.

Fourthly, trade in services was expanding rapidly and GATT had no rules regarding trade in services.

Fifthly, countries that produced intellectual property movies, computer programs, patented pharmaceuticals were becoming increasingly frustrated by the lack of intellectual property protection in many developing nations. TRIPS and TRIMS Play important role in Trade Related Intellectual Property Rights and Trade Related Investment Measures in developed and developing countries.

Lastly, the rules regarding trade-related investment measures for example, domestic purchase requirements for plants built from foreign direct investment were hotly disputed.

To address these problems, a new round of trade negotiations the Uruguay Round was launched in 1986. The goals of the Uruguay Round were far more ambitious than in previous rounds. It sought to introduce major reforms into how the world trading system would function. The treaty negotiated during the Uruguay Round, the GATT treaty of 1994, established the WTO the international institution to govern trade that was first visualized by the attendees of the Bretton Woods Conference 50 years earlier. The new GATT treaty provided for an entirely new and different dispute resolution mechanism to eliminate the gridlock of the old system. Furthermore, the Uruguay Round expanded GATT's authority to new areas agreements regarding trade in textiles, agriculture, services, and intellectual property were major achievements. Finally, new sets of rules regarding administered protection came into effect with the creation of the WTO in 1995. It is relatively young for an international institution, it has its origins in the Bretton Woods Conference at the end of World War II. At this conference, finance ministers from the Allied nations gathered to discuss the failings of World War I's Versailles Treaty and the creation of a new international monetary system that would support post war reconstruction, economic stability, and peace. The Bretton Woods Conference produced two of the most important international economic institutions of the postwar period: the International Monetary Fund (IMF) and the International Bank for Reconstruction and Development (the World Bank).

11.4 Trade Block- The Organization Of The Petroleum Exporting Countries (OPEC)

OPEC is an intergovernmental organization of 14 nations, founded in 1960 in Baghdad by the first five members (Iran, Iraq, Kuwait, Saudi Arabia, and Venezuela), and headquartered since 1965 in Vienna, Austria. As of September 2018, the then 14 member countries accounted for an estimated 44 percent of global oil production and 81.5 percent of the world's "proven" oil reserves, giving OPEC a major influence on global oil prices that were previously determined by the so called "Seven Sisters" grouping of multinational oil companies.

Objectives of the organization are-

- Coordinate and unify the petroleum policies of its member countries;
- Ensure the stabilization of oil markets, in order to secure an efficient, economic and regular supply of petroleum to consumers;

- A steady income to producers;
- A fair return on capital for those investing in the petroleum industry.
- A significant provider of information about the international oil market.

The effect can be particularly strong when wars or civil disorders lead to extended interruptions in supply. In the 1970s, restrictions in oil production led to a dramatic rise in oil prices and in the revenue and wealth of OPEC, with long-lasting and far-reaching consequences for the global economy. In the 1980s, OPEC began setting production targets for its member nations; generally, when the targets are reduced, oil prices increase. This has occurred most recently from the organization's 2008 and 2016 decisions to trim oversupply. Economists often cite OPEC as a textbook example of a cartel that cooperates to reduce market competition, but one whose consultations are protected by the doctrine of state immunity under international law. However, the influence of OPEC on international trade is periodically challenged by the expansion of non-OPEC energy sources and by the recurring temptation for individual OPEC countries to exceed production targets and pursue conflicting self-interests.

Current member countries in OPEC :

As of January 2019, OPEC has 14 member countries: five in the Middle East (Western Asia), seven in Africa, and two in South America. According to the U.S. Energy Information Administration (EIA), OPEC's combined rate of oil production (including gas condensate) represented 44 percent of the world's total in 2016, and OPEC accounted for 81.5 percent of the world's "proven" oil reserves.

Approval of a new member country requires agreement by three-quarters of OPEC's existing members, including all five of the founders. In October 2015, Sudan formally submitted an application to join but it is not yet a member.

Qatar left OPEC on 1 January 2019, after joining the organization in 1961, to focus on natural gas production, of which it is the world's largest exporter in the form of liquefied (LNG).

11.5 Summary

The formation of OPEC marked a turning point toward national sovereignty over natural resources, and OPEC decisions have come to play a prominent role in the global oil market and international relations.

Suggested Readings

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Questions

Unit-1 Meaning and approaches to Economic Geography, New Economic Geography

1. Define Economic Geography
2. Illustrate the scope and content of Economic Geography
3. What do you mean by regional approach in Economic Geography?
4. Differentiate between regional and systematic approach in Economic Geography
5. Describe the characteristics of activity approach.
6. Elucidate the basic objectives of Economic Geography
7. Explain the main themes of different approaches in Economic Geography
8. Highlight the new trends in Economic Geography
9. Identify the areas of global trends in Economic Geography

Unit-2 Concept in Economic Geography : Goods and Services, Production, Exchange and consumption

1. Explain the concept of goods.
2. What are the different kinds of goods?
3. What do you mean by services?
4. What are the types of services?
5. What is meant by consumption?
6. Write a short note on production.
7. Give a brief description on exchange.
8. Identify the relationship between goods and consumptions.
9. Describe the linkage among goods, production and services.
10. How do goods and services, production exchange and consumption depend on each other?

