NETAJI SUBHAS OPEN UNIVERSITY

STUDY MATERIAL

POST GRADUATE GEOGRAPHY

Paper : 3
Group : A

ECONOMIC GEOGRAPHY

PREFACE

In the curricular structure introduced by this University for students of Post-Graduate degree programme, the opportunity to pursue Post-Graduate course in any subject introduced by this University is equally available to all learners. Instead of being guided by any presumption about ability level, it would perhaps stand to reason if receptivity of a learner is judged in the course of the learning process. That would be entirely in keeping with the objectives of open education which does not believe in artificial differentiation.

Keeping this in view, the study materials of the Post-Graduate level in different subjects are being prepared on the basis of a well laid-out syllabus. The course structure combines the best elements in the approved syllabi of Central and State Universities in respective subjects. It has been so designed as to be upgradable with the addition of new information as well as results of fresh thinking and analysis.

The accepted methodology of distance education has been followed in the preparation of these study materials. Co-operation in every form of experienced scholars is indispensable for a work of this kind. We, therefore, owe an enormous debt of gratitude to everyone whose tireless efforts went into the writing, editing, and devising of a proper lay-out of the materials. Practically speaking, their role amounts to an involvement in 'invisible teaching'. For, whoever makes use of these study materials would virtually derive the benefit of learning under their collective care without each being seen by the other.

The more a learner would seriously pursue these study materials, the easier it will be for him or her to reach out to larger horizons of a subject. Care has also been taken to make the language lucid and presentation attractive so that they may be rated as quality self-learning materials. If anything remains still obscure or difficult to follow, arrangements are there to come to terms with them through the counselling sessions regularly available at the network of study centres set up by the University.

Needless to add, a great deal of these efforts is still experimental—in fact, pioneering in certain areas. Naturally, there is every possibility of some lapse or deficiency here and there. However, these do admit of rectification and further improvement in due course. On the whole, therefore, these study materials are expected to evoke wider appreciation the more they receive serious attention of all concerned.

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Vice-Chancellor

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POST GRADUATE GEOGRAPHY

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Netaji Subhas Open University

PGGR – 03
Economic Geography

Group A

UNIT 1 ❑ SCOPE, CONTENT AND RECENT TRENDS IN ECONOMIC GEOGRAPHY

Structure

1.1 DEFINITION

Geographers define geography in several ways. Some believe that the way man lives in a place is greatly influenced by landforms, climate and soils. A few believe that human activities are determined by geographic factors. In spite of differences of opinion, all geographers will probably agree that geographic study may well include an examination of spatial patterns on the surface of the earth.

Spatial patterns and their variation have profound significance for human life. Geography analyses and explains variations in activities over space. Economic Geography is the study of the spatial variation on the earth's surface 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 Hartshorn and Alexander. Prof E.W. Zimmermann pointed out that "Economic Geography deals with the economic life of man with relation to environment". According to Dudley Stamp, "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".

In pursuit of its aims, the economic geographer answers to three questions : [1] Where is the economic activity located? [2] What are the characteristics of the economic activity ? To what other phenomena is the economic activity related? The first question relates to the location. Maps provide the answer to the question "where". If no such map exists, the Geographer will have to construct one because maps are the basic tools and are essential in understanding of areal relationships. The idea of pattern or distribution may facilitate one grasp of the concept of location. A pattern is the arrangement of an element over the face of the earth. The world pattern of

population, for example, reveals some densely populated areas in China and India some areas of less extreme density in U.S.A. and Russia and some sparsely settled areas in North Africa and central Australia. The second question decides the significant characteristics of the economic activity and their description. For example, what are the characteristics of tea plantation that distinguish the regions devoted to it ? How many acres do the plantation farm occupy ? What kinds of buildings are 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 the 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. In answer to the third question there are four ways to investigate the relationships: [1] One useful approach is through an analysis of cause and effect. [2] Some Geographers concentrate on relationships with physical and cultural phenomena. [3] An alternative approach is to consider relationships within a region and those between regions. [4] Finally, some Geographers prefer to study relationships in terms of correlations.

1.2 SCOPE, CONTENT AND OBJECTIVES

Different points of view are held as to the meaning, approach and objective of the subject. Economic Geography deals with the problems of making a living. It belongs more to the field of human than to physical geography. Special emphasis is laid on economic production and trade. According to Ellsworth Huntington, "Economic Geography deals with the distribution of all sorts of materials, resources, activities, institutions, customs, capacities and types of ability that play a part in the work of getting a living. Farming, manufacturing and trade are the main methods of getting a living. Hence, Economic Geography combines three main phases agricultural, industrial and commercial-but mining, lumbering and fishing must also be considered. Economic Geography, like other branch of Geography cannot be separated from physical geography. Its main problem is to discover ways in which the distribution of physical conditions influences the distribution of the methods by which people satisfy their needs for food, clothing, shelters, tools and other products."

The study of the manner of exploitation of the earth's resources and the limits set by physical environment is the proper scope of Economic Geography. According to Jones and Darkenwald 'Economic Geography deals with the productive occupations and attempts to explain why certain regions are outstanding in the production and exportation of various articles and why others are significant in the importation and utilization of these things."

In this study of interdependence of production emphasis should be given upon the degree of human initiative and the nature of physical forces enacting to shape certain life patterns. They should be studies as a comprehensive system of interaction between man and nature. It is not only content with the analysis of the present pattern of production and productive occupations, it also studies their dynamics. Global resource pattern changes not only in response to increasing knowledge, improved skills and technique but also, perhaps more, in relation to charging socio-political scenario. Thus, Economic Geography is a much-embracing subject. It not only aims at the understanding of different natural phenomena but also takes cognizance of racial traits and customs, advantages of an early start, availability of capital and labour, accumulated technical knowledge and skilled managements, stability of Governments, Government aids or hindrances in the form of tariffs, subsidies or urbanization schemes and so on.

Economic Geography investigates the diversity in basic resources of the different parts of the world. It tries to evaluate the effects that differences of physical environment have upon the utilization of these resources. It studies differences in economic development in different regions or countries of the world. It studies transportation, trade routes and trade resulting from this development and as affected by the physical environment.

The problem of economic resources has become more complex today with millions starving and unemployed. Disparity in the state of economic being and competitive attitude of many countries give rise to socio-economic problems. Economic Geography also aims at resolving such problems by better and efficient utilization of limited resources through rational, systematic, scientific and long-term planning. Economic Geography serves as an essential tool for reducing and finally eliminating world society's disparity gaps by scientific study of their economic resources, modern needs and cultural heritages.

1.3 APPROACHES TO ECONOMIC GEOGRAPHY

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

I. Regional Approach
II. Systematic or Commodity Approach
III. Activity approach
IV. Principles Approach

Regional Approach : In considering this popular approach, the world, a continent or even a country or a state may be divided into geonomic 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 Commodity Approach : This approach provides a systematic description and interpretation of the distributional pattern of individual resources or commodity (eg. Wheat, rice, tea) or an industry (eg. 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 & 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 trade and transportation.

Principles 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 settlements" 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 RECENT TRENDS IN ECONOMIC GEOGRAPHY

The Economic Geography of the world has changed a lot in the last 25 years. During this period, the world economy mushroomed in size & complexity. At the same time, greater interdependence among nations added new dimensions to the world system. Major new work forms emerged as the post industrial economy revolutionize 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 become 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. World inflation rates accelerated in the 1970s, an energy crisis emerged, and a crisis of finance gained momentum as the disparities between the developed and developing countries increased in the mid-1980s. Several newly influential groups of countries became important in the global market place. These included "the Organisation of petroleum exporting countries (OPEC) block, the newly industrializing countries (NICs), the Organisation

of Economic Cooperation and Development group (OECD) 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 comlex 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 as well. In turn, the more developed nations moved to knowledge- intensive activities such as electronics integrated circuits, robots, arcospace, telecommunications and biogenetics.

To finance this process, nations bought and sold one another's products at an accelerating and unprecedented pace. Unfortunately, aberrations in the process have occurred, such as protectionism in the form of import restrictions or tariffs to insulate declining activities in some nations. The more developed nations generally financed the expansion of activity in less developed areas by extending credit, leading to growing dependency on the major powers by the third world countries.

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 the NIEO are grouped under five headings in the UN resolution-international trade, transfer of real resources, science and technology, industrialization, and food and agriculture. The concerns of economic geography in the 1990s and beyond must also include the heartland-hinterland 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 century. 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.

Classification of Economies : The economy is the system of production & consumption, including the means of decision making and the allocation of resources in a particular country. Economic, categorization can be made [A] by per capita propensity to exchange, [B] by level of economic development and [C] by political-economic affiliation.

[A] Classification by Per capita propensity to exchange— It can be approximately measured by (1) money income (2) real income. Money income indicates the average amount of money actually received by each member of an economy over a given period. The real income indicates the actual value of average money income to each person expressed in terms of what that money will buy in the economy of which he is member. Using this per capita real income as the master criterion, the world economies can be classified into 3 categories: (1) commercial, (2) commercial-

subsistence, and (3) subsistence-with-some-commerce. This represents a declining order of propensity to exchange.

The commercial economies account for nearly one-fifth of the world's people. The countries with the highest per capita propensity to exchange, nearly all of which are politically independent, are the manufacturing and commercial nations of NW Europe and their younger offshoots in North America, South Africa and Oceania.

Commercial-subsistence economies, involving about one third of the world's population, are particularly conspicuous in Latin America, countries and West Asia, northern Africa, eastern-Europe, Russia and the island nations of the Far East. Politically they tend to be either entirely or partially independent. Few of them are controlled completely by foreign capitals.

Nearly one-half of the world's people living under subsistence or subsistence-with-some-commerce conditions are found largely in the low latitudes of Africa and in eastern and southern Asia. Recent world trends towards nationalism are affecting many of these countries. Among the large countries that contain the basic ingredients for raising their levels of economic activity are Communist China, India, Indonesia and Pakistan. They make up the lion's share of the world's most underfed, ill-clothed, ill-housed and yet rapidly multiplying inhabitants.

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scale, it is also important if we are to understand the context in which economic geographers view the issues of current global concern.

[B] Classification by level of economic development— Following this method economies can be classified in two levels development: [i] those which are economically and technically advanced and [ii] those which are economically and technically underdeveloped.

A multitude of criteria have been employed to determine level of economic development. Of these, two appear to generalize the results— (a) the percentage of a country's labour force in agriculture and (b) the per capita gross national product.

Accordingly Chile, Argentina, and Uruguay are placed into the underdeveloped category while Poland, Venezuela and Kuwait one grouped into the technically advanced ones.

[C] Classification by political-economic affiliation— The degree of public and private ownership is the key features of economies under this category. Accordingly there are two types— [i] economies of subordinate affiliates and [ii] economies of sovereign nations.

Economies of subordinate affiliates are controlled mainly by their mother countries, with the rigidity and degree of that control varying with the status of the dependency. There are two affiliates— affiliates of non-communist countries and affiliates of communist countries. The first category includes colonies and overseas territories. All communist nations operating independently, namely Russia belong to the second category.

Among the world's sovereign states, ownership of the means of production and exchange is primarily public or semi-public. The USA alone stands as a major nation where private ownership is outstandingly championed. The non-communist European nations are characterized by government ownership and government policy is dominant in formulating and executing economic arrangements.

Although they contain less than one-third of the world's people the technically advanced countries tend to dominate economic affairs, using their methods and instruments of scientific and technological know-how of capital accumulation, of a higher standard of living and of outright political ownership.

Spatial Organisation of economic activities : Beginning in the 1950s. Economic Geography made new attempts in creating a theoretical approach and in building on the workshop economies and in relying heavily on quantitative methods to understand the "spatial organization" of economic system. Spatial organization is the aggregate pattern of use of space by a society. It refers to the relative internal location of the elements in a spatial distribution: the location of each element relative to each other element and the location of each element relative to all the other elements together.

In order to explain the spatial structure and national economic development.

J. Friedmann suggested a simple model. The model shows the stages of spatial organization, a national economy passes through a primaitive per-industrial society to industrial maturity. The four stages in its progress are illustrated as-

(1) A spatial pattern of separate cities, each in an enclave isolated from the others.

(2) At the time of incipient industrialisation the pattern is dominated by a single strong center or core, surrounded by an extensive periphery.

(3) The care-periphery situation is gradually transformed as strong peripheral sub-centers emerge alongside the single national center. Inter-metropolitan peripheries now replace the previous national periphery. The sub-centers bring further resources into the national economy, thus enhancing the growth potential of the economy.

(4) Finally, a functionally interdependent system of cities appears. Inter metropolitan peripheries are completely absorbed and full integration of the economy is achieved, thus minimizing regional imbalances and maximizing the nation's growth potential.

Sectors of economy-Primary, Secondary, Tertiary— It is convenient to divide the many forms of economic activity into three groups known as primary, secondary and tertiary.

Primary activities are those related to the extraction from the nature. They include age-old activities such as hunting animals, gathering and collecting forest products, extracting minerals and fuels from the Earth's crust, fishing from the rivers, lakes and oceans, and harvesting trees. All these activities yield raw materials for subsequent processing. Primary producers may be labeled "red-collar" workers due to the outdoor nature of their work.

Secondary activities embrace all forms of manufacturing and processing of raw materials. Secondary production increases the value or usefulness of a previously existing item by transforming its form. Such activities include manufacturing and industrial efforts. The farmer, for instance, applies seeds, fertilizers and modern technology in the form of harvesting and cultivating in the agri cultural farm to increase the yields of crops. Steel makers turn iron into metals in blast furnaces. Generation of power also falls under this category because it uses raw materials like coal, oil, uranium etc to produce energy. This group is collectively known as the blue collar labour force.

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. Retail 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 all 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.

The quinary activities, the upper most one in hierarchy. remains more restricted in size in comparison to the other groups of activities. The most visible persons in this group include chief executive officers and other top-management executives in both government and private service. Research scientists, 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 centers or in close proximity to large University/medical or research centers. An appropriate label for this group is the "gold-collar" works.

1.5 CLASSIFICATION OF ECONOMIC ACTIVITIES

A. Production

1. **Primary** : harvesting and exploring the nature (agriculture, forestry, mining) fishing.
2. **Secondary**
   Increasing the value and usefulness of primary items by transforming their form and nature (manufacturing industries and activities)
3. **Tertiary** : Services (Clerical, personal, business). Trade and commerce.
4. **Quaternary** : financial, health, entertainment, education, information and data-processing services, middle management administrative service; government service.
5. **Quinary**
   (a) High-level managerial and executive administrative positions (public and private)
   (b) Scientific research and development services.

B. Consumption : Use of commodities civic amenities and services by human beings to satisfy needs and wants.

by Transportation and distribution services :

(a) Increasing the value of commodities by changing their location (freight transportation).

(b) Exchanging services and ideas by telecommunication or face-to face contact.

(c) Satisfying the needs of people by changing their location (passenger transportation)

(d) Warehousing and distribution function.

(e) Wholesale trade.

(f) Retail trade

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UNIT 2 ❑ NATURAL RESOURCES : ITS CLASSIFICATION AND SPATIAL DISTRIBUTION.

Structure

2.0 INTRODUCTION

A resource is something material or abstract that can be used to satisfy human want or deficiency. So, the existence of a resource depends on its value to human. What makes a thing a resource is not its intrinsically valuable properties but the fact that a given society express a desire for it and is willing to pay for it. In 1933, Prof. E. W. Zimmermann promulgated his famous "concept of Resource". The word resource does not refer to a thing or a substance but to a function which a thing or substance may perform or to an operation in which it may take part, namely, the function or operation of attaining given end such as satisfying a want".

2.1 CLASSIFICATION OF RESOURCE

A. In general, resources are classified into two groups on the basis of existence a) Material resources b) Non-material resources. Material resources are tangible substances, eg., coal, petroleum, iron ore, copper, water etc. Non-material resources are intangible substances, eg. health condition, culture, ethics, freedom, environmental harmony etc. Material resources are freely bestowed by nature. Non-material resources are cultivated by human beings with the help of increasing knowledge.

Material resources may again be sub-divided into two groups :

(i) Organic resources like forest, fish, livestock etc. ,

(ii) Inorganic resources like iron-ore, manganese, mica etc.

B. On the basis of durability or nature of availability resources may be classified into two groups :

1. Fund or exhaustible resources— this is not everlasting and exhausted for ever after use, eg. coal, petroleum, uranium etc.

2. Flow or inexhaustible resource— here supply of resource remains unchanged even after renewed use, e.g., river water, sea-wave, sunshine, airflow etc.

C. On the basis of ownership, resources may be divided into three groups:

(i) International or world resource : This is owned by global population, i.e., the total resources owned by all individuals and nations. The sum total of all material and non-material resources comes under this category.

(ii) National resource : This is the sum total of resources of the inhabitants of the nation and resources of the nation itself.

(iii) Individual resource : Both tangible resources, i.e, property, money, wealth and intangible resources, i.e. knowledge, wisdom, health etc. owned by any individual is known as individual resource.

D. On the basis of availability or frequency of occurrence, resource can be classified into two groups : i) ubiquitous ii) localized. Ubiquitous type of resources are found everywhere, eg. sunshine, air etc. Localized resources are available only in some places, eg. petroleum iron ore etc. These resources are sometimes rare, for example water in a desert area. Some resource is unique in the sense that it is available only in one place, for example, cryolite is found only in Greenland.

E. On the basis of resource aspects, resource can be classified into

(i) Natural resource— all the components of nature having functionability and utility, eg. sunshine, water, forest, soil, minerals etc.

(ii) Human resource— Physical power and brain power of man comprise human resource.

(iii) Cultural resource— Different aspects of culture which contribute to the development of the society and which have positive functionability are known as cultural resources, e.g. Education

Classification of Resources

Basis of classification	Type of Resource	Examples
A. Existence	1. Material	Iron ore
	2. Non-material	Freedom
B. Nature of availability	1. Fund	Coal
	2. Flow	Sunlight
C. Ownership	1. International	World population
	2. National	Natural wealth
	3. Individual	Individual property
D. Frequency of occurrence	1. Ubiquitous	Air
	2. Localized	Gold
E. Resource Aspect	1. Natural	Minerals
	2. Human	Knowledge
	3. Cultural	Education

2.2 SPATIAL DISTRIBUTION OF RESOURCES

Forest :

Forests are close association of plants. The economic activities of man are greatly influenced by forests. Man gets food, fuel, fibre, timber, drugs, nuts, tan materials, cork, rubber etc. from forests. Forest indirectly affects climate, stream flow, soil conditions and thus influence agriculture, grazing, recreation and wild life.

Forests are very unevenly distributed over the globe. Spatially, forests are not very homogenous. The major factors influencing its growth are :

(a) Temperature— A monthly average temperature of 6°c is necessary for plant growth. Excessive cold or very high temperature is detrimental to plant generation.

(b) Rainfall— Various types of plants grow in different areas having different amount of rainfall. Hydrophytes are water loving plants and grow in excessive water condition. Xerophytes require very little water and grow in arid condition.

(c) Soil— Soil provides basic, life -sustaining forces to the plant, Texture, porosity, permeability and retentive capacity of soil determine the different types of vegetation. The chemical composition of the soil favours the growth of different plants.

(d) Altitude— This factor affects plant growth as the temperature falls with the rise in the altitude. Plant species differ with the variation in the elevation.

(e) Wind— Excessive flow of wind restricts the growth of trees due to increase

in the transpiration. Strong winds like typhoons, cyclones, tornedo etc may kill the trees. Sea breeze sometimes favours the growth of certain types of trees.

(f) Slope— Slope changes the quality of vegetation on the windward and leeward sides of the mountains. Gentle slope favours the growth of certain types of plant.

(g) Sunlight— Generally, sunlight favours the growth of plants by supplying chlorophyll necessary for plant food. The assessment of FAO (Food & Agricultural Organisation) in 1990 revealed that around 40% of the earth's landmass (about 5.1 billion hectares) were covered by woodlands and forests. Among this, only 3.4 billion hectares can be designated as forest while 1.7 billion hectares are scrub, woodlands or bush. The most important forest is the tropical forests which occupy nearly 1.8 billion hectares of land in 1990, the tropical rainforests alone covering 714 million hectares. The temperate forest is in the second position covering an area of 2.4 billion hectares in 1990. The standard and widely accepted classification of forests with their climatic parameters and major species is given below.

Forest Type	Climate Type	Rainfall & Temperature	Major Tree species	Distribution
I Tropical Forest a) Tropical Moist evergreen Rain forest	Equatorial Region	200-250cm 27°-28°C	Mahogany Rubber, Iron wood, Rose-wood, Palm, ebony etc.	South America, Mid Africa, SE Asia, Equatorial region
b) Tropical Deciduous Forest	Tropical Monsoon	100-200cm 23°-29°C	Teak, Sandal, Sal, Khair, Sissu etc.	S&SE Asia, S.America, & Parts of S. Africa
II. Temperate Forest a) Mediterranean Forest	Mediterranean Climate	50-100cm 18°-25°C	Oliv. Oak, Cork, Myrtle etc.	Mediterranean Coast, California, in USA.Cent Chile SE Australia.
b) Temperate broad-leaved Deciduours and Mixed Forest	Mid-latetude warm Temperate region	Less than 50cm16°c	Oak, Maple, Elm, Birch, Walnut etc.	Cent & South Europe, Russia & Parts of USA
c) Coniferous soft-wood Forest	High-latitude cold temperate region	30-50 cm avg. 10°C	Pine, Fir, Birch, Spruce, Lirch, Hemlock etc.	Extensive regions of N Asia N. Europe

Animal Resource :

Animal resources are important in the economic life of mankind even since the dawn of civilization. The animals and their products are used as the source of food, as a source of dairy product, as motive force and as a source of raw materials. In different cultural landscapes, man started using his animals in different manners. Degree of dependence of human economy on animal use is controlled by different spatial factors. Utilization of animals in different spatio economic regions are—

1. Nomadic herding— This type of pastoral nomadism is prevalent in the arid and semi-arid regions of the world. Animals are used as the source of meat, milk and means of transportation. Camels, sheep, horses and cattles in different parts of Africa and Asia, Yak in Himalayan high altitudes and Reindeer in polar region are sometimes the only earthly possession of the local people.

2. Livestock ranching— In areas of hostile climate and difficult terrain, people are engaged in pastoral ranching. Hordes of catties, goats, sheep are raised for commercial purposes. Dairy products, meat, hide and wool are extracted and sold in the market. This economic activity is widely practised in parts of Argentina, USA, Venezuela and Australia.

3. Mixed Farming— In this farming, animals are reared side by side crop cultivation in the same plot of land. In this capital-intensive highly organised agriculture, sometimes crops are cultivated for animal consumption. This type of farming is widely practised all over Western Europe and N. and S. America. Infertile grasslands like Praire in N.America, Pampas in S.America and Veld in S.Africa are suitable for mixed farming.

4. Dairy farming— In this farming, livestock are reared scientifically to extract milk. This capital and labour intensive farming is prevalent in Western Europe, Australia, New Zealand, North America, Canada and Parts of S. America. Manufacture of different milk products are also included in dairy activity.

The spatial concentration of commercial livestock grazing is controlled by several physico-economic and climatic factors like topography, climate, nature and quality of grassland, economy of the region and the use of animate energy. Grazing grounds can be classified into two broad types.

1. Commercial grazing in temperate grasslands— Australia and New Zealand are traditionally famous for livestock rearing. Australian grassland (Downs) supports millions of livestock, particular/ sheep, that provide wool and animal meat. In New Zealand the major livestock products include wool, milk, butter, cheese, leather etc. Grazing in North America covers vast stretches of land in western part of Canada and USA specially in Alberta, Nevada and Texas. This region produces beef, pork and mutton. In S. America, the Pampas of Argentina and Uruguay are famous for commercial livestock ranching and Argentina is the largest exporter of dairy product and wool. South African grassland veld is famous for sheep rearing.

2. Commercial grazing in tropical grasslands— African Savanah supports a large number of wild animals. The tribal people own large number of cattle population, but grazing is still at its primitive level. Here the grassland is vast and extensive. American grasslands are smaller and they include Lanos of Venezuela, Savanah of Bolivia, Campos in Brazil and El. Gran chako of Argentina. Commercial cattle-rearing is prevalent in the interior parts of these areas.

Power Resources :

Power resource is considered as an index of any country's economic development and its importance is ever increasing. On the basis of the pattern and nature of use and its distribution, power resources may broadly be classified into two groups - a) conventional and (b) non-conventional. Conventional power resources include coal, petroleum, natural gas, nuclear power and hydelpower. Non-conventional power resources are sunlight, wind, geothermal energy, tidal energy, bio-gas etc. Petroleum is the most important source of energy (39.4%), followed by natural gas (23%), coal (22.3%) hydelpower (7.1%), nuclear power (6.6%) and others (1.6%) . The following table shows the reserves of major conventional sources of energy, 1999.

Reserves of Major Conventional Sources of Energy, 1999

Coal (million Tonnes)		Petroleum (billion barrels)		Natural Gas (billion cubic meters)	
Country	Total recoverable Reserve	Country	Reserve	Country	Reserve
1. U.S.A.	249,993	1. Saudi Arabia	263.5	1. Russia	48,127
2. Russia	56,978	2. Iraq	112.5	2. Iran	22,996
3. China	114,472	3. U.A.E	97.8	3. Quator	8,493
4. Australia	90,382	4. Kuwait	96.5	4. UAE	6,002
5. India	74,718	5. Iran	89.7	5. Saudi	5,789
6. Germany	66,986	6. Venezuela	72.6	6. USA	4,739
7. South Africa	55,322	7. Russia	48.6	7. Vnezuela	4,034
8. Ukraine	34,349	8. Libya	29.5	8. Algeria	4,521
Others	145,212	Others	206.1	Others	41,084
World	987,362	World	1,016.8	World	145,785

Coal :

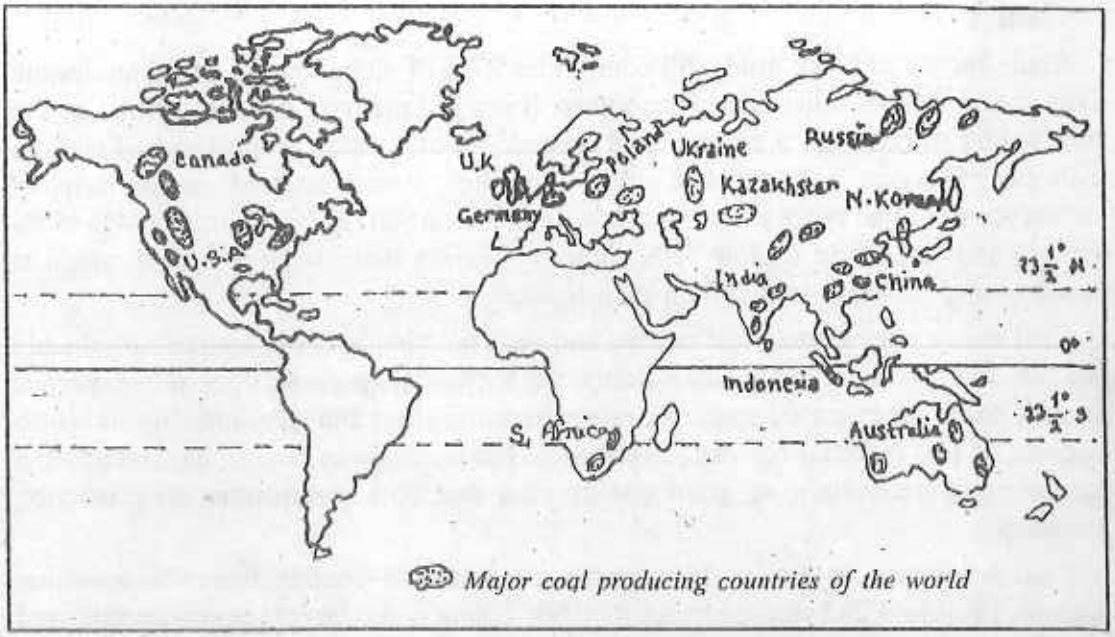
Coal, known as black gold, still contributes 27% of global energy demand despite wide use of various other energy resources. It is a sedimentary deposit formed by the slow action of heat and pressure. Coal is made up of various proportions of carbon, hydrogen, Oxygen, Nitrogen and other impurities. It is classified on the basis of carbon content. The types are - 1. Anthracite (92% carbon) 2. Bituminous (74% -85% carbon) and 3. Lignite (below 50% carbon). Besides there is Brown coal which is powdery and contains less carbon than lignite.

Coal is not only a source of energy and heat but also it is the source of valuable products like gases, tar, pitch, coke, ammonia, fertilisers, synthetic dyes and numerous drugs. Coal is the essential source of raw material for iron and steel industry. It is also a source of raw material for various chemical products. Reserves of coal is declining due to rapid exhaustion of good quality coal and poor environmental protection measures.

Coal production in the world recorded a remarkable decline from 4886 million tones in 1990 to 4,292 million tones in 1999. China is the largest producer fallowed by USA, India and Australia other major producers of coal in 1999 were Russia, South Africa, Germany, Poland, Ukraine and N. Korea. The following table shows the coal production in the world as percentage of the World's total.

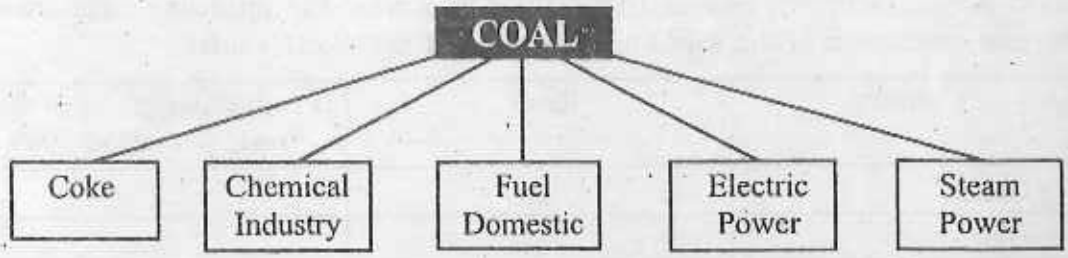
Country	Rank	Production (as % of the World's total) in 1999
China	1	23.6
U.S.A.	2	23.2
India	3	6.9
Australia	4	6.8
Russia	5	5.8
South Africa	6	5.2
Germany	7	4.8
Poland	8	4.0
Ukraine	9	1.9
N. Korea	10	1.8

World Production- 4297 million tonnes
Source : Energy Statistics, U.N.O., 1999



Major coal producing countries of the world

Major uses of coal



China is the largest consumer of coal in the World, followed by U.S.A, India, Russia, Germany and Poland. Australia is now the largest exporter of Coal. The other notable exporters are Canada, South Africa, Poland etc. Bangladesh, Nepal, Italy, Japan import bulk of the international coal trade. Conservation of coal is essential for sustainable development. Conservation measures may include reduction of consumption, expansion of its functional value and the prevention of its wastage.

Petroleum :

Petroleum is the inflammable mixture of hydrocarbons having a complex composition, variable density and colour. Impurities like sulphur compounds and nitrogenous substances may be present in the petroleum and as such there are different grades of oil- paraffin based, asphalt based and mixed based. Paraffin-base is the lightest and the best quality crude oil (gasoline & petrol). Asphalt base is heavier with less commercial significance. Mixed base is an intermediate type.

Petroleum is of animal and vegetable origin. Rocks of marine oxygen, sedimentary

rocks like substances, shale's and limestones contain petroleum. It occurs in strata which are not too folded and faulted. Three structures are favourable for the oil accumulation- the anticline, the fault and the stratigraphic trap. In order to locate oil-bearing strata, structural studies of underlying rocks, core boring and sounding are resorted to.

The importance of petroleum is extremely great .It has revolutionised the entire transport network-road, rail, water and air transport. Motor vehicles and aero planes use petrol or gasoline & buses, trucks & locomotives use diesel and gasoline are used in gas turbines to produce electricity. Natural gas contributes 23% of the global energy production. There is no substitute of Mobil as lubricating oil. Almost all chemical and petro-chemical industries use petroleum byproducts as raw material. Kerosene and liquified petroleum gas (LPG) are used worldwide as cheap fuel for domestic purpose. Besides there are many usable petro-chemical byproducts-plastics, detergents, synthetic rubber, synthetic fibers, perfumes, chemical fertilizers, insecticides, dyes, paints, varnishes etc.

Global distribution of crude oil is grossly imbalanced. Some regions like Middle East contains 60% of global reserves while SE Asia & Latin America are practically devoid of crude oil. This situation causes great political stress and strain. The following table shows the crude oil reserves of the main oil producing countries in 1990.

Crude oil Reserve- 1990

Country	Reserve (million tons)
Mexico	6,906
U.S.A.	3,560
Canada	720
Venezuela	8,604
Norway	1,025
Great Britain	535
Russia	6670
Libya	3150
Nigeria	2400
Algeria	1800
Saudi Arabia	35,620
Kuwait	13,358
Iraq	13,417
Iran	12,700
UAE	12,300
China	726
Indonesia	810

Production of crude oil in the world has increased by 8.8% during 1990-1999. Middle East has maintained its supremacy as an oil producing region. Position of Soudi Arabia as an oil producing country has been improved from 3rd to 1st. USA has become 3rd and its production is declining. After the dissolution of USSR oil production in Russia has steadily been declined but in 1999 it held 2nd position as an oil producing country. Saudi Arabia, USA & Russia together accounted for 30% of the world's total production in 1999. The accompanying table shows the oil production in the world.

Country	Production of oil (as % of the world's total)			
	1990		1999	
	Rank	%	Rank	%
Saudi Arabia	3	10.6	1	11.9
Russia			2	9.2
U.S.A	2	12.2	3	8.9
Iran	4	5.1	4	5.4
China	5	4.6	5	4.9
Norway	12	2.8	6	4.6
Mexico	6	4.2	7	4.4
Venezuela	7	3.5	8	4.3
U.K.	10	3.0	9	4.1
Iraq	9	3.4	10	3.
World's Production : 60.57m. barrels per day			65.87m barrels per day	

Source : Energy Statistics, UNO, 1999

U.S.A. is the single largest consumer of petroleum in the world which accounted for 25.7% of world's total consumption in 1998. Japan is second with a consumption of 7.5%. Other major consumers are china (5.6%), Germany (4.0%) & Russia (3.3%). In U.S.A., consumption grew by 9.2%. Among the leading petroleum consumers, growth of consumption is found to be the highest in China. India was the 12th largest petroleum consumer in the world in 1998 accounting for 2.5% of the world's total consumption.

Hydelpower :

Hydelpower is the energy harnessed from running water. The contribution of hydel power in the world energy production is immense and ever-increasing. Power generation from running water has been made possible by

a) Rotating turbines— contain Kinetic energy of swiftly flowing water.

b) Dynamo— Changes the kinetic energy into electrical energy

c) Cement— helps large constructions to tame the mighty rivers

Hydelpower generation requires a difference in height between the place where water is found and the place where it can be let down. The height is secured in there ways. The first is by building dams across rivers. The second is to take advantage of drops or falls or steep gradient in the riverbed and the third is by diverting the water from one basin into another river basin at a lower attitude.

Favourable factors for the development of hydelpower —

Physical factors—

a) The catchment area of the river must have regular and abundant rainfall or snow-melt water throughout the year. Mere ruggedness of topography is not sufficient unless and until there is steady volume of water.

b) The temperature must remain above the freezing point.

c) Water must be silt free as siltation reduces workability and life span of the machines.

d) All hydel-power stations require large dams to store water in huge reservoirs. Natural lakes and water bodies within the rivers may save this expenditure.

e) An impermeable rock structure is necessary to retain the stored water & prevent any large-scale seepage.

f) Large space and sparse population are prerequisites for hydel projects.

g) Climatic and geological stability is essential. Droughts, floods and earthquakes are potential threats to the survival of the plant.

h) Presence of forest in the nearby areas reduces soil erosion, lessens the probability of landslide and enhances rainfall in the area.

Socio-economic factors—

a) A nearby densely populated area is ideal where demand of electricity is large and which can provide viable market.

b) Lack of substitute energy source is helpful in some way. Coal and oil deficiency in Japan, Norway, Sweden compelled then to develop hydropower stations.

c) Huge amount of capital investment is necessary for work force, raw materials & massive construction work for a long-drawn period.

d) Improved modern technology is a prerequisite in the intricate construction of hydro-power station.

e) As construction requires huge and varied machinery and construction materials, easy transportation and smooth communications are the prerequisites for project works.

Hydro power potential and world production

The total known exploitable hydropower potential of the world is 4 million megawatts. The following table shows the known exploitable potential of the top ten countries in 1995.

Country	Known Potential (in '000 Megawatt)
1. China	2,168
2. C.I.S	2,016
3. Brazil	1,116
4. Indonesia	709
5. Canada	614
6. Zaire	530
7. Columbia	418
8. Peru	412
9. Argentina	390
10. U.S.A	376

It is estimated that as a continent Africa ranks first in the Known exploitable potential by accounting 30% of the world's total. But there lies a large gap between the potentiality and utilization. On the basis of installed capacity Europe comes first followed by North America. On the basis of actual production North America comes much ahead of Europe indicating a very high rate of utilization of the installed capacity. The following table shows the production of hydropower in the major countries of the world.

Hydelpower production as % of the world's total

Country	1990		1999	
	Rank	%	Rank	%
Canada	1	13.56	1	13.05
Brazil	4	9,44	2	11.73
U.S.A	2	13.36	3	11.72
China	5	5.77	4	8.54
Russia			5	6.06

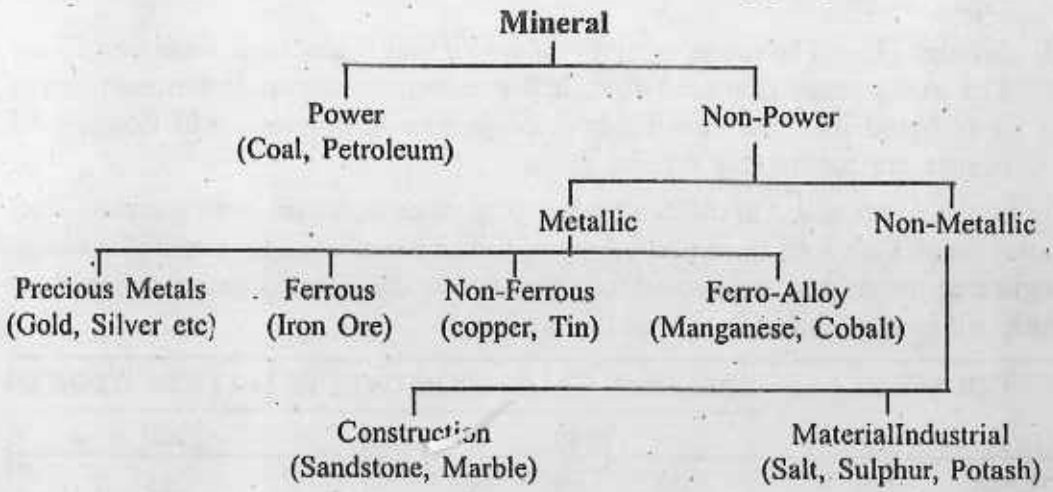
Country	1990		1999	
	Rank	%	Rank	%
Norway	6	5.53	6	4.60
Japan	7	4.08	7	3.26
India	9	3.27	8	3.10
France	10	2.44	9	2.75
Sweden	8	3.31	10	2.66
World generation 2,167 billion Kw Hours			2,607 billion Kw hours	

Source : Energy Statistics. U.N.O., 1999

MINERAL RESOURCES :

A mineral is a natural substance of inorganic origin with definite chemical and physical properties. Minerals sometimes occur on the earth's crust but mostly they are buried below the surface. The extent of exploitation of minerals depends on (1) size of the deposit, (2) depth, amount & location of the deposit (3) economic need of the people, (4) level of industrial development, (5) geological structure & (6) technical knowledge and ability to extract and process the mineral resources.

Broadly, minerals can be classified into the following groups:



Mining and the processing of minerals exert tremendous impact on the economic wellbeing of a country in a number of ways-

1) They provide employment opportunities.
2) They attract population to be settled around the mining sites.
3) They stimulate the development of transportation

4) They open new scope for export earnings
5) They extend the scope for the development of domestic industries.

IRON ORE :

1) Iron ore is the most common metallic mineral. Since industrial revolution, use and production of iron ore received priority in the developed industrialized nations. According to usage, functionability and composition, iron ores are principally of four major types.
2) HEMATITE— This is reddish in colour & derived from sedimentary rocks. Average iron content is between 60 to 75%. Industrially, this is the most important type of ore and is generally mined by open cast method. It is found in Great Lake Regions of USA, Orissa in India etc.
3) MAGNETITE— It is the richest among all iron ores with little impurities & the iron content varies between 70-72.5%, the colour varies between brown to black. It is found in igneous and metamorphic rocks. Its excellent magnetic properties make it suitable for electrical industry. It is found in Bailadila (India), Magnitogorsk (Russia) etc.
4) LIMONITE— This is a brown coloured ore found in sedimentary rocks. Iron content varies between 50-65%. Because of its low iron content, it is only mined in places where rich ores are scarce. It is found in Alabama (USA), Japan, France etc.
5) SIDERITE— The ore is ash-grey in colour and found in sedimentary rocks. The iron content is around 40%. It is a carbonate of iron and in many areas it is found near the coal fields. Lincolnshire of England and Lorraine of France are the notable siderite fields.

Pig iron is reprocessed in different ways to produce cast iron, wronght iron, steel and alloy steel. Cast iron is an easily broken form of iron used for making castings. Wronght iron resists rust and is used for pipes, chains etc. Steel is the most important product. Alloy steel includes special types of steel.

COUNTRY	PRODUCTION OF IRON ORES IN MILLION TONNES	
	1980	2000
CHINA	68	215
BRAZIL	115	190
AUSTRALIA	96	158
RUSSIA		80
INDIA	42	68

COUNTRY	PRODUCTION OF IRON ORES IN MILLION TONNES	
	1980	2000
USA	71	61
UKRAINE		50
CANADA	49	34
SOUTH AFRICA	26	30
WORLD	891	1010

IRON ORE PRODUCTION IN THE WORLD

Iron & steel industry is the largest consumer of iron ores. The production of ore declined from 902 million tonnes in 1975 to 861 m. tonnes in 1985 due to the recession in the steel industry. But with the revival in the demand for steel, the production of ore increased to 1010 m. tonnes in 2000. China, Brazil, Australia, Russia and India together accounted for 70.3% of the world's total production.

Total reserve of iron ores in the world is 140 billion tonnes. China has the largest reserve of 25 billion tonnes which is 18% of the world's total reserve. On the basis of reserve of iron ores, first five countries are China, Ukraine, Russia, Australia & U.S.A.

2.3 CONSERVATION AND MANAGEMENT OF RESOURCES

Conservation means "to preserve", "to retain intact or unchanged". Resource conservation is the conservation of natural resources, be they plants, animals, nature in general, landscape resources and even the whole environment. The modern conservation movement was initiated by a concern about forest depletion & soil erosion in the USA in the 19th century. Among the types of conservation the first is the conservation of ecological and scientific values. Wildlife or nature conservation is basic to the maintenance of the scientific and ecological value of organic resources. Problems of wildlife conservation include the identification and management of endangered species. Closely related to wildlife conservation is that of wilderness preservation. The second is the conservation of biological values whose central theme is the concept of sustained yield. Sustained yield implies the maintenance of optimal production under a given level of use. Sustained yield in forestry, fishing and agriculture alike require that the rate of cropping does not exceed that of resource renewal. The third is the conservation of aesthetic values. Modern intensification of land use and expansion of outdoor recreation has stimulated increasing concern for the aesthetic value of organic resources. The problem basic to the conservation of aesthetic values is that of the perception of beauty. Conservation of aesthetic qualities tends to con-

flict with that of biological/economic values. The fourth is the conservation of environmental quality. Modern conservation has become synonymous with the maintenance of environmental quality of which pollution control is the most crucial point. The main problems of pollution control are the establishment and maintenance of environmental standards.

Finally, it is to be noted that the conservation of resources and of environmental quality are very closely interdependent. With respect to the whole problem of curbing resource depletion and pollution, humans do not lack the technical know-how. The main difficulty is that they have not yet learnt to cope with the national and international economic, political & social implications of ecosystem conservation.

2.4 CHANGING NATURE OF ECONOMIC ACTIVITIES

The history of Economic Geography is an ever changing one and may be divided into four distinct periods, each provided a different approach to the subject.

I. In the first period Economic Geography traced its roots to commercial geography which had grown up as the Western European nation expanded their trading relationships and empires across the globe. Commercial geography reached its zenith in the work of G.G.Chisholm who founded the school of geography at the University of Edinburgh in 1908 and published a book "Handbook of Commercial Geography" in 1925. This book provided a precise account of world production and trade. Chishlom also identified forces of concentration and deconcentration. The forces of deconcentration or decentralisation would ultimatley lead to a more equal worldwide distribution of industrial activity.

II. The search for better explanations led next to a more theoretical Economic Geography in the United states where it focused on the study of the relationships between economic activity and the physical environment. By the 1920s the field was well established and a journal "Economic Geography" appeared in 1925. This new Economic Geography was concerned with "environmentalism" or "environmental determinism"- the theory that economic differences were caused by environmental factors, failed to explain the diversity of economies in similar physical environments, and ignored the freedom of individuals to make their own choices, within limits, of what they produced.

This environmentalist idea was clearly expressed by W.M.Davis in 1906. To him human society was an organism that survived by adjustment to the physical environment, the nature of its growth was environmentally prescribed. E.Huntington in his book "civilisation and climate" published in 1915 argued that climate was the decisive factor in health and physical and mental efficiency, and that since a civilisation is the result of the energy, efficiency, intelligence, and genius of the population, ergo,

climate is the "mainspring" factor in the progress or regress of civilisations, J,Russel Smith (U.S.A) and T.Grifith Taylor (Australia) were all determinists and maintained an active correspondence with Huntington. They believed that it is the duty of geographers to study nature's plan, and to see how best their national area may be developed in accord with temperature, rainfall, soil etc. whose bounds are quite beyond our control in any general sense. The idea of the interdependence of culture and nature was also developed by the French geographer Vidal de la Blache in his book "Principles of Human Geography" in 1926. William Von Royen in his book "Economic Geography" in 1942 also indicated that "differences in productive activities are often results of differences in environment".

III. A third Economic Geography emerged that concerned itself with areal variation in production and the economic regions that resulted. Environmental determinism was almost abandoned by economic geographers and the American geographers became concerned with resources and the conservation of the environment and the majority of economic geographers from 1930 to 1960 returned once agin to a very descriptive approach. Economic Geography according to R.S.Thoman became "an inquiry into similarities, differences and linkages within and between areas in the production, exchange, transfer and consumption of goods and services". To J.W.Alexander, Economic Geography became "the study of the areal variation of the earth's surpace in mans' activities related to producing, exchanging and consuming wealth". In areal differentiation, definition and mapping of economic regions became an end in itself, the ultimate in descriptive generalisation.

IV. After World War II Economic Geography took new and different directions. The search for theoretical approach intensified. Social sciences became interdisciplinary. At this time, the computer technology began to revolutionize quantitative analysis and gove nments subsidized research particularly for planning and policy-oriented studies. Geographers rediscovered the classical economic theories of location of J.H.Von Thunen, Alfred Weber, Walter Christaller and August Losch. The locational analysis of Walter Isard called for the creation of a new discipline, "Regional Science". Location theory sought to describe economic landscapes created by "economic person" in which areal differntiation results not from differences in climate, soils or physiography, but instead from accessibility, transportaion costs,& economies of scale. Thjs new image of humanity (Economic person) has perfect knowledge of present circumstances and future events so that he or she has powers of perfect prediction, the goal being maximization of profits. Most location decisions with which this economic person must grapple involve tradeoffs which is a function of accessibility, rents and transportation costs.

But this image of "economic person" no longer satisfies economists or economic geographers. In reality, hunman behaviour displays "bounded rationality" in which

profit maximizing must be weighed against competing objectives. Hence, a new image of the decision-maker is being developed-the "satisficer image," with decisions based on limited knowledge and bounded rationality. Thus, the changing nature of Economic Geography is very much associated with the lessons and contributions of each of these four periods.

2.5 DETERMINANTS OF AGRICULTURE

Agriculture is the science and art of cultivating the soil & the rearing of livestock. Agricultural land is the most basic of the world's resources. Human beings are fed, clothed and sheltered from it. Prof. E.W.Zimmerman defined agriculture as "Agriculture covers those productive efforts by which man settled on land, seeks to make use of, and, if possible, accelerate and improve upon the natural genetic or growth processes of plant & animal life, to the end that these processes will yield the vegetable and animal products needed or wanted by man."