Unit-3 Concept of Economic Man

1. Elaborate the concept of economic man?
2. Write a short note on economic man.

3. What is the significance of economic man?
4. How do economic man perform develop mental activities?

Unit-4 Economic Distance and Transport cost.

1. Explain the concept of economic distance.
2. What are the types of Transport cost?
3. Differentiate between fixed and variable cost.
4. What is marginal cost?
5. Explain terminal cost?
6. Briefly highlight the comparative cost on transport modes.
7. What is comparative cost advantage?
8. Mention the infrastructural facilities for transport development.

Unit-5 Concept and clarification of Economic activities

1. What are the characteristics of primary activities?
2. Examine the scecondary activities.
3. What is the basic concept of tertiary sector?
4. Mention two objectives of Quaternary activities.
5. What is called "Think Tank"?
6. What are the difference between primary and secondary activities?
7. How do secondary activities link with primary activities?
8. Explain the relationship among different economic activities.
9. Clarify economic activities with suitable examples.
10. Explain the concept of economic activities with specific examples.

Unit-6 Factors affecting location of economic activity with special reference to agriculture (Von Thunen) and Industry (Weber).

1. What is location rent?
2. Describe briefly economic rent.

3. What are the concentric zones in Von Thunen Model?
4. Highlight the assumptions of Weber Theory.
5. What is 'Locational triangle'?
6. What is Isotim?
7. Define Isodapane.
8. What do you mean by 'Material Index'?
9. Examine the role of critical Isodapane on industrial location.
10. Illustrate Von Thunen's model on agricultural activities and bring out its relevance in present day context.
11. Critically analyse the industrial location theory of weber and find out its relevance in present day context.
12. Explain 'Least cost Approach' in industrial location with suitable examples.

Unit-7 Primary activities : Subsistence and commercial agriculture, forestry, fishing and mining.

1. What is the meaning of subsistence Farming?
2. Describe characteristic features of commercial farming.
3. How do you differentiate commercial fishing from domestic fishing?
4. Why mining is called robber industry?
5. Examine the economic importance of foresting?
6. Explain the role of subsistence agriculture on rural development.
7. How is commercial agriculture related with economic development?
8. What is renewable resource?
9. Give examples of non-renewable resources.
10. State on negative environmental impact & mining and excessive fishing.

Unit 8 Secondary Activities : manufacturing (cotton textile, iron and steel), concept of Manufacturing regions, special economic zones and technology parks.

1. What do you mean by 'Manufacturing industry'?
2. Name the major manufacturing regions of India.
3. What is special economic zone (SEZ)
4. Give an idea on 'Technology Parks'.
5. Why cotton textile industry is called 'Food loose industry'?

6. What are the factors for marine growth of cotton textile industry in New England region?
7. What are the causes of migration of cotton textile industries Towards southern regions of U.S.A.?
8. Analyse the locational factors for development of cotton textile industries in western region of India.
9. What are the factors for growth and progress of iron and steel industry in Japan?
10. Account for the concentration of iron and steel industry in eastern part of India.

Unit-9 Tertiary Activities : Transport, Trade and Service.

1. What do you mean by Tertiary activities?
2. What are the different types of Trade?
3. Which mode of Transport is suitable for heavy loaded goods in international Trade?
4. What are the purposes of pipe line Transport?
5. What are the demerits of road Transport?
6. What is 'Out Sourcing'?
7. Write a short note on intra and international trade.
8. How GDP growth is related with trade and service?
9. Good network & Transport system leads to economic development of a region.
10. Bring out the relationship among Transport, trade and services.

Unit-10 Agricultural Systems : Case studies of tea plantation in India and mixed farming in Europe.

1. Define plantation.
2. What do you mean by mixed farming?
3. What is the difference between plantation and mixed farming?
4. Write a short note on export of Indian tea.
5. What are the major tea producing regions in India?
6. Examine the growth of tea industry and its recent trend in India.
7. Most of European countries are famous for mixed farming—elucidate.

8. Explain how mixed farming is related with economic development.
9. Mention the salient features of plantation.
10. Name the European countries where mixed farming is practised.

Unit-11 Transnational sea-routes, railways, highways with reference to India.

1. What do you mean by Transnational sea-routes?
2. Write the name of Transnational sea-routes from Mumbai port.
3. What is 'Golden quadrilateral'?
4. What are east-west and north-south corridors?
5. How do railways and roadways network promote intra-regional transport?
6. What is the importance of Transnational sea routes for international trade?
7. Name the major railway routes across India.
8. Mention the important highways across India.

Unit-12 International agreements and Trade blocks : GATT and OPEC.

1. What do you mean by Trade blocks?
2. What is GATT?
3. What is OPEC?
4. What is the significance of economic and political blocks?
5. What is Liberalization?
6. What is TRIPS?
7. Define TRIMS.
8. Why OPEC was formed?
9. What is Privatization?
10. What is Globalization?
11. Write a short note on impact of ATJ on Indian economy.

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