About 40% of 37 million acres of land in the world may be considered cultivable. The degree of availability of cultivable land is determined by a number of physical and socio-economic limitations. Physical limitations fix up the outer limit of cultivable land.

PHYSICAL FACTORS

[1] CLIMATE— Climatic factors exert the greatest control over the world distribution of agricultural types. The climatic elements which affect agriculture are-

a) TEMPERATURE-Temperature conditions determine the degree of warmth, the duration & the intensity of sunshine which affect crop maturity to a certain extent. Night frosts may damage the tender leaves of plants. Very low temperatures and heavy snow fall in the Arctic regions preclude any form of crop cultivation.

b) MOISTURE- Moisture is essential for plant growth. The amount of mousture, the distribution pattern during the year, the rate of evaporation and the conditions of relative humidity at the periods of sowing, growing and harvesting may or may not be conducive to the growth of agricultural crops.

c) WIND- Some plants are harmed by strong winds which may accelerate evaporation & physically damage the plant (e.g.- Cocoa cultivation in Brazil). On the other hand, sea breezes and light winds are often advantageous to certain plants like coconuts and coffee.

[2] TOPOGRAPHY— Configuration of the earth determines the flatness or ruggedness, degree and direction of slope etc. The most intensively cultivated parts of

the earth are the lowlands which ease cultivation and the use of machinery. Some crops like tea and coffee grow best on well-drained hill slopes. Steep slopes are prone to soil erosion.

[3] SOIL— Soil forms the physical support of plant and is fundamental to any form of agriculture. The composition of the soil is greatly dependent on the nature of the parent materials - i.e. the rock on which it was developed. Soil is either sedentary or transported and accordingly the composition varies. The fertility of the soil is often determined by the amount of humus present. Soil structure is dependent on the size of the soil particles. Aeration and water supply in the soil and the soil temperature are also important considerations for plant growth.

[4] BIOTIC FACTORS— Crop cultivation may be affected by weeds, parasitic plants, diseases insect-pests and animals. Some insects like bees & butterflies help plant pollination and earthworms assist in breaking down the particles and mixing the various layers. Fungal parasites also weaken and eventually kill plants.

[5] SOCIAL FACTORS— The type of farming practised depends on the culture of the farmers concerned, the type of crops produced and the yields obtained. For example, intensive wheat farming in Europe gives far greater yields than extensive wheat farming in the North American Prairies. Social factors also affect the type of crops grown. In Africa, tribal differences lead to agricultural differences. Masai tribe hates settled agriculture. Certain traditional crops are grown by certain people. The ownership and inheritance of land also affect the farm size and agricultural methods employed. In India, fragmentation of holding is a problem.

Some social and religious influences have profound effects on animal rearing, specially pigs & cattle.

[6] ECONOMIC FACTORS- Three kinds of economic controls are operative in all farming practices- (a) Operation costs, (b) Marketing expenses & (c) Government Policies.

Operation costs include purchase or rent of land, maintenance costs, recurring expenses, purchase of farm machinery, farm improvements, loans, mortgages, taxes etc.

Marketing expenses include freight charges by different modes of transport. It is also dependent upon the type of commodity (perishable or not) and the distance from the market Price fluctuation due to demand can be very violent. Overproduction may cause a glut.

Government policies may encourage the productivity and efficiency of farming by a system of guaranteed prices and subsidies to farmers. International agreements on major crops (like coffee, wheat) also affect farmers. By such agreements quotas are imposed on the producing countries so that supplies do not exceed demand.

Thus, agriculture becomes a function of a multiplicity of factors associated with different phases of culture and they vary both with time and space.

2.6 AGRICULTURAL REGIONS

Agricultural regions are not the natural regions. They are defined in terms of agricultural elements, that is, by crop, livestock, farming processes etc. The term agricultural region conveys that it is an uninterrupted area having some kind of homogeneity with specifically defined outer limits. Its homogeneity is determined by the criteria formulated and used. An agricultural region is created by the use of certain selective agricultural features that are relevant to a regional interest.

A primary basis of basic agricultural regionalisation may be the combination of crops and livestock which are raised. Further, the levels of agricultural productivity, extent of intensiveness in agriculture, degree of commercialisation, degree of subsistence level, types of farming practices, ensemble of structure and the diffusion of farm-technology may be considered as additional criteria for further subdivision within the basic regionalisation.

Any agricultural region involves two propositions-definition and delimitation. The definition takes into account structural attributes of agriculture, such as dominant crops, crop structure, crop and livestock association, farm processes, agricultural types etc. The delimitation involves drawing of maps in quantitative terms. There are various techniques which have been used from time to time for the delimitation of agricultural regions. These may be grouped into five distinct techniques: (1) normative; (2) empirical; (3) single element; (4) statistical (multi-element, new statistical and complex multi element); and (5) complete multi-facet (quantitative and qualitative)

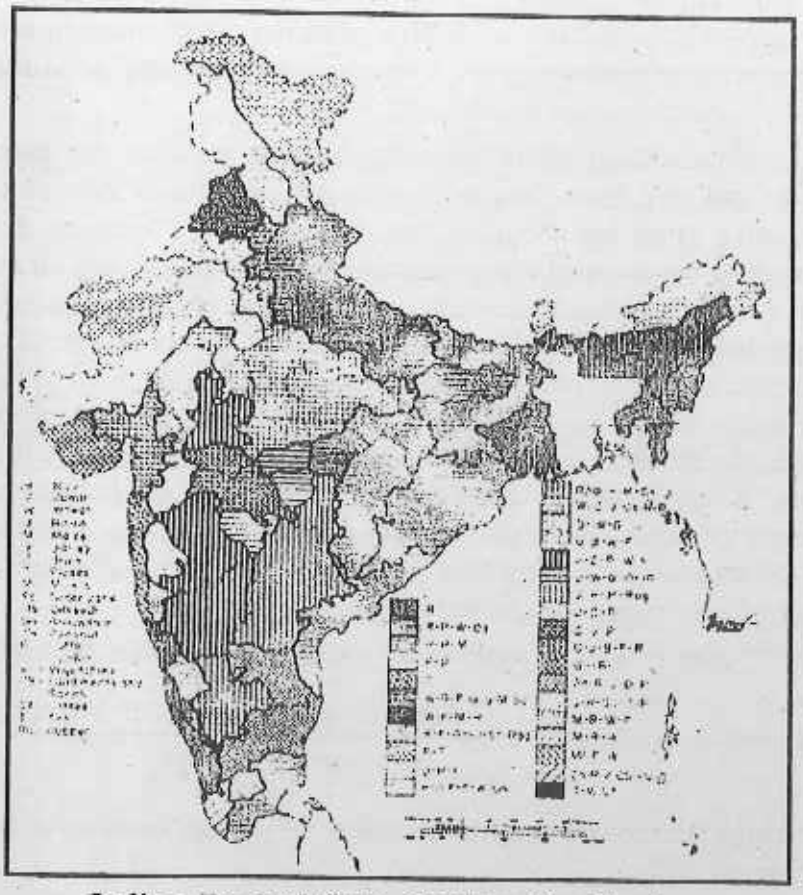
2.7 CROP COMBINATION

Agricultural geographers have worked out various statistical techniques which are an improvement on other techniques. The new statistical technique for agricultural regionalisation is a combination of two approaches - a) cluster analysis and b) combination analysis.

J.C.Weaver (1954) has pointed out three different lines in which crop -combination analysis may have more significance. Firstly, they are essential to an adequate understanding of individual crop geography, secondly, crop - combination in itself is an integrated reality that demands definitions and distributional analysis; thirdly, such regions are essential for the construction of the still more complex structure of valid agricultural regions.

Weaver proposed this technique to establish crop, livestock or enterprise combinations involving both the qualitative and quantitative aspects of crop production, livestock husbandry & functioning forms of agriculture. The technique involves comparing the actual propositions of the gross cropped hectareage occupied by different crops with abstract theoretical distributions' model wherein the gross cropped area is equally distributed amongst the different crops. The purpose is to establish the combinations where actual & theoretical distributions closely resemble each other. This situation arises when the standard deviation is the lowest. The least squares technique may be adopted for the derivation of crop combinations. Jasbir Singh (1976) applied it in Indian situation. The least square technique suggests that theoretical 4 crop combination in an enumeration unit is ideal where eleven crops are considered.

The least squares technique may be regarded as an important algorithm for establishing combination of homogenous crop farming or livestock raising only in those areas where they are practised as independent agricultural activity.



India : Ranked Crop Combination Regions

2.8 CROP DIVERSIFICATION

Crop diversification is a normal feature of stable agriculture & progressive farm management. This has been made possible by modern irrigation and the liberal use of fertilizers, HYV seeds, pesticides and mechanical technologies. Besides, there are other factors which force the cultivators to take crop diversification. First, Vagaries of weather compel the cultivators to saw a number of crops or practice a variety of enterprises on their a operational holdings so as to get some return under adverse conditions of weather. Second, rural life & the orthodox farm practices force them to obtain most of their domestic requirements from their holdings. Third, the agricultural experts are laying emphasis more on crop diversification for agricultural sustainability, maintaining soil health, & gainful employment at farm throughout the year.

The choice of cropping system is dependent primarily on physical variables & secondarily on technical & economic considerations, when physico -socio-economic conditions stimulate the growth of a variety of crops, farmers obviously tend to diversify the agricultural pattern. Crop diversification is important from the point of view of the steep rise of farm inputs. Consequently, each crop is bound to occupy only a small proportion of the arable land.

Many agricultural geographers have attempted to measure the indices of crop diversification and map them. Normally, it is assumed that if the number of crops grown in an unit is large, say about ten, each occupies only 10 percent of the cropped area. It means that the cropped area is distributed uniformly among all the ten crops. In such a case, crop diversification is of a very high degree. In contrast, if a particular crop occupies 100 percent of the cropped area, then there is no diversification at all. Here, monoculture or crop specialisation is the rule. It may be inferred that lower the value of the index, higher is the degree of crop diversification & vice-versa. In most parts of India, the number of crops grown varies from two to twelve. Suppose, in a regional unit "A" there are six crops occupying 30, 20,18,12, 8 & 6 percent of the cropped area respectively, & in the regional unit "B", three crops cover 67,20 &10 percent of the cropped area respectively. The degree of crop diversification in the former place (A) is higher than in the latter.

Bhatia (1965) has evolved a formula for measuring the index of crop diversification as

$$\text{Index of crop diversification} = \frac{\text{Percent of sown area under } \times \text{ crops}}{\text{Number of x crops}}$$

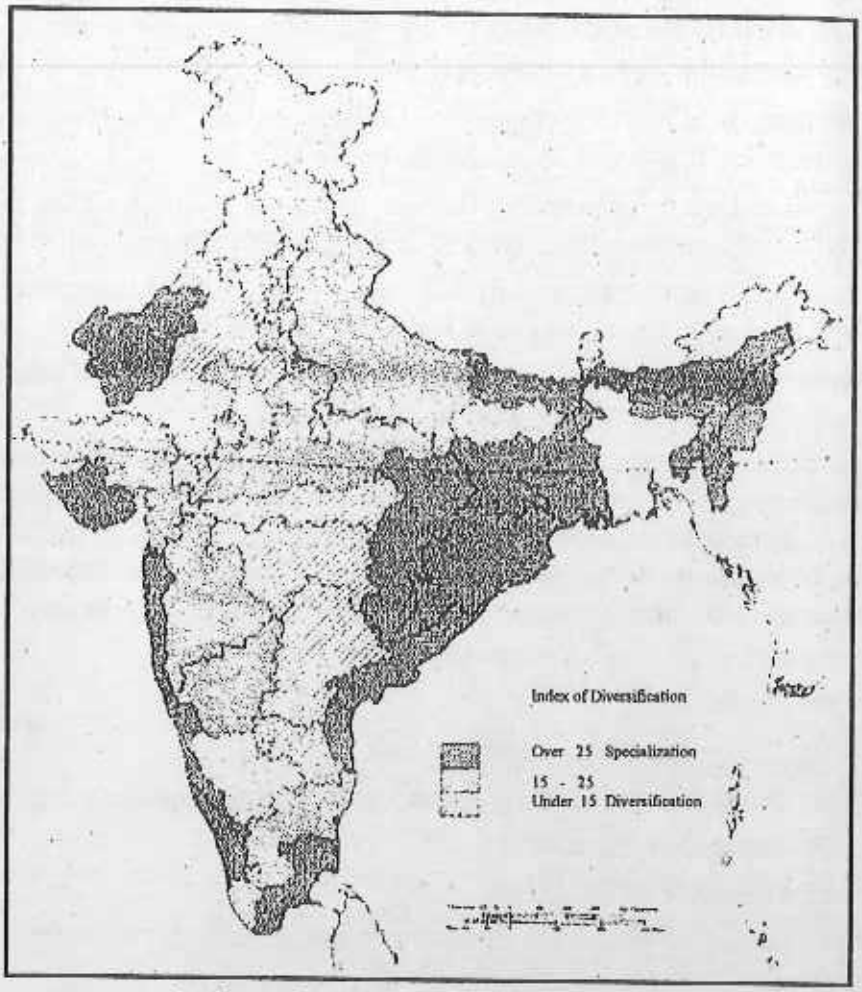
Where x crops are those crops which occupy 10 percent or more of the cultivated area in a regional unit.

Jasbir Singh (1976) used the formula in a modified form as

$$\text{Index of Crop Diversification} = \frac{\text{percentage of total harvested area under n crops}}{\text{Number of n crops}}$$

Where n crops are those which individually occupy 5 percent or more of the total harvested area.

The indices of crop diversification thus derived are mapped & exhibit a very significant spatial pattern of crop diversification in India.



India : Crop Diversification Regions

2.9 VON THUNEN'S MODEL AND IT'S RELEVANCE

The very first attempt to devise a scientific theory explaining the location of an economic activity can be credited to Johann Heinrich Von Thunen (1783-1850) of Germany. Both a scholar and a farm operator, Von 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 East Germany.

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

(1) There is an isolated area consisting of just one city and its agricultural hinterland. Such an area could be called "an isolated state".

(2) The city is the market for surplus products from the hinterland & receives products from no other area.

(3) The hinterland ships its surpluses to no other market except its city.

(4) The hinterland has a homogeneous physical environment favourable to the production of mid-latitude plants and animals.

(5) The hinterland is inhabited by farmers desiring to maximize their profits and capable of adjusting their type of farming to the demands of the market.

(6) The hinterland is traversed by only one means of land transportation. In Von Thunen's day this was the horse and wagon.

(7) 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, & 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 & supplies)

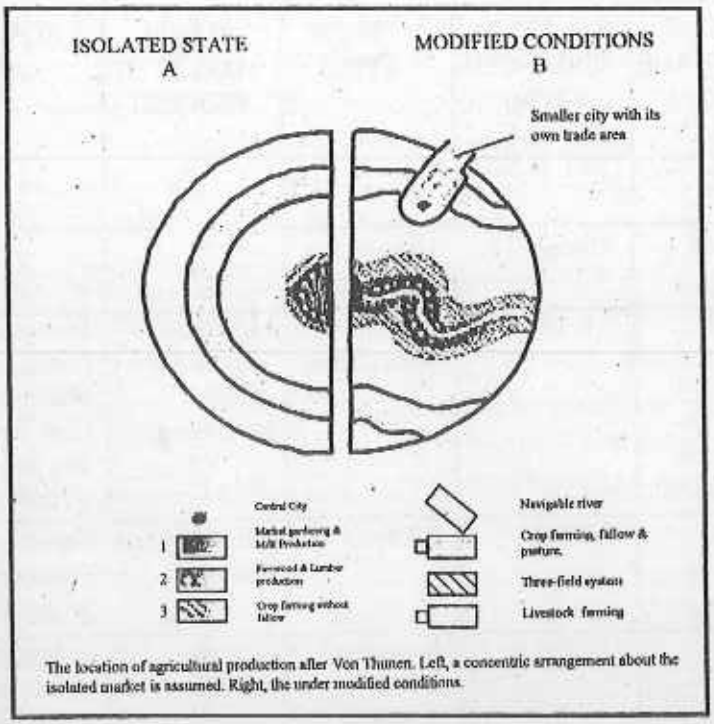
T= Transportation cost

Two principal themes of his theory are-

(1) The number of profitable options decreases with distance from the city market,

(2) 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



The location of agricultural production after Von Thunen. Left, a concentric arrangement about the isolated market is assumed. Right, the under modified conditions.

Zone 1 - The land nearest 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 2 - This zone would be specialized in producing wood, with firewood in much greater demand than lumber. According to Von Thunen, forestry yielded greater returns to the farmer near the city than did any other type of production except milk and vegetables.

Zone 3,4 &5 - 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 by the proportion of fallow land - 0 in zone 3, 14% in zone 4 and 33% in zone 5.

Zone 6 - 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.

This theory would be modified by the presence of a navigable river and a smaller market city as illustrated in B in the diagram.

The following table has given a summarized version of the main characteristics of the rings of land use given by Von Thunen in his isolated state.

RING	AREA AS PERCENTAGE OF TATAL AREA OF ISOLATED STATE	RELATIVE DISTANCE FROM CENTRAL CITY (UNIT)	LAND-USE TYPE	MAJOR MARKETED PRODUCT	AGRICULTURAL ACTIVITY
0	Under 0.1	Under 0.1	Urban-industrial	-	-
1	1.0	0.1-0.6	Intensive agriculture	Milk and Vegetables (Market gardening)	Dairy and truck (horticulture and olericulture) farming; land heavily manured, and no land is left fallow.
2	3.0	0.6-3.5	Forest	Firewood and timber	Forestry (sylviculture): Firewood and timber production.
3	3.0	3.5-4.6	Intensive arable rotation	Rye and potatoes	6-year rotation: rye-potatoes-clover-barley vetch (bean like climbing plants, some of which are used as cattle feed); no land is left fallow, and cattle are stall-fed in winter.
4	30.0	4.6-34.0	Arable with long ley	Rye	7-year rotation: pasture-pasture-pasture-rye-barley-oats-fallow.
5	25.0	34.0-44.0	Extensive agriculture	Rye and animal products	Three-field arable system: area under rye, barley and fodder crops; fallow, and pasture
6	Over 37.9	44.0-100.0	Livestock ranching (beef)	Animal products	Mainly livestock raising, and some rye produced for on-farm consumption
7	Beyond	100.0	Wasteland	-	-

RELEVANCE

The highly empirical contents of Von Thunen's classical model can be understood in terms of the early years of his life & their influence on his locational 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 & provided a framework for location theorists like Weber (1909), Hoover (1936 &1948), Losch (1954), Dunn (1954) & 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 technological achievements (refrigeration) & the replacement of firewood by certain substitutes (coal, gas, electricity etc.). Many of the needs of his time now seem obsolete. With improvements in transportation and reduction in transport cost, the radii of land use zones have become larger, but the concentric zones may still be recognised on a continental scale. At the small scale of farmstead & village, the ring effect still persists. Hence the movement continues to be measured in terms of time & man-days rather than freight costs.

In the less developed & underdeveloped countries the conditions may still be simi9lar to those of Von Thunen's isolated estate & there are several cases cited in geographical likerature 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 Thiinian agro-spatial model is no longer operative in its original format.

2.10 GREEN REVOLUTION OF INDIA

Between 1947 and 1967, efforts by the Govt. of India at achieving food self-sufficiency were not entirely successful. In a perfect case of Malthusian economics, population was growing at a much faster rate than food production. This called for drastic action to increase yield and the action came in the form of Green Revolutions which took place from 1967 and 1978. It is a term applied to successful agricultural experiments in many third world countries. It was most successful in India.

There were three basic elements in the method of the Green Revolution:

1.Continued expansion of farming areas,

2. Double cropping in the existing farmlands,

3. Using seeds with improved genetics.

The area under cultivation was not enough to meet the rising demand for food . Though other methods were required, the expansion of cultivable land also had to continue. So, the Green Revolution continued with this quantitative expansion of arable lands.

Double cropping was a primary feature of the Green Revolution. Instead of one crop season per year, the decision was made to have two crop seasons per year. The first crop was based on natural monsoon and water for the second phase came from huge irrigation projects. Dams were built and simple irrigation techniques were adopted.

Using seeds with superior genetics was the scientific aspect of the Green Revolution. The Indian Council for Agricultural Research (ICAR) developed new strains of high yielding variety (HYV) seeds, mainly wheat and rice and also millet and corn.

The Green Revolution was a technology package comprising HYV seeds of two staple cereals (rice and wheat), irrigation and improved moisture utilisation, fertilisers and pesticides and associated management skills.

BENEFITS OF GREEN REVOLUTION

The Green Revolution resulted in a record grain output of 131 million tonnes in 1978-79. This established India as one of the world's biggest agricultural producers. Yield per unit of farmland improved by more than 30% between 1947 and 1979. The crop area under high yielding varieties of wheat and rice grew considerably during the Green Revolution. The production of millet and corn has also registered an increase. The Green Revolution also created plenty of jobs not only for agricultural workers but also industrial workers by the creation of related facilities such as factories and hydroelectric power stations. This improved the quality of life of the people in villages. India paid back the loans it had taken from the World Bank. This improved India's creditworthiness in the eyes of the lending agencies. India transformed itself from a starving nation to a food exporting country. The Green Revolution was one factor that made Mrs Indira Gandhi & her party INC a very powerful political force in India.

SHORTCOMINGS OF GREEN REVOLUTION

The Green Revolution, however impressive, has not succeeded in making India totally and permanently self-sufficient in food. Ever today, India's agricultural output sometimes falls short of demand. In 1998 and (2005) India had to import onions. Last year India imported sugar. The country has also failed to extend the concept of HYV seeds to all crops or to all regions. In terms of crops, it remains confined to foodgrains only. In regional terms, only the states of Punjab and Haryana showed the best results. The eastern Ganga Plains in West Bengal also showed reasonably good results but in other parts of India the results were not so impressive.

The Green Revolution has created some adverse impacts on the environment. The increasing use of agrochemical based pest and weed control in some crops has affected the surrounding environment as well as human health. Increase in the area under irrigation has led to rise in the salinity of the land. Although HYV seeds had their plus points, it has led to significant genetic erosion. By the 1970s the new seeds, accompanied by chemical fertilizers, pesticides and for the most part, irrigation, had replaced the traditional farming practices in the developing countries. The Green Revolution cannot therefore be considered to be successfull in all aspects.

UNIT 3 ❑ CLASSIFICATION OF INDUSTRIES

Structure

3.1 INTRODUCTION

Industries are diverse but they may be basically divided into - Primary, Secondary, Tertiary & Quaternary.

1. **Primary Industry**— These industries are concerned with extracting material direct from the earth (or sea) and do not involve the processing or fabrication of a finished product. They are located at the source of raw materials and can not be located anywhere else. The examples are - the production of metal from mineral ores, the production of power from coal and oil, the processing of agricultural commodities to form food stuffs or industrial raw materials etc. such industries also include the smelting of bauxite to make aluminum, the processing of latex to make rubber sheets or the pulping of logs to make paper.
2. **Secondary Industry**— These industries cover a very wide range of operations, varying greatly in complexity. Industries in this group are characterised

by the variety of their locations. Some are located with reference to the final purchaser; others are strongly tied to their raw materials, while some are in between these two extremes. They are sometimes subdivided into heavy industries; eg. engineering, metal goods, heavy chemicals, shipbuilding, locomotives and light industries; eg. electrical equipments, plastics, textiles, cosmetics and toilet articles. Basically they include all re-processing of partially manufactured goods to make more complex products; eg. the use of cloth in clothing, the use of iron parts in the manufacturing of machinery, the use of copper wire in the electronics industry and the use of paper to make books.

3. **Tertiary Industry**— Industries in this group are concerned with providing a service and tend to be located where services are required. Industries such as retailing are market oriented. Tertiary industry is not a branch of manufacturing at all but consist of sendees like trade, transportation, commerce, entertainment, personal service, tourism, administration and so on,
4. **Quaternary Industry**— These are concerned with the provision of information & expertise. Included in this group would be Universities, "think tanks", research establishments, the producer sendees, comprising planning, management, legal, financial, marketing and accounting services for large corporations & governments. Such activities also tend to be market oriented but could theoretically be located almost anywhere since information can be transmitted easily from place to place by electronic media. So it is potentially footloose.

There is another category called quinary which involves high-level decision making or control functions that manipulate the vast recourses of private business & governments.

Industries can also be classified as resource based industry and footloose industry.

3.1.1. Resource based and foot loose industries :

The resource based industries are tied with the source of raw materials and markets, eg. iron and steel industry, aluminium industry, cement industry etc.

Foot loose Industry— Today the basis of power for much industry is by means of the electricity grid. Electricity as a source of power has become virtually ubiquitous. It is found almost everywhere. This has laid geographers to coin the term "foot loose" to describe those industries, which are relatively united to localized sources of energy. In such industries, a set of production costs do not very much geographically and the manufacturer can suddenly go elsewhere with little or minimum loss in capital investment.

3.2 THEORIES OF INDUSTRIAL LOCATION

The distribution of industries over the world varies from each other on the basis of raw materials, the process of manufacturing, the resultant product and the markets. So, the locational preference will also differ. The studies primarily concerned about the spatial variation of industrial locations are known as industrial location theory.

GENERAL LOCATIONAL FACTORS :

The extreme complexities are involved in location decisions. The availability of raw materials, cheap labour, transport cost and proximity to market make the manufacturing cost differential between the places. If profit maximization is the chief objective of the plant owner, least cost location will be preferred. The different locations have different geo-economic character. The governing factors fall into two broad groups : (1) Geographical factors, (2) Socio-economic factors. The subdivisions are as follows :

Geographical factors :

a) Land, b) Raw materials, c) Climate, d) Water-resources, e) Fuel

Socio-economic factors :

a) Capital, b) labour, c) Transport facilities & charges, d) Demand, e) Market, f) Government patronage & policies etc., g) Tax structure, h) Management, i) Other factors.

We can discuss all these factors under the broad headings of -(A) Market, (B) Production Costs, (C) Agglomeration Economies and (D) Environmental Factors.

(A) Market :

For a growing number of industries, the market has become of increasing importance in the locational choice. The cost of transporting a manufactured product is normally higher than transporting a non-manufactured material. Furthermore, there is often a weight gain in the manufacturing process. A location near the market avoids the transport charge on materials added during manufacturing. Two basic reasons for market location are - the higher freight rate on the finished product & a weight gain in the manufacturing process. Another reason involves perishability and communication cost and convenience. A market location implies a desire to improve sales. If the sales revenue is high enough, a somewhat higher production cost can easily be accommodated.

(B) Production Costs :

Several elements of production costs are labour cost, labour availability, energy,

materials and other related factors. Labour is a major cost item. Manufacturing processes requiring highly specialized and skilled labour must pay high wages. There is always a tendency for industries that are labour - intensive but require unskilled workers to locate in low-wage areas (e.g garments making industry - tailoring)

The availability of labour is also a critical factor, especially skilled labour. A realistic option for a manufacturing plant is to locate in an area of surplus labour, where the wage rate is likely to be depressed and people will be willing to work for lower wages. Labour productivity is another consideration vital to the locational choice. If a labour force is available at a low wage rate and the productivity level of the workers is low, it may be more economical to select a location having higher productivity and higher wages.

Energy costs have been rising rapidly in recent years. Certain kinks of manufacturing are more energy - dependent than others (e.g. the aluminium industry). The degree that energy costs and availability vary geographically shapes the locational sensitivity of manufacturers to energy.

One of the major costs for manufacturing is the purchase of materials. Material costs will be specially significant in a region at an advanced stage of economic development. Suppliers who understand the material requirements of a manufacturing plant and who provide reliable, timely and convenient sendees play a vital role because most manufacturing operations require a consistent flow of material inputs.

Other related factors include access and cost of capital, tax advantages, community development, local amenities and personal considerations.

(C) Agglomeration Economies :

The term agglomeration implies a concentration of activities in one place. Economies mean savings. Agglomeration economies are those savings that result from concentrating economic activities in one place or adjacent to one another. Four kinds of agglomeration economies that result in profitability to an industrial firm are - transfer economies, internal economies of scale, external economies of scale and urbanization economies. Each of these concepts is important in understanding the location of manufacturing activity.

Transfer economies are the transportation savings that a plant gains by locating close to other plants. Plants may locate near one another to benefit from successive stages of production. When material sources and markets are dispersed for a manufacturing plant, a location at a strategic node on the transport network means a saving in transport costs.

Internal economies of scale are the savings a particular plant enjoys from increasing its scale of operation or size. Size may be measured in number of employees, amount

of payroll, value added, or volume of output. As the size of the plant increases, the average production cost of the items manufactured normally decreases.

A third agglomeration advantage is external economies of scale or localization economies. These costs reductions come about from a spatial concentration of plants in the same industry. The scale economics arc external to a particular plant but internal to the specialized machinery replacement for its manufacturing operation.

Urbanisation economics occur when the average cost of production units is lowered as may industries develop in one place, such as a large urban area. Several industries share the burden of certain costs, and this results in a reduction of average costs to all. A large urban area has a large, flexible labour pool, well-developed commercial and financial services, such as fire and police protection.

(D) Environmental Factors:

Over the last several years, environmental factors have taken directly into account in the location decision either through the perception of the business person or through policy requirements at he state or local level. Environmental regulation will have a major and continuing effect on the location of manufacturing. The principal concerns arc with air, water, noise, solid wastes and land use. Four types of impact of environmental regulations on manufacturing arc - same site versus new site, regional development, changes in the location decision process and increased awareness of space.

On-site expansion normally involves less risk and uncertainty. The location of a new facility would probably result in longer delays than expansion on-site.

Areas that arc currently experiencing rapid regional development are likely to remain as industrial targets. Regions with relatively little industrial development may wish to protect their relatively unspoiled environment by excluding dirty industrial growth.

Environmental factors arc now recognized as important in the location decision process. Such items as waste disposal, water quality controls, and air pollution standards are now basic influences on location decision.

A final consequence of the greater environmental concern is the enhanced awareness of spatial factors. The focus is now more explicit for an increasing number of manufacturers. The increased awrarencss of space should ideally result in a better pattern of location in the long run.

3.3 INDUSTRIAL LOCATION : 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 ike location of Industries"* 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 aims to explain the location of industrial activity in terms of three economic factors namely, transport costs, labour costs and agglomeration economies. His explanation is based upon finding the least-cost location for production.

Assumptions & Principles:

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

1. 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.
2. The size and location of centers of consumption of the industrial products are given. The markets are thus points on the plain.
3. There are several fixed locations 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.
4. The area has a uniform culture, race, climate, and political and economic system.
5. The entrepreneurs seek to minimize the total cost of production.
6. 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.
7. Costs of land, building, equipment, interest and depreciation of fixed capital do not vary regionally.
8. There is a uniform system of transport over a flat surface.

Several terms introduced by Weber need to be defined. Ubiquities are materials available everywhere, examples - water, sand, gravels etc. localized materials are available only at specific locations, examples-coal, iron ore, bauxites etc. Weber also made a distinction between pure materials and weight-losing materials. Pure materials lose no weight in processing, example : Cotton. Weight losing materials import only a portion of their weight into the finished product: example : iron & 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 costs of transport of the materials. So his general regional factors affecting production are reduced to transport costs and labour costs. He identifies another local factor called agglomeration or deglomeration economics. The first are the savings to the individual plants that result from their operating 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 economics also include linkages between firms, where there are flows of goods between the plants, the 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. Deglomeration 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 minimum transport costs. (2) A discussion of the circumstances under which production will be attracted away from this point owing to advantages gained from cheapest 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 & (B) One market and two sources of material supply and involve Weber's classic locational 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 processing will locate at the material source to avoid transporting waste materials.

(B) One market & two sources:

In the first example of the locational triangle, Si & S2 are the two material sources & M is the market location. Because distances 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 the two needed materials can be shipped there at a total unit cost of $2.00. If processing were to locate at Si, there would be the 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 unit of material from both Si & 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 charged to get the material from Si & 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.

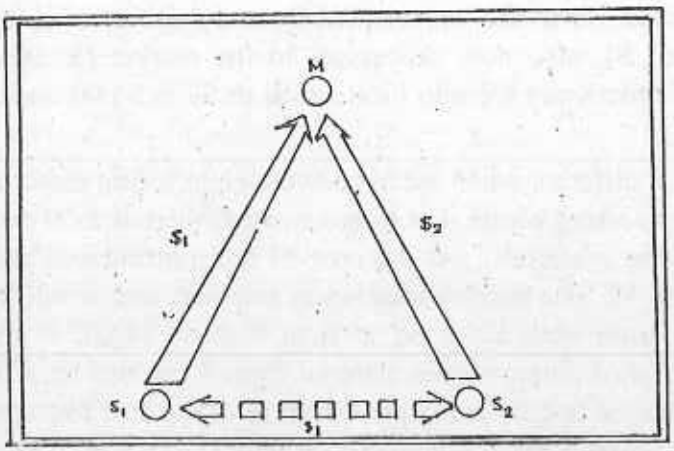
Weber was concerned with selecting the least-cost or optimum location. An intermediate location at P would be optimum, rather than M, Si or S2, where the transport cost at P would be less that $4.00. Besides, if one material had a greater weight-loss ratio than the other, the intermediate location for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

Labour Cost :

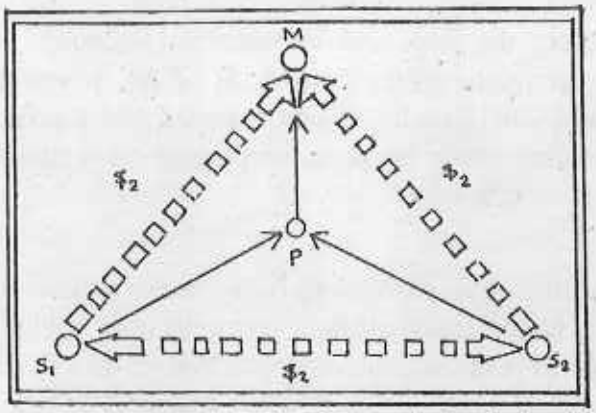
The geographic variation in the cost of labour was viewed by Weber as a distortion of the basic transport pattern. An area handicapped by high transport cost might be attractive to industry because of inexpensive labour. According to Weber, an industry would select the location that has the least combined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

To determine this location, Weber introduced two concepts - Isotim an Isodapane. Isotim is a line of equal transport cost for any material or product. Tn the diagram the isotims are given in $1.00 interval. The cost of shipping the finished products is shown by single line isotims. If one located processing at the material supply site (MX 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 source i.e. $3.00

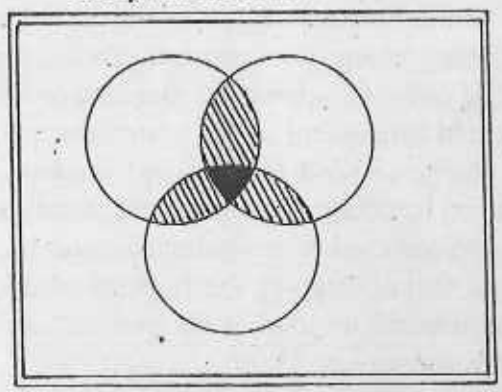
The Isodapane is a line of total transport cost. The isodapane is found by summing the isotims at a location. Once the isodapanes are determined and one is able to identify the point of least total transport cost, then the variation in labour costs can be considered in combination with the isodapanes. The reason for using isodapanes



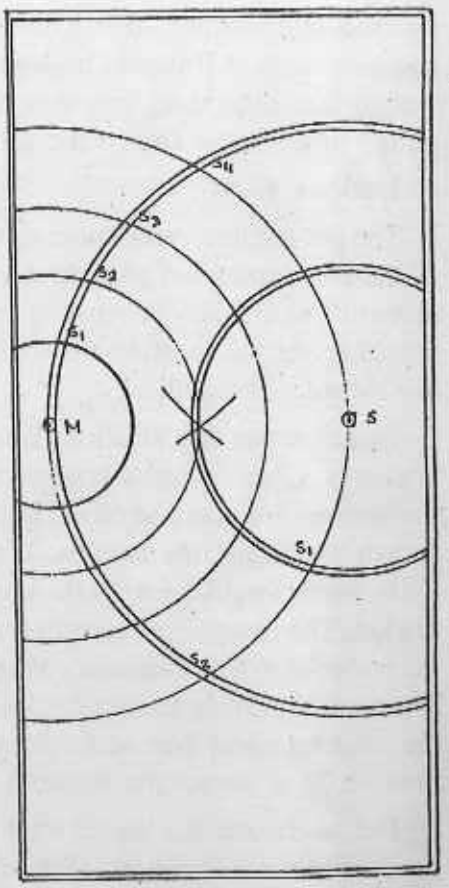
Weber's Locational Model with one market (M) and two source of raw material (S_1&S_2) supplies



Weber's intermediate location emphasis the least cost production location is at P



Where the critical isodapanes overlap, firms A, B & C can take advantage of agglomeration economics



Isotims, or lines of equal transport cost show that the market (M) is the optimum location for production

is to introduce the labour component into Weber's locational theory. In the diagram, the construction of isodapanes and the optimum location points are shown.

Agglomeration :

Weber recongised that agglomeration may operate as a distinct locational factor. He viewed agglomeration as the dollar savings per unit that would accrue to a plant from locating within a cluster of other plants. Weber saw agglomeration not as producing internal-scale economies, but rather external economies including urbanization economies. The figure illustrates the cost of three manufacturing plants, A, B & C, which have each 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 saving if they were to locate within the shaded triangle.

Criticism :

Weber's purpose was to provide a general theory of industrial location & in this regard his contribution has proved most valuable. His work, however, has a number of shortcomings that limit its application in explaining folly 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 costs are not proportional to distance & 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 is an ideal condition. In the long ran it is very difficult to sustain perfect competition in the region. Competition and price fluctuation in the economy is a natural phenomena. Weber failed to recongnise that.

3.4 AUGUST LOSCH'S THEORY OF PROFIT MAXIMISATION :

August Losch,, a German economist published his theory of profit maximisatiion in "Economics of Location" in 1954. Losch recognised the least-cost versus maximum-

sales approaches to location theory. He noted that "in a free economy, the correct location of the individual enterprise lies where the net profit is greatest". Net profit is the difference between sales receipts and minimum costs, and the entrepreneur's solution is to find the location where these differences are the greatest. According to Losch it is empirically impossible to examine all points in an area to determine cost and demand and hence "the place of greatest money profit". So, ignoring transport cost, labour cost and agglomeration cost, he emphasized more on the total production cost. To get the maximum profit, Losch emphasized most on the price reduction of the commodity. Any decrease of price would stimulate the volume of consumption. This can be illustrated by the following diagram. In this simple model, it is evident that when the price of the commodity drops from R to P the consumption increases from M to N.

Like Weber, Losch also considered certain assumptions for the success of his theory. In the presence of certain optimum conditions the maximum profit location may occur :

1. The area should be an extensive homogeneous plane where raw materials are distributed evenly.
2. The ""transport cost" is uniform and directly proportional in all the directions.
3. The people inhabiting the region have a general homogeneity either in taste, knowledge & technical skill.
4. There is no economic discriminations among the people. The economic and career building opportunities and open and uniform to all individuals.
5. The population distribution is very even and the area is self-sufficient in agricultural production.

To achieve homogeneity of economy within the region, the theory required some more conditions. These are as follows :

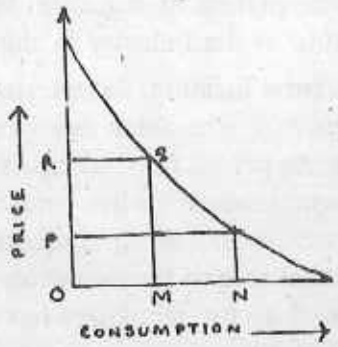
1. The entire area should be equally served by the factories. No area should be exempted from the supply, therefore, no new firm would dare to venture in the area.
2. There must be conformity in the range and quantum of profit. In case of abnormal profit, new firms may try to establish their own plant.
3. The location must satisfy both producer and consumer. The profit of the firm and satisfaction of the consumer must be optimum through the location.
4. There must be provisions for consumers to get the products from other adjacent areas.
5. The number of consumers, producers and areas should be well defined and not very extensive. Only a limited number of producers within a small area

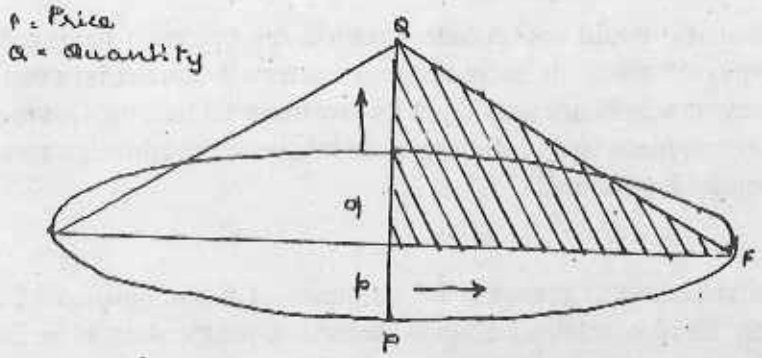
will be able to overcome the complexities and satisfy completely the handful of consumers.

According to Losch, to get the desired result from the location and sustained growth of the industry, these conditions are pre-requisites.

Theory :

The major objective of Losch's location theory is to attain equilibrium in the producing area and the product and the ability of the producer. If a single entrepreneur enters in the production process, within a vast area, the distribution cost will be very high. But when several small producers are engaged in the production process in separate regions, the distribution cost will come down and due to increasing competition, efficiency of the product and cost of production will be lower. The profit will increase substantially.





To establish his theoretical model of the theory, August Losch proposed three distinct phases of development. The phases are as follows : -

(I) In the first phase Losch observed that if sufficient and symmetrical demand of a product prevails in the market, the market conditions may be explained by a demand cone. The above diagram illustrates that the effective demand of the particular product will be exactly same as the volume of the cone.

P is producer, and demand curve is lying on QF? P or price line, controlled jointly by transport cost and distance. The price increases from P to F. Along the Y axis or PO. demand of quantity is measured between PF and QF. When PF is taken as a measure of distance and is rotated about P, the circular market area is formed, bounded by the locus of points F, where the price becomes too high. Total sales are given by the volume of the cone produced by the rotation of POP. It is clear from the diagram that, away from the centre, with increasing distance, demand of the quantity drops drastically.

(II) In the second phase, within the vast rounded area, several factories will concentrate. The extensive market area will give a lucrative operational area. But despite the growing competition among the firms to capture larger share of consumer and larger market areas, there should be some void in the boundary zones and a certain amount of region will remain unserved or poorly served. The circular pattern of industrial hinterland in phase II will ultimately decide the future of the industry in that region.

(III) In the third phase of industrial location, the intermediate space between two market areas will be narrowed. The areas fall vacant between the different market areas become the target of new enterprises. As new firms set up within the vacuum, the hinterlands of earlier industries become reduced. The reduction of the market area results in rapid disruption of the early circular pattern. Gradually the market area of the industries attain a hexagonal shape. Thus around the nucleus of a city, numerous hexagons of market areas of different commodity will grow.

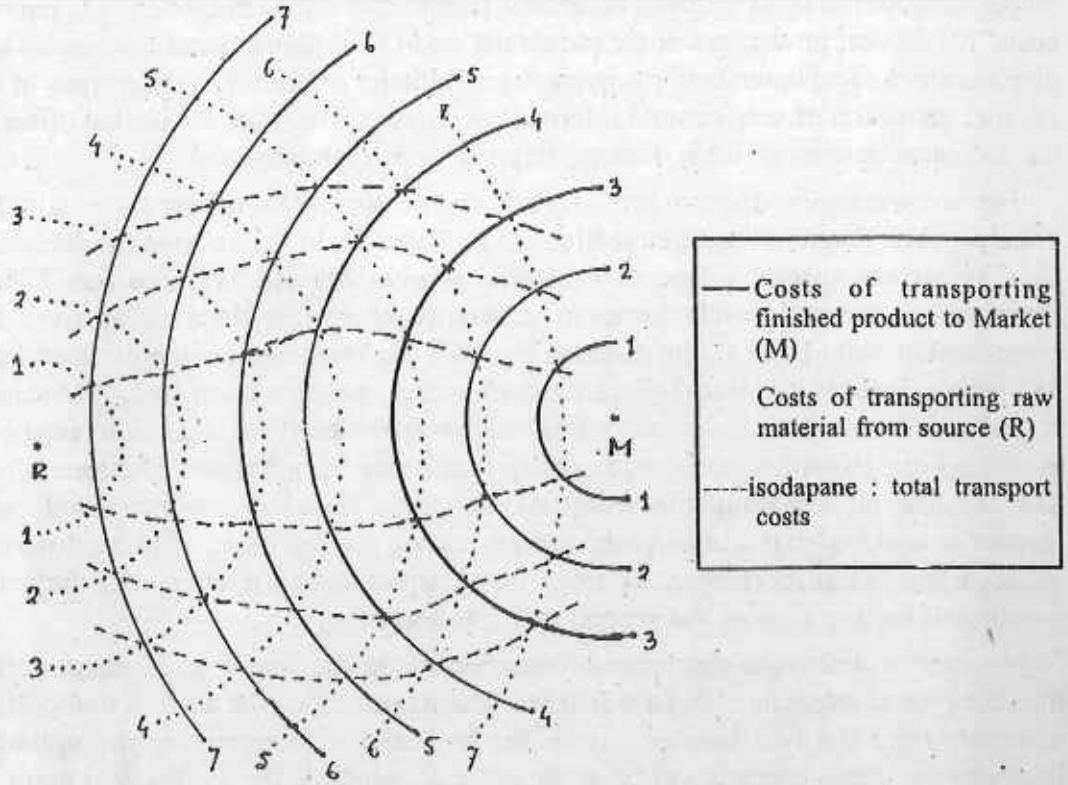
In this way, industries would concentrate within a region, each having different products. So, all types of materials including raw materials should be available on that point. Hence, any new industry would get its raw material nearby. Obviously, the total transport cost in that place will be minimum. In this way, "equilibrium conditions" as stated by Losch may be attained.

Criticism:

Losch was the first person to consider the influence of the magnified of demand on industrial location. He also emphasises upon the rate of competition as an important determinant of locational analysis. His theory has also a philosophical contribution on the motive of entrepreneur's role. His equilibrium concept is perhaps the greatest contribution among the location theories developed later on.

However, Losch's theory was not entirely flawless. His theory is essentially a simplified model of an ideal condition. In reality, only in a rare occasion, these events may occur. The assumed conditions of homogeneous plain region, equal distribution of raw materials and uniform transport rates never occur in reality. Therefore, according

to some critics, this theory is nothing but an intellectual exercise. Losch even assumed the cultural homogeneity and uniform taste of the people within the region and the idea is quite absurd. He ignored the variation of technological development of different regions. The difference in technical know how may offset the theoretical model. Political decisions also play an important role in the industrial location. Losch overlooked this point. The variation of the cost of raw materials and labour wage rates were not given proper weightage in this theory. He categorically separated the role and effect of agriculture and industry. But this difference is somehow arbitrary in nature. The abstract and optimum situation demanded by the theory may be available



The construction of isodopanes : one market, one raw material case with transport costs proportional to distance and no weight loss. Optimum location either at R or M, or if no extra handling charges anywhere along the line between R and M

in agriculture but not in the complex production process of modern manufacturing industries. Thus, Losch's theory is more practical in agriculture rather than in industry.

3.5 ISARD'S THEORY OF SPACE ECONOMY

Another major contribution to location theory was the publication of "Location and the Space Economy" by Walter Isard in 1956. Isard incorporated all relevant

locational and spatial factors into a general theory of the space economy. He considered all the costs of inputs and outputs over time and space as well as selling prices in order to create a more general theory. Isard developed his theory by integrating the works of Von Thunen, Weber and Losch. He linked his location theory to the general theory of economics through the substitution principle.

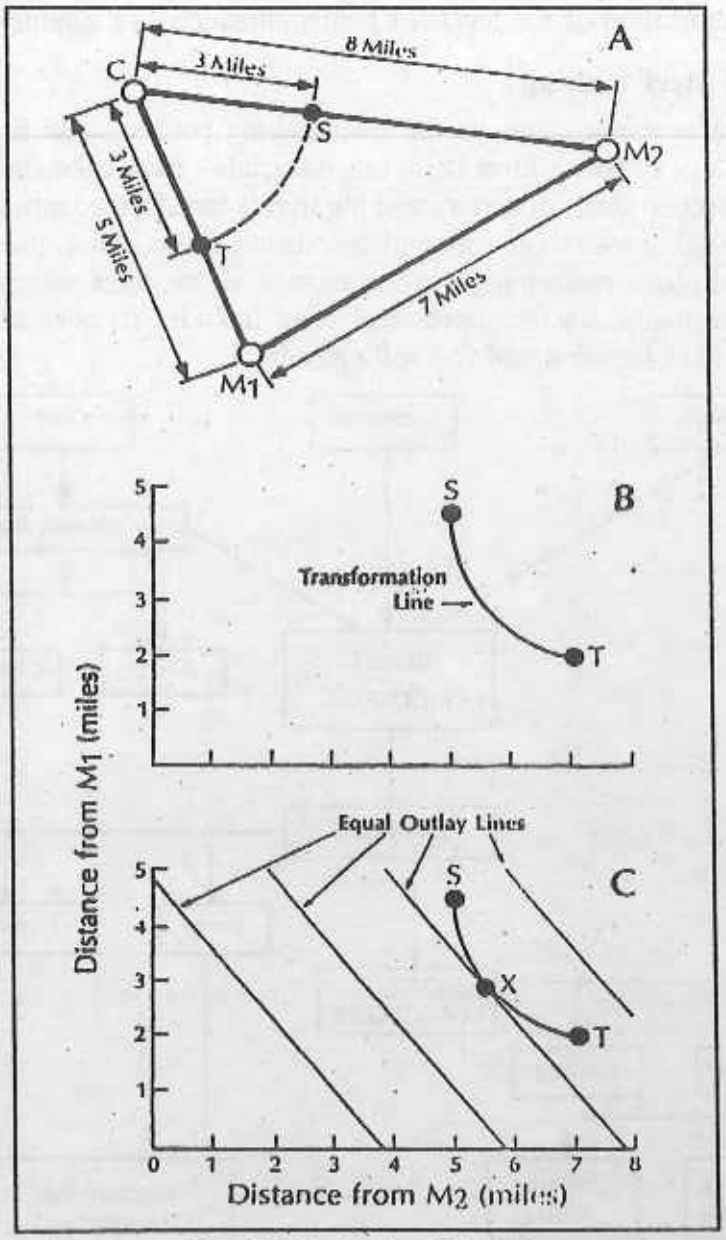
Isard's spatial equilibrium through substitution approach allows for substituting any of the factors in the production process, not just transportation. Cheap coal might be exchanged for higher cost natural gas in determining an optimum location for one firm, while another might respond to changing costs by adjusting the mix of its output. In general, Isard grouped locational factors into three categories : (1) transfer costs; (2) labour, power, tax costs and so on; and (3) agglomeration economies and diseconomies. The latter factor reflects the advantage offered by urban areas in the cheaper provision of services and information. These savings are somewhat offset by the increases in cost of other factors, referred to as diseconomies.

The accompanying diagram provides one simple illustration of Isard's substitution principle. The diagram has three sections of A, B and C. In A, we have the Weberian situation of one market C and two material sources Ml and M2. The line T to S represents a set of possible locations arbitrarily chosen at three miles from the consumption point C. In B, the distance from Ml is plotted against the distance from M2 with respect to the line T-S, referred to as the transformation line. At location T, distance from Ml is only two miles, but seven miles from M2. Conversely, at location S the distances are approximately four miles from Ml and five miles from M2. As one moves along this transformation line, distances are increasing with respect to one material site and they are decreasing for the other. If these distances are regarded as transport inputs or costs, the transport costs for one source are being substituted for the cost of the second material source.

In order to determine the optimum location along the line T to S, equal outlay lines are plotted on section C-of the diagram. These lines depict the costs of transporting materials from the two sources. Given the objective of determining the optimum location, the place selected will be at the point X, which is the lowest-cost point on the line T to S for that equal outlay line. Therefore, based on the simple example of substituting among locations at a three-mile distance from the consumption point, the optimum location will be at X with respect to transport costs from Ml and M2. The results of this analysis by Isard follow Weber, except for the conceptual emphasis on substitution.

Isard sought to create an overall theory based on the fusion of the frameworks of Von Thunen, Losch and Weber. He linked location theory with other branches of economic theory through the substitution principle. Greenhuts summarized the substitution approach to location theory as follows : "The event to which labour can

be substituted far capital or land and vice versa is basically the same problem as the selection of a plant site from among alternative locations." For example, given two equally advantageous sites for a factory, one may have cheaper land, the other cheapter labour. By locating on the cheaper land site, an entrepreneur would be substituting cheap land for cheap labour. Both locational and economic theory have as one objective the optimal allocation of resources.



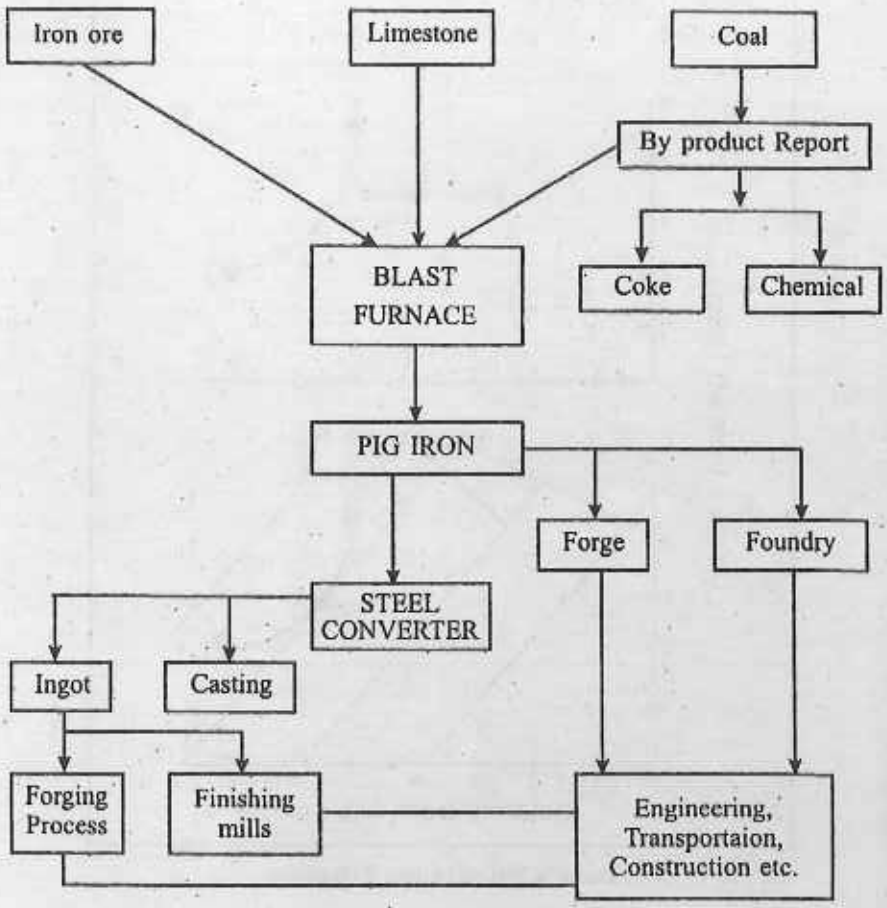
Isard's Substitution Principle

3.6 IRON AND STEEL INDUSTRY

The structure of modern industrial world is made of steel. Iron and Steel industry is the basic industry of any country. Most of the subsidiary industries like automobiles, locomotive, ship-building, machine-building and also manufacturing of chemicals are all directly linked up with the iron and steel industry. The extent of its growth gives a clear indication of the levels of industrialization in a country.

Process of steel making

There are three major stages in the steel making process. The first stage is the blast furnace stage in which three basic raw materials - iron, coke and limestone are placed. In the second steel converter stage pig iron is transformed into steel. The third stage is the finishing mill stage where plates, sheets, strips, tubes, bars, rails etc. are produced. Steel plants performing the operation of all the three stages are known as integrated steel plants. An integrated steel plant includes (i) coke ovens, (ii) blast furnaces, (iii) steel furnaces and (iv) rolling mills.



The history of Iron and steel industry is as old as human civilization. U.K. was first developed as the most dominating producer of iron & steel. Gradually, the production of U.S.A., Germany, USSR outplaced U.K. and they emerged as dominant iron and steel producing nations. After Second World War, Japan also joined in the fray. China and India are also making rapid strides to be leading producers of iron and steel.

World Review of Steel production—

Production of steel in the world after experiencing a recession in 1980s, recovered significantly in 1990s. Total production of crude steel increased from 724 million tonnes in 1992 to about 830 millions tonnes in 2001. China became the world's largest steel producer and continued to hold the position in 2001. Other leading producers are Japan, U.S.A., Russia and Germany.

Country	Crude Steel Production (million tonnes)							
	Production		Country	Production		Country	Production	
	1992	2001		1992	2001		1992	2001
1.China	80.94	141.39	4. Russia	67.03	57.53	7. Ukraine	41.76	33.11
2. Japan	98.13	102.86	5. Germany	39.71	44.80	8. India	18.12	27.29
3. USA	84.30	89.71	6. South Korea	28.05	43.85	WORLD	724.00	823.92

Source : International Iron and Steel Institute.

Iron and Steel Industry— CIS

In the post revolution period, the Soviet steel industry had achieved a remarkable expansion. From the early period of Stalin era, steel industry have experienced all-round government patronage. During the Second World War, however, the Soviet iron and steel industry were affected badly. However, within 1975, the country became the largest iron and steel producing nation in the world. Till now, the CIS has been able to maintain the performance in the same fashion.

The increase of the Soviet iron and steel output is indeed astonishing. In 1930, the output of pig iron was a mere 5 million tonnes, which went upto 10 million tonnes in 1934. From this period onwards, the Soviet steel industry had witnessed an unprecedented growth. The growth rate can be noticed from the table—

Annual Production (million tonnes)								
	1930	1936	1955	1965	1973	1983	1990	1996
IRON ORE	5	14	33	—	216.0	245.19	236.0	105
CRUDE STEEL	41	75	50	91.0	131.46	152.52	154.0	120

The consistent increase of iron and steel production enabled the country to retain the top position along the iron and steel producing countries. In 1996, the major constituents countries of CIS namely Russian Federation and Ukraine jointly produced 71 million tonnes of crude steel. Russian Federation and Ukraine produced 49 and 22 million tonnes of steel respectively and secured third and fourth position among steel producing countries.

Distribution

The industry first took its birth in Moscow region some 300 years back. After revolution subsequent exploration of new iron and coal deposits encouraged the decentralization of the industry to the remote areas.

The location of Soviet steel industries are mostly controlled by raw material availability. In fact, the total transport cost for raw material assemblage in this country is often so high, that this may be regarded uneconomic in any country other than socialist economy.

Iron and Steel Industry in the Former Soviet Union Industry

The major iron and steel producing countries are :

1. The South District,
2. The Ural Region
3. The Kuznetsk Basin
4. The Central District
5. The Other Centres,

1. The Southern district.— This is one of the oldest iron-steel producing centre in the CIS. The existence of Krivoy Rog iron ore and Donbas coal belts within the region gave the industry a tremendous fillip. The Yelenovke limestone, Nikopol manganese, and Kirch iron ore were considered as added advantage of the area.

The iron-steel districts of both the Krivoy Rog and Donbas had a symbolic relationship regarding raw material supply. According to the reciprocal relationship, Donbas coal is used in Krivoy Rog and after unloading coal, it collects Krivoy Rog iron ore for Donbas steel industry. Therefore, both the centres became mutually benefited and overall transport cost is reduced.

2&3. The Ural— Kuznetsk region— This region was primarily based on nearby iron ore deposits. It was one of the oldest iron-steel districts in the CIS. The real development of the Ural region, however, began after the introduction of 'combine' system with Kuznetsk. In fact, during the middle of 20th century, two giant plants were erected, one each at the Urals and Kuznetsk. The iron ore based plants of Magnitogorsk in Ural and coal based plants of Novo Kuznetsk in Kuznetsk basin became an instant success.

4. The Central district— The region is located around the capital city of Moscow. Perhaps this is the only market based iron and steel region in the CIS. The development of the Moscow-Tula industrial region forced the planners to set up iron and steel centres in this region.

5. The other regions— Besides these traditional centres, new iron and steel producing centres have developed around Kursk magnetic anomally, Electrostal, Cherepovets, Kolpin, Leningrad, Vertsilya, Liyapaya in the east and Yarmak, Kuzbass and Petrovsk-Zabaykalsky in the south central region.

Iron and Steel Industry—United States

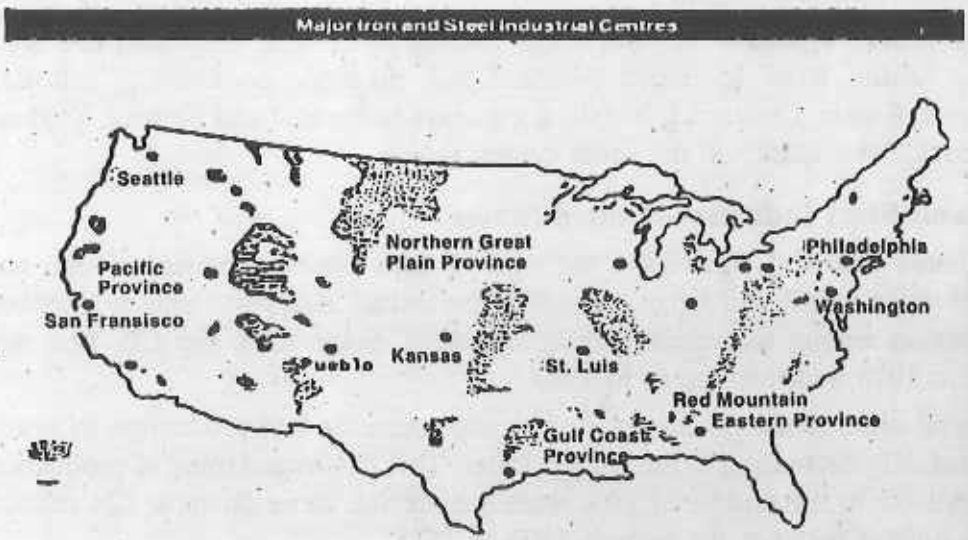
The United States of America is the world's third largest producer of iron and steel, next to the USSR and Japan. Till 1974, the United States was able to maintain its top postion among the manufacturing countries. Since then, the CIS first surpassed it in 1978 and then Japan in 1983.

A general observation on the production chart reveals that production of crude steel is gradually decreasing in the United States. This downward trend of production was first visible in the middle of 70's, when production came down to 124 million from 132 million between the periods 1973 to 1978.

However, keeping pace with production, the consumption volume in the country has also come down. In 1992, the total consumption of crude steel in the USA was 93.33 million tonnes or 13.7 per cent of the world total. Except the CIS no other country in the world consumes such a large amount of crude steel.

Trend of Crude Steel Production in the USA							
	1960	1967	1973	1978	1983	1992	1996
Crude Steel production (in million tonnes)	107.00	115.00	115.00	115.00	76.76	84.32	95
Crude Steel production (in million tonnes)	---	---	144.12	145.01	94.01	93.33	107

The set-back received by the US steel industry in recent decades was not very unexpected. According to US exports, the growing competition among the developing countries to capture international market, protection and subsidies introduced to safeguard their home market were the principal reasons for their unprecedented growth. On the other hand, because of historic reasons, the US steel industries have developed certain problems of their own. The unscientific Tittsburg plus policy' and the introduction of multiple basing point system restricted the spontaneous development of new industrial centres. The US steel industry, as a whole, suffered a lot in the absence of spontaneous growth.



Apart from these, most of the US plants are old, uneconomic and poorly managed. On the other hand, new entrants like Japan, using sophisticated, fuel and cost efficient production machinery largely reduced the cost of production. A strict vigil on quality and use of scrap as raw material largely helped the countries like Japan to achieve a tremendous success and curb the US monopoly on the iron and steel industry.

Distribution

After the construction of first iron and steel plant at Massachusetts in 1629, the US steel industry had undergone a sea-change through last 350 years or more and now placed in a cross road. It is not the distribution but the tendency of dispersal is of greater importance. The major iron and steel region in the USA may be classified as follows—

1. Youngstown-Wheeling-Johnstown iron and steel region
2. Lower Great Lakes region
3. Eastern region
4. South-East region
5. The Western region

1. Youngstown-Wheeling-Johnstown region— The region was once regarded as the world's iron-steel capital. At that time, Pittsburg iron-steel industry was unparalled in the world. The nearby Pittsburg coal and Lake Superior iron ore, wonderful transportation network and excellent marketing facilities favoured the growth of this region. This region attained success and fame, that even after the decline of this industry, to protect the industry, US Government introduced the infamous Tittsburg Plus' policy.

2. Lower Great Lakes region— Gradually, with the passage of time, Pittsburg lost its eminence as a steel centre. From the early period of 20th Century iron-steel industry in USA started shifting towards the southern part of Great Lakes. Besides Lake Erie, new steel centres developed at Buffalo, Erie, Cleaveland, Detroit and at Lorrin.

To serve the western and southern market, massive steel plants were developed in the Chicago-Gary district and at Duluth. The greatest advantage of this region is that it lies within the route of Lake Superior and Mesabi iron ore deposits and Appalachian coal. This break of bulk situation or advantage of loading-unloading enabled the region to get both iron ore and coal at a much cheaper rate. The good transportation system either by water through lakes or train was added advantage. Till recently, this industrial zone gown at a tremendous speed.

3. Atlantic Coastal region— Initially, iron steel industry developed here, around the iron ore mines of the Adirondacks, and Cornwall area. Though the iron ore deposits were exhausted very soon, the steel industry continued to grow. The nearby large market provided excellent opportunity to grow vigorously.

The most important steel centre in this region are the Maryland, Sparrows Point and Pennsylvania. Sparrows Point and Maryland are two old plants, initially developed for the nearness of the Virginia coal.

Entire steel industry collects coal from Pennsylvania and Virginia mines and iron ore from Lake Superior, Adirondacks and Cornwall areas.

4. The South-Eastern region— This region extends from the Virginia on the east to Albania on the south. From the early days of steel making, steel plants were developed around Kentucky, Virginia and Tennessee. This area, particularly the Albama-Birmingham concentration have proximity of both iron ore and limestone deposits of Red Mountain and extensive deposits of good quality coal situated within the region. Among these deposits, Warrior ore deposits in the Birmingham region is notable. The cheap, abundant labour also gives the region a distinct advantage over its competitors. However, lack of market is a problem to this industry.

5. The Western region— This region extends from Colorado in the interior to the California on the West. Among the steel region in the USA, this region is new one. Only after Second World War, for strategic reason, the government had set up steel mills. Later on, steel industries were developed Fontana in California and Provo in Utah. Initially, iron ore was collected from Wyoming and coal from Colorado.

The Government-owned steel cooperation constructed a steel plant at Geneva to manufacture machines for military purpose.

The plants situated at California collects coal from Sunny side in Utah and iron ore from single Mountain.

Iron and Steel Industry—Japan

The steel industry in Japan had witnessed a complete metamorphosis in its not too long history. Like all other industries, the iron and steel industry was also devastated completely by Second World War. But, from the complete destruction, soon it was revived and touched the pre-war levels of production. The growth rate increased in such a pace that, within a few years, it surpassed the production of Great Britain, Germany and France. This tremendous increase of steel production was made possible by the complete reformation of the industrial set-up.

Without having any of the required raw materials, the growth and expansion of Japanese Steel Industry is indeed a perplexing phenomenon. Compared to any other country, the per capita steel production in Japan is the highest in the world. Almost all of the Japanese steel manufacturing units are very large as well as integrated. Japan is having some of the highest steel producing units in the world, each producing more steel than the combined output of even some developed countries.

The beginning of the iron and steel industry in Japan dates back to the middle of 18th Century. The Sino-Japanese War and heavy military demands of the Second World War came as a blessing to the Japanese steel industry. To meet the growing demand from foreign countries, as well as in the home, the iron and steel industry in Japan had undergone a complete modernization and rapid expansion programmes. In this period, manufacturers started using scrap as a raw material. The iron ore was obtained-from China, Australia and India at a much cheaper rate. Just before the on-set of Second World War, production recorded a new high of 8 million tonnes.

Circles represent the distribution of Japanese Steel centres and their relative productions

Second World War completely devastated the Japanese iron and steel industries. In the subsequent years, rapid recovery from war devastation was the priority of Japanese industry. The period between 1950-1970, Japanese industry was able to double its production. The overall industrial boom in the country and latest technology adopted in the steel manufacturing process, made Japan one of the leading steel producing country in the world.

The hard working labour force, national pride of the Japanese people, cost reduction in the manufacturing process and ready market in the third world countries helped Japan to secure an enviable position among the world's steel manufacturing circles.

Distribution of Iron and Steel Industries in Japan

The spatial distribution of Japanese steel producing centres may be sub divided into six principal regions. These are :

1. Tokyo-Yakohoma Area
2. Nagoa Region
3. Osaka-Kobe Region
4. Fukuoka-Yamaguchi Region
5. Oka-Yamaha Region
6. Hokkaido Region.

1. The Tokyo-Yokohoma Region— Tokyo, the centre of politics, culture, economy, transportation and all other aspects of Japan, naturally attracted large iron and steel industries within its fold. Hitachi is another industrial area around. Tokai also provided all facilities to the iron and steel industries at the beginning. The reclamation of

Tokyo Bay provided large extensive plane land for steel manufacturing units. The Tokyo-Chiba region grew very fast as a major iron and steel centre.

2. Nagoa Region— Nagoa region is now popularly known as the 'Detroit' of Japan. This region had witnessed a massive growth of industries within the period 1950-1960. At present, this region contributes nearly 20 per cent of the total value of shipments.

3. Osaka-Kobe Region— Osaka-Kobe is another large agglomeration of iron and steel industries. The combined output of Osaka and Kobe surpassed all other region's output. The largest steel plant in this region is located in the South-East of Osaka, at Wakayama. At least 70 per cent of the total output of this region is exported to the foreign countries.

4. Fukuoka-Yamaguchi Region— In the extreme south of Japan within Kyushu and western most end of Honshu, this region is located. The output of this region is not very large, though the growth rate of this region is very high. The initial advantage of this industry was the nearness of Chikulo coalfields. The Dokai bay situated very near, provided easy water transportation to import the iron ore from China and export of the products to the foreign countries.

5. Oka-Yamaha Region— Oka-Yamaha steel centre is one of the newest steel centres in Japan, situated in between Osaka-Kobe and Hiroshima. Though the present production is not very large, introduction of latest technology and government incentives made this industrial region one of the most up-coming steel producing centres in Japan.

6. Hokkaido Region— Hokkaido, which is not very famous for industrial developments, possesses the single iron and steel producing centre near Muroran. The coal fields of Ishikari, Kushiro and Romai initially attracted the entrepreneurs to set up iron and steel industry at Muroran. The fluxing material and manganese are collected from Kamino-Kuni region of Hokkaido.

The total Japanese production of crude steel in 1992 was 98.13 million tonnes, while consumption of steel in that period was 99.15 million tonnes. In production, Japan secures first position in the world, while in consumption it ranks second, next to CIS.

Iron and Steel Industry - China

The People's Republic of China is the largest producer of iron and crude steel. The country is now producing more steel than Japan and United States. Regarding consumption China secures third position in the world, next to the Japan and United States of America. In 1996, China produced 100 million tonnes of crude steel. However, in that year, total consumption of steel was lower i.e. 71.0 million tonnes.

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

Trend of Crude Steel Production in the China
[Production in million tonnes]

	1960	1967	1973	1978	1983	1992	1996
Crude Steel production	18.5	17.0	27.26	31.78	39.95	80.0	100
Crude Steel production	-	-	25.08	42.51	51.91	71.04	95

Source : US Bureau of Mines

Development

The history of iron and steel making in China is very old. The initial development basically of cottage industry level. The indigenous technique of fabrication was highly developed. The scale of production was not very significant.

The modern blast furnace was erected in China only in 1890. In the first half of the 20th century, the political turmoil and repeated foreign aggression hindered the growth of small scale steel furnaces. However, in this period, the Japanese established their control over Manchuria. To consolidate their economic position Japanese people started the construction of modern steel plants over Manchuria. These plants were short-lived. After Second World War due to dearth of capital and raw materials, most of the factories were closed.

Distribution

The iron-steel centres in China are located in three separate regions. These are :

1. Southern Manchuria
2. Northern China
3. Yangtze Valley.

1. Southern Manchuria— This is the oldest steel producing area in China. The oldest steel plant is located at Anshan. This plant, which was destroyed by the Russians and Chinese Communists, was later revamped. The plant was first designed by Japanese colonialists. Considering the location of raw materials, this plant is ideally situated. Coal is supplied from Fushan coal deposits and iron ore and limestone is obtained locally. During the initial period, this iron-steel plant was regarded as the largest steel plant in China, though at present production is not very satisfactory. Old and obsolete machines and back-dated technology are the major problems of this steel plant.

2. Northern China— Northern China iron and steel producing region stretches from Paotow to Shantung. Large steel plant are located at Shantung, Beijing and Shensi. Coal is obtained from Yangku, iron ore is available in the vicinity. Two large steel plants came into functioning one each near Anyang and Yellow river valley.

3. Yangtze Valley— Of late, this region became the undisputed leader of iron and steel production. This region stretches from Sanghi to Chungking. The major iron and steel plants are located at Chungking, Wuhan and Sanghi. Coal is obtained in the south of Nan-Chang and Chungking. Several hydro-electricity plants in the region provide energy to the plants. The extensive deposits of iron ore in southern Yangtze river provides uninterrupted supply. Most of the plants in this region are integrated.

The phenomenal growth of Chinese iron and steel industry after 1970 enable the country to meet most of the domestic consumption. Considering the large reserves of iron ore, coal and domestic demand, the future of Chinese iron and steel industry "Seems to be very bright.

Germany

After the re-unification of East and West Germany in 1990, the country is now one of the major steel producing nations in the world. West Germany was, however, all along a dominant steel producing nation. In 1996, Germany produced 42 million tonnes of crude steel and secured fifth place in the world. The production of steel in this part was very consistent. In 1978, it was fourth largest producer of crude steel.

Trend of Crude Steel Production and Consumption - Germany [In million tonnes]							
	1940	1953*	1975*	1980*	1985*	1992	1996
Crude Steel production	20	13	46.89	51.15	48.35	39.77	42
Crude Steel production	-	-	25.08	42.51	51.91	71.04	95

Source : US Bureau of Mines, World Bureau of Metal Statistics (UK)
* Data are for West Germany

Germany., as a whole, is rich in reserve. The vast coal deposits of Ruhr valley and upper Silesia and enormous iron ore deposits of Lahnsieg, Ergburg provided excellent opportunities to develop iron-steel industry in the early period. Though the quality of iron ores is of inferior grade, coal deposits are very superior in quality. Apart from domestic iron ore, the country had every opportunity to import coal from neighbouring countries. Before the out break of the Second World War, German steel production went up to 20 million tonnes. The large-scale import of pig iron enabled the country to expand its steel industry very rapidly.

Most of the German steel output comes from the Great Ruhr industrial area. The extensive deposits of good quality coal within the region, presence of Ergberg and Lahn-Sieg iron ore and excellent import facilities through good transportation network helped immensely for the rapid growth of Ruhr iron and steel industry.

France

France maintains a key role in the production of iron and steel. In 1996, France was able to produce crude steel of 18 million tonnes. Since 1973, production of steel is gradually decreasing in France, because of the declining demand of crude steel in modern manufacturing industries.

Trend of Crude Steel Production and Consumption [In million tonnes]									
	1913	1929	1950	1960	1973	1978	1983	1990	1996
Crude Steel production	2.30	6.5	5.8	12.2	25.26	22.84	17.62	19.02	18
Crude Steel production	-	-	-	-	19.31	16.00	14.00	17.56	17

Source : US Bureau of Mines. World Bureau of Metal Statistics, World Resources -1998-99,

The large and very good quality Lorraine iron ore and imported coal from adjacent Ruhr basin of Germany prompted rapid development of iron and steel industry in France. At least three regions emerged as major iron and steel producing districts. These are :

1. The Lorraine Region.
2. The Denain-Anzin Region
3. The Central France Region

The Lorraine iron-steel region contributes most of the product. Here, Minette ore deposits are of very good quality. Coal is also obtained from nearby Moselle area. Though most of the coal is to be imported from neighbouring countries. The reduction of coal requirement in modern techniques adopted by the plants enabled the region to grow at a faster rate in the middle of the century. The major plants are located around Rombas, Knutange and Moselle.

Great Britain

Great Britain was the pioneer country in steel making. For centuries, the country achieved such a fame that a. one time it alone contributed half of world's iron and steel production. The country is now not able to retain herself within the list of top ten iron and steel producing nations in the world, though it secures 10th place in the world regarding consumption.

Since 80's, the production of United Kingdom fell short of 15 million tonnes. Its consumption, however, is greater than 15 million tonnes. The country is now deficient in iron and steel production. In 1996, the country produced only 17 million tonnes of crude steel and consumed 17.5 million tonnes.

During the early period of growth the industry used charcoal as fuel, but after the middle of 18th century the discovery of good quality coking coal helped to raise the production level. Within middle of 19th century the iron and steel industry in the country developed so much that output of the industry equaled three-fourths of world production. The industrial revolution and subsequent inventions of different new steel producing techniques, enabled the country to raise its production rapidly. At the end of 19th century, though production of Britain gradually increased but the relative share of its production to the world's share declined considerably, mainly because of the rapid growth of production in other countries particularly USA, Germany, Japan. The production of USA exceeded Britain in the year 1890. By 1935 the country became fourth, lagging behind to USA, Germany and CIS.

Though most of the old plants are now not in the production. The original distribution of Great Britain were as follows :

1. Northern Region - (a) North-East Coast, (b) North-West Coast, (c) Scottish Low-land.

2. Eastern Region - (a) Northumberland-Durham, (b) East Midland, (c) North Lincolnshire.
3. Western Region - (a) Cumberland, 9b) Lancashire, (c) West Midland.
4. Southern Region - (a) South Wales.

At present, most of the old, worn out manufacturing units are closed and only twenty five odd units are producing steel. The largest among them is British Steel Corporation.

The depletion of the British coal and iron-ore deposits forced the industries to migrate near coastal regions. The continuous mining through several centuries exhausted the deposit and cost of mining also increased substantially. Now British coal and ores are costlier than imported ore. The major steel plants are located in Glasgow, Teesside in the North-West Hartlepool and Consett in the north-east. South Yorkshire, South Lancashire, Stanton Starely Corby and West Midland in the central region and South Wales, Port Talbot in the south-west and London in the south-east.

Italy

Italy is a consistent producer of iron and steel. In 1988, the country secured seventh position in the production of crude steel. Since 1973, there has been a consistent output in Italy. The country is entirely deficient in raw materials like coal and iron ore. Almost entire industry is dependent on the imported iron and coals. As a late-starter, Italy got the advantage of high technology. Most of the mills use electric furnace and basic oxygen process. Half of the Italian output is contributed by a giant public sector company.

Italian iron and steel industry is currently dependent on imported iron ore. The country imports iron ore from Sweden, Brazil and Australia. Nowadays most of the steel is produced from scraps. Formerly coal had to be imported from UK and Germany; now cheap hydel power substituted coal. The major industries are mostly located along the coast. Important industries are situated at Naples, Genoa, Aosta and Trieste.

Trend of Crude Steel Production and Consumption
[In million tonnes]

	1973	1978	1983	1986	1992	1996
Crude Steel production	20.99	24.28	21.67	22.9	24.9	28
Crude Steel production	23.65	19.60	18.82	20.5	26.59	27

Source : US Bureau of Mines, World Bureau of Metal Statistics, World Resources 1992-93

Other countries

Europe— The other major European steel producing nations are Poland, Belgium, Luxemburg, Spain, Holland, Sweden etc.

Poland— Poland is the 15th largest iron and steel producing country in the world. Poland is a surplus producing country. The vast Silesian coal help Poland to build up a massive steel plant near Nova-Huta and Krakow. The country is deficient in iron ore. It has to import iron ore from CIS and Sweden.

Czechoslovakia— Iron and steel industry is moderately developed in this country. The greatest steel plant in the country is Skoda steel plant.

Sweden— Sweden is very rich in her iron (ore reserve. Energy is obtained from cheap Hydel-power. Swedish steel is of very high quality. The best quality steels are generally exported. This country is not self-sufficient in ordinary steel production.

Holland— This country is deficient in both iron ore and coal. As most of the steel plants are new, productivity rate is very high. The country has to import large amount of steel for domestic consumption.

Belgium and Luxemburg— The reciprocal relationship or symbiotic system of transportation of Luxemburg ore and Belgium coal helped both the countries mutually. The combined production of the two country exceeded 15 million tonnes of steel in 1990.

AUSTRALIA— Australia is very rich in coal deposits. Most of the steel plants are new in Australia. So, the productivity is very high. The important steel plants are New Castle and Part Keembfa.

ASIA— Apart from Japan, China and India the other countries are not very developed in steel production.

SOUTH AMERICA— In South America, the major steel producing countries are Brazil, Argentina, China, Uruguay and Venezuela.

Trend of Production and Consumption of Crude Steel in Major Producing Countries

Countries	Production (in million tonnes)					Consumption (in million tonnes)				
	1973	1980	1985	1990	1996	1973	1980	1985	1990	1996
China	_	37.12	46.72	66.1	101	—	43	71.5	68.4	74
Japan	119.3	111.4	105.3	110.34	99	78.98	79	73.4	99	99
U.S.A	136.8	101.5	80.07	89.73	96	144.12	114.43	105.6	105.4	106
Russian Federation	131.5	244.7	247.7	236.0	49	137.5	197.8	203.8	199.7	×
Germany	49.5	51.15	48.35	43.9	42	35	44.6	40	40	41
Korea Republic	1.16.	86	13.6	23.1	39	3.26	6.1	11.3	21.5	27

Countries	Production (in million tonnes)					Consumption (in million tonnes)				
	1973	1980	1985	1990	1996	1973	1980	1985	1990	1996
Italy	21	23	24	23	28	24	27	22	28.5	27
Brazil	7.2	15.4	20.5	20.6	26	×	×	×	×	V
France	---	---	---	---	18	---	20	15	18	17
U.K.	---	---	---	---	17	---	16	14	17	15
India	---	10.4	12.2	15.3	14.6	---	10.8	14.4	21.7	24

* Data before 1996 refer to U.S.S.R.

Source - World Resource - 1996-1997, 1998-1999, U.N.M.B.S.

Trend of Crude Steel Production—Brazil [In million tonnes]					
	1973	1978	1983	1992	1996
Crude Steel production	7.15	12.11	14.66	24.0	25

Source : US Bureau of Mines, World Bureau of Metal Statistics, World Resources 1992-93

Brazil — The development of the production of steel in Brazil is spectacular. 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 deposit is located near Minas-Geraes. Most of the mills obtain energy from hydel power plants.

NORTH AMERICA— Apart from United States, Canada and Mexico are two other noteworthy steel producing nations in North America.

Canada— The Canadian steel industry is not very old. Most of the iron and steel centres are developed around Lake Ontario, Sydney, Nova Scotia. Canada is self-sufficient in the production of iron ore and coal. Most of the coal reserves are located with Nova Scotia and iron ores are located around Sydney. Apart from that, steady supply of iron ore and coal from adjacent USA enable Canada to develop a large steel industry. Some of the major steel plants are, Hamilton, Sault Ste, Ontario, Sydney, etc.

Mexico— Mexican steel industry is as old as American steel industry. The largest steel platn is located at Mouterrey. The others are Monclova, Coahuila, Piebras

Negras, and Colima. The Coal is obtained from Salivas area and iron ores from Durango.

AFRICA— Africa contributes insignificant amount of iron and steel. The largest producer in Africa in South Africa. The major producing centres are located at Transvaal and New Castle.

Present Production Trends

During last two decades the total steel output of the world increased considerably. There was a big production slump in 1983 when the production came down to 662.79 million tonnes and again registered a sharp increase and the production in 1988 became 721.32 million tonnes. The top ten producing countries namely, CIS, Ukraine, Japan, USA, China, Germany, Brazil, Italy, France, Republic of Korea, and Poland constituted bulk of the production. In 1973, the countries produced 76.4% of the total production which was slightly decreased to 73.06% in 1983, and again marginally dropped to 71% in 1996. So, it can be said that production of iron and steel is largely concentrated in some selected countries.

Though there has been steady increase of world production in the volume of iron and steel production, the production of crude steel in traditional countries like USA, Japan, Italy, Germany is gradually decreasing. Iron and steel industry is no longer considered the mainstay of the industrial economy. The use of scrap as raw material largely reduced the requirement of pig iron production. The technology oriented industries like automobiles, computers require very low amount of fresh steel. In developed countries of Western Europe and USA, the traditional industries suffered massive set-back. So, output of steel also declined, keeping pace with decreasing market.

The Third World countries, meanwhile, are advancing rapidly in the production of crude steel. Asian countries like South Korea, India and Brazil of South America are rapidly expanding their iron and steel industry.

International Trade

USA is the traditional iron and steel exporting country. The other exporters are Japan, Germany, Netherlands, Italy, Belgium and Luxemburg. At present, Japan is the largest exporter of steel followed by Germany, France, Belgium, Luxemburg, Netherlands, South Korea, Italy, USA and Taiwan. These countries export more than 80 per cent of the international export.

3.7 TEXTILE INDUSTRIES

Textile industries mostly produce articles of cloth ing using variety of raw materials like cotton, jute, flax, hemp, wool, silk etc. Besides, there are synthetic fibres derived from wood pulp, cotton linters etc. The important branches of textile industries are :

1) The cotton textile industry
2) The woollen textile industry
3) The artificial fibre or rayon industry

The Cotton Textile Industry :

It is one of the oldest industries of the world. The real development of this industry started in the 18th century after a series of British inventions such as Hargreaves' spinning jenny, Crompton's mule, Cartwrighfs powerloom and subsequent inventions of steam engine and cotton gin. These inventions led to a rapid growth of cotton mills industry in U.K. Subsequently it spread to other countries and today the industry is most widespread throughout the world. Almost every country in the world is now engaged in the manufacture of textile products.

The cotton textile industry is a labour-intensive agro-based industry. Though the requirement of labour is entirely dependent on the technological advancement of the country, compared to other industries, labour involvement is very high. The cotton textile industry involves processes like (i) ginning (ii) carding (iii) spinning, (iv) weaving and (v) dyeing and bleaching. The process of ginning separates seed from the fibre. By carding the fibres are made parallel to each other. Spinning Yields the yarn and weaving yields the cloth. When a single cotton mill does all the operations, it is called a composite mill. Otherwise there may be mills specialized with one or two of these functions.

Location of the Industry

Any unplanned industrial concentration, in its advanced stages, has to face several socio-economic disadvantages. A scientific and planned location is only able to maximize profit by minimizing the cost Cotton textile industry is no exception. To reduce the total expenditure of production and marketing, and sustainable growth in future, the industry has to find out the least cost location. Like other manufacturing industries, the cost of labour, market and transport plays pivotal role in the selection of industrial location.

According to Weberian terminology, cotton as a raw material is pure in nature. It has been estimated that weight loss of raw cotton during manufacture is negligible. For example, one tonne raw cotton produces one tonne of yarn. This amount of yarn

also produces one tonne of cloth. As there is no weight loss of raw material in the manufacturing process, according to Weberian hypothesis, raw material cannot exert significant influence on the locational pattern.

In this case, cotton textile industry may be located either in market, raw material or in any intermediate location. Whatever be the location, transport cost would not change.

As transport cost is unable to exert any considerable pull, the other factors like wage rate of labour, market facilities, availability of raw material, climate, power and agglomeration of industries determine the location.

The general trend of the location of textile industry reveals that three types of location are preferred by the entrepreneurs. These are :

1. The textile centres located within market.
2. The textile centres located within raw material source.
3. The textile centres developed between those two regions.

According to least cost location concept, the market location should be most preferred. If power and cheap labours are available within market, the production cost will be minimum. The market situated within cotton producing area will, of course, be most lucrative location. However, this is a rare combination. Bombay, Ahmedabad in India, Shanghai in China, Tashkent in CIS and Atlanta in USA represent this type of location.

Formerly, climate used to play dominant role in the location of cotton textile industry. Most of the industries in last centuries were developed in regions of mild and humid climate. In dry regions, breakage of thread was the major obstacle for both weaving and spinning. The classical example of climate guided locations were in Bombay in India and New England in USA.

Textile goods, particularly demand of clothings, are always fashion-guided. In most of the cases, textile goods are conspicuous in nature. With the passage of time, fashion of the society and taste of the consumer changes markedly. To keep pace with the changing fashion and to be aware of the modified taste of consumer textile mills, which produce clothings, set up their units near the market. For example, in its early growth, US textile mills were established in New England, i.e., vicinity of the market; though the bulk of the cotton were produced in the southern states. Since Tsarist period, cotton is largely grown in the Asiatic CIS but textile mills were primarily concentrated in its European counterpart, mostly in the Moscow-Tula and Ukraine market region.

So, regarding the localization of cotton, the factors are complex. The factors of localization varies spatially. Even the social and economic conditions of the region controls the site selectlion. The reasons are also very dynamic in nature. Unlike other

industries, locational factors are also not static. In fact from time to time, locational pattern changes, For example, the New England State in USA is no longer an ideal location for the growth of the industry. It has lost much of its earlier advantages. The industry has been shifted towards the cotton growing areas of southern USA. In Russia, a migratory trend of textile mills towards the Astatic cotton growing tracts has been visible. In India, for instance, the Bombay-Ahmedabad textile centres be also loosing their previous significance and new centres are being set up around the local markets.

A historical analysis of the locational pattern reveals that, at its earlier period of growth textile mills were developed towards raw material source, because at that time transportations system was ill developed. Away from the cotton growing region, availability of raw cotton was also very low. Naturally, due to higher demand, prices of raw cotton was high at the distant places. But in its second phase of development, rapid progress of transportation system facilitated easy accessibility within the region. At that time, price of raw cotton became same both near the raw material source and the market. Naturally, market became favourite for plant location. The importance of raw material gradually lost its previous importance.

The importance of power in the localization of cotton textile industry cannot be under-estimated. At initial period of development, textile industries were mostly located adjacent to water source. But with the introduction of coal, water site was no longer important.

At that time, wage rate of the labours was very low. The wage rate of the labour was an important consideration for the location. A slight hike of the wage rate made a lot of difference between one place and another. For example, New England textile centres in USA shifted towards Piedmont because of prevailing wage rate._

In some cases, specialization in a particular product and the general quality of the product helped a lot to a sustain development. In these case textile industry thrive for export market. The development of Lancashire region in England and Tokyo-Yokohama in Japan depended heavily on foreign market.

The Recent Trend in Localization

The recent trends in the development of textile industries are distinctly different in developed countries like USA, Japan, UK, and developing and underdeveloped nations like China, India, Bangladesh etc. But the general observations revealed that the basic trends in location of textile and apparel industry is diffusion.

In highly developed countries of Western Europe, Japan and USA, production of traditional goods is no longer important. These countries now concentrate on the production of quality goods rather than coarse fibre production. The import of "primary" products from underdeveloped countries are cheaper to produce it within

the countries. These imported goods are treated as raw materials and used for quality production. The technical know-how of the developed countries are cheaper to produce it within the countries. These imported goods are treated as raw materials and used for quality production. The technical know-how of the developed countries are now acting as their capital. The restricted technology creates an advantage to the advanced nations. So, the role of underdeveloped countries are now considered to be a mere raw material supplier.

The automation and high wage rate of the labour forced the countries to adopt a capital intensive manufacturing activity, rather the former labour intensive activity.

But, compared to the other manufacturing activities, cotton textile still require comparatively low amount of capital. The traditional top-ranking nations in cotton textile industries, like USA and Japan, are now facing steep competition from the emerging countries like Taiwan and South Korea.

To resist the invasion of foreign products, textile industry is becoming more and more knowledge intensive. Least cost factor also plays a dominant role. The innovations of synthetic fibres are posing major problems for the growth of textile industry. To face this steep competition, improved variety of looms like shuttle less loom and air-jet looms were introduced for higher production. The omnipresent market of cotton textile industries throughout the world is, perhaps, responsible for the dispersed or diffused nature of cotton textile industry.

Distribution United States

The United States of America is one of the front-runners among the textile manufacturing countries. The country maintained her lead position in textile production.

The first cotton mill was established with 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.

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 :

1. Development of water power from small, turbulent streams.

2. 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.
3. The facilities of export and import of materials through the ports of Boston and Providence.
4. The humid climate of New England. The climate of New England was most suitable for spinning.
5. Large financial help from the local urban tycoons.
6. Cheap female worker from the surrounding regions.

Despite all these advantages, New England region gradually lost all of its glory. The industry started shifting from this region to the southern part of the country.

The cotton was then largely imported 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 lahour and port advantages lost their significance with the passage to time. The machines became obsolete, cost-benefit ratio became unfavourable 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. These mills became obsolete.

From the very early periods, the southern Piedmont planes of Georgia, Florida, Carolina, Albania, 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 migration of the textile mills to the southern states are as follows :

1. Easy access to abundant raw cotton within reach.
2. Relative advantage of transport facilities, due to proximity and assured availability.
3. 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.
4. Development of electric power in the southern states also played a vital role in shifting the industry.
5. 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.
6. 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 U.S. textile industry.

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 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 downfall of Tsarist period, sound policy of 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 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. New centres have developed near Taskent, Stalinabad, Askabad, Kirovabad and Georgia. At present, there are 13 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 constitute more than 12 per cent of the value of total industrial production of Japan, Japanese textile producing centres are very small. Most of the yarn production comes from innumerable small centres, scattered all over the country.

The beginning of textile industry in Japan dates back to 1876, 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. During the initial period, Chinese yarn market imported bulk of the Japanese product.

After Sino-Japanese ware 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 Kante 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 : (1) The Kwanto Plain, (2) Nagowa, (3) The Kinki Plain, and (4) Along the Northern Coast.

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. 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. Soon, Japan became the exporter of not only textile products but also textile machines.

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 was normal practice of village weavers. Most of the output was contributed by cottage industries. The over-all development of cotton textile industry in China is indeed a recent phenomena. Till the end of Second World War, production of textile goods in China were insignificant and China was considered as the largest single textile market in the world. After the take over of Communists, proper efforts were taken to develop national textile industry.

Distribution

The textile mills are distributed throughout China. The dominant centers are Shanghai, Manchuria, Tienshan, 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.

The Manchuria textile unit 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, when quality goods are produced. In the Yangtze river valley, textile mills are concentrated within Chungking and Hankow. The Beij ing-Hankow industrial conurbation including the smaller towns of Paoting, Singta, Chengchow, emerged as leading textile centres.

Of course, among all the textile-producing centres, Shanghai was most important. At second 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 Cotton 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, several factors were responsible for the development of Lancashire in its early phase. The factors were :

1. The optimum climatic condition of Lancashire with mild humid climate.
2. Skilled local labours and cheaper wage rate.
3. Abundant water resource in the proximity and the softness of water.
4. Presence of coal within Pennine hill range.
5. Low development of other industries.
6. Cheap price of the land.
7. 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, outdated machines and use of substitute materials gave several 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.

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 sale. 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.

Other Producing Countries

Among the other producing countries, Italy, France, Switzerland, Belgium, Poland, Spain in Europe, Brazil, Mexico in American continents and HongKong, Egypt Bangladesh, Pakisthan 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 region. 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 glow. The major textile centre 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 made goods in entire Latin America. The textile mills are located around the urban centres of De Janeiro, Sao Paulo, Rio Grande and Minas Geraes.

Mexico is the other cotton textile manufacturing country. Larger textile units are concentrated around Mexico city and Arizona.

Production and Trade

Though the textile industry is one of the most diffused industry in the world and

developed throughout the world, bulk of the production comes from few countries in the world. The traditional producing countries like China, Japan, CIS and India contribute most of the production; but, due to heavy demand within the country, export of these countries are gradually coming down. In fact, the newly developed countries like Taiwran, South Korea, Hongkong, Singapore, Brazil and Mexico exports more than half of the total export of manufactured textile goods. The rapid development of synthetic fibres in the developed countries like USA, Japan, South Korea. Germany and CIS largely reduced the production of cotton textile products. The cheap rate of the products from new countries also reduced the export of leading countries.

According to the available figure of 1998-99, six countries comprising China, India, CIS, USA, Japan and Italy produced 73.26 per cent of the world's production in 1996. China secured first position in the production of cotton textile clothings followed by India, C.I.S., USA and Japan. The production of different countries are given in the Table.

Japan is the leader of the export of cotton textile products. Nowadays Taiwan, Hongkong and South Korea also export substantial amount of textile products. India and Germany, after meeting their domestic requirement, export some amount of textile products.

Production of Cotton Textile Clothes - 1996

Sl.no.	Countries	Production (million sq. mts.)
1.	China	18,300
2.	India	17,175
3.	U.S.A.	3,750
4.	Russia	1,005
5.	Japan	916
6.	Egypt	630
7.	South Korea	338
8.	Turkey	450
9.	Pakistan	307
10.	Romania	190

Source : Statistical Year Book- 1988

3.8 THE WOOLLEN TEXTILE INDUSTRY

The woollen manufacturing industry is perhaps older than cotton textile. Long before Industrial Revolution, woolen industry developed mostly at a local and cottage industry level. Since then, the industry had experienced a complete metamorphosis. The present day woollen factories mostly use sophisticated machines.

Location

Wool, as a raw material, is impure in nature. During process, weight loss ratio is quite high. So, the industry should be located, at least in theory, near raw material source. Though the general distribution of woollen industry all over the world suggests that market exerts maximum influence on the locational pattern. Most of the highly productive woollen manufacturing units are located within the markets of Western Europe. On the other hand, the principal wool producing areas of southern hemisphere are not very developed in the manufacturing of woollen goods.

Raw wool is prepared in the temperate and sub-tropical areas. Though sheep ^rearing is a popular occupation in the sub-tropical countries, specially by nomadic herders, most of the woollen product is generally consumed by high latitude people. Most of the raw wools are produced in the region of :

1. The Oceania region, comprising New Zealand and Australia.
2. The Latin American region, comprising Peru, Argentina, Uruguay, Colombia and Bolivia.
3. The South African region.

These three regions together contribute more than half of the raw wool requirement of the world. Though sheep rearing and wool production is highly developed in this region, woolen industry as such is not very developed in the region. Several geo-economic reasons are responsible for the poor development of woollen industry within the wool producing regions. The major reasons are :

I. The countries like New Zealand, Australia, Argentina is situated in the sub-tropical region. The winter is not too harsh. The local consumption is, therefore, not very high.

II. These countries are industrially ill-developed. The necessary infrastructure for woolen industry is absent.

III. These sparsely populated countries cannot provide large market.

IV. The manual labour is expensive and inadequate in these countries.

Distribution

The bulk of the wool is produced by a handful of developed countries; e.g., C.I.S., USA, Japan, UK, Germany, China, France and Italy. Almost all the countries in Europe produce at least some amount of wool.

The major consumers are also the countries of Europe, USA and Canada. Europe alone consumed more than half of the wool products. Though Europe is moderately developed in her wool industry, it is a deficit country in wool supply, as demand exceeds the production . The harsh, chilly cold in the greater part of the year is the principal reason for the high demand of woolen goods. On the other hand, Asian

countries, like Japan and China, possess milder climate and export sizable amount of woollen product. The leading woollen goods producing countries are : Soviet Union, Japan, United States, United Kingdom.

CIS

The CIS is having innumerable sheep and goat population. In 1998, the number of sheep and goat population in CIS was 147.74 million. Four-fifth of this number is sheep. Sheep is mostly reared for the extraction of raw wool.

The woollen industry is one of the oldest type of manufacturing activity in former Soviet Union, dating back to Tsarist period. The early century were developed around Volga basin and around Moscow.

Gradually, new centres started production of woollen goods. The central region and Leningrad region developed sound woollen manufacturing units. The early factors that favoured uninterrupted growth of the industry in former Soviet Union were :

1. The ready market for woollen products all over Soviet Union.
2. The traditional base of the industry since Tsarist period.
3. Abundant supply of raw wool from sheep rearing communities.

This country is more or less self-sufficient in wool production. After installation of communist regime, a planned and co-ordinated effort was undertaken to make Soviet Union self-reliant in wool production. For balanced development of the industry, dispersion of the industry, particularly to the remote Asiatic parts, was undertaken on priority basis. As a result several new centres were developed. Notable among these are Kharkhov in Ukraine, Caucasus and Kazakstan. The leading woollen goods manufacturing centres are Moscow-Tula, Leningrad, Central region, Kazakstan and Caucasus.

After Second World War, however, growth of woollen industry remained stationary for quite a few years. Since 1955, production of woollen goods gradually picked up and in very recent years it crossed 900 million yards.

Japan

The traditional hand woollen type of wool manufacturing process was largely replaced by machine after 1925. The growth of Japanese woollen industry was very high, even in the early period of growth. The rapid rise of Japan, in woollen industry, checked the absolute supremacy of UK and USA in the Asian wool market. Considering the number of people in this industry and total volume of production it is one of the major manufacturing industries in Japan. The major wool producing centres are located within Tokyo-Yokohoma, Nagoya, Kobe, Hemaji, Osaka, Nagasaki etc.

The major factors that encouraged the all-round progress of woollen industry in its early period of development are :

1. Availability of cheap power resources, particularly hydel power.
2. High productivity rate per worker
3. Low cost of production
4. Low consumption within the country.

Japan now secures third position in the manufacturing of woollen goods in the world. The rise of synthetic fibre production greatly hampered the continuous growth of woollen industries.

United States

Manufacturing of woollen products in one of the oldest manufacturing industry in USA. The woollen manufacturing provided large scale employment to the people, in its early phase of development. Woollen goods has a market all over USA, specially for clothings.

The early centrs of woollen production developed near new England region. Massachusetts and Rhode Island are the reputed centres. The other renowned centres are Pennsylvania, New York, Wisconsin, Georgia and New Jersey.

The factors responsible for early localizations of woollen industries were :

1. Large-scale sheep rearing in northern grasslands.
2. Favourable cooler climate
3. Easy availability of hydel power
4. Steady market and available skilled workers, particularly, the people migrated from Lancashire, U.K.

Like cotton textile industry, woollen industry is USA had also experienced a massive migration from New England to Southern states particularly to Carolina, Georgia and Florida. The productivity and quality of southern mills are far better than its northern counterpart.

United Kingdom

The United Kingdom pioneered in the production of woollen goods. The first woollen industry was developed as early as 13th century. At its early period of growth, Yorkshire became the leading centre of production. Subsequently, new centres were developed in Mid-lowland and Lancashire. In the latter state, the industry experienced further dispersion in Scottish lowland, South Wales and Ireland. The early localization factors were :

1. The climate of Yorkshire was ideal. The soft-water supply was an added advantage.
2. The abundant power supply from Penine coal and hydel power.
3. Cheap and skilled labour supply.
4. Steady market not only in Britain but also in abroad.

Unlike cotton textile, which declined rapidly, woollen goods production in Britain survived and produced consistently, though its relative dominance has gone down considerably. The rise of demand in home market helped immensely for the survival of woollen industry in United Kingdom.

At present, important producing centres are Leeds and Bradford. UK is now not self-sufficient in raw wool production.

Other Producing Nations

Among the other producing countries, Italy, Germany, Poland, Romania, former Yugoslavia in Europe and China and India in Asia are noteworthy.

In between the two World Wars, Germany had made spectacular progress in wool production. The great war came as a severe blow and most of the plants were completely devastated. After the war, West Germany regained some of its old reputation in the production of woollen goods. However, after 70's emergence of new countries outpaced West Germany production. Combined output of both the Germanics exceed many top ranking countries. Most of the woollen producing centres are located in Saxony, Westphalia and Ruhr region.

Italy has emerged as one of leading producers of woollen goods. Even in recent years, production surpassed Japan and China. Most of the plants are located at Naples and Po river valley.

China, in Asia, is traditionally famous for the production of woollen goods. It now secures third position in the woolen production. Shanghai, Canton are the major producing centres.

India is also one of the leading nations in the manufacture of woollen goods. The huge number of sheep reared all over India provides raw wool to the industry. Most of the woollen products are manufactured in the north-western states. Major manufacturing centres are Ludhiana, Simla, Kanpur, Bhatinda, Dhariwal and Jullundhar.

Trade

Major wool and wool product exporting countries are Japan, Italy, USA and former Yugoslavia, USA, Canada, France are the major buyers of woollen goods.

Production of Woollen Goods

Sl.No.	Countries	Production [(million sq. mts.) 1992]	Percentage of world production
1.	CIS	746	23.2
2.	China	610	12.5
3.	Italy	475	11.5

Sl.No.	Countries	Production [(million sq. mts.) 1992]	Percentage of world production
4.	Japan	370	8.7
5.	USA	215	4.6
6.	India	165	4.3
7.	Poland	143	4.0
	World	3700.00	100

Source : Statistical Year Book - 1996

Artificial Fibre of Rayon Industry

Artificial fibres, popularly known as rayon, may be produced through different ways. The raw materials used for the manufacturing process also varies markedly. Broadly, all artificial fibres may be sub-grouped into two :

1. The fibres produced from agro-products, specially wood.
2. The fibres produced from chemical fibres, like nylon, dacron etc.

Whatever be the raw material, cellulose is the principal component of the manufacturing process. The major constituents of the raw materials are wood, caustic soda, acetic acid, ether etc.

Development

It is very difficult to ascertain the birth place of rayon manufacturing, but it is certain that first units were established somewhere in Europe, possibly in UK. Before the Second World War, several factories had already started production in UK, Germany and France. In 1910, first rayon manufacturing plant took its birth in USA near Pennsylvania.

In the first phase of development of artificial fibre manufacturing. United Kingdom dominated totally. At that period, UK was the only exporter of raw cotton. But, like many other industries, supremacy of Britan in rayon production did not last long. New countries gradually were able to develop their indigenous industry. Apart from European countries and USA, Japan soon started production of artificial fibres.

Locational Factors

Preparation of chemical fibres involve three-tier process of raw material processing and preparation of cellulose, manufacture of fibres from cellulose and knitting of the fibres.

This is a complex process which requires tremendous technological advancement and enormous capital

The uninterrupted supply of raw materials, e.g. fossil fuels, transportation of raw material, skilled technical workers and huge investments are pre-requisites for the establishment of a chemical fibre plant. The availability of these discerns the location of the industry.

Distribution

Of late, several countries have started production of artificial fibres but still traditional countries hold the key to the magnitude of production. In this technology based industry, only countries having' sound technical backgrounds are dominating the scene. The major producing countries are Europe as a whole, USA, Japan, Former Soviet Union, India and China.

Europe

Europe was the pioneer in artifical silk manufacturing. In fact, most of the early patents were exclusively reserved by European countries. The traditional producers are United Kingdom, Germany, France, Italy, Belgium, Sweden and Holland.

The dearth of raw cotton inspired the manufacturing of rayon during its early growth. The high degree of technological prosperity, huge capital and general industrialization of the country helped immensely for the rapid growth of manmade fibre in those countries.

The major centres of production in Europe are Ruhr valley, Dortmund and Westphalia industrial zone in Germany, Marshei and Paris region in France, Naples in Italy and Central England.

United States

USA is now the largest producer of artificial silk. All early attempts to manufacture rayon, before 1910, have failed miserably due to patent dispute. Most of the product comes from Appalachian region. The Appalachian coal, nearby hydel power, easy transport, skilled labour and general development of manufacturing industry within the area promoted rayon industry in this region. The leading producing states are Pennsylvania, Georgia, Arkansas, Alabama and North & South Carolina.

Recently, Japan is posing a threat to US rayon industry due to its cheaper rate of the products.

CIS

Soviet Union is another leading producing nation of artificial fibre. Most of the factories here, are new and constructed very recently. Improvement of Soviet rayon industry in recent decades were spectacular. The major producing centres are Moscow-Tula, Ural and Ukraine region.

Japan

Japan was the only country, besides Europe and USA, to start production of rayon in as early as 1915. The early growth of chemical fibres, specially rayon was spectacular. In 1965, Japan was able to multiply its production 100 times more than 1915. The major factors which favoured this growth were :

1. American financial and technical assistance.
2. Patriotic zeal of the labour force and its cheaper rate
3. Use of sophisticated technology.

The major producing centres in Japan are :

1. Fukai Region
2. Ishikari Region
3. Kwanto Plain
4. Kyoto Region

The other leading rayon-producing countries are China, India, Korea, Taiwan etc.

Trade

Japan is the largest exporter of artificial fibre, followed by USA, Germany, UK, Taiwan and Korea.

Asian giants like Japan, Korea and Taiwan now contribute more than half of export. Major importing countries are African, Middle East and countries of Oceania

3.9 ALUMINIUM INDUSTRY

Bauxite, the raw material to aluminium occurs most frequently in tropical areas having clay limestone rocks exposed to weathering. Bauxite can be converted into aluminium by producing an intermediate product, alumina. To produce alumina, bauxite is crushed, washed, pumped into pressure tanks, heated and subjected to a precipitation process using caustic soda to remove impurities, such as iron and silica. It is then cooled and dried in large furnaces to drive off moisture and reduce weight. A weight loss of 50 per cent occurs in this process. For this reason, concentration often occurs near the raw material source.

An electrolysis smelting process next converts the white powder alumina substance to aluminium. Alumina is dissolved in a cryolite bath and "direct electrical current is passed through it by means of carbon electrodes to complete the operation. Because of the large electrical power needs, the industry seeks cheap electrical power locations. Aluminium smelting facilities are therefore oriented to the availability of cheap electricity rather than to raw materials or markets.

Major uses of Aluminium

(1) Aircraft manufacturing— Lightness and toughness of aluminium have made it an essential metal for the manufacturing of aircraft.

(2) Structural uses— Aluminium is highly resistant to corrosion. So it has been used for all construction purposes like walls, door and window frames and internal fittings. It is also used in the construction of railway wagons, automobiles and ships.

(3) Electrical goods— Aluminium is a good conductor of electricity and is used for the manufacture of electrical cables.

(4) Food packing— It is conveniently used for the manufacturing of food containers and aluminium foils are used for wrapping and packaging of food stuffs.

(5) Aluminium alloys— Alloying aluminium with copper makes it as strong as steel.

Alloying aluminium with silicon makes it highly ductile and shock resistant.

Several countries with plentiful and cheap electrical power have significant aluminium processing activity even though they possess neither the raw material supplies nor final markets. Canada and Norway fit this circumstances. Other leading aluminium producers in the world, including the United States, Japan and West Germany, possess large markets and significant production but little raw material. The Soviet Union stands alone as a major bauxite producer, aluminium manufacturer and major consumer.

Rank	Nation	Production	Percent of World Total
1.	United States	3,857	23
2.	Soviet Union	2,535	15
3.	Canada	1,414	8
4.	Australia	939	6
5.	West Germany	820	5
6.	Norway	785	5
7.	Brazil	600	4
	Sub total	10,950	66
	World Total	16,928	100

World Aluminium Production,
1985 (thousands of short tons)

Source : American Bureau of Metal Statistics, 1986 (thousands of short tons)

Aluminium consumption domination by the U.S.A., Japan and Russia overwhelms the use in other areas of the world, but Western Europe also provides a significant market. In addition to the aircraft assembly industry, a wide variety of fabricators use aluminium. U.S. factories now use more aluminium than any other metal except iron.

Together with third-world domination of bauxite production, the multinational corporations control the aluminium industry as a whole. Six integrated corporations, all based in developed countries, accounted for over 70% of the bauxite output of market economics. These six firms include the Aluminium Company of America (Alcoa), Pechiney Ugine Kuhlman from France, Swiss Aluminium., the Aluminium Company of Canada (Alcan) and Reynolds Metals Co. (United States). Historically, these corporations became involved in bauxite production due to the large capital and sophisticated technology requirements of the industry, although resources were not locally available in developing areas. By integrating vertically from mine through refining to fabrication and recycling, these firms also limited their risk exposure.

Today, cost factors tend to favour developing areas for the manufacturing process, specially if cheap electrical power can be obtained. The market for aluminium is also growing rapidly in these areas. Trans-national corporate control continues, although several firms now possess minority partners from the host country. The potential for developing grass roots based integrated operations exists in only a few countries, such as Brazil and India, but partial integration does occur frequently.

Distribution

U.S.A. : The alumina factories clustered in the south central part of the United States include six mills strung along the Gulf coast from Texas to Alabama, and two in Arkansas. These factories consume three types of raw materials : bauxite, fuel and caustic soda. These mills feed on bauxite arriving by water, the main source regions being Jamaica, the Dominican Republic and Surinam. After processing, alumina can be shipped by rail.

A rational pattern of spatial development occurred with the U.S. aluminium industry, which has experienced five major developmental phases in various parts of the country. The first aluminium - processing plants occurred in New York State at Niagara Falls and Massena where cheap hydropower could be harnessed. In the second phase, two plants came into being in the Tennessee Valley Authority (TVA) region and they also took the advantage of cheap hydroelectric power. In the third phase, a wave of four plants built in the Pacific north-west "during World War II and they also took advantage of relatively inexpensive electrical power in that region. This area has remained a major producer, leading the United States in output. The fourth phase of development in the aluminium industry emerged after World War II with new sites located in Texas and the plants depended on locally produced lignite

as a source of electrical power. The fifth and most recent trend in the U.S. aluminium industry reflects the growth of smelters in the Ohio river valley to take advantage of cheap thermal electrical power sites near coal mines. These sites have the further advantages of being near the northeastern market and accessible to Ohio River barge transportation.

Canada

Canada provides an example of a region that has become a dominant world producer even though completely lacking native ore and having scarcely any domestic market. Although lacking in bauxite, Canada maintains aluminium mills at the extreme eastern and western parts of the country, near cheap electrical power sites. The first plant was established in 1901 near Quebec. Alumina for the plant come from Germany. This mill still operates but limited water power restricts expansion. In 1926, Aluminium Limited of Canada (Alcan), which operated the Shawinigan Falls concentrator, built a new plant at Arvida in a forested wilderness 120 miles NE of Quebec on the Saguenay river. Here a local alumina mill was opened in 1928. Bauxite arrives by ocean freighters from Jamaica and Guyana at Port Alfred.

Western British Columbia also claims a large aluminium mill at Kitimat, a development lured to a west, rugged wilderness, again by potential waterpower resources. Here the direction of flow of a stream (Nechako river) has been reversed to cause it to fall down the western side of the mountain. Electricity thus generated at Kemano moved 50 miles downstream to the Kitimat mill site, which is accessible to ocean vessels delivering alumina and bauxite.

European Countries :

The aluminium industry came to France in 1886 with France and Germany the early leaders. Today, France, along with Greece, still supplies a large portion of the bauxie for western European mills. In the production of alumina and aluminium, Norway, France and Germany pace the continent. Germany serves as the largest link in a chain of aluminium manufacturing nations that encircle the Alps. The largest single producer is Norway, which, like Canada, lacks both ore and markets but is blessed with power resources. Europe accounts for about 12 per cent of the worlds' bauxite output and 20 per cent of the refined aluminium.

CIS

Before World War II the Soviet Union had two aluminium factories, the bigger one at Zaporozhye and the smaller one at Volkhov. The German army destroyed both of these factories. A third plant was established at Kamnesk, on the eastern flanks of the southern Ural Mountains, to take advantage of bauxite in the Urals and local lignite for thermal electricity. A fourth mill at Stalinsk came into existence using bauxite from

Kuzbass field and machinery evacuated from Volkhov. After the war, the Russians rebuilt the Volkhov and Zaporozhye mills, using machinery expropriated from Germany and a large new mill built at Krasnoturinsk topped the bauxite reserves of the Mount Urals. To take advantage of the hydroelectric potentials of dams on the rivers Yenisey and Angola, the Soviets have built new aluminium smelters at Beatsk and Krasnoyarsk. Another plant located near Irkutsk at the southern end of lake Baykal and a plant at Sayanogorsk dramatically increased the capacity in Sibera. Today Sibera accounts for 60% of the country's' aluminium production.

Japan

Japanese aluminium refineries are widely dispersed throughout the country in smaller coastal cities, from Hokkaido Island in the North to Shikoku in the south. Many of these facilities occur near locally produced coal, which provides inexpensive thermal electrical power. The largest plant was located at Toyama on the pacific coast of Central Honshu. But, aluminium production is a "sunset" industry in Japan today, suffering from higher energy costs and significant production cutbacks are occurring.

3.10 THE CHEMICAL INDUSTRY

The chemical industry is comparatively a new addition to the manufacturing world. The prosperity of chemical industry in the national economy is the true reflection of the simultaneous development of the industries like engineering, metallurgy and several other manufacturing activities.

Process of Manufacturing

Chemical industry, as such, differs widely in terms of raw material, process and product from region to regin.

Raw. materials vary widely, ranging from nitrate, potash, salt, coal, petroleum, natural gas, caustic soda, sulphur, alchohol, phenols etc. The peculiar characteristics of chemical industry is that, final product of a industry may be used as raw materials to another industry.

The industry is the outcome of sophisticated technology. The process involved are intricate and very complex. The production process requires tremendous precision. The multiplicity of products and by products make the task even more difficult. There are very few industries in the world, where such a wide variety of products are prepared. The important products are divided into two broad groups : organic and inorganic.

The organic chemicals are mostly derived from coals, wood, petroleum etc. On the other hand, the minerals and other non-organic products are used in the production of inorganic chemicals.

Some of the chemicals produced are fine or pure in nature, while others are gross or impure. For instances, drugs and pharmaceutical products are pure but fertilizers are gross products.

Factors of Location

The chemical industry is considered as 'knowledge intensive high technology industry'. The technological advancement and attainment of know-how is a prime requisite for this type of industrial development. It has been observed that only countries having sound economic base and high degree of industrial growth were able to build up big chemical plants.

Another factor that prohibits the setting up of chemical plants are 'patents', occupied by multinational companies. The exclusive right on design and processes, by these companies, are the principal reasons for concentration of industries in some selected countries.

Raw materials used for the manufacture of chemicals are bulky and weight-losing. So some of the plants develop within raw material source. But, as the products are mostly expensive and basically used in other industries, market plays the decisive role in the localization of the plant. Several raw materials are generally used in this indusrry. It is obtained from different sources. It is most unlikely that all the raw materials will be available on a single place. The market or port locations are preferable, because of the availability of all the raw materials.

The other factors influencing the location of heavy chemical industries are all traditional in nature. These factors are :

1. **Power Supply**— Abundant power supply is necessary for the manufacture of chemical products. Formerly, coal, petroleum or hydel power sources influenced the location buf now due to the adaptation of energy efficient technique, the influence of power sources have greatly been reduced.
2. **Capital**— Chemical industry is the capital intensive industry. Most of the plants are largely automated. These expensive plants require huge investment.
3. **Land**— Market and raw material sources exert pull on the location of chemical industry. Availability of land is also a significant factor which sometimes influences the location.
4. **Transport and Communication**— Most of raw materials used in chemical plants are bulky and weight loosing. It is desirable to have a good transportation network. Water-side location is a favoured location.

Classification of Chemical Products

The products of chemical industries are broadly divided into two major groups

like organic and inorganic. But, according to the quality and use of the products, chemical industry is distinctly divided into -

1. **Heavy Chemicals**— Heavy chemicals are mostly manufactured from mineral deposits or industrial by-products. The major products are acids and alkalis. The acid group comprises sulphuric acid, nitric acid, acetic acid, hydrochloric acid etc. and alkalis comprises chlorine, caustic soda, soda ash, sodium salts, ammonia, urea and different fertilizers etc.
2. **Light Chemicals**— Numerous chemicals are included in this type of chemicals. Among these, soap, detergents, perfumes, cosmetic, dyes, plastic, explosives, pesticides and insecticides are important. These materials are all costly and require tremendous care during production.

The United States Bureau has made the following standard industrial classification:

(1) **Industrial inorganic and organic chemicals :** Alkalis and chlorine, industrial gases, coal for crudes, dyes, dye intermediates, organic pigments, inorganic pigments, other industrial organic chemicals - Chemicals as acetic, formic, synthetic perfume and flavouring materials etc. Other industrial inorganic chemicals - inorganic salts of sodium, potassium, aluminium, calcium, magnesium, etc.

(2) Plastic materials and synthetic resis, synthetic rubber, synthetic and other manmade fibres, except glass.

(3) **Drugs :** Biological products, medical chemicals and botanical products; pharmaceutical preparations.

(4) **Soap, detergents and cleaning preparations, perfumes, cosmetic and other toilet preparations :** Soap and other detergents, except specially cleaners. Specially cleaning, polishing and sanitation preparations, except soap and detergents. Perfumes, cosmetics and other toilet preparations.

(5) **Paints, varnishes, lacquers, enamels and allied products.**

(6) **Gun and wood chemicals.**

(7) **Agricultural chemicals :** Fertilizers, agricultural pesticides, other agricultural chemicals, as soil conditioners and trace elements.

(8) **Miscellaneous chemical products :** Glue and gelatin, Explosives, Printing ink, Fatty acids, Carbon black.

Distribution of Chemical Indsutry

As chemical industry is completely a knowledge intensive industry, it has concentrated only in areas where since and technology is highly developed. Besides this, the stability of economy and steady demand of the product are the other major considerations for the establishment of chemical industry. The global chemical industry

is mostly controlled by few multinational companies as they have the patent right of the products and the processes. The major producing countries are Untied States, CIS, Germany, France, Italy, Britain, Belgium, Japan, India, China, Israel, Brazil, Australia etc.

United States

The United States of America secures first position in the output of chemical products. They provide more than 20 per cent of the world's output. Several reasons are responsible for the supremacy of US chemical industries. These are :

1. High degree of industrial development and stable economy.
2. The development of science and technology.
3. Abundant raw material reserve.
4. Steady demand of the products.

The distributional pattern of US chemical industries reveals that this industry is mostly diffused and scattered over entire United States. The largest agglomeration of chemical industries is visible in the northern states of Pennsylvania, Ohio, Kentucky, Indiana, Tennessee, Albama, Virginia etc. Some industries often require products of other chemical industries. This symbiotic relationship between the chemical plants forced most of the industrial establishments to settle within the same region. The other reasons are the presence of nearby market, excellent transport facilities and availability of all kinds of raw materials within their periphery.

The Atlantic coastal tracts ranging from New York, New Jersey, Maryland to the south-eastern state of Florida contribute more than 70 per cent of the chemical output. Of late, states of southern USA are heading for rapid development of chemical industry.

Major Chemical Producing Regions of U.S.A.

Each dot represents relative volume of production

Different states of the USA are now specializing on different products like Tennessee on fertilizer and Texas on petro-chemicals and Pennsylvania on heavy chemicals.

Heavy chemical industry in USA is one of the oldest and most consistent in production among all others. Sulphuric acid production is, by far, most important both in output and demand. It is one of the basic raw materials used in other chemical industries throughout United Sates. The other important heavy chemical products are caustic soda, ammonia and chlorine.

All these heavy chemical products have a large and ready market throughout USA. The light chemical plants are the major buyer of these products.

Light chemical industry includes various products ranging from detergents, toilet products to pharmaceuticals. These products are secondary in nature and mostly produced from the basic or heavy chemical products. Several multinational giants control this industry in USA. The internationally famous companies are now operating from USA:

USA is also leading producer of drugs and pharmaceuticals. It is single largest pharmaceutical producing country in the world.

Petrochemical industry is a comparatively new addition in the chemical industry in USA, but its present shape and rate of expansion is really remarkable. Different plastics, P.V.C., synthetic rubber is produced in a large scale. The polymerization process, developed in USA during 70's, evolutionized the concept of chemical industries. At present, USA contributes more than 10 per cent of the petro-chemical output of the world.

The country earns a sizable amount of revenue from the export of all kinds of chemical products.

Fertilizer production in USA is an age-old industry. This country produces enormous amount of fertilizer, comprising NPK group and sulphur products. The eastern half of the country produces more than 80 per cent of the total fertilizer production in United States. United States exports considerable amount of nitrogen, phosphate and potash fertilizers.

CIS

The heavy chemical industry is one of the most important and prestigious industry in Soviet Russia. The co-ordinated development of national industry is closely related with the growth of chemical industry.

Though CIS is richly endowed with all the necessary raw materials for the development of chemical industry, it was poorly developed in Tsarist period. The early chemical producing centres were largely concentrated around Moscow-Tula industrial centres, St. Petersburg and Ukraine region, including Donbas, Odessa. At

that time, fertilizer, acids, soda and other necessary products were insufficient in CIS. The perplexing fact is that, due to underexploitation of mineral resources within the country, the country had to,import raw materials like potassium, different salts and phosphates from Germany, Chile and Morocco.

Major Chemical Producing Regions of U.zS.S.R.

Each dot represents relative volume of production

During the plan period, special care was taken to improve heavy chemical industry. The mammoth industrialization of the country naturally boosted the demand of chemical goods, specially fertilizer, acid and soda. In the production of heavy chemical products like sulphuric acid, caustic soda and fertilizers, CIS is now the second largest producer in the world next only to USA.

Distribution

The most important fact about CIS chemical industry is its self-reliance on indigenous raw materials. The major products of chemical industry in CIS are plastic, rayon, nitrogen, synthetic dyes, rubber and acids.

The locational factors that played important role in the growth of the industry were :

1. Presence of huge amount of raw materials within the national territory. CIS is self-sufficient in the production of potassium, appetites, phosphate, sulphur and almost all the salts. Production of these raw materials are also satisfactory.

2. The vast market within the country. The huge demand of chemical products in other industries.
3. Government patronage and provision of financial assistance.

Special care was taken for the decentralization of the industry even in the remotest places of CIS. The areas to become leading chemical producing centres are N Ukraine, Volga, Siberia, Urals, Armenia, Kazakhstan and Central Asia.

Some of the industries preferred raw material location. The industries using coke and non-ferrous materials to produce nitrogen and potash fertilizers developed near Ukraine, West Siberia and Urals. The industries producing sulphuric acid were concentrated around Ukraine, Caucasia and Moscow-Gorky area.

The largest concentration of heavy chemical industry, however, occurred near petroleum producing areas near Volga, Ukraine, Caucasus, Baku and Ural regions.

In different plan period, at least 175 new chemical plants were established and more than 150 pre-existing plants were thoroughly modernized. The maximum number of chemical plants were located around Moscow, Leningrad, Kuznetsk. The Petroleum and gas based plants are located in Urals, Ukraine and Bukhara in Asia. Even as far as Omsk and Krasnoyarsk in Siberia became chemical producing centres in recent periods.

The raw material based industries are located in Kola peninsula and Berezniki on local apetite ore, Solikansk in potassium ore and Urals near phosphate ore. Donetz basin is famous but of loose confederation CIS and related political turmoil greatly disrupted growth of chemical industry.

Japan

With the meteoric rise in all branches of industry in last couple of decades, Japan also made considerable progress in heavy chemical industry in recent years. The infrastructure and productivity of per worker is significantly higher than the European countries. It has been estimated that, in near future production of Japan may exceed even the productions of USA.

The origin of heavy chemicals industry in Japan is not very old. Only after First World War, Japan stared to establish some of its chemical plants. But since then, rapid growth of this industry was very phenomenal. With Herculean effort, Japan was able to rebuild its chemical industry within a very short period. Even before 1968, Japan surpassed its pre-war production level.

Most of the Japanese chemical plants are either newly constructed or completely re-built, so output and productivity is very high. All the plants are new, modernized and automated.

Japan is deficient in raw materials. More than 80 per cent of its factories are

entirely dependent on imported raw materials. The only raw material abundant in Japan is sulphur, deposited extensively by volcanic eruptions. Most of the chemical plants in Japan are located within the industrial agglomerations of 'Osaka-Kobe', Tokyo-Yokohoma, Nagoya, Hemagi and Kyushu.

United Kingdom

It is one of the oldest chemical-producing nations of the world. Though the relative share of UK in the world output is gradually declining. It still holds an important position in the world chemical production. The major factors responsible for the early growth of the industry were :

1. Huge good quality of coal reserve at that time.
2. Large salt, potash and petroleum by-products from oil refineries.
3. Availability of cheap hydel and thermal power.
4. Large market both at home and abroad.

The chemical industry in Britain is widely diffused. The leading producing centres are Lancashire^ Glasgow, Manchester, Birmingham, Yorkshire, etc.

Italy

Italy is now considered as a leading producer of both light and heavy chemical products. The growth rate in the industry is quite high. Several reasons are responsible for the development of chemical industry in Italy. These are :

1. The presence of vast amount of raw materials within the country, including limestone, dolomite, sulphur and potash.
2. The availability of cheap hydel power.
3. Good transport system and market facilities. The major chemical centres in Italy are Naples, Milan, Tarney, etc.

Germany

Germany has the traditional supremacy in chemical production. The erstwhile West Germany was a consistent producer of several chemical products, including caustic soda, soda ash, nitric and sulphuric acid etc. The major reasons for the high development of the industry in the country were :

1. The economic stability and research facilities.
2. Availability of several raw materials like salts, potash, limestone, dolomite, sulphur etc.
3. Development of thermal power from the adjoining coal deposits.
4. Extensive market facilities.

The major chemical industries are concentrated in Ruhr industrial agglomeration,

Bavaria and Elbe area. Larger concentration occur in Munich, Frankfurt, Strassfurt etc.

France

Of late, France has emerged as a leading chemical-producing nation. The strong industrial infra-structure, abundant coal reserve, high development of petroleum refinery industry, presence of several raw materials, like salt, dolomite, limestone and potash, within the country has facilitated the growth of chemical industry in France.

The industry is well-developed in regions of Lorraine, Marsai, Bordo etc.

China

Chemical industry, as such, is a very new phenomenon in China. After the take-over of the Communist, proper emphasis was given to self-reliance in every industry. Special care was taken to increase the production of caustic soda, soda ash, sulphuric acid, hydrochloric acid and nitric acid. The effort was so sincere that at last three decades production increased threefold.

The major chemical-producing centres in China are located in its northern part. The urban centres of Nanking, Shanghai and Shantung contributes maximum of the chemical output. The other noted chemical factories are located at Manchuria, Fushun, Penki, Dairen and Anshan. The largest of the plants are locatd at Manchuria. Some of the plants only specialize in the production of items, e.g. Dairen plant in soda ash, caustic soda, Mukden plant in Ammonium sulphate, urea and phosphate products etc. Chungkiang in Yangstze valley is famous for the production of fertilizers.

India

India is now one of the leading manufacturers of chemical products. The urban centers of Delhi, Kolkata, Chennai, Bangalore, Kanpur, Ahmedabad are leading producing centres.

Other Countries

In the present era, several other countries have developed their own chemical industry. The other leading producers are Spain, Belgium, Poland, Canada, Australia etc. Most of these countries concentrated on the production of fertilizers, caustic soda, soda ash and different heavy-chemical products.

PRODUCTION OF HEAVY CHEMICALS IN SELECTED COUNTRIES 1997-98
(in thousand metric tons)

Countries	Sulphuric Acid	Hydrochloric Acid	Nitric Acid	Caustic Soda	Soda Ash
USA	34978	2515	7368	9886	1670
USSR (Old)	22450	-	-	2810	4910
(1991) West Germany	4735	906	2900	3280	1406
East Germany	4678	105	-	420	850
UK	3500	135	2700	-	-
France	4600	300	3100	1340	1400
Japan	6440	500	650	2800	1500
India	2266	200	520	590	598
Spain	4020	142	890	420	316
Poland	3268	65	2113	460	680
Canada	3280	158	-	1040	-
Italy	2967	525	1039	990	710

Source : U.N. Statistical Year Book & Monthly Bulletin of Statistics

PRODUCTION OF CHEMICAL FERTILIZER IN SELECTED COUNTRIES 1997-98
(in thousand tonnes)

Countries	Nitrogen Fert (N)	Super Phosphate (P_2O_5)	Potash Fert (K_2O)
USSR (1991)	12004.2	7685.6	8531.0
USA	14244.0	10500.0	843.0
France	250.0	129.0	-
Germany	1290.0	200.0	3278.0
Japan	869.0	307.0	-
Holland	1700.0	340.0	-
Poland	1469.4	428.6	-
Italy	693.8	257.6	-
UK	800.0	90.0	538.0
India	8768.8	2616.4	-
China	18898.0	6074.3	115.0
Australia	240.0	300.0	-

Source : U.N. Statistical Year Book and Monthly Bulletin of Statistics.

3.11 INDUSTRIAL COMPLEX (REGIONS)

The spatial distribution of manufacturing industries shows a distinct trend of localization towards a few selected areas on earth. These areas have not developed haphazardly but have developed gradually, stage by stage through many years. Agriculture and other primary occupations are of minor importance in these areas. Some of these industrial regions are confined within political boundaries and a few have extended beyond the limit of the countries. The agglomeration of industries occur in countries where general level of industrialization is high and a sound infrastructure exists. The industrial regions have developed at some favourable sites.

(1) Where coal or more recently hydro-electric power has been available.

(2) Where raw materials are available or produced.

(3) In or near large centres of population where there is an abundant labour supply and a good consumers' market.

(4) At good trading locations to which both raw materials and labour can be brought at reasonable expenses, and from which the finished products can readily be shipped to wide market.

These factors are interrelated and in a particular industrial district, one or more than one of these advantages may be available. The entire region is thoroughly connected by well developed transportation and communication systems. The presence of favourable climate, flat land, use of machines and above all human skill and culture are some of the original factors which may help the growth of an industrial region. Besides, the availability of capital and organizational capacity are also very important factors.

Within such wide industrial regions sometimes comparatively small but more closed and compact industrial areas develop wherein factories and urbanization continue for miles together almost without any break. Such smaller areas are better termed as industrial district/complex rather than industrial regions.

According to geographical concentration, industrial regions may be subdivided into following groups.

A. North American region, comprising of U.S.A. and Canada.

B. European region consisting of the industrial regions of highly developed European countries like U.K., Germany, France, Italy etc.

C. The regions of Soviet Union/CIS.

D. Asian regions, comprising of the industrial regions of China, Japan, India, etc.

The USA

1. The North-Eastern industrial region with the following districts—
    i) Pittsburg-Wheeling-Cleveland,
    ii) New York - Philadelphia - Baltimore
    iii) Southern New England
    iv) Detroit and the surrounding area
    v) Southern Lake Michigan
2. The Southern Industrial region with Piedmont district.

Europe

1. The North-West European Industrial Region comprising of
    i) Scottish Lowland
    ii) New-Castle and the surrounding areas
    iii) East Pennine
    iv) Midland
    v) Lancashire
    vi) South Wales
    vii) North France - Belgium
    viii) The Ruhr
    ix) Saxony - Bohemia
    x) Silesia
    xi) The Swiss Plateau
    xii) The Po valley of North Italy

Soviet Union/CIS

1. The Soviet European Industrial Region which includes -
    i) The South Ukraine
    ii) The Central Industrial district around Moscow
    iii) Leningrad and the nearby area
    iv) The Volga region
2. The Urals
3. The Kuznetsk (basin) Region
4. The Caucasus region
5. The Soviet Central Asia (around Tashkent)
6. The Soviet Far East Region

Asia China

1. In around Mukden
2. The lower Yangtze valley

Japan

1. Tokyo- Yokohama (The Kwanto plain)
2. Osaka-Kobe-Kyoto (The Kinki district)
3. Nagoya area
4. North Kyushu

India

1. The Eastern Industrial zone including Kolkata, Asansol, Burdwan Jamshedpur, Siliguri.
2. The Western Industrial Zone including Mumbai and Ahmedabad.
3. Northern Zone around Delhi, Haryana and West Punjab
4. Southern Zone including Chennai, Bangalore, Coimbatore, Madurai etc.
5. Central Zone including Nagpur, Bhilai, Bhopal, etc.

3.12 SELECTED INDUSTRIAL REGIONS OF THE WORLD

USA

USA is the most dominant industrial super-power in the world. The total contribution of industry in the national Gross Domestic Product (GDP) in 1995 was 31 per cent of the total, i.e. $6952.020 million. The value of Merchandise import and export in 1996 was $814,888 and $575,477 respectively. At least 26% of the populations are directly or indirectly involved in manufacturing activities.

Achievement of this industrial supremacy has become possible due to her natural, human and cultural background. The USA is a vast country with an area of 3 million sq. miles. Moderate climate, long coast line, natural waterways, productive soils, extensive plains, forest and fishing grounds are some of her unique natural endowments. Her immense reserves of coal, petroleum and nuclear and hydro-electric potentialities and huge deposits of important minerals, like iron ore, copper, bauxite etc. have given the opportunity for a mechanical revolution. Originally people came here from different countries of West Europe and they brought with them advanced culture and technological skill. They all merged together to form a mighty nation. This has given her opportunity to have a strong and stable Government, which always fostered individual initiative, general education, scientific researches and economic growth. The country possesses the world's fourth biggest population of about 200 million, among many varieties of manufacturing units, iron and steel, engineering, automobiles, locomotives, aero planes and machine building, chemicals, textiles, paper and food processing are more important. Among the many industrial regions of the country, the most important is the North East Industrial Region which is discussed below -

The North-East Industrial Regions

In North America a great industrial region has emerged in the North-eastern part of the United States. This region covers only one-tenth of the country's land area, yet, it contains half of the U.S. population and three-fourths of her manufacturing industries. A number of historical, geographic and economic factors are responsible for the growth of this region.

(a) The region facing Europe attracted earlier settlers leading to a rapid growth of population having skill and finance.

(b) Coal and petroleum of the North Appalachian area, water power of New England States, iron-ore of the Mesabi range and various other minerals of this area have been very important factors for the growth of industries here.

(c) Excellent transportation facilities have been provided by the Great Lake system, rivers and by a net-work of man-made canals, roads and railways.

(d) Behind this region to the south and west lies a vast agricultural hinterland, rich with raw materials.

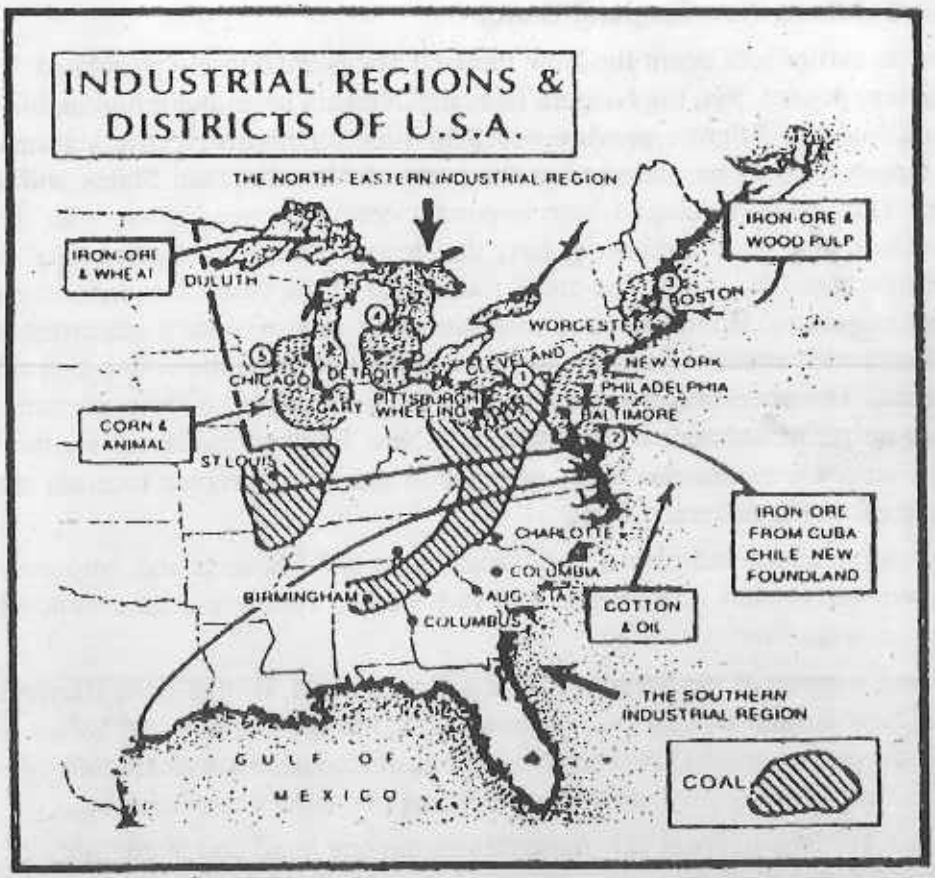
(e) The dense population provides an enormous market.

Within this region a number of industrial districts have developed within thicker concentration of manufacturing industries. They are as described below.

(i) Pittsburgh-Wheeling Cleveland District (or the Pittsburgh District)

This industrial district has developed on the North Appalachian coal-fields of Pennsylvania and Ohio. Pittsburgh stands at the junction of the rivers Monongahela and Allegheny (forming the river Ohio). The entire coal region is drained by these rivers and their tributaries. The most common sights of these rivers are the barges with cargoes of fuel for Pittsburgh industrial district. High-grade coking coal and easy transportation facilities are the two most important factors which have helped the development of this industrial district. Here iron and sted industry dominates specially in Pittsburgh, Youngstown and Wheeling. Numerous associated steel fabricating industries have also developed in this area which extend up to Cleveland on the Lakeshore. Iron-ore from the Lake Superior district can be obtained here cheaply through the Great Lake water routes.

It has easy access to the markets both in the Atlantic coast and in the Western interior. Pittsburgh has also important glass and textile industries. Arkon is the largest rubber manufacturing centre of the world. East Liverpool is noted for pottery.



(ii) New York- Philadelphia-Baltimore District

Besides these big cities of New York, Philadelphia and Baltimore, this area includes most of the northern New Jersey and a considerable portion of eastern Pennsylvania. It is within easy reach to the Appalachian coal-fields of West Virginia and Pennsylvania. Easily available -coal, port facilities, dense population and good trading locations are the factors for the growth of this area with highly diversified industries.

Baltimore has iron and steel, clothing, tinware, petroleum and copper refining industries. Philadelphia has textiles, foundry products, electrical apparatus, petroleum and sugar refining, cigar, leather goods manufacturing and other. In East Pennsylvania, iron and steel, foundry products, locomotives, silk, rayon and knitted goods are important. In New Jersey centres, skill and rayon, electrical apparatus, pottery, refining of petroleum and copper are important. New York has highly diversified industries. Clothing and fur manufactures are specially important. Foundry products, electrical apparatus, chemicals, perfumery, knitted goods, textiles, printing and publishing are other important industries of New York.

(iii) Southern New England States

Due to earlier settlement the New England States are densely populated. This area is deficient in coal. Yet, the Niagara falls, the .Niagara river and innumerable streams flowing into the Atlantic provide excellent sites for hydro-electric stations. In the past, cotton used to be collected at the ports of New England States and then exported. Thus have developed here important cotton centres. Later, with the aid of hydro-electricity, textile industries have developed. Now, coal is also brought here by rail or by coastal shipping. The coniferous forest of the North has encouraged paper and pulp industry. Boot and shoe manufacturing is also a very important industry here. The textile industry is facing severe competition from the cotton-belt centres of the South. The shoe-making industry also faces competition from western centres situated nearer the sources of raw materials. New England industries are now highly diversified due to hydro-electricity, population and its geographic location in relation to the great north-eastern market.

The cotton textile industry is in Massachusetts and Rhode Island. Important towns are Lawrence, Lowell, Manchester and Providence. Textile machine-building is important in Worcester.

Of late, a group of industrial towns, e.g. Spring-field, Bridge-port, Hartford, New-Haven, New Britain-Bristol etc., have developed in the Connecticut Valley of Western Massachusetts and in Southern New-Hampshire. These towns are mostly engaged in lighter engineering and other machines, copper wire, aeroplanes etc.

In fact, for lack of local raw materials on the one hand and availability of hydro-electricity and skilled labour on the other, the New-England states are now more devoted to such industries which demand more power and skill and lesser raw materials.

(iv) Detroit District

The city of Detroit stands on the river Detroit. The carriage building industry was important here due to original hardwood forest near Grand Rapids. The New mid-western population and its convenient location with reference to iron and coal have made it the greatest automobile centre of the country. Here have developed centres like Lansing, Flint, Pontiac, Jackson with specialization in the manufacture of motor vehicles, iron and steel, foundry products, machine tools, wire, paints and such other things directly or indirectly associated with automobile manufacturing.

(v) The Southern Lake Michigan District

This district includes the great industrial centre of Chicago with cities of Milwaukee, Gary and South-Bend. It has developed due to -

(a) easy access to iron-ore of the Upper Lake districts, and the coking coal of Ohio and Pennsylvania.

(b) proximity and access to the big and growing western interior market with excellent transport connections.

Here have developed iron and steel and its closely associated industries, e.g., foundry, railway car building, locomotive, equipments, farm machinery, electrical machinery, power engines, wire, motor vehicles and various other industries. Because of extensive agricultural hinterland Chicago has become the greatest meatpacking centre of the U.S.A.

Europe

The industrial heart of continental Europe occupies the west-central portion of the mainland, from the North Sea shores eastward to central Poland and from the Po valley northward to southern Sweden. This great territory contains most of the manufacturing plants of Europe. The area shows a strong correlation between high population density and manufacturing and between manufacturing and transportation. This part contains most of the large cities and leading ports of Europe. This region contains a highly productive farmlands and expansive stretches of forests. Among the many sub-regions, the Ruhr district of West Germany is the most promising industrial area of Europe.

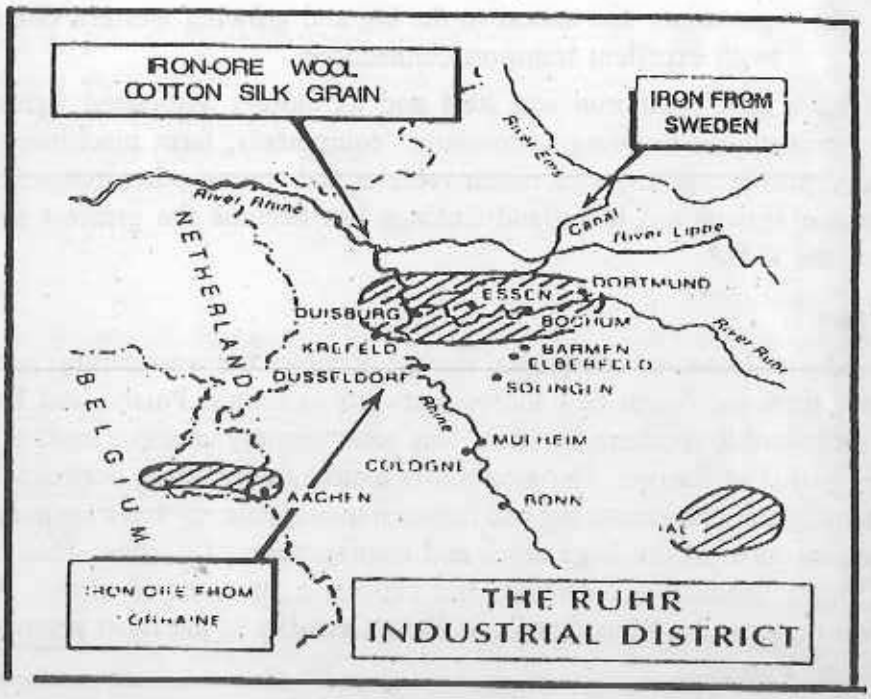
The Ruhr Industrial District

The Ruhr industrial district is an oblong area of land measuring 75 miles east west and 40 miles north south and containing more than a dozen of industrial cities. The position of the Ruhr relative to other countries and to different transportation routes is significant. The Rhine, the most heavily trafficked river in the world, flows along the Western end, which is only 10 miles from the Dutch border. Within the region, three small rivers flow into the Rhine. The region is served by efficient canal networks.

The Ruhr now the industrial core of Germany has grown up comparatively recently , within the past 100 years. Normally the Ruhr leads Europe in the production of coal and steel. It manufactures all kinds of metal products, from large machineries of knives and needles. It has also important textile and chemical industries.

The reasons for the growth of this area may be listed as :

1. The Ruhr basin contains the largest (coking) coal deposit in whole of Europe. It is of excellent quality and tremendous quantity.
2. The area lies in the heart of the great industrial concentration of Europe.
3. The perfect inland waterways presented by the Rhine system and canals, and a co-ordinated developed of other transportations systems,
4. The German skill and ingenuity.
5. Earlier capital from the traders of cologne.



Indeed, the keynote of industrial growth of the Ruhr region lies in its highly integrated and co-ordinated transportation arrangements with an excellent inland waterway system. Iron-ore is brought here from Sweden, Lorraine, Spain, Algeria, Tunisia and Austria. Cotton, wook, raw silk and grains are brought here from raw-materials relatively an easy task. The area is drained by the river Rhine and its tributaries, such as the Ruhr and Lippe. River, canals and railways supplement each other in the distribution of raw materials and manufactured goods. It has 3000 miles of railroad in every 100 square miles of area. There is hardly a factory which does not stand on some water channel. With the exception of Lorraine's iron-ore, all other heavy and bulky goods move principally by water. The Rhine is navigable by sea-going vessels even up to Cologne.

The main industrial area is to north of the Ruhr, stretching from Duisburg to Dortmund. Essen, Bochum Gelsenkirchen, Dortmund, Dusseldorf and Duisburg are all important steel centres having steel plants, heavy engineering and machine-building works. Solingen, Hagen and Remscheid are famous for cutlery and weapons. Barmen and Elberfeld are important textile centres, specially woolen. Krefeld has silk textile industry. With the by-products of coking industry and with local deposits of potash, chemical works and dye-stuff plants have developed in many towns of this area. The chemical industry is rather widely distributed here among larger cities like Duisburg and Dusseldorf.

During World War II, the allied military strategy was to pulverize the Ruhr. Al-

though recovery in the Ruhr was back to pre-war production levels; since then it has surged above them. This astonishing recovery epitomizes the ideal interplay of numerous geographic factors : Central location to large population, location atop a high-grade coal field, land for easy transportation, especially by rivers and canals, and nearness to the sea. Above all, Ruhr is peopled with an unusually energetic and ingenious folk. With such endowments, the Ruhn could hardly be repressed.

Soviet Union/CIS

The Socialist Revolution (1917) marked a turning point in Russian industry. Before that date the Russian economy was agrarian. An extremely high percentage of the workers were farmers and most farming was at a subsistence level. Victorious in their Revolution, the communist rulers formulated a long-range industrial strategy : first, to increase the role of manufacturing in the Russian economy, and second, to enlarge the role of steel and machinery industries within the industrial structure. These goals were eventually combined with goals for agriculture, mining, and all other phases of the economy in a series of five year plans. Locationally, there has been a pronounced shift to the east. Before the Revolution there was comparatively little manufacturing east of the Moscow area. Roughly 80 per cent of Soviet manufacturing takes place in European Russia and the Urals. There are several dispersed manufacturing regions like the Soviet European Industrial region consisting of Ukraine, Moscow-Tula-Gorki, Leningrad and Volgograd. Besides there are Urals, Kuznetsk, Tashkent, Caucasus etc.

The CIS is one of the mighty industrial power of the world. In 1995, industry contributed nearly 40 per cent of the gross national product in Russian Federation. Nearly 47 per cent of work forces in 1991 were engaged in manufacturing industry. Broadly speaking, the Soviet power resources and raw materials are rather widely scattered. But her policy was towards extreme concentration and to build up a few large-scale integrated plans for achieving lower operation cost even at the expense of higher transportation charges on fuel and raw materials. Transportation cost for long distance movement of coal, iron-ore and other raw materials was found too high. Therefore the Govt. had changed its subsequent plans and a policy of industrial dispersal has been followed with a view

1) to have fuller utilization of power resources and raw materials locally.
2) to save transportation cost by developing industries near sources of raw materials and power.
3) to promote a well-balanced industrial development throughout the country.
4) to have greater security in respect of strategic consideration.

Since then the extension of industries in the underdeveloped areas has been emphasized. Industries have been developed behind the Urals, in Siberia, in Central Asia, in the Far East and also in the Caucasus region. But till now industries have been more vigorously developed in the European part.

The Soviet European Industrial Region

The region is bounded by Leningrad, Kiev, Odessa, Rostov, Volgograd and Moscow. It includes some of the oldest and largest industrial areas of the Union. The following factors have helped the development of industries here.

(a) The area is near the great industrial countries of Europe and it had some manufacturing activities even before the coming of socialism.

(b) The huge coal reserve of the Donetz basin, the brown coal deposits of the Moscow basin and the giant hydroelectric installations on the Dnieper and Volga have been the principal sources of power.

(c) The region is rich with minerals and agricultural raw materials.

(d) This is the most densely populated part of the Union. More than half of her people live here.

(e) The rivers Volga, Don, Dnieper and the Black Sea together with a net-work of man-made canals, roads and railways have made the transportation easier. The entire region may be sub-divided into a number of important industrial areas. They are as described below.

(i) The South Ukraine

It includes the Donetz basin coal-field area, the Dnieper industrial area, Krivoi Rog and the north shore of the Black Sea. Coal of the Donetz basin, iron-ores of Krivoi Rog and Kerch, various other minerals and agricultural raw materials, splendid transportation facilities provided by the Black Sea, the Dnieper, Don and Volga and a dense population are the factors for the growth of industries in the southern Ukraine.

Iron and steel manufacturing is the principal industry of this area. It has developed remarkably in the Donetz basin towns, e.g., Donetsk, Kramatorsk, Voro-shilovgrad, Artemovsk, etc. It has also developed on iron-ore centres of Krivoi Rog and Kerch. Many steel plants have again developed on the Black sea coast.

Engineering industries have developed extensively throughout this area. Machines of every description are built up here. Voroshilovgrad and Donetsk specialize in locomotive building ; Kiev, Odessa and Rostov-on-Don in agricultural machineries. Due to cheap hydroelectricity from the Dnieper Dam, Zaporozhe has high-grade steel alloys, machine tools, ball bearings, tractors and aluminium manufacturings. A little away from this area towards north is the city of Kharkov with its highly developed engineering industries.

Chemical industry has developed here as an off-shoot of the coking coal industry in the Donetz basin. Deposits of salt have further helped its growth. Chemical fertilizer industry is important specially for beet cultivation in this area.

In Ukraine coal, metal and chemicals form, as it were, a single combine. It has also important sugar factories and cotton mills.

(ii) Moscow-Tula-Gorki

This area has developed around Moscow and is roughly bounded by Kalinin, Smolensk, Tula, Ryazan, Gorki and Yaroslavl. This is the most highly developed industrial area of the Soviet Union. It has developed not because of local raw materials but because of its central geographical position, transportation connections, dense population and skilled labour. The brown coal of the Moscow basin, coal from the Ukraine and oil from the Volga-Ural and Caucasus regions are utilized as sources of power. Additional power is also supplied from the gigantic hydro-electric installations to the south-east of Kuibyshev and Volgograd. The area has unique transport relations with different parts of the country. It is drained by the rivers Volga and Oker. About a dozen of railway lines radiates to different directions from Moscow. Moreover, it has extensive road and waterway connections. Numerous diversified industries have developed here among which steel milling, engineering, textiles and chemicals are the most prominent.

Steel mills : With the help of imported coke and local iron-ore and scrap small and scattered steel plants have developed in Moscow, Tula, Gorki and Lipetsk. The local steel production can meet only a fraction of the local demand for engineering industries.

Engineering : This area is particularly remarkable for engineering industries. Production of machine tools, instruments, lathes, ball-bearings and various types of machines is carried on in Moscow and nearby towns. Automobile manufacturing is important in Moscow, Gorki and Yaroslavl; locomotive in Kolomna; railway coach building in Kalinin; and agricultural machines, synthetic rubber and auto-tyres in Yaroslavl.

Textile : This area has the greatest concentration of textile mills. Cotton fabric, woolen, silk, linen and variety of knitted goods are manufactured here. Linen is available locally while raw cotton is brought here from central Asia. Ivanovo is the principal cotton mill centre and is called the 'Manchester of the Soviet Union'. It is surrounded by a number of cotton-manufacturing towns. Moscow itself is also a very important textile producing centre. Linen mills are specially important in Kalinin which is surrounded by flax producing areas.

Chemicals : A great variety of chemical industries including dyes and fertilizers have developed. Local deposits of phosphates and brown coal are used. Moscow is the most important centre of the chemical industry.

Manufacturing of rubber, leather-tanning, boot, shoe, starch and alcohol are other industries of this area.

(iii) Leningrad

It is the only permanent Russian port facing European countries. The city stands alone as an industrial giant surrounded by a vast hinterland scarcely having any manufacturing activities. Like Moscow, Leningrad also lacks local supplies of coal and raw materials. Indsutries have developed here due to its geographical position, transport connections and skilled labour. In technical efficiency Leningrad surpasses all other industrial areas of the country and this has been an important factor for its prominence. Local hydroelectric stations and coal from the Pechora valley supply the power. Machines, tools, ships, paper, textile and chemicals are the most important items of the country's ship-building, 50 per cent of electrical equipment and 35 per cent of paper are manufactured here. It has also fur, shoe, rayon and furniture industries. For paper and rayon industries, it obtains softwood from the northern forest and for engineering industry, it obtains steel from Ukraine.

RAILWAY ROUTES OF MOSCOW

(iv) Volgogad (the Volga Region)

Volgograd (the new name of Stalingrad) is a major industrial centre on the Volga.

It is situated in the heart of agricultural region. Industries are in the area of thirty miles up and down along the river Volga and they include metallurgical works, manufacturing of tractors, oil refining, ship-building, machine building and lumber yards. Coal and steel are obtained from the Donetz basin, and oil is obtained from Baku. From the northern forest timber is floated down the river Volga. Importance of this area has increased with the construction of Volga-Don Canal. Kuibyshev, Saratov, and .Voronezh are important riverside industrial towns of this area.

Asian Region Japan

To-day Japan is one of the highly industrialised countries of the world. Four major islands of the country are Hokkaido, Honshu, Shikoku and Kyushu, and including Ryuku the total area comes to about 3,71,857 sq. kms. Eighty-four per cent of her area is covered by hills and mountains. There are dangers of active volcanoes and devastating typhoons. Japan does not possess a strong resource base for manufacturing. She lacks minerals and raw materials. Her coal is non-coking. Iron-ores, copper, lead and zinc are inadequate as well as inferior in quality. Raw cotton and wool are totally absent. Yet the country is now world's third biggest producer of steel, largest producer of ships, second biggest producer of woolen fabrics and the foremost exporter of textiles. In fact, modern industrial development of Japan, in spite of her natural handicaps, is unprecedented. The country has recorded the highest rate of industrial growth in post-war period. Japan now dominates almost all key industries. At present 35% of the working people are engaged in manufacturing activities. In 1995, manufacturing in Japan contributed 38 per cent of the country's G.N.P.

The geographic location of the country, her long and indented coast-line, vigorous forests, fertile soils, rich and extensive fishing grounds have, however, created a natural environment favourable for economic progeress. The moderate climate with well-distributed rainfall has not only helped agriculture but has also presented in ideal condition for extensive development of hydro-electricity in this mountainous country. The manufacturing industries of Japan depend largely on imports of raw materials and exports of finished goods.

Japan is an outstanding example of a nation which has reached industrial eminence on the basis of cultural aptitudes. Japanese people are highly intelligent, skilful and hard-working. Quick adaptability to c' anging circumstances is their special characteristic.

Only with 16 per cent level land Japan has a prodigious population of 100 millions. Nowhere else on the earth surface can one find such incredible human density on arable and habitable plains. Japanese people with their inherent skill simplified the process of production, broke them up, where possible, to fit suitably with her traditional home workshop and small factories. Extensive development of hydro and thermal electricity has made the task easier. About 98 per cent of houses in Japan have

electric connections. Nearly half of her industrial workers are engaged in these small factories and home workshops which are now well-equipped with power-driven machines. Western-style large factories are found only in big cities and in the fields of steel, ship-building, heavy engineering, heavy chemicals and yarn spinning.

Thus, the introduction of modern system of production did not very much disturb the old organisational pattern and old social order of the country. She did not encounter the chaotic period of transition. This has led to lower labour cost and lesser labour disputes. Workers always try to up-keep the family tradition of efficiency.

The centralized and the decentralized sectors of industries always work in close cooperation. One is complementary to the other. Industrial organizers of Japan are more efficient and practical-minded. They are particularly keen about internal and external market demands. With a population of 100 millions, Japan has a fairly big internal market.

Being fully aware of country's economic position Government has always been helpful towards her commercial and industrial development. It is due to Government's effort that the country has attained to-day cent per cent literacy. Many of Japan's key industries have had their origins under Government ownerships. At present, though there is no state-owned factories, industries get patronage and backing from Government in the form of loans, export subsidies and technical counsel. In post-war period Government has brought rapid rate of progress by introducing plans and programmes.

In short, water power, human skill, government backing, coexistence of centralized and decentralized sectors and superior organizing ability are the principal factors behind Japan's industrial success.

For years textiles were the most outstanding industry. In recent years steel mills, ship-building and chemicals have become more important.

The only industrial belt of the country runs through central Japan from Tokyo to northern Kyushu. It is about 700 miles long. Four industrial districts punctuate this industrial belt: e.g.

(1) The Kwanto Plain,
(2) The Kinki Plain,
(3) Nagoya and
(4) Northern Kyushu

The Tokyo-Yokohama Region or the Kwanto Plain : This industrial region covers the areas of two prefectures, namely Tokyo and Kanagawa. The entire region gradually developed taking base of two separate core, Tokyo on one hand and Yokohoma the other. The industrial boom of Japan and shortage of plane land forced the areas to merge with one another. Even in recent period, industry invaded into the neighbouring prefectures of Satima and Chiba.

At present, this area produces nearly 26 per cent of Japanese industrial products. At lest 25 per cent of the total working population in Japan are engaged in this industrial connurbation.

Inspite of heavy agglomeration of industries in Tokyo-Yokohoma area, a change of decentralization is discernible in the zone. At present, 5 out of 7 industries are selecting its location beyond Tokyo-Yokohoma region. The reasons liable for this decentralization trends are - (1) a heavy congestation in the area, which resulted escalation of land price, high wage rated labours, worn out condition of the old and outdated machinery etc. (2) high land value and shortage of land, (3) stiff competition etc.

In this famous industrial region, almost all types of industries are found. In Tokyo and adjacent territories of Yokohoma, Kawasaki, the major products are : iron and steel, refined oil, petro-chemical, heavy chemical, cement, footwear, toys etc.

The eastern Tokyo, where industry first flourished, is still producing the traditional items. But most of the production is on the cottage industry level.

Along the coast lines of Tokyo Bay, the heavy manufacturing industries are located. Due to growing shortage of space for the new industrial ventures, efforts are on to reclaim the lands from the sea. In the west of Tokyo, new industrial centres like Fugigawa and Zame were developed to meet the growing demand of industrial space. The oldest and most productive Tokyo-Yokohama industrial region possesses some distinct relative advantage over the other industrial regions of the country. These reason are :

(a) The rare flat lands of Kwanto region, unparallel in mountainous Japan.

(b) Wonderful communication network, through rail, road and water ways with the rest of Japan.

(c) Presence of coal resources in nearby Joban coalfield initially favoured the growth of the industry.

(d) The abundant supply of skilled labour at a much cheaper rate.

(e) Rugged mountain rivers provided water resources for industrial purpose and hydel power generation.

CHINA

China is gradually becoming one of the most dominant industrial powers in the world. In the year 1995, China produced 48 per cent of her GDP from industrial sector. During this year, China handled the trade of merchandise product worth $138,833 million import and $151,047 million of export.

The real development of industry in China began only after the installation of Communist rule in 1949. At present, (1990) 15 per cent of the labour force in China are engaged in manufacturing activities.

Chinese industrial system had gone through a complete transformation in last 50 years of Communist Rules. Old industrial policies were discarded and new policies were adopted States power is supervising industrial development of the country in a planned manner. Eradication of regional imbalance and dispersion of the industries were encouraged. Basic industries like iron-steel, chemicals, textiles were given priority.

On the basis of concentration of industries and their output, Chinese industrial regions may be sub-divided into following regions :

1. The Manchuria Region
2. The Yantze Valley Region
3. The North China Region
4. The South China Region
5. Other Regions.

The Manchuria Industrial Region— Even prior to Communist regime, Manchu-

ria developed as a industrial region. Several factors were responsible for the growth of this region. These were, developed agricultural hinterland, good transportation network, skilled labour local capital and Japanese participation.

The setting up of Anshan steel plant in 1917 initially boosted the industrial growth. The Penki, Kungyuan, Heilungkiang, Kirin, Linkow steel plants were gradually established. During 1960, Manchuria was able to contribute half of the Chinese iron-steel production. For availability of Fushun, Pehpiao coal, Penki, Kungchuling iron ore, not only iron and steel industry, several other metallurgical industries like machine building and heavy engineering industries were set up in Mukden, Harbin, Fushun and Dairen.

Besides, ferrous industries, heavy chemical plants were also developed in Manchuria.

INDIA

Since independence (1947), India has gradually emerged as a moderately industrialized nation. In some fields of manufacturing activity, Indian advancement is really spectacular. It is now considered as one of the leading industrialized country in the world.

In 1995, industry contributed 29 per cent of the Gross Domestic Product. In 1980-81, 13 per cent of the total labour force were engaged in industry, which slightly increased to 16 per cent in 1990-91.

Spatially, Indian manufacturing establishments are mal-distributed. Some states are having very high concentration, while other regions are devoid of industries. It has been observed that regions situated in the plain, fertile lands and colonial heritage are historically having sound industrial base. Due to the failure of new centres to complete with old traditional centres, almost a status quo is maintained even today. Of late, some new industrial centres were evolved, specially around the steel cities.

Among the states, Maharashtra contributes largest amount of industrial products, followed by Gujarat, Tamil Nadu, West Bengal, Uttar Pradesh, Bihar, Karnataka etc.

According to the regional concentration of industries, Indian manufacturing regions may be sub-divided into six broad regions. These six regions are :

1. The Calcutta Conurbation.
2. The Bombay-Poona Megalopolis.
3. The Ahmedabad-Vadodara Region.
4. The Southern Industrial Region.
5. The Damodar Valley Region.
6. The Capital Regions.

1. The Calcutta Conurbation— Broadly, a narrow strip running from Banshberia

and Naihati in the north to Budge Budge and Uluberia in the south along the river Hooghly may be taken as the demarcating line of this oldest and vast industrial region in India. Several suburban and satellite townships were developed within this region. Notable among these are Howrah, Liluah, Bally, Uttarpara, Hind Motor, Konnagar, Rishra, Srirampur, Chandannagar, Bandel, Uluberia in the western bank and Budge Budge, Birlapur, Dum Dum, Belghoria, Sodepur, Titagarh, barrackpur, Shyamnagar, Naihati in the eastern bank of river Hooghly..

The major industries located in this region are jute mills, cotton textiles, chemicals, drugs and pharmaceuticals, engineering, machine tools, automobiles, tobacco, food processing, eather, fabrication, paper, match, etc.

Several factors proved to be advantageous for the growth of these industrial regions. These were : (1) The port facilities of Calcutta, (2) Calcutta was then the seat of administration and capital of imperialist power. (3) Good transportation, through rail, road and water ways. (4) The proximity of the region towards mineral belts of Chotanagpur plateau. (5) Large market within Calcutta metropolis. (6) Extensive hinterland over eastern India. (7) Development of science and technology in renaissance period. (8) Cheap, available labour force from adjoining Bihar, Uttar Pradesh. (9) Enterpreneurial ability of the foreign and national bourgeoisie etc.

2. The Bombay-Poona Megalopolis— This region stretches from Bombay metropolis to Poona in the south. Major indusrial centres are Andheri. Belapur, Thane, Kalyan, Pimpri and Poona. This is the biggest industrial agglomeration in India. The major manufacturing items produced here are : Textile, drugs and pharmaceuticals, chemical, petro-chemical, paper, leather engineering, fertilizer and precision instruments.

The major factors responsible for the growth of this industrial region were (1) Development and growth of Bombay port (2) Development of communication system through rail and road. (3) Vast hinterland. (4) Managerial and entrepreneurship ability of Parsee Bhatia people. (5) Huge capital from foreign and indigenous source. (6) Development of science and technology in the region. (7) Cheap power resources. (8) Cheap labour from Konakan and other regions etc.

3. The Ahmedabad-Vadodara Region— Due to growing congestion and related problems, cotton textile industry gradually shifted from Bombay and grew in this region. Later on numerous other industries like petrochemical, chemical, fertilizer and engineering factories were evolved. The other centres of manufacturing industries are Varuch, Surat, Kalol etc. Exploration of petroleum in this region gives it a distinct advantage. This is one of the highly growing industrial regions in India.

4. The Southern Industrial Region— The extensive industrial region of South India is popularly known as Madras-Combatore-Bangalore region. This is also an old region.

The major products of the region are textile, sugar, engineering, refinery, chemical, drugs and pharmaceuticals, automobiles, fertilizer etc. The reasons for the development of the region are (1) The facilities of export-import through Madras Port, (2) Easy communications through rail and road, (3) Large hinterland etc.

5. The Damodar Valley Region— The mineral-rich area of Chotannagpur area is now one of the most developed industrial region in India. The availability of local coal, iron ore, bauxite, limestone, manganese, mica and other minerals, attracted a large number of minerals based industries. Besides mineral, proximity to Calcutta market, cheap labour and high demand also facilitated the development.

The major industrial areas are steel cities of Jamshedpur, Durgapur, Bokaro, Burnpur, Hirapur, Kulti, Asansol; coal centres like Raniganj, Jharia, Dhanbad and township Ranchi etc.

Apart from iron-steel, heavy engineering, metallurgical, glass, ceramics, machine tools, alloy steel, agricultural machinery, etc. are produced in this region.

6. The Capital Regions— Adjacent to the Delhi metropolitan area, several industrial establishments developed. This' is the new industrial area, compared to the others. The major centres of production are Faridabad, Gaziabad, Mathura, Saharanpur etc.

The major products of the region are textile, engineering, leather, drugs and pharmaceutical, petroleum refinery, toilet and cosmetic products, detergents etc.

Other Regions— Besides these major industrial regions, numerous isolated industrial centres have developed in India. Among these Kanpur, Lucknow, Meerut, Allahabad, Varanasi, Jalandhar, Patiala, Jaipur, Bilaspur, Cuttack, Bhubaneswar, Hyderabad, Trivandrum, Alleppe, Quilon etc. are important.

Besides these major industrial regions, there are some isolated and scattered indsurial centres in Asia. Among these notable are Seoul, Chongtu, Taejon, Taegu, Pohang, Ulsal and Kwangju in South Korea, small islands like Hong Kong and Singapore are important. Of the smaller centres Karachi in Pakistan, Kualalampur in Malaysia and Kuwait are important.

UNIT 4 ❑ TRANSPORTATION—MODES OF TRANSPORT

Structure

4.1 INTRODUCTION

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-economic 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 overemphasized. 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 analysed, such as relationships 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 a subsistence level and regional specialization yielding exchangeable surpluses would be impossible.

Transportation involves two aspects : (a) a vehicle or unit of conveyance & (b) a medium upon which to move. The form of one transport mode differs from that of another because of the technological differences 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 form of route, the way, course or track on which to operate. Both roads and railways, the basic forms of land transport cannot take place without the construction of suitable route ways. Rail transport requires a more specific route in the form of a special track and other operational infrastructure like signalling 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 a 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 the vehicles. The animal driven vehicles are still popular, so is the bicycle. The auto vehicles have now become an intetral part of our transport system. The railway locomotive, ships and aeroplanes 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 the 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.

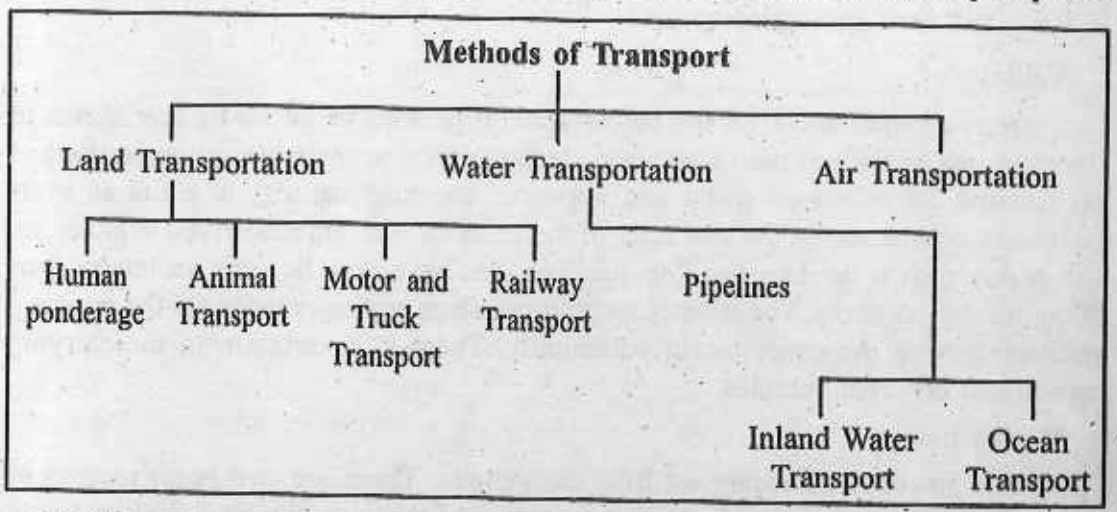
Terminal:

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. They are ports with their docks, wharves, warehouses, custom offices etc. For air terminals, there are arrangements for the take off and landing of aircraft.

4.2 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 vehicles. 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 automobilies, 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 routs are (i) the land routes including transportation by path or track, 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 service 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 vehicles can supply services over public highways on even or uneven terrain or on poor roads. Traffic in "smalls" can be sent daily and easily by 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 is 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 class 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 is 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 track. 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 track 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.

Ocean Transport :

The sea offers a ready-made carriageway for ships which requires no maintenance. Ships can travel within a limited numbers 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 revolutionized the pattern of sea trade. The Red Sea-Suez-Mediterranean route has become the most important 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 (rivers) 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 rives, the Amazon system, the Panama-Paraguay system and the 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 carnage of commodities which are low in bulk but high in value. Air services are of two main kinds : (i) short-distance services operating within a country, called domestic services; (ii) long-distance services like trans-continental and trans-oceanic flights, called international services. There is a world wide 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 cost iron was laid down in Pennsylvania (USA) in 1865. Today 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.

4.3 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 a 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 the transport activity.

Private transport costs are made up of three elements—

(i) Track costs— of providing and maintaining a surface cover which transport services can opeate;

(ii) Running costs— the cost of purchasing, maintaining and operating a vehicle to run on the track surface;

(iii) Interchange costs— the cost of providing facilities at the beginning and completion of a journey.

The two broad categories of transport costs are (1) Fixed costs or Inescapable costs and (2) Variable costs or Escapable costs.

Fixed costs : These are costs which are incurred before any traffic at all passes.

They include the costs : (i) of providing the infrastructure (i.e., the roads, the port or the railway line); (ii) of providing, equipping and staffing the terminal facilities (i.e., bus depots, railway stations or airports); (iii) of providing managerial, administrative and maintenance staff and their offices and workshops. These costs are inescapable because they can not 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 lines.

Variable Cost : These are costs incurred by the actual movement of traffic and they vary with the level of the traffic passing. They include the cost of fuel, crew wages and the maintenance of vehicles. For example, the replacement of worn bus tyres or routine inspection of an aircraft after a flight. They are called escapable because they can 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.

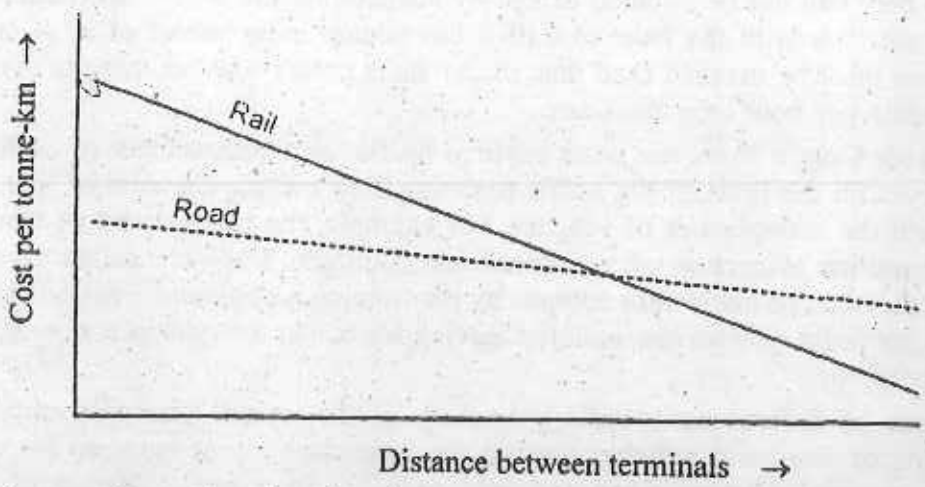
Because of differences in basic technology of the various transport modes, the proportion of fixed and variable costs in the total costs varies between the nodes. 44% of railway costs are fixed and 56% variable. In contrast, road transport is characterized by a much lower proportion of fixed costs in its total costs (which may be higher, equal to or lower than rail costs in a given situation). On average 22% of road haulage costs are fixed and 78% are available. The identification of fixed and variable cost for the main modes of transport is shown in the table below

Fixed and Variable Costs of the Main Modes of Transport

Mode	Fixed Costs	Variables Costs
Private car	Insurance, road fund tax, depreciation, interest	Petrol, oil, vehicle maintenance and tyres.
Public Service vehicle	Administrative and workshop overheads, depreciation, interest, insurance and licences	Fuel oil, lubricants, maintenance and cleaning labour costs.
Rail	Track, administrative and technical overheads, terminal costs, depreciation and interest	Fuel, vehicle servicing and maintenance, labour costs.
Air	Terminal and engineering overheads, insurance, depreciation and interest, central administration	Fuel, landing fees, certain servicing costs and labour costs.
Sea	Terminal and engineering overheads, insurance, depreciation and interest	Fuel and oil, in- voyage maintenance, crew costs and expenses

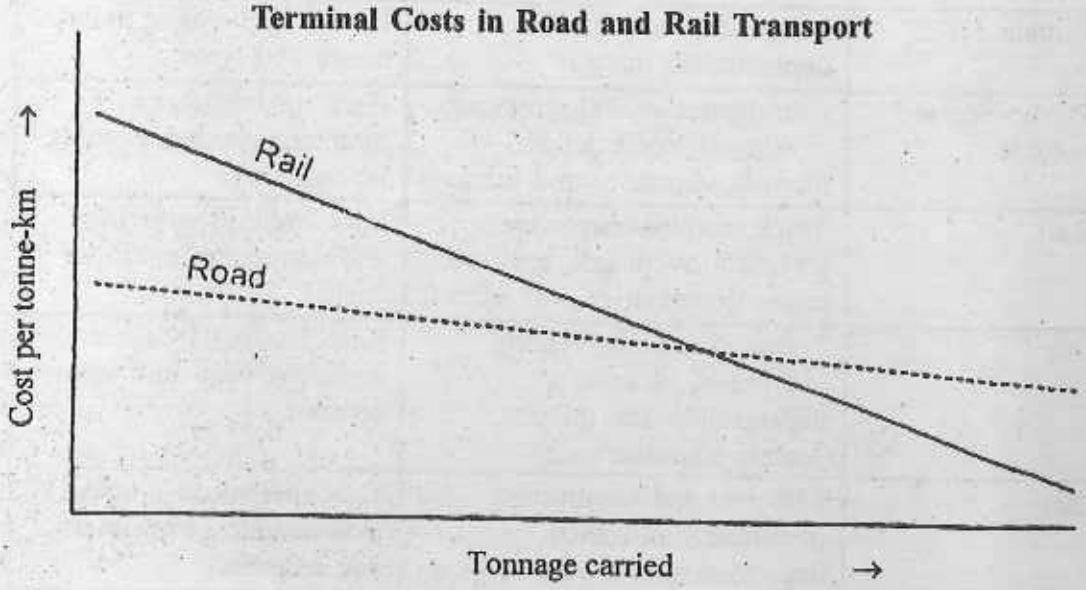
The transport costs per unit varies with the increase in traffic, it falls off rapidly in case of rail than road. If traffic is light, unit costs of rail are definitely high, but if flows are very heavy, unit costs are greatly reduced and rail becomes very competitive.

Unit Costs in Road and Rail Transport



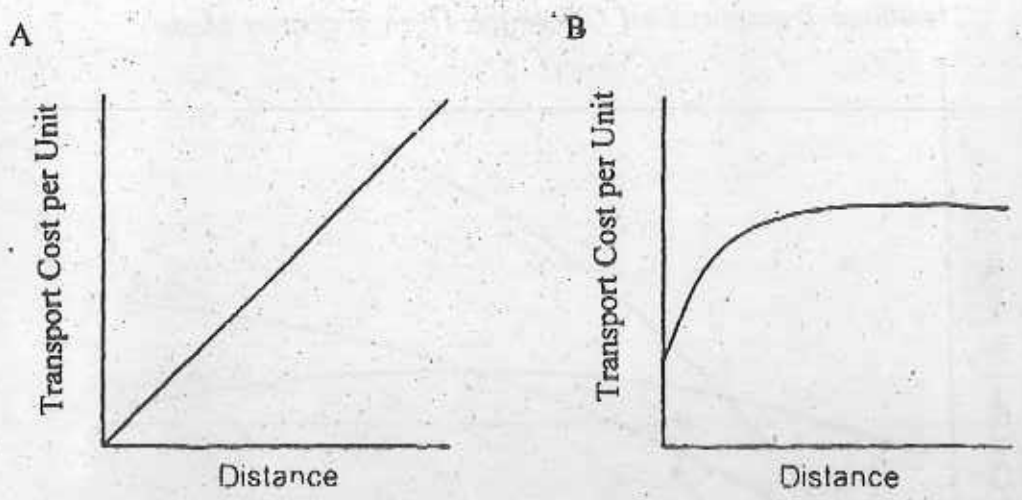
All transport operation also give rise to terminal costs and line haul (over the road) costs. Terminal costs are those associated with loading and unloading the commodities and the accompanying paperwork. The terminal costs are both fixed and variable. The proportion of terminal costs in the total costs 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 reversing the process at the other end.

Terminal Costs in Road and Rail Transport



The transport costs are also proportional to distance. Each additional unit of distance adds an equal increment of cost to total transportation costs as shown in the figure below -

Transport Cost Curves (A) Proportion to distance;
(B) Less than proportion to distance



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 an 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 may even mean allow 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 to total costs. Upto the capacity of the transport unit or transport mode (bus, aircraft, train, ship), any further increase in traffic incurs negligible marginal costs. Then there is a sharp increase at the point, where a second unit becomes necessary. Marginal costs do vary between modes of transport.

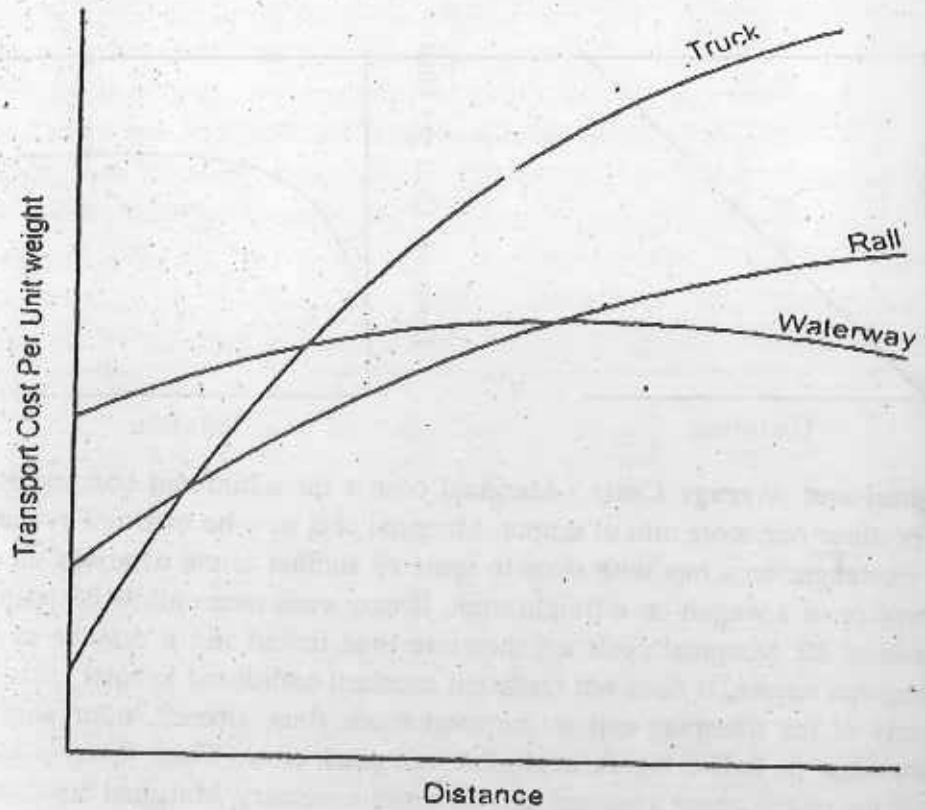
Average costs are obtained by dividing the total costs of the operation by the work done, expressed in terms of passenger-km, tonne-km or transport-unit-km. Average costs will of course vary with output, for greater the product the more the fixed costs can be spread.

4.4 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. Comparing water, truck and rail, terminal costs for water transport are obviously highest because of the expense of developing and maintaining a harbour and the cost of labour and equipment for the loading and unloading operations. The cost of loading a truck is not very great and involves much less costly equipment than the other modes. This leaves rail terminal costs somewhere between water and truck.

Idealised Transport Cost Curves for Three Transport Mode



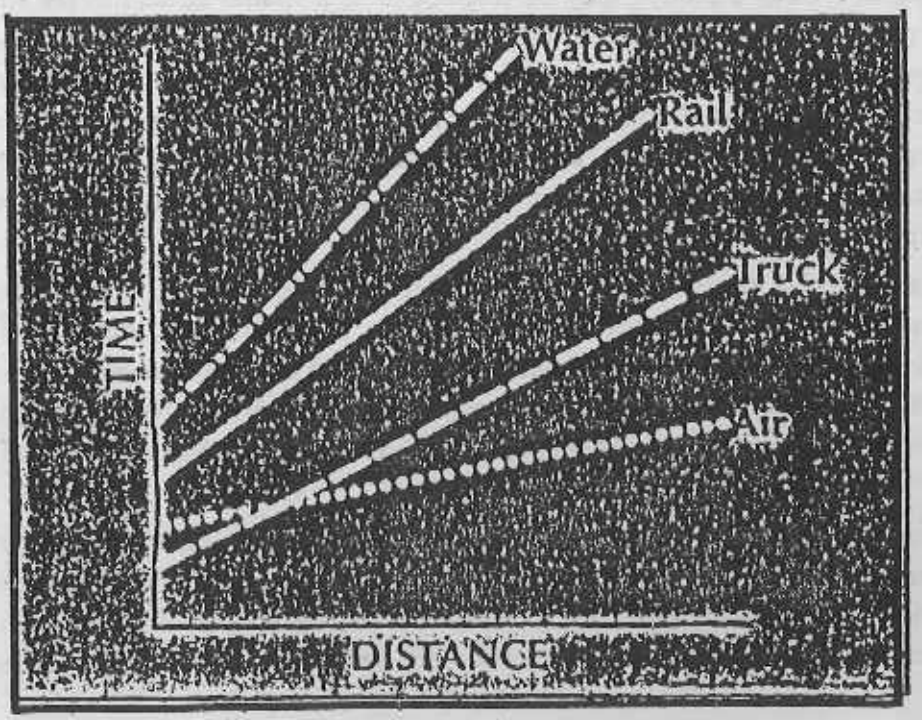
The variable form of the relationship between movement costs and intervening distance is very interesting. The tapering off of movement costs with distance varies from one transportation medium to another. In general the taper is more marked in those media which incur heavy handling costs at points of origin and destination. A rail road, for example, must collect the freight on a truck, transport it to the railroad, unload it on to a flat car, move it to its railroad destination, unload it again, and then transfer it by truck to its ultimate destianation. By comparison, the handling costs incurred by a truck company are minimal.

Clearly, over a short distance, truck transportation of commodities is cheap, and this is reflected in the prices offered to the customer. For longer distances, however,

railroad transportation is cheaper per unit of distance travelled. For still longer distances water transportation comes into its own. In a sense, therefore this cost structure preserves a certain complementarity 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 costs, vary with distance; but, because of the tapering effect already discussed, 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 distances 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 cetain 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 a shipper must consider in choosing among alternative transport modes. Another equally important factor is service. Transportation service implies a great many things, including speed of delivery, scheduling convenience, avoidance of damage and reliability. The figure below illustrates how four modes, with air cargo now added, stack up, on the average, with respect to speed of service, probably the most important service consideration. Loading time is indi-



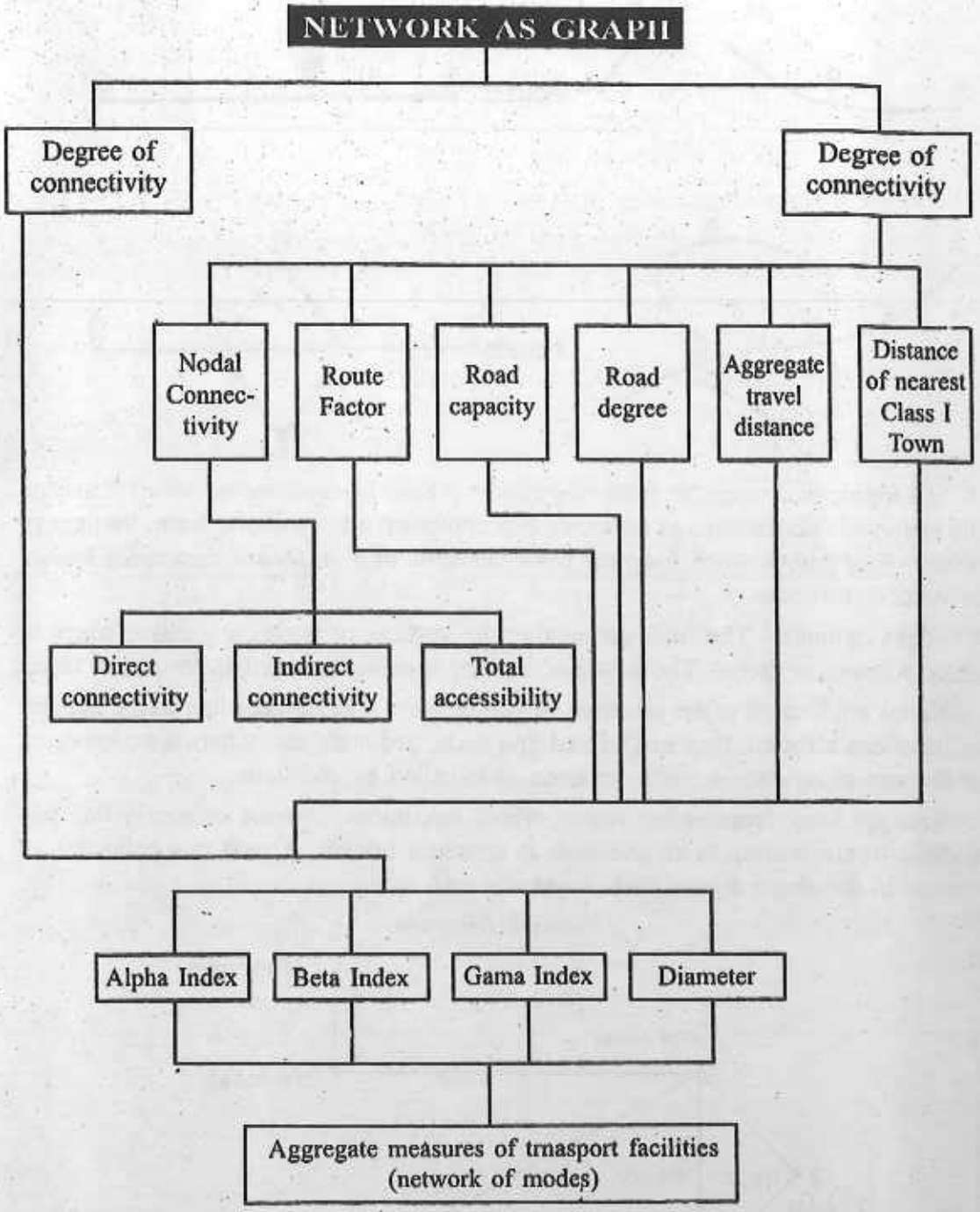
cated where the respective lines meet the vertical axis. The lines themselves show total delivery time as it increases over distance. Loading time is highest for ocean shipping, followed by rail, air and truck. Movement time as opposed to loading time, naturally favours air by a sizable margin. Water and rail again are slow in moving freight whereas truck service is, by contrast, fast.

All in all. the mode possessing the greatest advantages, considering both cost and service, is the motor truck. Air shipments occur primarily as emergency services. For example, when an auto assembly plant is running short of fenders, it is willing to pay the high air-transport cost to avoid the significantly higher cost of shuttling down the plant for lack of parts. High value goods per unit of weight may be sent with air freight when speed of delivery is of primary importance. Cut flowers for example are being flown in daily from the Netherlands and Colombia to several metropolitan areas in the United States. Rail and water transport compete for long distance movement of bulky items (low in value per unit of weight) for which speed of delivery is not particularly crucial. The railroad's advantage over water movement is in its more articulated network, which serves more areas and in its somewhat greater speed of delivery. Pipeline transport is however, closely associated both functionally and financially with the petroleum industry.

Every transportation network has an areal arrangement or layout, known as its spatial pattern. Such a pattern may be referred to as a spatial structure. By studying a network's structure or pattern of routes, one can gain much insight into the economic geography of the area the network serves. Although no two transport networks are exactly alike in spatial arrangement, there are similarities in structure that reflect the function the networks serve. Three basic measures of a network's spatial structure are important in the location of economic activity. They are accessibility, connectivity and circuity.

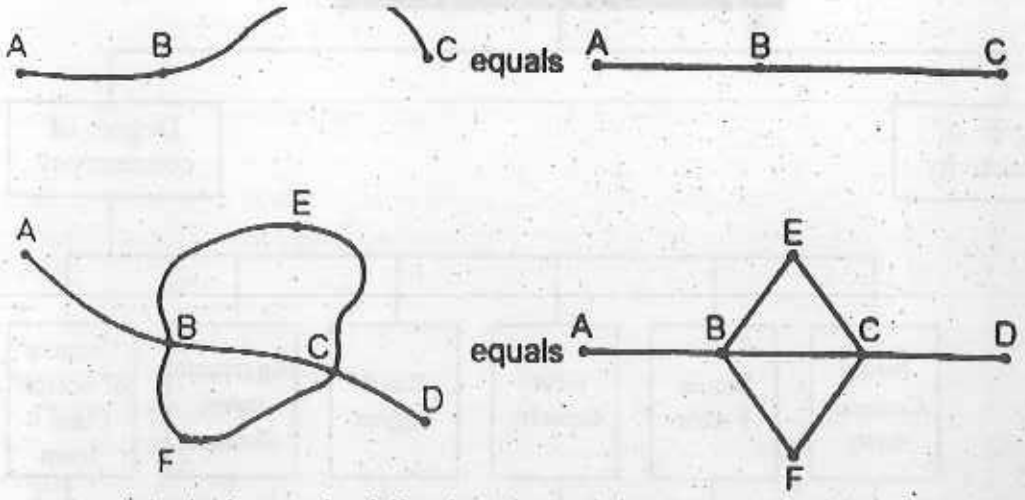
The analysis of transport network is based on graph theory. The network of transport in an area is very important from the point of view of human interaction and is an important indicator of the level of its development. Application of graph theory in the analysis of transportation network has been attempted by many authors, namely Eular in 1736, Konig in 1936, Robinson & Bainford in 1978.

The regional transport network analysis is done by developing topological map. A topological map or graph reduces a transport network to its simplest form. In such a map the line patterns or networks are described in terms of their topological characteristics. They are dependent upon continuity, relative locations and systematiza-



tion of lines and junctions. The figure below depicts topological transformation of actual routes. It provides a basis for the measures of the structural properties of the transportation system.

Topological Equivalence



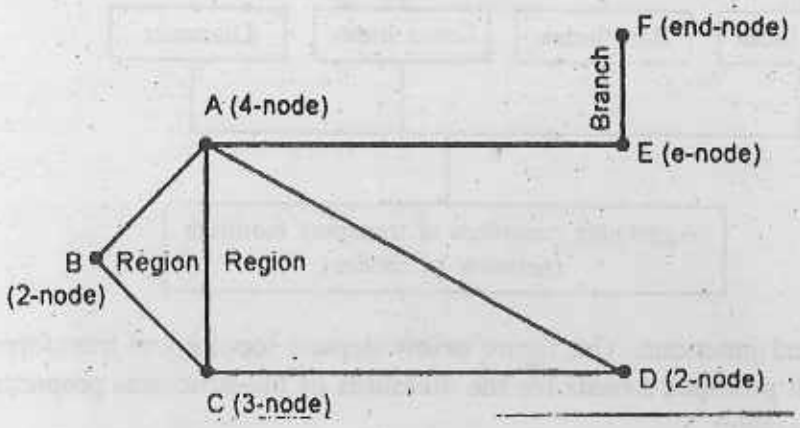
In a topological map, the following elements have been identified, which translate the observed relationships of networks into numerical and symbolic form. Vertices or nodes - The points which form the basic elements of a graph are commonly known as vertices or nodes.

Edges or links - The lines connecting the vertices or nodes are called edges or links. Regions or faces - The areas enclosed by lines are referred as regions or faces.

Nodes are located at the junctions of two or more areas. According to the number of junctions affected, they are termed 2nd node, 3rd node etc. where a node occurs at the end of an arc, i.e., at a terminus, it is called an end-node.

Arcs are lines, representing routes, which link nodes. One arc only may link two nodes. An arc leading to an end-node is termed a branch. A path is a collection of routes. In the above figure ABCD forms a path.

Network Diagram



Circuits are formed by a closed path. In the above figure ABCDA & ACDA are circuits. A circuit which does not contain any other circuits is called a fundamental circuit (ABC A or ACDA). It is different from ABCDA which is made up of two other circuits.

A region or a face is an area bounded by a fundamental circuit thus in the figure above, there are two regions.

A network is said to be connected when it is possible to reach a vertex from any other vertex by following the lines or the edges connecting the different vertices. Otherwise, the graph is considered to be unconnected.

4.5 CONNECTIVITY AND ITS MEASUREMENT

'The connectivity of a network may be defined as the degree of completeness of the links between nodes" (Robinson and Bamford, 1978). It is indicative of the complexity of the spatial order that imposes on the region it serves. The greater the degree of connectivity, the more efficient is the network system.

K.J. Kansky (1963) has studied the structure of transportation networks, developed several descriptive indices for measuring the connectivity of networks, i.e. alpha, beta, gamma indices and cyclomatic number.

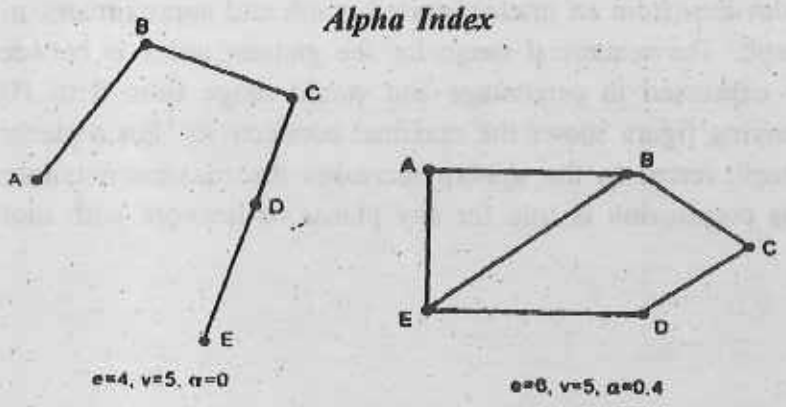
Alpha Index

One of the most useful measure of the connectivity of a network is the alpha index (a). The alpha index may be defined as

$$\alpha = \frac{\text{actual circuits}}{\text{maximum circuits}} \text{ or } \alpha = \frac{e - v| + 1}{2v - 5}$$

where e is the number of edges, v is the number of vertices. The alpha index gives the range values from 0 to 1, that is from 0 to 100 per cent. The higher the index, the greater is the degree of connectivity in the network. The figure below shows two networks having the same number of vertices (5) but different structures. In the case of first network, the alpha index is zero (0) and in the second network, it is 2/5 = 0.40.

Alpha Index



e=4, v=5, α=0 e=6, v=5, α=0.4

Beta Index :

The beta index (P) is a very simple measure of connectivity. It is calculated by dividing the total number of edges or arcs in a network by the total number of nodes. Thus.

$$\beta = \frac{\text{area}}{\text{nodes}} \text{ or } \beta = \frac{e}{v}$$

The beta index ranges from 0.0 for networks, which consist of nodes with no arcs, through 1.0 and greater where networks are well connected. The beta index will give a measure of connectivity regardless of the size of the area involved. Some characteristics of p index are -

(i) β value for tree types of structures and disconnected networks would always be less than 1. It would be zero (0) when there are no edges in the network,

(ii) β value for any network structure with one circuit would always be zero (0).

(iii) β value exceeds 1 for a complicated network structure having more than one circuit.

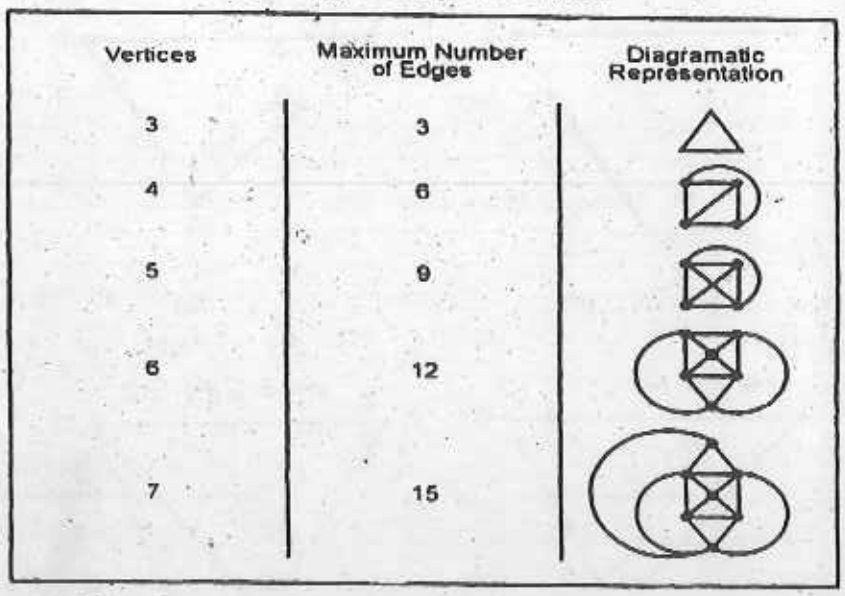
Gamma Index

The gamma index (y) is a ratio between the observed number of edges and vertices of a given transportation network. For a non-planar graph, the gamma index has been defined as :

$$\gamma = \frac{e}{3(v-2)}$$

Network connectivity as measured by gamma index, indicates the degree by which the network deviates from an interconnected graph and approximates in maximally connected graph. The numerical range for the gamma index is between 0 and 1. This may be expressed in percentage and would range from 0 to 100 per cent. The accompanying figure shows the maximal connectivity. For a planar graph, the addition of each vertex to the system increases the maximum number of edges by three. This proposition is true for any planar or network with more than two vertices.

Maximal Connectivity: The relationship between the number of nodes (v) and the maximum nunibcr of linkages (e) in a planar graph is always c = 3 ('v - 2). The inclusion of one additional node to a netivork of more than 2 nodes increases the number of possible linkages by a 'value of 3. There is no intersection of linkages except at a node.



Cyclomatic Number :

Cyclomatic number is a different way of measuring connectivity. This is based upon the condition that as soon as a connected network has enough arcs or links to form a tree, then any additional arcs will result in the formation of circuits. Thus, the number of circuits in a connected network equals the total number of arcs minus the number of arcs required to form a tree, i.e. one less than the nodes or vertices. It may be written as :

Cyclomatic number = a – (n-1)

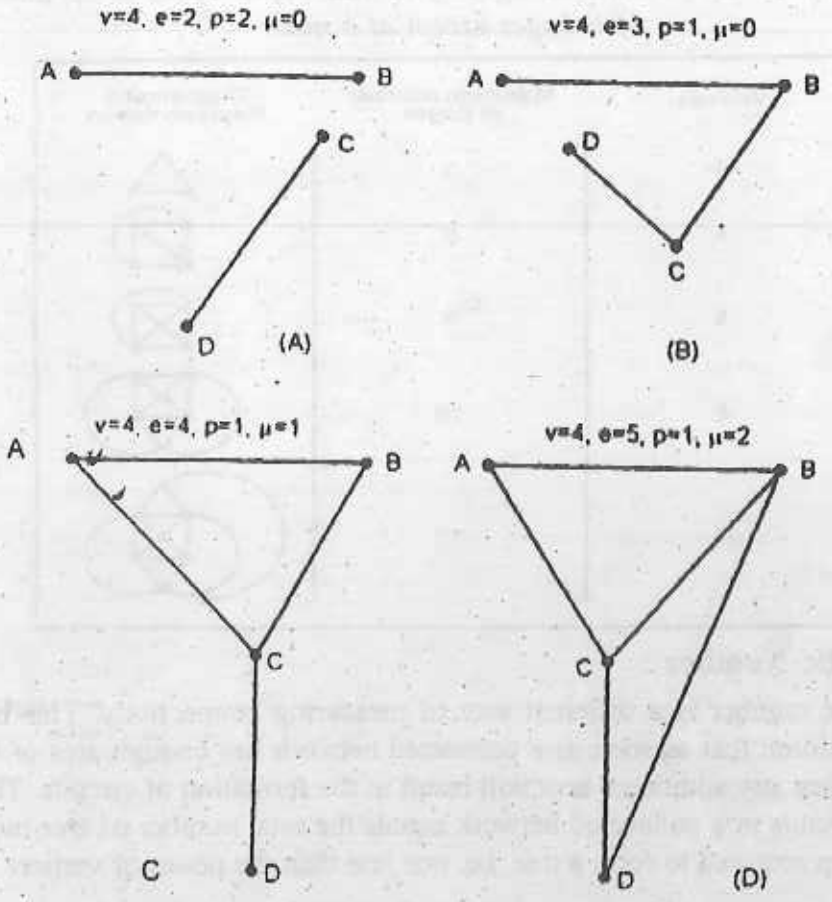
or = a – n+1

Where a equals the number of arcs and n the number of nodes. This formula applies to a connected graph, where there happens to be two or more sub graphs. Then the formula for cyclomatic number is a - n+x where x equals the number of sub graphs. This has also been expressed as :

Cyclomatic number (μ) = e - v +p where e = number of edges or arcs, v = number of vertices or nodes, p = number of non-connected sub graphs. The relationship of the cyclomatic number with the network structure has been examined through the figure below. In a tree type graph, it has a cyclomatic number of 0. As the graph moves closer and closer to a completely connected state, the cyclomatic number

increases. The limitation of the cyclomatic number arises since it depends upon the number of vertices and edges only.

Cyclomatic Number



4.6 ACCESSIBILITY

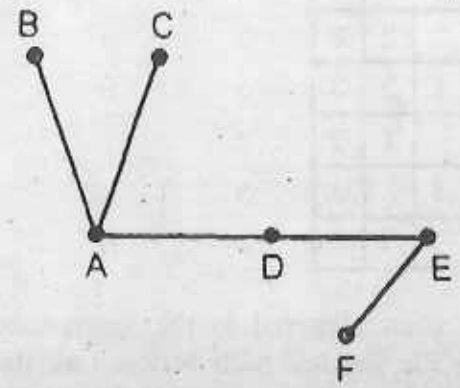
One of the most important attributes of a transportation network is accessibility, and the geographers are particularly concerned with accessibility as a locational feature. Accessibility is the case of movement among the nodes or points on the network. Several methods have been used to measure or to represent the accessibility. The traditional method is to measure the distance along the routes or from centres. Thus an area adjoining to a route or centres is more accessible and inaccessibility increases with the distance from routes or centres. Within a network, accessibility can be measured in three ways : (i) by shortest path matrix; (ii) by the associated number and (iii) by the Shimbel Index.

The shortest-path matrix method follows the number of arcs used in the shortest-path between all possible pairs of nodes. Any network may be represented as a matrix with rows as set of origins and the columns as set of destinations. The number of rows and columns would correspond to the number of nodes in the network. It is assumed that the horizontal rows of a matrix are identified as a set of origin nodes and the vertical columns of the matrix are defined as a set of destination nodes. Each cell entry in the matrix may be used to record some information on the relationship between a pair of nodes.

Any node which is well connected to other nodes in a network is said to be accessible. The figure below shows five nodes linked together by a series of arcs and it can be seen at a glance that node A is the most accessible. But such assessment is not possible in more complex network involving larger number of nodes and alternative routes. In such cases, accessibility can be found out by compiling a matrix commonly known as shortest path matrix as demonstrated in the figure below.

Accessibility: Shortest Path Matrix

(a)



(b)

	To A	B	C	D	E	Total
A	0	1	1	1	2	5
B	1	0	2	2	3	8
C	1	2	0	2	3	8
D	1	2	2	0	1	6
E	2	3	3	1	0	9

In this matrix, a count is made of the number of arcs separating the various nodes and inserting the appropriate number in appropriate box. For example, the number of arcs separating A from B, C, D and E respectively is 1, 1, 1 and 2 and E from A, B, C and D respectively is 2, 3, 3 and 1. The totals of each row can be added up and the lowest total indicates the node, which is most accessible. In this case, ;A' is having a total of 5 (lowest) thus most accessible, while WE* is the least accessible with highest total of 9.

Topologically, accessibility can be measured in three ways :

(i) by shortest path matrix - the number of arcs used in the shortest path between all possible pairs;

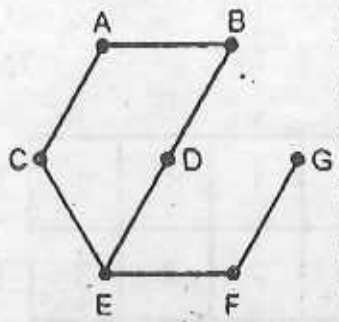
(ii) by the associated number - the number of arcs needed to connect a node to the most distant node from it; and

(iii) by the Shimbel Index, derived from the shortest path matrix, which indicates the number of arcs needed to connect any node with all the other nodes in the network by the shortest path.

The figure below indicates the accessibility, as measured by associated number and Shimbel Index.

Accessibility: Associated Number and Shimbel Index

(a)



(b)

	A	B	C	D	E	F	G	Associated number	Shimbel index
A		1	1	2	2	3	4	4	13
B	1		2	1	2	3	4	4	13
C	1	2		2	1	2	3	3	11
D	2	1	2		1	2	3	3	11
E	2	2	1	1		1	2	2	9
F	3	3	2	2	1		1	3	12
G	4	4	3	3	2	1		4	17

From the figure, a shortest path matrix has been prepared in the appropriate squares. The number of arcs has been taken as the shortest path between all the paired nodes. The top row of figures in the matrix gives the number of arcs in the shortest paths from node A to all other nodes; the second row from node B to all others; and so on. Since the associated number is the number of arcs needed to connect a node to the most distant node from it, the associated number is the highest number in each row, for example, in row A, 4 and in row F, 3. Thus E, with an associated number 2, is the most accessible of all nodes. If we add up all the associated numbers and divide the total by the number of nodes, we get the mean associated number and a low mean figure (in this case 23/7 = 3.3).

Shimbel Index can be derived from the shortest path matrix. The total of each row gives the Shimbel Index. In the figure, A & B are having Shimbel Index of 13, C and Dll, E9, F12 and G17. Since E is having lowest value of all the rows, it is most accessible of all the nodes by the Shimbel Index 9.

Usually, the more centrally located a node is on a network, the more accessible is the node to other nodes. Hence, we expect accessibility, centrality and economic growth to be geographically correlated.

Networks also differ in degree of circuity. Circuity is simply the difference between the desire line distance, represented by a straight line between nodes, and the actual route distance. A circuity index may be calculated for each node on a network by finding the total circuity involved in going from that node to all other nodes on the network. This index is an indication of the geographic efficiency of the network and of the nodes. Economic activity will shy away from locations with high circuity values.

Throughout the world, there is a close association between networks and economic development. In fact, transportation networks are integrated parts of economic systems. Any change in the networks spatial structure has an impact on the economic system as there is an adjustment in the accessibility, connectivity and circuity of nodes. Likewise, a change in the economic system, such as rapid growth in part of a region, affects the network. Expansion or improvement of the network may be necessary. Geographers continue to gain a better understanding of the complex interdependencies between transport networks and the economic systems they serve by examining network impact on economic activities.

4.7 IMPACT OF GLOBALISATION ON INDIAN ECONOMY

Globalisation is the buzzword of the moment, the most talked about and perhaps the least understood concept of this new millennium. Environmentalists, human rights advocates, trade unionists, third world farmers and citizens groups decry it at meetings of the world's power elite but it is a historical inevitability.

The entanglement of diverse cultures and economies, now known as globalization has been spreading for centuries and the world has been shrinking as a result. But the old story of globalization has developed a new twist sparked by the rapid rate of technological change over the last 25 years. The micro-electronics revolution has irrevocably changed the essence of human contract on earth. Distances are shrinking and information is spreading faster than ever before. The Internet and the world wide web have helped this process, enabling business to communicate more smoothly and efficiently. Globalisation has integrated the various world economies without creating any obstacles in the free flow of goods, services, technology, capital and labour. It has four parameters :

(1) Reduction of trade barriers to permit free flow of goods and services among nation-states;

(2) Creation of environment in which free flow of capital can take place among nation-states;

(3) Creation of environment, permitting free flow of technology; and
(4) Creation of environment in which free movement of labour can take place.

Thus, basically globalization signifies a process of internationalization plus liberalization. In nutshell, globalization is considered as the engine of growth, technical advancement, raising productivity, enlarging employment and bringing about poverty reduction along with modernization.

Trade :

One of the principal aims of globalization is to expand trade in goods and services. This trade expansion did not occur uniformally across all countries, with the industrialized countries and a group of 12 developing countries accounting for the lions share. During the 13 year period (1990-2003), India's merchandise exports increased at the rate of 9.1% per annum (from $17.97 billion to $55.98 billion), while that of China and Mexico were 16.2% and 11.4% respectively. However, compared to the world average annual exports of 6.1% during the period, India did benefit from globalization in increasing its export growth rate.

India's performance in service sector exports was relatively much better, Service exports increased from $4.6 billion in 1990 to $37.7 billion in 2003, indicating an annual average growth rate of 17.5% during the period.

India's exports of goods and services together increased from $22.50 billion in 1990 to $93.7 billion in 2003, indicating an annual average growth rate of 11.6%. As a consequence. India's share in world exports of goods and services improved from 0.53% in 1990 to 1.01% in 2003.

There is no doubt that India has gained as a consequence of globalization in improving its share of world exports of goods and services to 1.0% but considering the size of its economy, the gain is much smaller when compared with other countries like South Korea, Mexico and China (See the table).

Table : Globalization and its Impact on India

Exports of Merchandise and Services of Selected Countries of the World

MERCHANDISE EXPORTS	Exports of Merchandise US$ million		% of World Exports		Average Annual Growth Rate
	1990	2003	1990	2003	
India	17,969	55,982	0.51	0.73	9.1
China	62,091	437,899	1.77	5.78	16.2
Brazil	31,414	73,084	0.90	0.96	6.7
Mexico	40,711	165,396	1.16	2.18	11.4
South Korea	65,016	193,819	1.85	2.56	8.8
World	3,505,243	7,578,698	100.0	100.00	6.1

	Exports of Merchandise USS million		% of World Exports		Average Annual Growth Rate
	1990	2003	1990	2003	
EXPORT OF SERVICES					
India	4,610	37,732	0.61	2.18	17.5
China	5,748	46,375	0.77	2.68	17.4
Brazil	3,706	9,591	0.49	0.55	7.6
Mexico	7,222	12,572	0.96	0.73	4.3
South Korea	9,155	31,502	1.22	1.82	9.9
World	7,49,408	1,729,132	100.00	100.00	6.6
EXPORT OF MERCHANDISE AND SERVICES					
India	22,579	93,714	0.53	1.01	11.6
China	67,839	4,84,274	1.59	5.20	16.3
Brazil	35,120	82,675	0.83	0.89	6.8
Mexico	47,933	177,968	1.13	1.91	10.6
South Korea	74,171	225,321	1.74	2.42	8.9
World	4,254,651	9,307,830	100.00	100.00	6.2

Source : Compiled and Computed from the data provided in World Bank, World Development Indicators (2005)

Foreign Investment Flows :

Globalisation leads to a greater flow of foreign investment in two forms - foreign direct investment (FDI) and foreign portfolio investment (FPI). FDI helps to increase the productive capacity of the economy and FPI is of a more speculative nature and is thus very volatile. The data (given in the table below) reveals that during the period 1990-91 and 1994-95, the share of FDI in total investment inflow was onlu 24.2% and that of FPI was 75.8%. For the five year period (1995-96 to 1999-2000), the proportion of FDI in total investment improved to 54.8% and the share of FPI was still high at 45.2%. During the next 4 year period (2000-2001 to 2004-2005) the share of FDI and FPI were 48.8% and 5 1 .2% respectively.

Year	Foreign Direct Investment	Foreign Portfolio Investment	Total USS billion
1990-1991 to 1994-1995	2441 (24.2)	7645 (75.8)	10086 (100.0)
1995-1996 to 1999-2000	13139 (54.8)	10853 (45.2)	23992 (100.0)
2000-2001 to 2004-2005	25169 (48.8)	26450 (51.2)	51619 (100.0)

It implies that as a matter of policy, the host country can depend on a regular inflow of FDI if it creates a conducive climate for the purpose. These inflows help to enlarge the productive capacity of Indian economy. Data reveals that there are five high priority sectors, namely, energy, telecommunications, electrical equipments including computer software and electronics, transportation and metallurgical industries which are attracting FDI ianflows.

Employment Situation :

The employment situation in India has worsened in the era of globalization. The rate of growth of employment which was 2.04 percent per year during 1983-94 declined to a low level of 0.98 percent during the period 1994-2000. This was largely a consequence of a negative growth rate of employment in agriculture which absorbed about 65 percent of total employed workers as also a sharp decline in community, social and personal services to 0.55 percent during 1994-2000 as against 2.90 percent during 1983-94. This was the consequence of neglect of agriculture and shedding the load of excess employment in the public sector by imposing a continuous ban on recruitment and not filling up the vacated posts after retirement of the public sector employees.

Table : Growth of employment by sectors in India

Sectors	1983-1994	1994-2000
Agriculture	1.51	–0.34
Mining and quarrying	4.16	–2.85
Manufacturing	2.14	2.05
Electricity, gas and water supply	4.50	–0.88
Construction	5.32	7.09
Trade	3.57	5.04
Transport Storage and Communication	3.24	6.04
Financial Services	7.18	6.20
Community and personal services	2.90	0.55
Total	2.04	0.98

Source : Govt of India, Planning Commission (2001), Report of the Taskforce on Employment opportunities.

The organized sector which was considered as the engine of growth failed to generate enough employment. During 1994-2000, employment growth in the organized sector was merely 0.53 percent. The growth of employment in the public sector

was negative (-0.03 percent) and that of the private sector was of the order of 1.87 percent. But since the share of the public sector in organized sector employment was of the order of 69 percent, enlargement of private sector employment failed to effectively offset the deceleration in the public sector. Consequently, the share of the organized sector which was 7.93 percent in 1983 declined to 7.08 percent in 1999-2000.

Thus, Globalisation pushed workers from the organized sector to swell the ranks of workers in the unorganized sector. The workers in the organized sector are relatively better paid than those in the unorganized sector. They enjoy better job security and other benefits. Within the organized sector, jobs in the public sector receive much higher wages and accompanying benefits than those in the private sector for similar skills. Globalisation, therefore, increased the process of informalisation of the economy. It has led to a process of casualization of workforce.

Inequality and Poverty :

Cheap imports lead to the closure of a large number of vulnerable small enterprises, they have adversely affected the informal economy as well as agriculture. As a consequence of globalization, the poor, the assetless and unskilled workers were the losers, and the rich endowed with capital and human capabilities have been the winners.

There is no doubt that poverty has declined from 36.0 percent in 1993-1994 to 26.1 percent in 1990-2000, though at a relatively decreasing rate in the post liberalization period. There is a rise in inequality or relative deprivation. The growth rates in per capita expenditure point to a significant increase in rural-urban inequalities at the all India level. There has been significant increases in differences in wage/salary incomes between those in rural and urban sectors.

Regarding social deprivation it is noted that decline in poverty among scheduled castes (SCs) and scheduled tribes (STs) has been slower than in other categories during 1993-1994 and 1999-2000. In the year 1999-2000, the proportion of population below poverty line among SCs and STs were 36 and 44 percent as against 16 percent in the case of other categories.

The main reason for the slow decline in poverty reduction is the geographical pattern of growth promoted by the policies of liberalization, privatization and globalization.

Weakening of the welfare states in favour of markets :

The advocates of globalization have been propagating a minimal rate for the state and a maximum role for the markets. Pressure of multinational companies, the IMF and World Bank force governments to take decisions about privatization of public enterprises, opening of FDI in several sectors, such as retail trade, consumer goods

like potato chips, hurting small and medium enterprises leading to their closure and resultant unemployments. Globalisation has also resulted in widening inequalities between the forward and backward states in India and also within groups have helped to create an elite. As a result, exclusion of marginalized groups, the poor and the assetless is taking place. It has also laid to declining earnings of unskilled labour, destruction of environment and deprivation of basic human rights including the right to work and rights at work place. Globalisation has led to more insecurity of workers, increased militancy of employers against workers and enhanced the phenomenon of lock-outs.

Adverse effects :

Globalisation has the potential to bring major improvements in productivity, innovation and creativity. But it is being overshadowed by a corporate led plan for economic integration which threatens to undermine the whole project. Instead of helping build a better world for all, the current free market model is eroding both democracy and equity.

Gaps between rich and poor are widening. The poor did not benefit from policies of liberalization and globalization and only a small section of the population pocketed all its benefits. The lives of the educated and rich had been enriched by globalization. The information technology sector (IT) was a particular beneficiary. But the benefits had not yet reached the socially deprived and rural poor. Regional disparities have been widened, decision making power is concentrated in fewer and fewer hands, local cultures are wiped out, biological diversity is destroyed, regional tensions are increasing and the environment is nearing the point of collapse. That is the sad reality of globalization, an opportunity for human progress whose great potential has been thwarted. Instead we have a global economic system which feeds on itself while marginalizing the fundamental human needs of people and communities.

4.8 SOME STRATEGIES AND POLICY FRAMEWORK

Economists believe that with appropriate policies, higher output growth and higher employment growth objectives can be simultaneously furthered. This will also raise the productivity level of the economy which can have a positive and significant impact on poverty reduction. The Central government should provide the much needed resources for infrastructural development. Once infrastructures are in place, it would be possible to attract private sector investment. Such a vision of development of backward states would help to achieve the goal of balanced regional development and lead to reduction in regional disparities. A much greater effort in terms of both monetary and non-monetary resources has to be made so as to promote employment growth and social security, education and health and an effective poverty alleviation

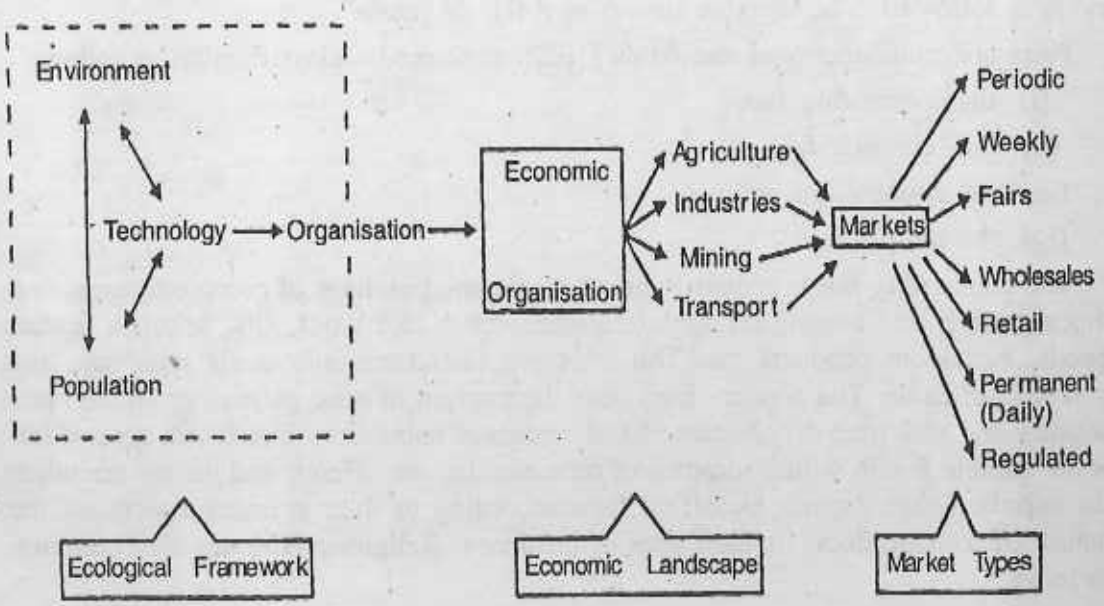
programme. A number of programmes were initiated by the government, such as Jawahar Rozgar Yojana, Employment Assurance Scheme, Pradhan Mantri Gram Sadak Yojana etc. and they did help to provide employment in rural areas and consequently alleviate poverty. The productivity of the informal sector must be raised so that these informal activities may provide decent jobs, incomes and protection and can trade in the international system.

Globalisation has been unfair to underdeveloped and least developed countries. India has been experiencing jobless growth over the last 15 years which means a large number of people have been marginalized even as the economy has grown. Pitching for globalization Prof. John Haris, Director, Development Studies Institute, London School of Economics said, "India has such a huge domestic market that it needn't rely on the overseas market for growth, but to realize that potential, people need to have incomes." India should therefore, endeavor to achieve synergy between employment generation and growth.

4.9 MARKETS, ITS TYPOLOGY AND NETWORK

Marketing Geography is a specialized study of market places and marketing. It is concerned with the channels of distribution through which goods move from producer to consumer. The growth of markets is a result of ecological factors. The model developed by the Dr. H.M. Sexena indicates the relationship between ecology and growth of markets.

Ecology and Growth of Markets



It becomes clear from the model that ecological factors (environment, population and technology) are responsible for the development of organizations. Among organizations economic organization is a prime one consisting of agriculture, industries, mining and transportation, and culminating on a place known as markets either periodic or permanent.

A market centre is a place where buyers and sellers meet daily or periodically for business transaction under certain regulations. As dynamic elements of a cultural environment the market centres are also in a state of change whether growing, developing, maturing or even declining. Geographically, market centres are the physical extent of territory varying from a petty village to a metropolitan city. Therefore, the market centres have to be considered from many angles for their typology or classification.

Classification based on periodicity :

Periodicity is one of the essential elements of market centres and classification based on periodicity is as follows :

i) regular or daily or permanent market centres; and

ii) periodic or temporary market centres

The regular or daily markets are those in which the marketing or buying and selling activity is a regular feature. Although it is a characteristic of urban centres, it is also seen in some rural centres and are called urban daily or rural daily markets. On the other hand, periodic market is a temporary feature; held either on a specific day or days of the week, fortnight or a month or once, twice or thrice in a year. The former is popularly known as a weekly market or "hut" in which mostly a weekly cycle is followed. The latter is known as a fair or "mela".

Fairs are multifunctional and Allex (1922) attempted a classification as follows -

(i) the commodity fair,

(ii) the livestock fair,

(iii) the country fair; and

(iv) the sample fair

The commodity fair is primarily held for sale and purchase of commodities, sometimes general and sometimes specific commodities like wool, silk, textiles, leather goods, handloom products etc. The livestock fair commonly deals with sale and purchase of cattle. The country fairs have their origin in rural gatherings in the open country and with time they became fixed centres of habitation. The fourth type of fair is the sample fair in which samples of merchandise are offered and orders are taken for supply. Other experts classified fairs according to their primary functions, the nature of their products or their area of influence. Religious fairs are also common in India.

Classification based on Census Status :

According to census classification, settlements are classified into two well-known categories - urban and rural and markets are also classified as rural or village markets and urban markets or market towns. In developed countries, every urban centre is a market town with varying size and functions. But in developing countries, every urban centres is not a developed market town. One of the basic problems in marketing geography is the identification of market towns. Dr. H.M. Saxena on the basis of the study he carried on in Rajasthan has devised the following norms for the identification of market towns -

(i) It should be a census town.

(ii) Its percentage of the population engaged in trade and commerce should be higher than the percentage of population engaged in trade and commerce of the region, or the percentage of population engaged in trade and commerce of a particular centre must be higher than the percentage of other functional categories of the workers group.

(iii) It should possess the following infrastructures : (a) a definite place of exchange of commodities or a regular "mandi", (b) banking facilities, and (c) storage facilities. In other words, it must have a market morphology comprising of retail and/or wholesale establishments etc.

(iv) It must be well-served by rail and/or by metalled roads. These criteria may be used at least for developing countries. On the other hand, rural markets are those settlements having at least 10 retail shops and/or a periodic market.

Classification based on Hierarchy :

The hierarchy of market centres too follows identification of market centres in a region. Hierarchy can be determined on the basis of several variables like -

(a) Number of retail shops

(b) Threshold population

(c) Arrival of commodities

(d) Size of trading areas

W. Christaller (1933) proposed six towns in Southern Germany with different levels of specialization arranged in a hexagonally shaped hinterland. For every six towns, there would be a larger, more specialized city which, in turn, would be situated an equal distance from other cities with the same level of specialization as itself. They are (a) Market hamlet, (b) Township centre, (c) County seat, (d) District city, (e) Small state capital, (f) Provincial head capital and (g) Regional capital city.

August Lasch (1954) determined the number of threshold farms with a minimum of three and thereafter continued through four and seven. Thrope (1968) has developed hierarchy of service and trade centres in U.K. and identified seven types of centres -regional centres, sub-regional centres, area centres, major centres, district centres, local centres and village or small suburban centres.

Berry's (1967) identification of the hierarchy of Central places in Iowa, Dakota and Chicago is the most notable work in U.S.A. Based on different variables and their correlation, he has identified seven levels of hierarchy namely - hamlet, village, large village, small town, regional centre, regional metropolis and national metropolis.

Classification based on location :

Cleef (1937) has categorized the markets on the basis of its location as follows -

(i) Junction of routes.

(ii) Head of navigation : (a) along rivers, (b) coasts

(iii) Change in direction of traffic routes : (a) river bends, (b) water bodies, (c) highlands or other natural features impending transportation,

(iv) Change in mode of transportation

(v) Arbitrary or accidental selection of location

Classification based on function in the distribution chain :

Hodder (1965) has described the following categories of market centres according to their function in the distribution chain :

(i) The feeder markets, which handle small amounts of trade.

(ii) The bulking centres, which receive goods from feeder market and also directly from the producers, thus dealing in a large volume of goods,

(iii) The major markets are those in which large scale trading activities are carried out by several trade agencies,

(iv) The large trade centres. These are larger than major markets, although having similar characteristics.

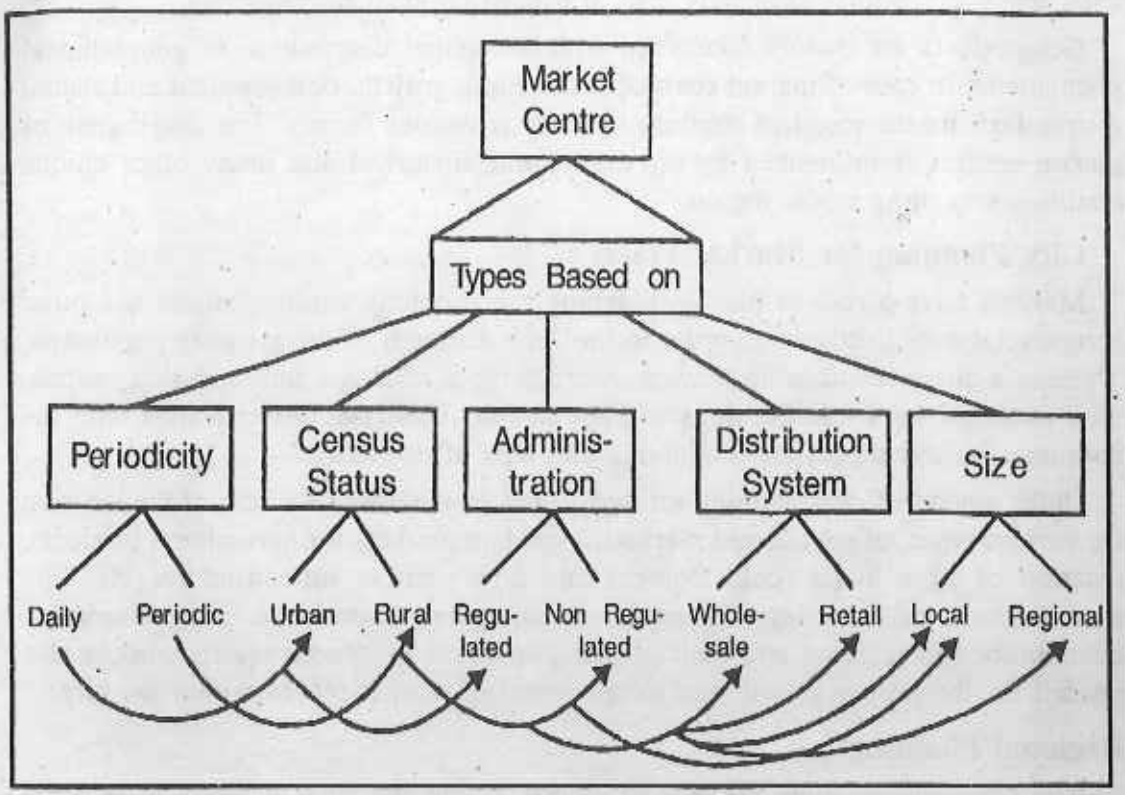
Specialized Markets :

Some market centres specialize, in one particular commodity, available in sizeable quantity. The commodities vary from livestock (Sonpur in Bihar) forest produce (Damoh in M.P.), rice (Nohta in Malwa plateau), handloom clothes (Erode in Tamilnadu) to leather goods, fruits and other items, used in different parts of the world. This is because, these are available there on a large scale, engaging larger number of people.

Grain market centres need special mention, usually classified in three categories

: (i) Bazars or Hats - they are primary market centres dealing in commodities required by rural persons and are usually regulated and controlled by village Panchayats. (ii) Mandis - at taluq or Tahsil level these secondary markets deal with wholesale transactions and are regulated by local bodies, (iii) Ganjs - the wholesale markets at rail heads work as terminal centres and are controlled by local bodies.

The above mentioned classifications of market centres are based on either their primary function or their status. In fact, types of market based on periodicity, nature, size, junction, hierarchy etc. are interrelated with each other and sometimes overlapping. The typology of market centres and their interrelationship has been depicted in the following diagram.



4.10 ROLE OF MARKET IN THE DEVELOPMENT OF TRADE AND COMMERCE.

There are several ways to deal with development. Every process or system has its own merits and demerits. The development strategy of market centres is one of the several ways to deal with rural development. Markets are indispensable features of modern life and they are the indicators of regional economic development. They are concerned with channels of distribution through which goods move from producer to

consumer. In other words, the trade and commerce of any area is fully controlled by the markets.

Market centres are not only the centres of marketing activity but they are also the nerve centres and nucleus of developments. They have economical, social and cultural importance and they help in increasing social contacts, serve as centres of diffusion and become focus for political and other activities. They are the controlling centers of marketing system and have an important role in stimulating production and consumption and also help to accelerate the rate of economic development. Thus development of market centres implies the economic development as a whole and their growth always follows the development of agriculture, transportation, industries, trade, etc. which ultimately lead to overall regional development.

Geographers are mainly concerned with the spatial distribution of geographical phenomena. In case of market centres, their origin, growth, development and spatial distribution are the result of combined efforts of various factors. The distribution of market centres is influenced by physio-cultural, historical and many other unique qualities prevailing in the region.

City Planning for Market Places :

Markets have a role to play in planning the shopping centres, stores and other commercial establishments in order to fulfil the demands of the growing population. There is a direct relationship between various types of shops and shopping centres, their potential sales and the threshold population. This relationship varies with the consumer behaviour, standard of living and type of economy.

Other aspects of city planning for market places includes selection of the location for various types, of specialized markets, including markets for agricultural products, location of store house, cold storages and other market infrastructures etc. The establishment of three-level hierarchy of shopping centres, i.e. neighbourhood, community and regional and their planning in terms of space requirements is also needed for the proper growth and development of market-places within the city.

Regional Planning :

It is necessary to study the role of market towns and rural markets in regional development and planning. Market towns are economically most viable and represent the regional pattern of development because market towns (i) provide trade and commerce to the region, (ii) act as nodal centres for transportation and (iii) serve as growth centres by providing various services to the region. Economic progress and market development are interdependent and their growth is mutual and symbolic in association.

The variation in the spatial distribution of market town is an indicator of development and/or backwardness of a micro unit within a region. The existence of

more market towns or their clustered pattern shows the availability of larger quantity of marketable surplus and vice versa.

There is a need to correlate economic development and existence of market towns. The pattern of economic development can be measured in terms of (i) percentage of total workers to total population, (i) per capita income of the unit, (iii) percentage of net sown area to total population, (iv) percentage of villages electrified to total number of villages, etc.

The hierarchy of the market towns in a region can be taken as base for development planning. Berry (1967) has rightly pointed out "A system of Centres arranged in a hierarchy and efficient way of articulating distribution too, and administration of regions. A proper system can avoid duplication and waste, and make possible the realization of social benefits from economies of scale". The pattern of hierarchy can help the planners in diversifying the resource allocation in a better way. The developed first-order market towns have self development potentialities, while the lower order centres require incentive for further development.

Rural Development :

Rural markets play an important role in the socio-economic life of the people, specially in the peasant society of the developing countries. Here, marketing activities are primarily periodic rather than occurring on a daily basis. There evolves some selected places which provide the services and to which people from surrounding areas assemble to avail the specific services of periodic markets. The consumers and traders establish a person to person contact and bargain before exchanging goods and services at market centres periodically. The whole economic system is, based on consumption, production, distribution, exchange and in the absence of any one, the economic system cannot run. The periodic marketing system is dealt with the rural economy which is found mainly in the countries affected by agricultural system. Hence, rural markets are likely to help promote the local production, effectively utilize the local resources, extend employment opportunity and promote a rural area from its depressed economic situation to progressive situation. These centres socially and spatially close to villages are organizationally and functionally more close to towns and urban centres.

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—*রবীন্দ্রনাথ ঠাকুর*

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—*সুভাষচন্দ্র বসু*

Any system of education which ignores Indian conditions, requirements, history and sociology is too unscientific to commend itself to any rational support.

—*Subhas Chandra Bose*

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NETAJI SUBHAS OPEN UNIVERSITY

STUDY MATERIAL

POST GRADUATE GEOGRAPHY

Paper : 3

Group : B

SOCIAL AND CULTURAL GEOGRAPHY

PREFACE

In the curricular structure introduced by this University for students of Post Graduate degree programme, the opportunity to pursue Post Graduate course in Subjects introduced by this University is equally available to all learners. Instead of being guided by any presumption about ability level, it would perhaps stand to reason if receptivity of a learner is judged in the course of the learning process. That would be entirely in keeping with the objectives of open education which does not believe in artificial differentiation.

Keeping this in view, study materials of the Post Graduate level in different subjects are being prepared on the basis of a well laid-out syllabus. The course structure combines the best elements in the approved syllabi of Central and State Universities in respective subjects. It has been so designed as to be upgradable with the addition of new information as well as results of fresh thinking and analyses.

The accepted methodology of distance education has been followed in the preparation of these study materials. Co-operation in every form of experienced scholars is indispensable for a work of this kind. We, therefore, owe an enormous debt of gratitude to everyone whose tireless efforts went into the writing, editing and devising of a proper lay-out of the materials. Practically speaking, their role amounts to an involvement in invisible teaching. For, whoever makes use of these study materials would virtually derive the benefit of learning under their collective care without each being seen by the other.

The more a learner would seriously pursue these study materials the easier it will be for him or her to reach out to larger horizons of a subject. Care has also been taken to make the language lucid and presentation attractive so that they may be rated as quality self-learning materials. If anything remains still obscure or difficult to follow, arrangements are there to come to terms with them through the counselling sessions regularly available at the network of study centres set up by the University.

Needless to add, a great deal of these efforts is still experimental—in fact, pioneering in certain areas. Naturally, there is every possibility of some lapse or deficiency here and there. However, these do admit of rectification and further improvement in due course. On the whole, therefore, these study materials are expected to evoke wider appreciation the more they receive serious attention of all concerned.

Professor (Dr.) Manimala Das
Vice-Chancellor

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NETAJI SUBHAS OPEN UNIVERSITY

Group B

UNIT 1 ❐ NATURE, SCOPE AND DEVELOPMENT OF SOCIAL GEOGRAPHY

Structure

1.1 SOCIAL GEOGRAPHY

Social geography is of recent origin. Though this connotation exists from the time of Strabo and Herodotus, yet it assumed an identity only very recently, probably in 1945.

It is been defined as the analysis of social phenomenon in space and hence Social Geography can properly be said to be the recent sub- discipline of Human geography, which explicit the social whereabouts over space.

The Geographical study has tend to split the field into two parts, (i) ***Physical Geography*** : a geography of the natural world and (ii) ***Human Geography*** : a geography of the man made world.

In 1932, French geographer, Camillie Vallaux used the term 'Human Geography' by defining it as 'synthetic study of the relationship between human societies and the earth's surface (following Ratzel, 1882-1851). Again, another French geographer, Vidal De La Blache, has made a holistic approach of the field and restricted the human geography to man-environment relationship. In 1930, cultural geography and economic geography found to be within human geography and its spectrum widened with political geography, social geography and statistical geography.

The antecedents of *social geography* can however be traced to the late 19th and early 20th century when there was a challenge to environmental determinism by possibilism.

Therefore, as compared to the other branches of geography, *social geography* has a certain amount of recency. Eyles visualized social geography as a continuation of the philosophy of Vidal De La Blache and Bobek—it stressed both the humanistic nature of the geographical work and the classificatory nature of human geographical work.

1.2 THE TERM 'SOCIAL'

The geographical use of the term 'social' has been prevalent in Britain with various meanings. To some extent the word has provided an alternative to 'human' and is .still prevalent in some of the universities of the world. Undoubtedly, the attraction of human geography was its social interest, its study of the way of life of people in many places, and at many stages of civilization.

Vidal De La Blache's ***'Principles of Human Geography'*** gathers up a mass of observations made in various regional studies, and relates them to the inherent qualities of various environments, and John Brunhes's ***'Human Geography'***, another classic to which readers of geography frequently return, is an illuminating study of types of life with an emphasis on the economic resources of varying communities as miners, farmers, here constructive and there destructive. Much has entered in to the geographical lore through these and similar books.

The term 'social geography' was perhaps introduced by Vallaux in 1908 through his Geographic Sociale : La Mer as a synonym for Human Geography and has since then remained ill-defined—its boundaries fluctuating at an alarming rate. (Moonis Raza, A Survey of Research in Geography, 1979). In the same volume the learned scholar states later that *Social Geography* "is often used simply as the equivalent of Human Geography, or in the U.S.A as 'Cultural Geography' , but usually it implies the study of population, urban and rural settlement and social activities as distinct from political and economic ones".

1.3 DEFINITION

While one accept that the term *'social geography'* has sometimes evoked ambiguity than clarity (Buttimer, 1971), one shrink from providing any hard and fast definition of the academic territory occupied by *social geography.*

According to Anne Buttimer, social geography can be considered as a field created and cultivated by number of individual scholars rather than an academic tradition built up within particular schools. Social geography is the subdivision of geography

that deals specifically with the social order, or that it is the systematic study of the social dimension in a real differentiation.

The virtually interchangeable use of the terms 'human' and 'social' by several geographers in the British and the Dutch schools serves to emphasize the logical (etymological) basis for this question.

- ***Bobek, (1959) Van Passen,* (1965)** : an idea that social elements could be systematized in to a general framework for geographical analysis .
- ***Watson* (1957)** : the identification of different regions of the earth's surface according to association of social phenomena related to the total environment.
- ***Pahl* (1965)** : the study of the patterns and processes in understanding socially defined populations in a spatial setting.
- ***Buttimer* (1968)** : the study of the a real (spatial) patterns and functional relations of social groups in the context of their social environment ; the internal structure and external relations of the nodes of social activity, and articulation of various channels of social communication.
- ***Eyles* (1974)** : the analysis of the social patterns and processes arising from the distribution of, and access to, scarce resources and... an examination of the societal causes of, and suggested solutions to, social and environmental problems.
- ***Jones* (1975)** : the understanding of the patterns which arise from the use social groups make of space as they see it, and of the processes involved in making and changing such patterns.
- ***Johnston* (1981)** : the study of consumption, whether by individuals or by groups.

Emrys Jones, the doyen of British social geographers and author of a classic piece of social geographical research noted (1975) that 'a subject dealing with so wide a topic as the spatial component of human behaviour is not easy to define. A brief review, however, leads his to the statement that. The social geographer is more concerned with describing and explaining spatial elements of the society in terms of the structure of that society. Holistic and regional or fragmentary and systematic, all approaches have in common that they begin with social groups. He defined as that social geography, involves the understanding of the patterns which arise from the use social groups make of space as they see it, and of the processes involved in making and changing such patterns.

Social geography is concerned with the ways in which social relations, social identities and social inequalities are produced, their spatial variation and the role of space ill constructing them. It places particular emphasis on the welfare issues which

affect people's life, and aims to expose the forms of power which lead to social and spatial inequality and oppression.

Although it is traditional to study human geography within the sphere of social geography, economic geography, political geography and cultural geography, there can be no clear distinctions between the four. Increasingly, the subject matter of each crosses the artificial boundaries which academics have drawn in the past.

Throughout the period of quantification and mathematicization in the early 1960s, philosophical discussions in social geography was rare and the imperatives issued by logical positivism were scarcely acknowledged. During the 1970's, the myth of geography as 'value free science' was exploded (Pahl 1967, Harvey 1973, Buttimer 1974) and geographers began to shake themselves free from the implicit bonds of positivism. In the late 1970s and early 1980s, geographers began to engage more readily in philosophical discourse exploring in particular a wide variety of 'radical' doctrines. Peet (1977) for instance, sought not only for explanations but also for revolutionary change involving 'a total attack on the philosophy, social function and practice of geography as it is presently known.' Muir (1978), in contrast, urged that greater attention be given to non Marxist forms of radical geography, opposing those who argued that a radical geography must be Marxist (Folke, 1972).

Peet (1977) described his radical geography as a study in the quality of life, and in a more practical vein, D.M. Smith's (1977) attempt to explain spatial variation in social welfare. A concern for man, his wellbeing and his status in the world likewise permeates geographical writing on the humanistic philosophies idealism (Guelke, 1974, 1981, Entrikin 1976, Ley 1978, Relph 1976, Tuan 1971), and Marxian humanism (Gregory 1981).

Today, then social geographers are seeking viable philosophical orientations in contexts ranging from rationalism to phenomenology and existentialism, from idealism to realism and materialism. Harvey and Holly (1981) and Stoddart (1981) reveals the extent to which discussion now centres on predominantly philosophical issues.

1.4 SCHOOLS OF THOUGHT

Indeed, most of the literature in this field can be assigned a position relative to the three extremes, which might usefully be conceived of as vertices of an imperfectly connected triangle. The triad incorporates three implicit tensions, (a) Between the assumed objectivity of positivist science and tile inherent subjectivism of humanist alternatives; (b) between the 'active' view of human agency implicit in humanism and the 'passive' view of man adopted to structuralist analyses; (c) between the positivist's interest in externally observable 'social facts' and the structuralist's belief in their subordination to an underlying explanatory structure.

❒ **Positivism** : August Comte was the first philosopher explicitly to claim the label 'positivist'. It's mark is imprinted in many spheres of social geography, most explicitly in the 'social physics' approach which attempts to apply the principles of Newton's gravity model to human migration. A somewhat different notion of social physics has been derived from Simmel, by way of Park and the dissimilarist school of spatial sociology (peach, 1975). Again, the factorial ecologies which summarise small area urban data using factor analysis and principal component analysis, is no less positivistic. These techniques were taken up with uncritical enthusiasm during 1960s. 'Laws were constructed to account for the spatial characteristics of social structure.

The progress of social geography on the decades since 1960s has taken three main paths, which may be conceived of three schools of thought.

(i) A welfare or humanistic school mainly concerned with the state of social wellbeing as expressed by territorial indicators of housing, health and social pathology largely within the theoretical framework of welfare economics. The humanistic perspective can therefore be described as a process involving the contextual interpretation of subjectively meaningful social action.

(ii) A radical school which employed Marxian theory to explain the basic cause of poverty and social inequality. This school of thought related the contemporary social problems to the development of capitalism.

(iii) A phenomenological school which laid an extraordinary emphasis on lived experience and on the perception of space by social categories based on ethnicity, race or religion.

It is thus obvious that contemporary *social geography* is in the line with the theoretical development in human geography as a whole. This definitely does not mean that the welfare or humanistic approach or the social inequality or the phenomenological perception of space have replaced the tradition of area differentiation or region formation. All these approaches are still actively found in the research of the subject.

The Concept of Social Area Analysis : the idea of 'Social Physics' was revived by Stewart in the forties of the twentieth century along with William Waantz. Based on this concepts a gravity model was developed in human geography which tried to measure the interaction between places in terms of distance and mass.

The study of social phenomena over space led to identification of 'social area analysis' as worked out by Bells and Shevsky. The Anglo-American sociology however adopted social area analysis as a technique to analyse social structure particularly in terms of urban patterns. This technique therefore introduced urban social analysis as a part of urban social geography.

The Social welfare approach of the American Sociology however has given thrust to the concept of social wellbeing.

It is evident that contemporary social geography deals with the contemporary social issues of the world and it is down to earth reality which today formed the contents, vision and elements of social geography.

Indian Context : In 1972 the Centre of Regional development at the JNU, extended research exclusively on social issues and made every effort to class geography as a social science.

1.5 APPROACHES TO SOCIAL GEOGRAPHY

● **Positivist Approaches :**

Positivists approach social geography as though it were a natural science, seeking to make general statements model geographical phenomena and discover 'laws' to explain human/spatial interactions. Quantitative methods have usually been employed in support of these goals. In most positivist research social scientists are assumed to be capable of being objective, neutral value- free observers. Although this position has been widely criticized, positivism has been a popular approach to social geography and dominant until relatively recently.

● **Humanistic Approaches :**

Humanistic approaches offer a longstanding alternative which challenges deterministic explanations. Humanistic social geographers assert that there is no objective geographical world, but that geographies are both perceived and created by individuals' perceptions, attitudes and feelings. They give centrality to human agency, diversity and difference and value the trivial, local and everyday human experience. They believe that science and scientists are subjective and involved and indeed may alter what they are studying.

● **Radical Approaches :**

Radical approaches emphasize power relations and social and political structures in explaining the social geographical world. Radical social geographers have an explicit political and moral commitment to the issues they study. The most influential have been Marxism, Feminism and Anti- Racism, all of which apply important bodies of social theory to the analysis of society and space.

Marxist geographies draw on the theories of Karl Marx, stressing the centrality of capitalist economic and political systems in underpinning social and spatial life, and adapting and refining theory to keep pace with current changes to society and economy.

Feminist geographies draw on feminist theories, and have expanded their focus from examining women's lives and the importance of gender in constructing space to a concern with other forms of difference and oppression.

Anti-racist geographies have highlighted and contested the racism endemic to western societies and in human geography itself. Radical approaches stress the need to constantly re-examine not only the content of social geography but the ways in which research and theory are done

● **Postmodern Approaches :**

Postmodern approaches to geography are disparate. Post modernism denotes a supposedly new era for western societies, the idea that we are now beyond the 'modern age'. Postmodern approaches generally involve challenging the linear progress of history and social science, the fragmentation of traditionally discrete forms of explanation and the rejection of realism, certainly and truth, including 'grand theories'. The term is often used to incorporate the cultural turn and postcolonial approaches. The perspectives it encompasses sometimes conflict. Some have viewed postmodernism as relativistic, while others claim it has opened up spaces for those previously excluded from geographical theory. (Ref : Introducing Social Geographies by Rachel Pain *et al.*).

1.6 NATURE AND SCOPE

In the late 19th century environment was found to be the determining factor in man's economy, activities, thinking, beliefs or in other words in man's living. Man was seen as a product of the earth's surface, which guided, moulded and dictated him his course of action. The possibilist view again expressed the relation between man and nature as two-way action. Man could largely decide how he would live, nature will provide him certain options, and it is man to choose which to opt through his creativity, man could overcome the tussles of the nature.

Freeing man from determinate nature early possibilists left him socially undifferentiated; it was assumed that all men and women had freedom of choice over their activities and ideas—a notion not fully debated until late 1960s and 1970s when the radical school stressed constraints and limitations but highlighted their social rather than environmental contexts.

Up till 1945, social geography was mainly concerned with the identification of different regions, reflecting geographical pattern of association of social phenomena. In fact, during the twenties and the thirties of the twentieth century, social geography started its agenda of research with the study of population as organized in settlements, particularly urban settlements. The process of urbanization had thrown up issues of social concern such as, access to civic amenities and housing and the related socio-pathological issues, such as incidence of crime, juvenile delinquency, and other expressions of mental ill- health. Socio- geographical studies of population distribution and ethnic composition in urban areas emerged as a major trend during this phase. The main idea to focus the social content of urban space, particularly bringing in the

fore front the ethnic composition of the urban areas, like blacks in American cities, North Africans in France, or Asians in Britain. Emphasis on population characteristics remained the main item of focus of the social geographers till the fifties of this century. In 1950 J. W. Watson (1957) argued that the social geographer was primarily interested in patterns, as these enable him to build his picture of the world and to compare and contrast differences from place to place.

This focus received a special dimension during early and mid 1960s when application of quantitative geography came into being. Thus the unconstructed empiricism of the 1950s gave way to sophisticated description based on much more data than those guided by the first generation of social geographer's (Eyles and Smith, 1978).

The focus on urban areas made social geography almost synonymous with urban geography. The methodical antecedents for such work lay Social area Analysis along with the important contribution of the Chicago School. In the work of Belfast (1960) Emrys Jones incorporated impact of values, meaning and sentiments in location activity. The theoretical aspects of human ecology were not given prominence. However, techniques were emphasized in factorial Ecology (the ecological investigation of the city using factor analysis). This explanation of city structure is a statistical manipulation, not a causal explanation.

The modem phase of social geography such the late 1960s is as much a product of events in society as of the nature of geographical enquiry. It is during the same period there came radical and rapid social change dominated by Vietnam war and war of liberation in remaining colonies and the attention was drawn towards presence of poverty and in-equality and concerned by these geographers who stressed social responsibility and sought a positive relevant role in combating contemporary social problems. The immediate impact was an increase ill studies of phenomena as race, health, crime, and poverty. This geography of social problems also traces its origin to its Chicago school, it put a similar emphasis on discovering the distribution of these social ills.

In the 1960s and 1970s, social geography was a thriving area of human geography. Its focus was particularly on the spatial patterns of social welfare and inequality. Linked to the radical perspectives emerging at the time, many social geographers took structural approaches (which focus on social power) to explaining these inequalities. The predominantly urban social literature focused on issues such as communities, crime, health, housing, segregation and poverty.

In the 1980s, these traditional interests were challenged, firstly, by new ways of theorizing the role of space and secondly, by the rapidly developing understanding of gender relations elsewhere in the social sciences. Some of the changes came in the

perspectives of social geography like, disability and age, or ageing population, social diseases and the cultural turn. This focus has shifted the attention away from traditional interests of urban socio-spatial inequality.

The term cultural turn has a relation with the present perspective of social geography. What social geography was like before 1980s and what the cultural turn entailed today however overshadowing some of social geography's central concerns. Infact, one welcome impact on social geography has been the greater recognition of the yoices of diverse social groups and the incorporation of the concems of those traditionally excluded from geography.

Informed by some aspects of the cultural turn and recent radical approaches in geography, today's social geographies refocus attention on to inequality, social power and the material world. Drawing political and economic processes back into social geography is as important as acknowledging the power of culture.

Today, the social geographers are seeking viable philosophical orientation in contexts ranging from rationalism to phenomenology and existentialism, from idealism to realism and materialism.

Western social geography, particularly school of thought pursuing social welfare approach attached the highest importance to the concept of social wellbeing.

1.7 A THEORITICAL FRAMEWORK

The focus of social geography is on people's daily living spaces, society and space and social relations.

■ Individual as part of society :

Social geography is about society. The focus is on social relations between people. 'Society' denotes the ties that people have with others. These ties are 'social' relationship, 'social' being used in its widest sense. Societies are usually perceived a sharing a distinct identity and a system of meaning and values which member share.

■ Space and Society :

Social geography focuses on the relationships between societies and the spaces they occupy and use. Space has an important role in actively constituting society. Space and place are important means by which societies and social groups organize themselves, distribute resources. Thus social geography has particular contributions to make to social theory and social problems. The social geography therefore outlines the different ways of conceptualizing relationship between space and society.

■ The Significance of Local :

The focus of social geography is on people's daily living spaces. The starting point for social geography is everyday experience and therefore analysis is usually of

events and phenomena at a local scale. Different meanings of place, and their relation to power have been a central interest.

■ **Social Relations :**

The social relations on which social geographers have concentrated their attention those of class, gender, race, age and disability. Social geography is also concerned with identities which are always linked to ways of life and so are not just about ideologies but power and resources.

1.8 THE DEVELOPMENT OF SOCIAL GEOGRAPHY

This can be analysed under two heads, (i) the historical precedents (ii) the works of twentieth century geographers.

❒ **Historical Precedents :**

So far the history goes, it implied the twofold work of Herodotus, Thucydides, Strabo and others that social life takes various forms in different parts of the world and that their differences are caused by or atleast are associated with differences in physical-climatic—environment chain. The second phase consisted of the various philosophical reflections on these and later geographical discoveries. The essential message of this second phase was that there is a rational order in world society and that this order can be discovered deductively (speculative approach) or inductively (positivistic approach).

During eighteenth century Kohl examined the social function and significance of various settlement types; later his colleague E. Hahn (1896), studied the evolution of livelihood and demonstrated the religious and social origins of some economic practices. Ratzel's findings were much more relevant to social geography than the Anthropo-geographie in enabling man to overcome physical barriers.

One of the most significant precedents to social geography in the nineteenth century was the work of Frederic Le Play. He set out to study the actual social conditions of worker families in France followed by geographers like, H. J. Fleure(1918). Many geographers, namely, Ritter, Von Humboldt, Hassinger, Ruhl, Hettner in Germany, Riclus in France, George Perkins Marsh in America, Mackinder in Britain deserve recognition as pioneers in social geography. However, the three major channels of thought that contained the most useful concepts were those initiated by Le Play (the social survey movement), Ratzel's (anthropogeographie, and Darkheim (social morphology-psychological interpretation).

❒ **Twentieth Century Social Geography :**

In 1902, Vidal De La Blache, well known french geographer, stressed his attention to human life within particular geographical milieus. Society for Vidal and his school could not be explained entirely in terms of biological, psychological, or environmental

interpretations. It was rather an intricate network of ideas and bonds that provided stability and orientation to human life within particular geographical milieus.

Genres de vie (patterns of living) were the concrete expressions of a society's ongoing contact with nature; sets of techniques, cemented through tradition whereby human groups secured the material necessities of life within a functional social order. Variation of this basic concept appear in the literature of other disciplines for example, social anthropology (Kroeber and Kluckhohn1952; Redfield1955), American human ecology (Mckenzie, 1934) and urban sociology(Park and Burgess 1921). That the society as the source and framework for all human activity reappears in the work of Hans Bobek in 1959. Again, Jean Bruhnes added the important dimension of group psychology, asking for example why similar environments were used in entirely different ways at different periods in history. He defined social geography as the third level of complexity in human geographies fourfold structure.

The four fold structure includes: (i) the primary groups of family, kin, and culture. (ii) the secondary groupings of livelihood and special interest (iii) the various forms of spatial interaction within and among these groups and finally, (iv) the legal systems which institutionalize a society's subdivision and access to land and property.

Most of the earliest work on social geography entails regional aspects and more descriptive than analytical. Prior to World War II little attempt was made to systematise the elements of social geography. Pierre George and Seorre (1943-1953) were the first great systematizers of social geography .Sorre in 1948 pointed the very nature of social geography to identify that society experienced a system of techniques—family and kinship systems, livelihood, languages and religions, each element is having specific spatial organization of mankind and his work. Bobek has made a similar attempt to construct a spatio-temporal framework for world society(1959).His systematic framework is based on holistic approach. Later, Wagner(1960), Ackermann (1963) also attempted a systematic framework. Hagerstrand, a swedish geographer in 1952, attempted for diffusion model in understanding the waves of innovation and diffusion.

❐ **Contemporary Social Geography :**

In general the empirical efforts in the study of social geography characterize as a multifaceted perspectives on the spatial organization of mankind. This in turn are leading to areal differentiation to social differentiation. Analysis of this social dimension in human geography involved two basic approaches, (i) the formal distribution in the light of their underlying social processes and (ii) a recent development of social geography particularly in North Western Europe is the involvement of the social geographers in inter-disciplinary research and regional planning. Social geography lacks definite boundaries and has neither a central unifying concept nor not even an agreed content.

It must be noted that both the western social science and social geography were alive to the real issue in society and the social scientists, including geographers, responded to political happenings and the social implications of these happenings attracted their attention. Social Geography, today is interested to study social power, social problems social lives of individuals and communities, social environment and social hazards.

Social geography is not a discrete discipline. It shares much subject matter and many theories and methods with cultural, economic and political geographies. However, Social geography has as a central concern the relations between people, people's identity, their spatial variation of these, and the role of space in their construction. It emphasizes welfare issues which affect people's lives and often involves moral and political positions which oppose social inequality and oppression.

It is high time for social geographers to refocus their attention on social relations and power, on the local, on the material issues that affect people's lives and on the social-and spatial processes which cause inequality.

1.9 CONCEPT OF SOCIAL SPACE

According to **Emrys Jones,** social geography is defined as the study of the patterns and processes involved in understanding socially defined populations in their spatial settings. In other words space is looked upon as something where events take place. Space as it is used and perceived by those inhabiting it; originally, a mosaic of areas, each of which is perceived as homogeneous by its residents. Each social space is, therefore identified with a specific social groups whose values, preferences, and aspirations are reflected in that space. The conceptual value of social space lies in its combination of the use and perception of space by distinctive social groups. The pioneering work on this concept of space was carried out by Firey in Boston. In Firey's view, the human ecologists saw individuals as being passive adaptors to place. He thought that physical space, considering apart from its culturally defined meanings, might be quite irrelevant to social interaction. Thus space may acquire important properties through cultural definition; a social group may possess certain sentiments about its living space, giving it a symbolic, culturally defined meaning.

The social definition of space has been examined by several different researchers.

Buttimer sees social space as the central concept of social geography. Social space is seen as involving synthesis of the perceived and objective dimensions of space.

Sorre envisaged social space as a mosaic of areas, each homogeneous in terms of the space perceptions of its inhabitants.

Chombart evolved a hierarchy of spaces-familial space, neighbourhood space,

economic space and urban sector social space within which groups live, move, and interact. It appears that Chombart has incorporated the notions of the use and perception of social space into a hierarchically arranged activity system.

Phenomenology, the ideas that knowledge does not exist independently of man, deserves to be discussed in its own right, as it is important in the study of behaviour and social space. It postulates that the world can only be understood in its reference to man and only through his attitudes and intentions. Phenomenology therefore provides the philosophical underspinnings of the idea of social space.

Rochefort (1963) in discussing this problem strongly emphasized that the real dimensions of geographic space must always be kept in mind. Therefore the central conceptual problem in social geography is to define space in such a way that both subjective and objective dimensions are included.

Social geography must incorporate subjective component of social space not only as morphological patterns on the earth but also as formative influences in molding a society's perception of its environment. The relevant groups include those which determine or condition the spatial distribution and interaction of people, for example, language and ethnic groups; those which influence a society's use of space, for example, religious and kin groups; and most significantly, those—

(1) to consider social space as a mosaic of social areas defined in terms of the occupant groups;

(2) to view social space in terms of nodality to act for spatial relation and interaction which develops as a result of society's mode of material subsistence, namely the genres de vie or livelihood groups, the bonds and values engendered by participation in these groups are not directly observable on the earth's surface, but they are essential to the understanding of the spatial movements and distribution of people on the earth.

'Social space' can be thought of as an umbrella meaning the social definition of space, how individuals and group pattern space by their perception and activities. Thus there are two elements in social space—activity space and perceptual space.The joint operation in turn gives rise to preference space, i.e. the evaluation of different parts of one's space on the basis of use and perception, and territorial space, i.e. the evaluation of part of one's environment fulfilling the needs of security, identity and stimulation or, put simply as home. The complexity of social space, however, is affected by certain constraints that limit and modify perceptions and activity.

1.10 SOCIAL STRUCTURE

Social structure strictly adhere to social elements particularly the tribes, caste groups, language and religious group displaying striking differences in social

organization and cultural patterns, even material cultures. There are differences in racial strands and ethnic and cultural identities. The social diversity is perhaps the most powerful manifestations of tribes particularly in India.

There are strongly defined tribal identities based on ethnic origins. The tribal identity is thus based on ethnicity, as differentiation took place along the ethno-lingual line.

Tribalism implies allegiance to traditional values of social equality, freedom, communitarian ethos, equality of status, including gender equality, segmentation along clan and kinship structures rather than social stratification or hierarchical order governing the status of the different sections of population. The tribal view of social order and social law is essentially different from the rest of the society.

The organization of space in tribal regions may thus be seen as a manifestation of the ways of adaptation to the environmental setting as determined by the historical process of peopling of the traditional habits by homogeneous clan and kinship groups.

The river valleys are occupied by peasant societies whose distinctive trait is a social hierarchical order based on the institution of caste. This hierarchical order enshrined in the institution of caste is found in every religion, Hindu, Muslim, Christian and so on. Caste is a social phenomenon of great relevance. In fact, caste and conunual identity together define the basic parameters of the organization of rural space. The layout and Jural morphology to some extent reflects the set up of the village society, how they have segregated according to rank and order. The high class society are the propertied class as they are the owner of land whose position in the village is reflected in the morphological plan and their status in the social hierarchy.

Dominant classes are the so called social power and they have monopolized the rule in the village society. Hence the cultural matrix, social segregation, linguistic dilemmas, caste based hierarchy all together making the social structure a bit specific. No doubt that the differences will lead to the regional inequalities in respect to space yet one cannot ignore the very change elsewhere due to these differences arising out of the social structure.

Poverty and poor housing in Third World are closely related and China and Cuba excepted-inherent in the social structure. In Latin America, the urban social stratification comprises a European or Europeanized elite, a small but growing middle class, and a mass of lower class persons who are set apart from the bourgeoisie by an enormous social and economic gulf. In other Third World regions, notably the Middle East, the social structure is often more traditional and reflects non-class inequalities, such as those of race, religion, culture, tribe, language or ethnicity; and even if class distinction are emerging they may remain subordinate to racial and cultural differences. However the detailed city morphology depends upon social structure of the country in which it is located, proportions of different classes and races and on topography.

Davies (1984), following Timms (1971) provides a different framework for explaining variations in urban structure. He suggests that, historically four major dimensions of social differentiation have dominated cities everywhere-social rank, family status, ethnicity and migration status and that these are combined in different ways in different types of society to produce varying urban structures. In traditional or feudal societies, family related considerations dominated the social structure, since prestige and status were based primarily on kinship. In the 'feudal city', therefore, a single axis of differentiation can be expected, combining social rank and family status as well as limited amount of ethnic and migrant variation. With economic specialization and the development of external economic linkages, division of labour intensifies, a merchant class is added to the political elite, and selective migration streams add to the social and ethnic complexity of cities.

1.11 SOCIAL PROCESS

Social geography has the concept of social process in its definition as given by Emrys Jones. It is argued that social geography is not concerned simply with people, but with people as members of groups. So their focus is on special patterns of groups and group behaviour and the processes involved in creating those patterns.

The focus is therefore on space, pattern and processes. Social geography bind the studies on the social groups as a unit of study and their common concern with spatial implication of social processes.

The word social process points out the social change, the change brought by the wave of modernization. Urbanization, industrialization, education, social reform movement, political awakening and advent of democratic processes all are influencing the social processes. Urbanization, for example, is one such process which has brought in its wake a whole series of changes leading to the transformation of traditional way of life, behavioural pattern of the people and to some extent the associated attitudes and value systems.

Metropolitanization again will have a different impact because of its delicacy in the culture. Moreover, the morphology of towns itself shows the very process of settling down of different social categories in the urban space. Further, urbanization and industrialization have gone hand in hand generating vigorous rural to urban streams of migration and effecting a systematic transformation of traditional occupational structure. Urbanization implies horizontal movement of the rural masses to the urban centres. The migration to the city involves not only a change in residence but also a vertical shift from the primary to the secondary or the tertiary sector of economy.

On the other hand, industrialization has been uneven in space and it has left an

impact which is spatially fragmented. But industrialization has also paved the way for a systematic transformation of the rural way of life, particularly in areas of progressive agriculture. This has led to an increasing degree of rural-urban interaction and a consequent loosening of the hold of traditional values. The industrialization effect do not weakens the traditional caste based hierarchical structure. Therefore the impact of industrialization as a modernizing process has not always been positive.

Ecological processes also bear some relation with the social structure of a region vis a vis the social processes. It may be said that infiltration, invasion, succession, competition, segregation all has a indirect links with the growth of the city formation and therefore also could be attached with the pattems and processes which lead to the city growth. The ecological processes are the responsible for the city structure and hence can be termed as one of the dominant force of city building factor. **E.M. Burgess**, urban sociologist, in 1920s did his model based on ecological approach and named the model as concentric zone model.

Social process therefore can be related with the change of the social structure.

1.12 REGION AS A SOCIAL UNIT

Regions have the reflection of the society. In fact, region is an agglomeration of people who belong to a society. Region has a geographical boundary, historical past and a common people's living,

The term **'region"** is undoubtedly one of the catchwords of the day among both the popular and scientific writers. To the practical man of affairs a region is simply all area with certain characteristics, in virtue of which it is a suitable unit for some particular purpose of business or administration. To the scientist and above all to the geographer, a region is an area which is homogeneous in respect of some particular set of associated conditions, whether of land or of the people, such as industry, farming, the distribution of population, commerce, or the general sphere of influence of a city. Such an association is discovered to exist in terms of a single common factor or in terms of a variety of interdependent areal factor.

Some writers conceive of 'natural administrative units', that is units suitable, in virtue of their being social and economic entities, to be used as administrative units. In this sense, a region is thought of as a 'natural' areal unit, natural in the sense that it is a real, existing unit, arising spontaneously from the very structure of society.

In brief, many of the most vital problems of the modem society find their common ground in the basic concept of the region-what kind area it shall be, what purpose it shall serve, how it should work.

All these varied problems have a common denominator, namely, the demand for a new socio-geographical unit in the place of the existing administrative unit. This

idea is found in the notion of the 'social unit' indicated some years back by the late Mr. Frank Pick as the essential basis of physical planning. The town, the city, the metropolis itself and finally the region will be aggregates of social units differentiated and combined to fulfill ever higher and broader conceptions of the good life.

This in fact, a restatement of the concept of regionalism, which has been elaborated on broad philosophical lines by such scholars as the late Patrick Geddes and, in more recent years, by Lewis Mumford but which still requires much attention from the social scientist. It is, in other words an area of common living.

Much has been written in elaboration of this concept of a region. The idea has been associated particularly with the geographers. It is widely assumed that the geographer's prime concern is to examine similarities in social structure only in so far as they are attributable to a uniformity in the character of the land and its physical features. An area of common living can be defined only in terms of the key traits of that common living, that is in terms of social considerations, not of a particular set of physical factors which condition only in part that pattern of living. This mode of approach throws emphasis on the study of regional associations and recognizes that with a marked degree of regionalization there emerges a homogeneous area, clearly defined in its core and vaguely defined towards its borders, usually where it merges into adjacent regions of similar definition.

1.13 SOCIAL CHANGE

The human society after crossing the phases of agricultural and industrial revolution is taking a step to a change towards a new era. This accelerated change seems to have gathered a force of its own. It has brought new family ties, novel ways of living, new thinking, outlook and quality of life.

❒ ***What is change?***

Change means alternation, modification, replacement, differentiation or integration within a phenomenon over a particular period of time caused by a force. Time is the measuring rod of the amount and direction of change. Any change requires a force factor, be it internal or external. TIle physical objects change at a faster rate than the social processes. Even within the society the material culture changes more rapidly than the non-material culture. Thus, the speed of change in the object is dependent upon various factors like, time, direction and nature of the object.

❒ ***Change of What ?***

According to Kingsley Davis, Social change can be defined as 'any such alternations as occur in social organization, that is, structure and functions of society'. The social structure by H. M. Johnson as, where individual are the important elements so far they occupy and performs different roles.

The whole social structure remains in a state of transition during most part of the existence. This state of transition which occurs because of any modification, alteration or replacement in these structural elements is known as the process of social change.

Social change, being the most important social process has been defined by a number of sociologists.

1. **H.T. Majumdar :** Social change may be defined as a fashion or mode, either modifying or replacing the old, in the life of a people- or in the operation if the society.
2. **Maclver and Page :** Social change refers to a process responsive to many types of changes; changes in man made conditions of life, changes in the attitude and beliefs etc.
3. **Gillin and Gillin :** Social changes are variations from the accepted modes of life; whether due to alteration in geographical conditions, in cultural equipments, composition of population. or ideologies, whether brought about by diffusion invention within the society.
4. **M.E. Jones :** Social change is a term used to describe variations or modification of any aspect of social process, social patterns, social interaction or social organization.
5. **M.d. Jenson :** Social change may be defined as modification in ways of doing or thinking of people.
6. **S. Koening** : Social change refers to the modifications which occur in the life patterns of a people.
7. **Maclver, 1959 :** Social change is a process responsive to many types of change, to changes in the manmade conditions of living, to changes in the attitude and beliefs of man, and to changes that go back beyond human control, to the biological and physical nature of things.
8. **Rogers, 1962-63 :** Social change is the process by which alteration occurs in the structure and function of a social system.

Thus, change is seen as a process not as a state. Because of its process nature, social change is without beginning or end, continuous and flowing through time. Kinsley Davis supports that culture change is a category of change broader than social change, including changes in technology, philosophy, belief systems, systems of expressive symbolic or art and system of values. However, for Davis social change refers only to alterations which occur in social organization, that is, the structure and functions of society.

TYPES OF CHANGE

The changes that can be calculated in terms of numbers, units, and the amount of which can be ascertained with some degree of assertiveness may be termed as quantitative changes, like, changes in population numbers, and composition, per capita income, per capita consumption, increase or decrease in number of family are all few examples of quantitative change.

But, there are other kinds of change which are not easy to be put in quantitative terms. They cannot be counted. They are to be evaluated and compared in their depth, nature and character, These changes are qualitative in nature .It may occur in any aspect of the social system—in the tools and other artifacts used by the members; in their technological process; in their informal or formal mode of association; in their language and its supplements; writings, pictorial representation etc; in their mode of socialization and social control, including law; in the body of myths, legends and ideologies; in their moral concepts; in their sentiments, opinions, values, tastes, prejudices or the like.

UNIT 2 ❐ SOCIAL WELLBEING AND DEPRIVATION

Structure

2.1 SOCIAL WELLBEING AND DEPRIVATION

After 1960s the geographers has adopted a welfare approach. This approach in fact emerged as the reaction to positivism, quantitative revolution, spatial science and model building which was thought to be insufficiently concerned with contemporary problems of human society.

The 1970s saw a major redirection of human geography towards 'welfare; issues like, poverty, hunger, deprivation, malnutrition, crime, distribution of assets, income, access to social services (health care and education). This corresponded to a major shift in social concern, from narrow economic criteria of development or progress to broader aspect of quality of life.

Social wellbeing is a condition in which the needs and wants of the population are satisfied. A well society is one in which people have sufficient income for their basic needs, where poverty has been eradicated, where people are socially and economically mobile and respectful of the dignity of others; and where they have access to good services in a stable, democratic and participatory environment.

Social wellbeing is used as a generic term for the family of overlapping concept which includes level of living, the quality of life, social satisfaction, social welfare and standard of living.

Level of living is clearly established as the factual circumstances of wellbeing (the actual degree of satisfaction of the needs and wants of a community) whereas standard of living relates to the circumstances aspired to by that community (Knox, 1975).

The notion of quality of life is again a broad expression of well being, but generally suggest an emphasis on the amount and distribution of impure public goods such as health care, education and welfare services, protection against crime, the regulation of pollution and preservation of fine landscape and historic townscape (Hall, 1972).

Similarly, the whole spectrum of social wellbeing covers the notion of social satisfaction which mainly highlights the collective psychological response to the objective conditions of reality.

2.2 INDICATORS OF WELLBEING, CONCEPT OF AMARTYA SEN.

According to United Nations Institute for social development (UNRISD) there is a list of 9 basic components of social wellbeing—

1. **Nutrition**
2. **Shelter**
3. **Health**
4. **Education**
5. **Leisure**
6. **Security**
7. **Social stability**
8. **Physical environment**
9. **Surplus income**

Smith's general criteria of social wellbeing :

1. **Income, wealth and employment**
   a) income and wealth
   b) employment status
   c) income supplements
2. **The living environment**
   a) housing
   b) the neighbourhood
   c) the physical environment
3. **Health**
   a) physical health
   b) mental health
4. **Education**
   a) achievement
   b) duration and quality
5. **Social order**
   a) personal pathologies
   b) family breakdown
   c) crime and delinquency
   d) public order and safety

Income, wealth and employment are important means of access not only to material goods but also as in USA to such things as health and education.

Employment status (occupied or out of work) is important because this affect income and also an individual's self esteem.

The living environment can be viewed at different spatial scales. Housing is important as a source of shelter, comfort and social status as 'home' performs basic protective and symbolic functions.

Neighbourhood quality covers such questions as whether the immediate environment outside the home is attractive, safe or threatening.

Health is obviously basic to human well being. Diet and food intake are included under health.

Education, like health is important as an aid to enjoyment of full human being.

Social order refers to lack of social disorganization threatening the functions of individuals and groups.

Social belonging attempts to capture the degree to which people are able to play their full chosen part in society.

Recreation and leisure recognizes the importance of non-work activity including access to opportunities and freedom to enjoy them. In practice this is difficult to measure.

■ **Needs and Wants :**

The most basic human needs are those relating to physical survival. **Lasswell and Kaplan (1950)** have recognized two important sets of values in human needs, relating to 'welfare' and 'deference'.

Welfare values include the well being of the individual in terms of health, safety, wealth, skill and enlightenment.

Deference values include the respect, rectitude and affection derived from relationships with other people.

Dahl and Lindblom (1913) suggests that the prism goal in Western societies include existence or survival, psychological gratification (through food, sleep and comfort), love and affection, respect, self-respect, power, control, skill, enlightenment, prestige, aesthetic satisfaction, excitement and novelty.

One of the most influential attempt to categorise human needs is the hierarchial arrangement prepared by Maslow (1954). According to him higher needs emerge as the lower ones are satisfied.

The first or lower level is survival.

The second is security.

The third is belongingness and love.

The fourth is esteem or the need for recognition, prestige, status.

Finally at the highest level is self actualization or the desire for self-fulfilment.

Amartya Sen's Approach to Well Being :

Equality of all is the basic idea in his thought, that human beings are diverse in their internal characteristics (such as age, gender, general abilities, particular talents, proneness to illness and so on) as well as external circumstances (such as ownership of assets, social background, environmental predicaments and so on). Human diversity is no secondary complication; it is a fundamental aspect of our interest in equality.

Human beings differ from each other in many different ways. We have different external characteristics and circumstances. We begin life with different endowments of inherited wealth and liabilities. We live in different natural environments – some more hostile than others. The societies and the communities to which we belong offer very different opportunities as to what we can or cannot do. The epidemiological factors in the region in which we live can profoundly affect our health and well being.

But in addition to these differences in natural and social environments and external characteristics, one also differs in one's personal characteristics (e.g. age, sex, physical and mental abilities). These are important for assessing inequality and equal income can therefore also create inequality. The differences in focus are particularly important because of extensive human diversity.

A person can and typically does have goals and values other than the pursuit of one's own well being (1985). In pursuing this, the distinction between well being freedom and agency freedom is particularly important. An increase in one's ability to promote goals that one has reasons to promote can lead to a reduction of well being freedom and correspondingly to a decline in achieved well being. An illustration may be useful to explain this. A doctor who is ready to sacrifice her own well being to go to work in some terribly miserable poor country, but is prevented to do so because of lack of means and opportunity to go to that far away land. Then there is a rise in her income and in this new economic situation she has both more well being freedom (e.g. she can buy lots of nice things for herself) and more agency freedom (she can go to the far away land and sacrifice her well being for tireless work in pursuit of the greater good of suffering humanity). Freedom and well being achievement can thus, move in opposite directions, no matter whether one interpret freedom as agency freedom or as well being freedom. Another important issue concerns the very different roles that the well being and the agency aspects can have in the use of interpersonal comparisons for diverse exercises. Society might accept some responsibility for a person's well being, especially when that is in some danger of being particularly low. But this does not imply that society must take an equal interests in the promotion of that person's other agency objectives as well. For example, society may be seen as having a special responsibility to make sure that no one has to starve, or fail to obtain medical attention for a serious but eminently treatable ailment. On the other hand;

this carries no implication that the society must take an equally protective attitude about the person's agency goal of, say, erecting a statue in honour of some hero he particularly admire. Therefore depending on the context, the agency aspect or the well being aspect might achieve prominence.

The well being aspect is specially important in such matters as social security, poverty alleviation, removal of gross economic inequality and in general in the pursuit of social justice. The well being aspect of a person has a great importance .of its own for the analysis of social inequality and the assessment of public policy. Problems of social injustice and inequality between different classes and groups relate strongly to extensive disparities in well being—including the freedom one enjoy to achieve well being.

2.3 GLOBAL REVIEW WITH SPECIAL REFERENCE TO INDIA

For the past several years, social wellbeing as a part of social development has acquired a new salience in development thinking. Third world countries faced crisis till 1980s. It was during this period that neglect of the social aspect was recognized as a basic constraint to development. This new turning to the social development through social well being factor came in to being in the global level in the form of the Summit Conference in Copenhagen in 1995. At the national level, this trend was reflected in the reprioritization of objectives and investment outlays in national development plans in favour of social development.

A social well being should deal with attitudinal barriers to social change and be concerned with institution of social stratification like customs, mores, the family, the community and the class. National Human Development Report 2001, is an attempt to map the state of human development in the country. The quality of life, and the level of human well being, in terms of change in a range of indicators have been traced across States at different points of time. The notion of well being has shifted away from just material attainments, or the means for development, to outcomes that are either desirable in themselves or desirable because of their role in supporting better opportunities for people. Similarly, poverty is viewed not only in terms of lack of adequate income, but as a state of deprivation spanning the social, economic and political context of the people that prevents their effective participation as equals in the development process. This has resulted in a renewed focus on development indicators in the are of education and health attainments–critical for capacity building and other social and environmental consequences that have a direct bearing on the state of well being.

There is today, a broad based consensus to view human development in terms of,

at least, three critical dimensions of well being. These are related to longevity–the ability to live long and healthy life; education – the ability to read, write and acquire. knowledge; and command over resources – the ability to enjoy a decent standard of living and have a socially meaningful life.

2.4 SOCIAL POLICY AND PLANNING'

As well as developing important diagnostic tools to measure inequalities, the social indicators approach has a major aim an attempt to influence public policy decisions. Social planning is the 'real world' counterpart of the concern for social justice and a fair society. Social planning can be defined as planning for people in space, Planning, is a necessary activity because it is unlikely in a complex, capitalist society that the maximization of the collective welfare of the community will come about from individual decisions. Even during the middle and late nineteenth century, confronted by overcrowded, unsanitary condition and unsafe buildings, it was realized that only a collective response could ameliorate these conditions. In a way then, planning has always been social. It in the 'Housing and Town Planning Act, 1909', which contained the following statement : 'the object of the bill is to provide a domestic conditions for the people in which their physical health' their morals, their character and their whole social condition can be improved by what we hope social planning secure in this bill'. The physical planning therefore includes within its framework the social planning too. The idea that social cohesion call result from physical planning is, of course an example of environmental determinism. The influence of environment and architecture on social life cannot completely be dismissed. But the nature of social activity depends not only on the simple determination of social life by the physical environment, but also on the residents' themselves, and it is true to say that all physical planning has social implications. The control of land uses through zoning, for example, often has the effect of keeping unwanted social groups out of certain suburban areas. There is however, a growing realization by planners that social issues require more explicit attention and social solutions.

Town planning .plays a crucial role in a mixed economy in redistributing spatial resources. In fact, urban planning also gives much attention to the social indicators, like, housing, poverty alleviation, deprivation, sewerage and sanitation so on and so forth.

There are three aspects to social planning :

i) the monitoring of the social implications of physical planning

ii) the identification of areas of social malaise and the attempt to ameliorate such conditions or remedial planning

iii) the promotion of social and welfare facilities to meet defined social needs or social development planning.

UNIT 3 ❐ NATURE, SCOPE AND DEVELOPMENT OF CULTURAL GEOGRAPHY

Structure

3.1 WHAT IS CULTURAL GEOGRAPHY ?

Cultural geography is emerging as an increasingly central concern within the larger discipline of human geography.

The contemporary *cultural geography* highlights both the traditional approaches and the modem approaches. The traditional approaches reflect the study of cultural geography, from the point of view of the landscape school and is largely concerned with delimiting the cultural groups and describing the landscape they created. The moderm approaches in turn reflect some more recently developed concerns particularly the group identity or the cultural identity.

A classic concern of *cultural geography* is to describe and explain the visible material landscapes that different group of people have fashioned from the physical geographic environment that they occupy. The word landscape may be referred to the German word *landschaft. Land* refers to the area used to support a group of people and schaft refers to the molding of a social unity such that *landschaft* expresses the experience and intention of a social group tied by bond of custom and law to a determined territory (Cosgrove, 1998).

Another outlook of *cultural geography* concerned with the identity of the group of people who mayor may not be associated with a specific place or who may lack a clear identity to involve themselves in a struggle to establish a distinctive identity.

Cultural geography is concerned with making sense of people and the places that they occupy, an aim that is achieved through analyses and understanding of cultural processes, cultural landscapes and cultural identities .

■ **Introducing Culture :**

Perhaps the most classic way of defining culture 'is the agent, the natural area is the medium, the cultural landscapes the result' (Sauer, 1925). Although culture is

thus the 'shaping force', it is affirmed that the physical landscape is of course of fundamental importance, for it supplies the materials out of which the cultural landscape is formed (Sauer, 1925).

The term society and culture defy exact definition. A society is an organized group of human individuals possessing distinct culture. This shifts the burden to the definition of culture. Perhaps it is simplest .to say that a culture is a people's design for living. The content of culture includes (i) systems of belief (ideology), (ii) social institutions (organization), (iii) industrial skill and tools (technology), and material possessions (resources). A composite and more explicit characteristics of a culture is a historically derived system of standardized forms of behavior which is acquired by the individual as a member of a society.

■ **The culture concept :**

The word 'culture' has long enjoyed wide currency. There is culture in sense of tillage or cultivation, there culture meaning the possession of standard of value, discrimination and good taste and implying good breeding, refinement and learning. There is culture in the simple ethnographic sense, referring to any particular body of beliefs, habits, practices and technologies possessed by a discrete human population. Culture is the distillate of human experience, its possession not only distinguishes man from other living forms but indeed sets him apart as a unique evolutionary product.

Cultures are dynamic; they are in constant process of change. Essentially change comes, in two ways, a) by invention within the society or by introduction of something new from outside.

Jackson : 1989

Culture is a domain, no less than the political and the economic, in which social relation of dominance and subordination are negotiated and resisted, where meanings are not just imposed but contested.

Mcdowell : 1994

- Culture is asset of ideas, customs and beliefs that shape people's actions and their production of material artifacts, including the landscape and the built environment. Culture is socially defined and socially interpreted. Cultural ideas are expressed in the lives of social groups who articulate, express and challenge these sets of ideas and values, which are themselves temporally and spatially specific.

Jordon, Domesh and Rowntree : 1997

- Culture is learned collective human behavior, as opposed to instinctive, or inborn behavior. These leamed traits form a way of life held in common by a group of people.

Although these definitions are but a few of many, they do combine to provide a meaningful overview of the approaches taken by geographers.

3.2 CULTURAL GEOGRAPHY : SOME ORGANIZATIONAL FRAMEWORK

Although cultural geographers have not been prone to defend their interests or issue programmatic statements, there have been several efforts to clarity both subject matter and approaches.

1. Wagener and Mikesell (1962)

In their pioneering and influencial book of readings, Wagener and Mikesell proposed the following five themes as constituting the core of cultural geography i.e. (i) culture,. (ii) cultural area, (iii) cultural landscape, (iv) culture history and (v) culture ecology.

2. Gritzner (1966)

Cultural geography :

- begins with anthropological concept of culture
- considers culture traits and groups in terms of development
- studies culture/nature
- interprets landscapes
- divides the world into culture regions and subregions

3. Spencer and Thomas (1973)

Rather than specifying themes, four conceptual entities were recognized as follows :

- population
- physical enviroument
- social organization
- technology

The process oriented scheme also proposed six inter-operative relationships

- population and environment
- population and social organization
- population and technology
- social organization and technology·
- physical environment and social organization
- physical environment and technology

4. Mikesell (1978)

- Identified seven persistent preferences :

- historical, orientation
- humans as agents of environmental change
- focus on material culture
- rural bias in North America, non-Western or pre-industrial bias
- links to anthropology
- substantive research
- fieldwork

Identified three 'recent developments :

- environmental perception,
- cultural ecology
- focus on United States

5. Norton (1989)

Proposed four themes :

- evolutionary
- ecological
- behavioral
- symbolic

According to Carl Sauer and Mikesell (1962) it welds historical geography and economic geography into one subject... and asserts no social philosophy as does environmentalist geography ...but finds its principal methodic problems in the structure of area.

Cultural geography has become a particular specialism among geographers in the United States, where it is characterized by conceptions of culture drawn from anthropology.

Cultural geography has developed a rich variety of themes, though a number have proved exceptionally stimulating and have established traditions of their own.

(a) ***Man's exploitation of his habitat and its resources :*** such studies have been characterized by enormous range in both approach and subject matter. Particularly persistent themes have been : (i) the form and use of primitive tools, together with the agricultural possibilities afforded by each;(ii)the domestication of plants and animals (iii) the economies and practices associated with particular type of food production.

(b) ***Man's impact on the ecology of the earth*** : recognizing man's impact may be Inadvertent (soil erosion as a result of cultivation, vegetation deterioration through grazing or burning, soil enrichment around villages by waste disposal)

as well as intentional (woodland clearance, slope terracing, resource mining etc), cultural geography takes into account all aspects of man-environment relationship.

(c) ***The origin and spread of cultures :*** the spread of culture is most easily investigated via particular cultural traits, though difficulties arise in that an entire nexus of cultural relations may be welded together by a particular culture group and spread over a wide area from a central origin. A way of life may thus be traced from its inception to its expansion into a greater territorial base and finally to its limits wherein it is absorbed or replaced by another expanding culture.

Much of the efforts of cultural geography has, accordingly, been devoted to the Identification of hearth areas and the sequent rise of civilizations, resulting either in the mapping of major cultural 'regions' or the more sensitive reconstruction of core and fringe areas of sub-cultures and the evolution of culture islands (Meinig, 1965).

(d) ***Cultural evaluations of the environment :*** these studies recognize that all environmental evaluations are culturally determined; that 'what man does with his natural environment depends upon technology on his perception of natural resources and of his place amongst them, and on a complex of values conceming the present and future'.

(e) ***Settlement forms :*** because settlement constitute a considerable proportion of the landscape features of man-made landscape, cultural geography, particularly the Berkley School has devoted a good deal of efforts to the study of settlement features. Such as house type, house arrangements, vernacular structures and relation of these to road networks, building materials, field pattems, physical obstacles and natural resources.

(f) ***Non-material culture :*** though cultural geography's concept ion of culture have generally been characterized by Krocberian views and therefore largely of a material nature, the study has admitted certain non-material aspects (e.g., language, religion etc).

3.3 DEVELOPMENT OF CULTURAL GEOGRAPHY

During the period extending from 1750-1920, most geographers held that human occupance patterns were strongly influence and controlled by environmental conditions that man lived on God's earth by sufferance according to some set of plans beyond the control of man. Since the early twentieth century, however, there has been a growing recognition of the role of cultural technologies and the power human societies to develop human occupance patterns of their own choosing. This is summarized by

the disputes between physical environmental determinism on the one hand and cultural determinism on the other.

Some geographers in the twentieth century categorize themselves as intereste in cultural geography as a specialized sub-division within the broad orientation of human geography. In the United States, the dichotomy normally has been stated as physical geography and cultural geography (meaning anything non-physical).

In the early nineteenth century, European geographers, American geographers, Indian/Chinese/Greek contains a bias in favor of physical geography in its professional development. Since in the late nineteenth and early twentieth centuries most geographers came into subject discipline from the earth science with concerns focusing on landforms and showing a tendency to rely on the writing of historians in accounting for the human side of spatial development.

During 1920's and 1930's the rise of economic concerns in geography brought into discipline. World War I and II brought wide and divergent developments in geography ranging from political geography to cartography to transportation.

The late 1920s also saw the rise of concern with the human element, in which viewpoints from anthropology and sociology broadened the practice of geography. During 1940s the growth of urbanism produced a wide range of interests in the city and patterns of urban growth. The most recent expansion of the outlook of the geography have included quantification, perception studies, environmental quality, social problems and the philosophical structure of geography.

Whatever the orientation, geography has always had an ecological viewpoint, with orientation towards the interface at which there meet inanimate phenomena and process, to form the changing spatial dynamics of the surface of the earth.

The beginning of the cultural geography proper can be traced to the seminal work of Carl Sauer, who drawing upon the European programmes of Friedrich Ratzel (on culture spread) and Eduard Hahn (on agricultural development), outlined a new prospectus which recognized the subject's brief as that of explaining how elements of the material culture of different groups give character to area through their inscription on the earth's surface, The focus thus defined was to prove both lasting and significant; the legitimate object of attention was finally identified as the works impact of man rather than man himself; the study was seen to be empirical, observational and above all historical; and the relationship between man and environment was viewed as at best reciprocal, with a marked emphasis on the abilities of man to transform (within limits) the landscape which he occupied.

In these respects Sauer's cultural geography found itself in marked contrast opposition to the then popular thesis of ENVIRONMENTAL DETERMINISM, and much of its early success as well as its strength was derived from the richness of

perspective which this allowed. Sauer's proposals which, through the character of his own empirical work and that of his students, became embodied in the very fabric of the famous BERKELEY SCHOOL also did much to bring about a general reorientation in American geography in the 1930s,1940s and 1950s cultural geography even within this limits has developed wide variety of themes hough the number have proved exceptionally stimulating and have established traditions of their own.

Currently, one of the most vibrant and contested sub-fields within human geography *'cultural geography'* has both a long scholarly tradition and multiple contemporary expressions. The outcome in American geography was a scholarly project emphasizing the active role of human groups in transforming natural environments, interpreting and mapping the cultural ecologies which resulted.

Highlighting the impacts of MODERNIZATION on traditional lifeways, the Sauerian project inevitably raised ethical questions about the impacts of human use of the Earth as a significant theme in cultural geography. Revivals of environmental concern in the early 1970s and again in the late 1980s have seen writers within geography and beyond turning to Sauer as a pioneer figure in global and local ENVIRONMENTALISM, while the continued significance of this ecological concern is evidenced in a 1990 re-examination of the issues raised in *'Man's role in chang ing face of the earth'*.

Criticism of Sauerian concepts of culture and landscape was a stating point what has come to be termed as 'new cultural geography' since the 1980s. A number of cultural geographical journals launched in the early 1990s. 'New cultural geography' which is re- introduced by two streams of thinking of ecological and ethnographic tradition ill American cultural geography in the 1990s. Criticism of Sauerian concepts of culture and landscape was a starting point for what has come to be termed 'new cultural geography' since the 1980s. In 1993, the journal named as 'Gender, Place and Culture' has been a forum for research on gender issues in cultural geography.

Contemporary trends in economy and society such as globalization, bringing people into ever closer and more immediate contact with one another, the growth and economic significance of such 'culture industries' as advertising, the arts, sport and media in many economies, the social impacts of virtual space and information technologies, and the end of GEOPOLITICAL domination by socio-economic IDEOLOGIES, have all contributed to a material increase in the significance of cultural matters within human affairs at the turn of the millennium and account for the significant increase of interest in geographical question of space, PLACE and TERRITORIALITY within cultural studies.

3A CULTURAL DIFFUSION AND ACCULTURATION

Diffusion is the process by which an idea or innovation is transmitted from one

individual or group to another across space. These may be of two basic types, i)either people move for any of a number of reasons, to a new area and take their culture with them (e.g., immigrants to the American colonies) or information about an innovation may spread throughout a culture.The fanner is known as relocation diffusion, the latter IS expansion diffusion.

The spread of culture elements or complexes from one society to another is called diffusion. **Diffusion** studies in moderngeography have been dominated by the seminal contribution of **Torsten Haggerstrand**. In 1952, a Swedish geographer Haggerstrand tried to make out the diffusion through four stages or phases. He did his research in rural community. of South Central Sweden.

Stage I : termed as primary stage marks the beginning of the diffusion process with a strong contrast between the innovating centres and the remote areas.

Stage II : the diffusion stage in which there is a strong centrifugal effect with the creation of new, rapidly growing centres in a distant areas and a reduction in the regional contrast of stage.

Stage III : the condensing stage, the relative increase is equal in all directions.

Stage IV : the saturation stage, there is a general, but slow asymptotic increase towards the maximum under existing condition.

ACCULTURATION :

When one culture group undergoes a major modification by adopting many of the characteristics of another, dominant culture group, acculturation has occurred. Indeed acculturation may involve changes in the original cultural patterns of either or both of two groups involved in prolonged first hand contact. Such a contact and subsequent cultural alteration may be the result of conquest when one society overcomes another and occupies its territory.

The study of diffusion is concerned with the spread of a culture trait or complex. However, one can also focus attention on a specific culture and how it is affected by the adoption of foreign traits. The result of the transmission may range from a relatively minor change to virtual assimilation. Somewhere, in between two extremes lies acculturation. The term is most commonly used for 'the process of interaction between two societies by which the culture of the society in the subordinate position is drastically modified to conform to the culture of the dominant society (Hoebel, 1966).

When one culture group undergoes a major modification by adopting many of the chatracteristics of another, dominant culture group, acculturation has occurred.

Acculturation may also results from commercial expansion. Territorial isolation is a strong and sustaining trait of ethnic separations and one that assists individual group to retain their identification. The 'China Town' of the North American cities

have provided the support systems essential to new immigrants in an alien culture realm. By retaining what if familiar, ethnic enclaves have reduced cultural stock and have paved the way for the gradual process of acculturation, which allows both - individuals and the groups to which they belong to undergo cultural and social modification sufficient to enable them to operate effectively in the new, large host society.

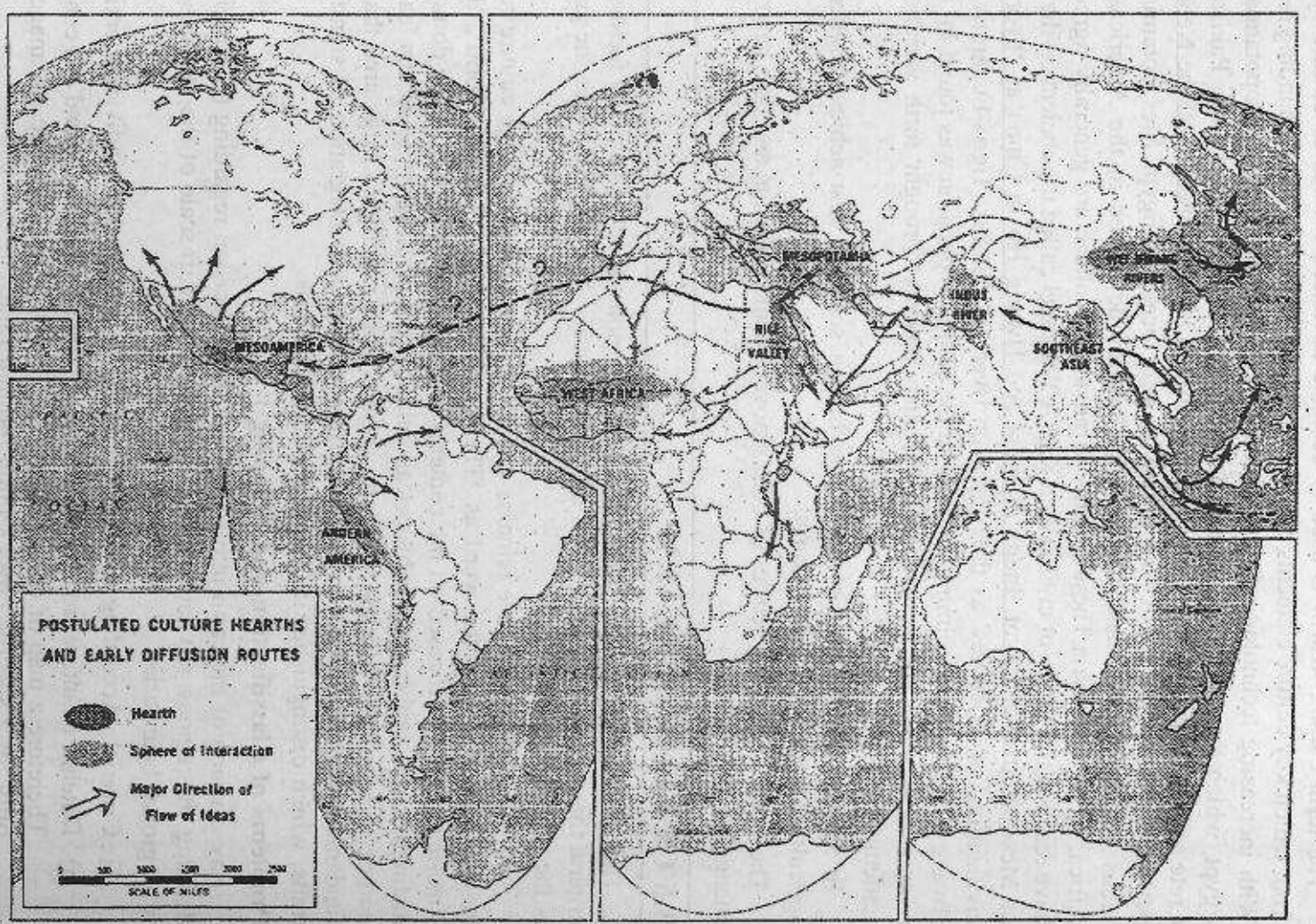
Acculturation is a slow process for many immigrant individuals or groups and the mother tongue may of choice or necessarily be retained as an ethnically identifying feature even after fashion of dress, food and customary behaviour have been substantially altered in the new environment. This process whereby a culture is changed substantially through interaction with another culture is acculturation.

3.5 CULTURAL HEARTH

Carl Sauer used the term specifically in examining the origin of characteristic agricultural systems. Hearths are the 'breeding grounds' of culture groups from which system associated with them may later diffuse. Sauer developed his ideas about hearth from F. Ratzel's concept of the natural 'forcing bed' and distinguished several characteristics favourable to the early development hearth areas, amongst them : a limited though valuable subsistence base rewarding intensive use; diverse raw materials in moderate amounts (not in abundance of a few staples); mountain valley terrain; easily displacable native vegetation; definite growing/resting reasons; and a congenial overall climate. The Berkley geographer, Sauer argued for separate hearths of domestication in both the old and the new world outside the conventional hearth areas. He places the old world hearth in South Asia and the later new world hearth in the valleys and lowlands of the Northern Andes. Sauer chose these areas on the basis of five criteria : (i) the domestication of plants could not occur in areas of chronic food shortage; the domestication of crops and animals implies experimentation, and a sufficient abundance of food so that the experiment cap wait awhile for results. (ii) hearth must be in areas where there is a great variety of plants and animals and thus a large gene pool for experiment and hybridization to occur. The large river valleys are unlikely hearth area, because their settlement and cultivation require rather advanced techniques of water control. (iv) hearth must be restricted to woodland areas where spaces can readily be cleared by killing and burning trees; (v) the original group of cultivators had to be sedentary.

By comparing these criteria Sauer chose as his hearth areas the most probable environment for agricultural innovation. In Sauer's view the seed agriculture of Middle East, China and Central America is much later, and more sophisticated outgrowth of the activity at the two earlier centres of this type of agriculture in Central Mexico and Asia Minor.

CULTURAL HEARTHS



The term *culture hearth* is used to describe advanced centres of culture system from which key culture elements diffused to exert an influence on surrounding region. With increasing technological advancement, writing appeared in Mesopotamia and Egypt, which then diffused outwards to the Indus Valley of present day Pakistan to Crete and perhaps to China. Several major culture hearths emerged ill the Neolithic period. Prominent centres of early greativity were located in Egypt, Mesopotamia, the Indus Valley, and Northern China. Other hearths developed in the Americas, W. Africa, Crete and Syria.These hearths of advanced culture are generally agreed to have reached the status of civilization. Karl A Wittfogel called the ancient civilization of Mesopotamia in Egypt, Indus in India and Hwang Ho in China as 'hydraulic civilization' or 'societies' as they grow on river Nile, Indus, Tigris-Euphratis, and Hwang Ho. The overwhelming majority of the settled population was found in' these river valley areas. The geographical variation however brought forth variation in settlement types.

In Saurian concept, the places where human societies first achieved sedentary agriculture were the earliest hearths.

The hearths were the centres of both innovation and diffusion and thus centres of change.

3.6 CULTURAL REALM

The study of culture landscapes and culture regions involves so many factors and criteria that it is best carried on at a manageable scale. The larger the area the greater is the complexity of details.

Still the world as a whole remains divided in to a number of huge culture realm. People sometimes use the word as 'The Arab World' or 'Islamic World', 'Latin America', and it is focused on the contents of that culture realm. It is the dominant, distinguishing combination of historical, cultural, and physiographic factors leads to outline the realm as on map. The term culture realm signifies a large area that has fundamental unity in the composition, arrangement, and integration of significant traits, which distinguishes it from other culture realms.

Problems of Classification and Mapping :

Any division of the earth into regions involves decision regarding (i) criteria for defining the regions, (ii) dateline of the presentation, (iii) scale of the investigation, iv) regional boundaries.

i) Criteria : According to Gestalt it is historically evolved individual entity.

ii) Dateline : Culture are in constant change, and their realms expand and contract. Therefore a map of culture realm is like a still from a movie, an image true only for a specific cross section through time.

iii) Scale of Study : If one considers only a part of the earth, such as the Carribean, West Europe or the Middle East, one can make true distinctions based on many culture traits. A.L. Kroeber in his study of native Indian culture of North America distinguished 84 culture area, grouped within ten broad categories (1949).

iv) Boundaries : Cultures grade one into another in a vast continuum. The Rio Grande is often quoted as a clear divide between Anglo America and Latin America. Thus the Rio Grande boundary is a political line drawn through a cultural frontier zone.

Arnold J. Toynbee, famous historian examined not all cultures but only those on the higher level which show or have shown a high degree of creativity.

Toynbee distinguishes 26 civilizations including five 'arrested' and several 'abortive' ones. Among the latter he characterizes three as Polynesian, Nomad, and Eskimo.

According to the geographers they have employed criteria like socio cultural or economic features to mark out the realms.

They distinguishes East Asia as 'Orient', South Asia as 'Indic' or 'Hindu', North. Africa together with South West Asia as 'Islamic' or 'Dry World', Europe–North Asia as 'Western World' or 'Occident'.

The following are the list of the six culture realms with alternate names in parentheses; (after Toynbee)

A. Major realms (Civilizations)

I. Occidental (Western European)

II. Main Islamic (North African-South West Asian; Arab– Persian)

III. Indic (Indian; Hindu)

IV. East Asian (Sinitic)

B. **Minor Realms** :

V. South East Asian

VI. Meso- African (Negro- African)

Each of these realms can be subdivided further. Nevertheless based on the dominant culture the world may be sub-divided into ***twelve culture realms.***

1. Southwest Asian- North African
2. Europe
3. India and the Indian Perimeters
4. The Chinese World
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6. Black Africa
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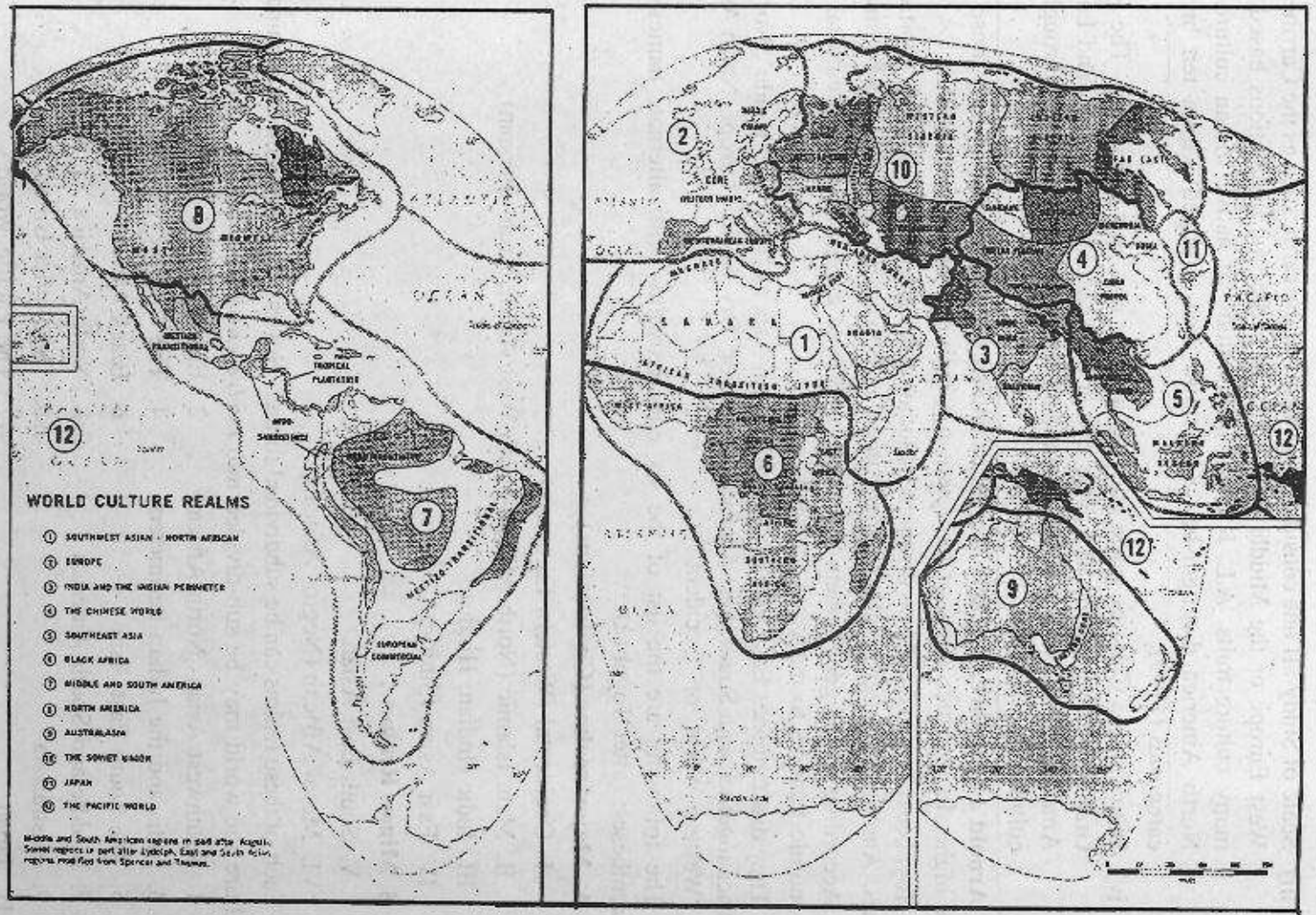
WORLD CULTURE REALMS
① SOUTHWEST ASIAN - NORTH AFRICAN
② EUROPE
③ INDIA AND THE INDIAN PENINSULA
④ THE CHINESE WORLD
⑤ SOUTHEAST ASIA
⑥ BLACK AFRICA
⑦ MIDDLE AND SOUTH AMERICA
⑧ NORTH AMERICA
⑨ AUSTRALASIA
⑩ THE SOVIET UNION
⑪ JAPAN
⑫ THE PACIFIC WORLD
Middle and South American regions in part after Angelo. Soviet regions in part after Lydolph. East and South Asian regions modified from Spencer and Thomas.

Southwest Asian-North African Realm :

This realm is variously named as Islamic realm, the Arab world, the dry world. This is a region of contrast extending from Morocco and Mauritania in the west to Iran and Afghanistan in the east, and from Turkey in the north to Ethiopia in the south. This is the region where huge desert areas separate strongly the clustered populations, characterized by rural poverty, strongly conservative traditionalism, political instability and conflict have marked the realm in recent times. But this is also the source area of several of the world's great religions and the site of ancient cultural hearths and early urban societies.

Europe :

Among Europe's greatest assets is its internal natural and human diversity. From the warm shores of the Mediterranean to the frigid Scandinavian Arctic and from the flat coastlands of the North sea to the grandeur of the Alps. Europe presents an infinite range of natural environments. Insular and peninsular west contrasts against the continental east. Excellent soil produce harvests of enormous quantity and variety. Population includes people of many different stocks named as Latin, German, Slavic.

Europe has minorities as well, like Hungarians and the Finns. Today Europe is a realm dominated specially in the west by great cities, intensive transport networks and mobility, enormous productivity, dynamic growth, a large and in many areas with dense population and an extremely complex technology.

India and the Indian Perimeter :

The familiar triangle of India is a subcontinent in itself, a clearly discernable physical region bounded by mountain range and ocean, inhabited by a population that constitutes one of the greatest human concentrations on earth, From the base of one of the ancient civilization, it has been the seat of vast British colonial empire. It is a region of intense adherence to the various faiths, a realn of thousand of villages and several teeming, overpopulated cities, an area of poverty and frequent hunger.

The Chinese World :

China is a nation state as well as a culture realn. The Chinese world may be the oldest of continuous civilization. In the lengthy process of its evolution as a regionally distinctive culture and a great nation state, China has had an ally in its isolation. Mountains, deserts and sheer distance protected China's "Middle Kingdom" and afforded the luxury of stability and comparative homogeneity. China is moving towards world power status and there are imposing new industries and growing cities. But for all its modernization, china still remains a realm of crowded farmlands, carefully diked floodplains, intricately terraced hill-slopes, cluttered small villages. Crops of rice and wheat are meticulously cultivated and the majority of the people still bend to the soil.

South East Asia :

South East Asia is nowhere nearly as well defined a culture realm as either India or China. It is a mosaic of ethnic and linguistic groups, and the region has been the scene of countless contests for power and primacy. The great majority of South East Asia's inhabitants have ethnic affinities with the people of China, but it was India that the realm received its first strong, widely disseminated cultural imprints : Hindu and Buddhist faiths, architecture, arts and aspects of social structure.

Black Africa :

Between the southern margins of the Sahara Desert and South Africa's Cape Province lies the Black Africa culture realm.The African realm is defined by a mosaic of hundreds of languages belonging to specific African language families, and by its huge variety of traditional, local religions that, unlike world religions such as Islam or China Christianity, remained essentially "community" religions. With fewexceptions, Africa is a realm of fanners.

Middle and South America :

Middle and South America constitute the realm often called "Latin" America because of the Iberian imprint placed on it during the European expansion, when the ancient Indian civilizations were submerged and destroyed. Catholic religion prevails throughout 'Latin' America. Still today, the realm carries the culture of its source region, in the architecture of its cities, the visual arts, music.

North America :

The North American culture realm consists of two of the most strongly urbanized and industrialized countries in the world. The North American realm is characterized by its large scale, massive technology, its enormous consumption of the world's resources and commodities; and its unprecedented mobility and fast paced lifestyles. Both the United States and Canada are plural societies. In both Canada and United States, minorities remain separated from the dominant culture. Quebec is Canada's French province, and racial segregation persist with back Americans concentrated strongly in particular urban areas. The problems associated with cultural pluralism are prominent modifiers of this culture realm.

Australia :

Australia has achieved identity as the island realm of Australasia. Australia and New Zealand are European outposts in an Asian-Pacific world. Although Australia was spawned by Europe and its people and economy are western in everyway, Australia as a continental realm is far from the crowded, productive, populous European world. With its British heritage, its homogeneous population, single language and type of economy. Australia's identification as a realm rests on its remoteness and spatial isolation.

The Soviet Union :

The Soviet Union–the world's largest country territorially constitute a culture realm not just because of its size. Since the world war II the state has risen from a backward, divided, near feudal country to a position of world power with a strong, individualistic culture, a highly advanced technology, and a set of economic and social politics that have attracted world attention and in some instances emulation.

Japan :

Japan is unlike any other non-western country, and it exceeds many western developed countries in many ways. In the post-war period Japan's overall economic growth rate has been the highest in the world. Japan constitutes a culture realm by virtue of its role in the world economy today, the transformation , in one century of its national life and its industrial power.

The Pacific World :

Between Australasia and the Americas lies the vast Pacific ocean, larger than all the land areas of the world combined. In this great ocean lie tens of thousands of islands, large (such as New Guinea) and small (some even uninhabited). This fragmented, culturally complex realm defies effective generalization. Population contrasts are reflected to some extent in the regional diversification of the realm. Thus the islands from New Guinea eastward to the Fiji group are called 'Melanesia'. North of Melanesia that is east of the Philippines, lies the island region known as 'Micronesia'. In the vast central pacific, east of Melanesia and Micronesia and extending from the Hawaiian islands to the latitude of New Zealand, is 'Polynesia'. Culture in the Pacific realm is similarly complex.

UNIT 4 ❐ CULTURAL DIVERSITY

Structure

4.1 RACE, RELIGION, LANGUAGE AND ETHNICITY

The cultural diversity includes race, religion, language, ethnicity, and tribes. The geographers considers 'race' from two different angles. In the scientific view, race concerns the physical variety of men as inherited and passed on from generation to generation and manifested in the biologically distinct groups living in different parts of the earth. The scientific approach differs sharply from the popular notion of what constitute 'race'. Each human group perceives its own racial character and that of others through the lens of culture.

Biologically speaking mankind is a single species, that is, an interbreeding population descended from a single source. Differences among human result from diversification and remixing within the species.

Geneticists tell us that man inherits from his parents such characteristics as the shape of nose, skin color, hair form and so on.

Race, then is first and foremost a biological concept, for it refers to people's physical features. A racial group such as European, African is recognized because it has a distinctive combination of such physical traits, the product of a particular genetic inherence. This inherence has been determined by many centuries of isolation and inbreeding, during which a certain dominant genes-a gene-pool–evolved for each racial group. As the concept of race was redefined, other terms emerged : Caucasoid, Negroid, Mongoloid, Australian. Classification are still changing. Anthropologists have recently been using a nine unit racial classification of man; (1) European (2) Indian, peoples of Indian subcontinent (3) Asian, people of China, Japan, inner Asia, South East Asia, Indonesia (4) African, peoples of African, south of Sahara (5) American, the indigenous Indian populations of the Americas (6) Australian, the original people of Australia (7) Micronesian (Melanesian) (9) Polynesian. The last three groups as already noted are the people of the Pacific Ocean's islands.

The European race includes not only Scandinavians, Russians, Germans but also

peoples of South West Asia (such as the, and Iranians, Syrians, Saudi Arabians) and North Africa (Egyptians, Algerians Moroccans).

The physical traits that form the bases of racial classification are color of the skin and the people's hair.

Skin color is to most people the hallmark of race. Skin color is the most pervasive of physical traits, and the differentiation by color has bedeviled human relationships for uncounted centuries. Skin color is a matter of pigmentation, a protective element against strong radiation. The more pigment, the darker the skin. But there are internal variations within groups; there are dark skinned northern Europeans and light skinned Africans.

Another somewhat obvious physical feature is the character people's hair; whether it is straight or woolly, fine textured or thick. Hair form and texture show significant racial differences. Asians tend to have straight hair, Europeans, curly hair and the African, woolly hair. Again, there are differences in people's stature or height.

Although this factor is related with to adequacy of nutrition, it is clear that there are genetic forces at work as well; under similar living condition peoples have developed quite different average heights. Most striking are the pygmies, who average less than 5 feet. Observations of other peoples indicate that stature increases with better food, medical care and hygiene.

Still another, less obvious physical trait lies in the shape of the head, like Japanese have round heads, Western European have long head etc.

Other physical traits including the shape of the eye, nose, of the lips, and the degree of protrusion of the jaw, all provide data to compare, but little in the of evidence for the racial differentiation of humanity. Among some African and Australian peoples prognathism (protrusion of the jaw) is common. Broadest noses are found in West Africa, the narrowest in Northern Europe, and those intermediate in Asia. It is very recently another physical feature has been studied with more success, the blood and blood group. There are four blood types : A, B, AB, and O. The world distribution of blood types holds much interest, although it remains subject to different interpretations.

The O gene occurs in high percentages among western Europeans, Australian aborigines, people of northeastern Asia, American Indians and some African populations. Lower O gene frequencies occur in East and central Asia and in the Middle East. The A gene is less easy to regionalize; high proportions are found in some outlying European populations, among North American Indians, among some Balkan and Middle Eastern peoples, and among some groups of Australian aborigines. Type A is almost absent in Middle and South America with low frequencies in

Africa, South Asia and north eastern Asia. The 'gene for blood type B is common in central and South East Asia, and in some parts of Africa.

It is no wonder, then that many different classification have been proposed. In the eighteenth century, Blumenbach, using skin colour as a differentiating feature identified 5 races, a century later, Deniker liste d29 races based on hair form, skin colour, and nose shape; in 1946 Hooton recognized 3 main racial stocks with 23 subraces, giving some consideration to mixtures. Certain classifications give the impression that they refer to sharp divisions, implying that each has arisen from "pure" types (Scientific American, 1960).

The Main Racial Stocks :

The great mass of the people belong to heterogeneous peoples with variable genetic structures. Although the physical types merge imperceptibly into one another, one can identify three distinct sets of genetic features which allow a broad division into Negroid, Mongoloid and Caucasoid racial stocks.

The Negroid set includes black skin and black woolly hair, dark eyes, broad and flat nose, thick and everted lips, long head, prognathous jaw and stocky body build. The region of selection appear to have been the hot and bright savanna lands of West Africa.

The Mongoloid sets includes light yellow to brown skin brown eyes, straight and coarse black hair, flat face and nose broad head, high cheek bones, and short stocky build. The regions of selection were the dry and bright mid latitude steppes with pronounced summer and winter seasons of Central Asia.

The Caucasoid sets includes fair skin and eyes, light and wavy hair, prominent and narrow nose, thin lips and abundance of body hair.The areas of selection were the damp, cool cloudy tundras and forests of western Eurasia. The climatic- vegetational-environmental mentioned do not describe the present, but the ecological conditions during the last glaciation.

Characteristics of Major Races :

Trait	Caucasoid	Mongoloid	Negroid
1. Skin colour	Pale reddish white to olive brown	Saffron to yellow brown, some reddish brown	Brown to brown black, some yellow brown
2. Stature	Medium to tall	Medium tall to medium short	Tall to very short

Trait	Caucasoid	Mongoloid	Negroid
3. Head form	Long' to short, medium to very high	Predominantly broad, height medium	Predominantly long, height low to medium
4. Face	Narrow to medium broad	Medium to very broad	Medium broad to narrow
5. Hair	Light blonde to dark brown colour and fine to medium texture, straight form	Brown to brown black colour and coarse texture, straight form	Brown black colour, coarse texture, woolly to frizzly form
6. Eye	Light blue to dark brown colour	Brown to dark brown colour	Brown to brown black colour
7. Nose	Narrow to medium broad	Medium broad	Medium broad to very broad
8. Body build	Linear to lateral slender	Lateral	Tends to be lateral and mascular
9. Blood group	More A than B	High in B	High in Rhe

Source: *Haddon, A.C. 1925, and Krogman, W.M. 1945*

Present Distribution of the Main Races :

The true Negro lives in West Africa.

The classic Mongoloid individual is found today in Mongolia. It is not so easy to divide the Caucasoid peoples into distinct subgroups living in separate regions. This is particularly true of Europe, where many migration shave resulted in much mixing and remixing. Three principal types can be recognized : (i) Nordic people, fair skin, wavy blond or red hair, blue eyes, narrow noses and long heads; They form the majority in Scandinavia, and a large minority in British Isles, North Germany (ii) The Alpines have broad necks, light skin and straight to wavy brown hair; they too are found in varying proportions in Europe. (iii) The Mediterranean type occupies lands from Portugal and Morocco to the Indian subcontinent. The nose is generally large, the head long, eyes dark and facial features smooth. The Mediterranean traits gradually fade away in South-east Asia and the islands of the Pacific Ocean.

Isolated Peoples :

Easiest to classify are several small isolated groups. Their isolation means that their genes play only a minor role in determining the physique of the mass of mankind.

Isolated Peoples :

Group	Features	Examples
Negritoid	Yellow to brown skin, Black spiral hair, short stature; Negrillo and negrito have different blood group	Congo river, Upper Nile Pygmy (Negrillo) Andaman Island,Semang of Malaya, New Guinea Pygmy (Negrito)
Bushmanoid	Hair and skin like Negrito, flat face,	Bushmen and Hottentots of southern Africa
Australoid	Dark skin and eyes. Dark wavy hair Broad nose Full lips Long head A and O blood types	Australian aboriginals, Ainu of Hokkaido and Sakhalin Yedda of Ceylon Sakai of Malaya Kununba of Deccan Plateau Bhil, Gonda of Deccan Plateau Oraon of Chotanagpur
Papuan-Melanesian	Much like the Australoid, but more frizzly hair	Papuans of New Guinea Melanesians of Solomons

Source : *A Geography of Mankind, p. 80*

The above table summarizes the nature and location of these peoples.

Religion

In many parts of the world, and especially in non-Western areas, religion is so vital a part of culture that it practically constitutes culture. In some societies, notably in the Western, industrialized urbanized commercialized world, religion has become a rather subordinate, ephemeral matter in the life of the many people. But in societies like Asia and Africa religious doctrine may exert light control over behaviour, through rituals and practice. Such rituals may attend significant events in people's lives; birth and death, attainment of adulthood, marriage. They are also expressed in routine manner in most of the Sundays in the Western world.

Religions especially the major, world scale faiths such as Christianity and Islam have produced vast and complex organizational structures. Modes of dress, the kind

of food people should or should not eat, commercial practices and even the location and the structure of the houses may be determined by rules of religion. In fact, society depends for its existence on a common ideology. Religion is among the foremost of ideologies. The main religion each have their centre of origin, routes of diffusion and pattern of present distribution. According to the Gelman sociologist Max Weber, a religion produces a distinct attitude towards life, and this orientation affects the further development of the society in question.

Sources and the Distribution :

The main religions : Buddhism, Christianity and Islam are soften called 'universal' religions, because each aims at worldwide, supranational acceptance. They, as well as Judaism are also exclusive in the sense that each holds its truth incompatible with that of the others (Kroeber,1948).

The religions of Christianity are presently the most widely distributed around the world, dominating in Europe, North and South America as well as Australia, the Philippines and residually in the Soviet Union. The Protestant Christian religions are in the majority in Northern and parts of Northwest Europe, in Canada and the United States, in Australia and in South Africa; Roman Catholic prevails in Southern Europe, Middle and South America and in the Philippines.

The Islam dominates Northern Africa, Southwestern Asia, extending into the Soviet Union and China and including outlying provinces in Indonesia, Bangladesh and Philippines. Islam is strong along the East Africa coast, and a 'substantial Islamic minority of the world resides in India.

The Hindu faith, is the religion primarily of India. Though the faith also extends over Nepal, Bangladesh, Myanmar and Sri Lanka.

Another religion that and its source in India, Buddhism is now a minority faith in that country but still strong in South East Asia, China and Japan.

The World Religions :

Hinduism :

Chronologically, the Hindu religion is the oldest of the major religions and one of the oldest extant religions in the world. Hinduism appears to have begun in the region. Hinduism appears to have begun in the region of the Indus valley, perhaps as long as 4000 years ago. The fundamental doctrine of the faith is the karma, which involves the concept of the transferability of the soul.

Hinduism is a manifestation of Indian ethos, as also of an extremely deep rooted spiritual-cultural pattern, which originated in an area of oldest civilizations of the world.

Hinduism's doctrine are closely related to the caste system.

Hinduism, born on the Indian subcontinent's western flank, spread eastward across India and even before the advent of Christianity into South eastern Asia. Hinduism is the age-old religion of India, which honour many gods and goddesses, and all of whom however are regarded as manifestations of the one divine spirit. Its core of origin is believed to lie between North West Frontier and Punjab. Rig Veda the oldest of Vedas does give evidence of its existence in tills part of the Indian subcontinent during Vedic times of Indian history. The historic records of Hinduism, thus date back to Vedic period around five thousand years ago. It was about 1500 B.C Aryan tribes of Indo European speech invaded India from the northwest and came in contact with the Indus Valley culture and might be that they had taken much from this culture and shifted to southeastward to the interfluve of Jamuna and Ganges river. By tills time Aryans accepted female deities from Dravidian culture mainly under Brahmin caste people. Aryans were divided into four groups; Brahmins, Kshatriyas, Vaishyas and Sudras.

Caste system originated at the time of the Aryans.

The total Hindu population in 2001 was about. The Hindus constitute about 12 percent of the total population of the world. Apart from India, the Hindus are found in Indonesia, Malayasia, Thailand, Kampuchia, Laos, Vietnam, Sri Lanka, Nepal, Mauritius and fiji. Hindus have migrated to almost every part of the world, particularly to U.K., Middle East, Africa, Canada, U.S.A South East Asia, Australia etc.

As an ethnic religion of India, Hinduism is tied to the holy character of much of the Indian landscape. There are numerous pilgrimage centres of Hindus and Hindus consider pilgrimage as an act of purification.

Nepal is the only Hindu Kingdom of the world. India which has the largest concentration of Hindu population (over 800 m) is a secular state.

However relaxation of caste rules mostly noticeable in the north than in the south, and mainly in the cities. Whether it will eventually result in the disappearance of the caste system is hard to foretell.

Buddhism :

According to tradition, Gautama was bom in the foothills of Nepal in the late sixth century B.C. and spent most of his life in the middle Ganges region. He became Buddha-the Enlightened One, when he perceived the path of salvation in the four noble truths.

Buddhism made slow headway in northern India. Thus Buddhism appeared in India during the sixth century B.C. as a reaction to the less desirable features of Hinduism. The faith was founded by Prince Siddhartha, heir to a wealthy kingdom

in what is now Nepal. The Buddha was perhaps the first prominent Indian religious leader to speak out against Hinduism's caste system. Buddhism now spread as far as south as Sri Lanka, and later west towards Mediterranean, north into Tibet, and east into China, Korea, Japan, Vietnam and Indonesia , all over a span of some 10 centuries. Like other religions, there ate two school of thoughts in Buddhism–the Hinayana the southem school. Because of its location in the south (Sri Lanka, South East Asia)and the Mahayana, which had its followers in the East Asian countries/ (China, Korea, Japan etc). Of the two, Hinayana was older and was associated with original precepts of Buddhism.

Today, Buddhism is practically extinct in India but there three pockets where it is still found arc Ladakh region of Jammu and Kashmir, the state of Sikkim and parts of Maharashtra though it still thrives in Sri Lanka, in Southeast Asia, in Nepal and Tibet and in Korea. Along with other faiths it also exists in Japan. The Buddhists constitute about 6.1 percent of tile total population of the world.

At one time, Buddhism became the most popular religious thought of most of Asian countries. It is said that at one time Tibet's population consisted of Lamas (Monks), Dalai Lama was the chief of lamas in the hierarchy and enjoyed both the political and spiritual leadership in Tibet. But after the annexation of Tibet by China in 1950s, Dalai Lama fled to India.

Distribution of Buddhist Population (2001) :

Countries	Buddhist Population	% of Total Population
Africa	84,801	0·012
Asia	699,324,941	98·73
Europe	1,795,849	8·25
America	3,610,579	0·79
Oceania	436,390	0·06

Chinese and Japanese Religion :

In China and Japan, important ethnic religions arc found. While Buddha's teachings drew converts in India and the issue of the transmigration of souls was debated there, a religious revolution of quite another kind was taking place in China (551-479 B.C.) and his followers constructed a blueprint for Chinese civilization in almost every field – philosophy, government, education and more.

In religion, Confucius addressed the traditional Chinese cults that included beliefs in heaven and the existence of the soul, ancestor worship etc.

Chinese philosophy was at the same time, being influenced by another school, Taoism.Taoism was founded by Lao Tsu (604-517B.C.)a contemporary of Confucius.

Lao's writings emphasized the mystical or magical aspect of life. Into this complex Confucianist-Taoist contest, Buddhism was introduced during the Han Dynasty as well.

Emperor worship, a reverence for nature and a strong feeling for land and nation are elements that forged the Shinto religion of Japan. The rulers of Japan recognized. Shintoism as the state religion of Japan until the Second World War. Following Japan's defeat in World War II, Shinto's role as the official state religion was terminated and the doctrine relating to the emperor's divine descent also was rejected.

Shintoism was thus as much a political cult as a religion and in cultural sense all Japanese are Shintoists. Many Japanese profess adherence to both Shintoism and Buddhism.

Judaism :

The oldest major religion to emerge west of the Indus region, Judaism grew from the belief system of the Jews, one of several Semitic, nomadic tribes that traversed South west Asia 2000 B.C. the Jews led an existence filled with upheavals. Moses led them from Egypt, where they had suffered oppression, to Canaan–where an internal conflict arose and the nation split into two, Israel and Judah. Israel was subsequently wiped out by enemies, but Judah survived longer, only to be conquered by the Babylonians. Regrouping to rebuild Jerusalem, the Jews fell victim to a sequence of alien powers and saw their holy city destroyed again in 70 A.D. Now the Jews were driven away and scattered all over the region and eventually into Europe and much of the rest of the world.

Modem time shave seen a division of Judaism into several branches.

Born in the deserts of Middle East about 3800 years ago, Judaism refers to the religion of the Jews-Hebrew. The ancestors of Jews were from among the Semitic speaking tribe, who nurtured the idea of one and only one God. The end of ancient Jews as an independent people came in 584 B.C. when Roman conquerors from Babylonia destroyed Jerusalem and sent them into exile. Even when they were allowed to retum, they had to remain under control of foreign masters. Finally, a revolt against romans in 70 A.D. led to their full dispersal.

Christianity :

The Christian religions had their beginnings in the Jews' search for deliverance from Roman oppression and the appearance of Jesus. Many saw in Jesus a manifestation of God, but probably even more hoped that he would be a temporal as well as a spiritual leader and secure freedom as well as salvation. It was Paul who played a central role in organizing the Christian church and disseminating Jesus' teaching to the European Mediterranean world. After Paul's death the church continued to grow, but at the cost of many lives as Roman authority resisted the intrusion.

A.crucial event in the development of the Christian faith was the conversion of the Emperor Constantine and from the fourth century A.D. onward it was the state religion. The eastern part Roman Empire remained the centre of Christian-hellenistic culture. By late 4th century the patriarchs of Church namely, Rome, Antioch and Alexandria had come up initiating the era of spreas and consolidation of Christianity.

The worldwide dispersal of Christianity was accomplished by the era of colonial acquisition on which Europe embarked at about the same time. Spain invaded Middle and South America bringing the Catholic faith to those areas. Protestant refugees, tired of conflict and oppression and in search of new hope and freedom came in large numbers to North America.

Today, Christianity is the most widespread and largest of the universal religions and the most pronounced missionary zeal in the world today and it is still gaining adherents in many areas. The faith has always been characterized by the aggressive and persistent proselytism of its proponents and Christian missionaries created an almost worldwide network of conversion during the colonial period. Christian accounted for 30.6 percent of the world population. They were mainly found in Europe, Latin America, Africa, North America, Asia and Oceania respectively.

Like all religions, Christianity too has had its reformists-the Protestants. The demand to reform the Church had been common to all Roman Catholic countries since 12th century onward. Such reforms succeeded only in limited areas and remained confined to the limited tenitories. Overseas migration of Christian from Britain, Netherlands and the North Western European countries of North America, South Africa, New Zealand etc gave all these colonies an essentially Protestant character. Protestants constitute 60 percent and Roman Catholics account for 40 percent pf country's population. The widespread missionary activities of the Christian colonizers in Asia and Africa during 19th century also led to large scale conversion to Christianity in all these areas.

In general, Roman Catholics are found more in north Europe, and Protestants in South Europe while Eastern Orthodox in East Europe.

Distribution of Roman Catholic Population (2001) :

Countries	Roman Catholics	% of Total Population
Africa	136,550,898	13·40
Asia	122,961,279	12·07
Europe	236,197,142	23·18
America	515,505,246	50·60
Oceania	7,642,673	0·75

Distribution of Protestant Population (2001)

Countries	Roman Catholics	% of Total Population
Africa	160,051,482	26-99
Asia	62,385,639	10·52
Europe	117,868,043	19·90
America	239,139,124	40·32
Oceania	13,474,012	2·27

Islam :

Like Judaism, Islam too had its birth in the deserts of Arabia around 600 AD when Prophet Mohammed who lived in Mecca began his mission.

The faith of the Moslems is the youngest of the major religions having been born of the teachings of Mohammedtborn in 571 AD). Islam brought to the Arab world not only a unifying religious faith, but also a whole new set of values, a new way of life, a new individual and collective dignity. Mosques made their appearance in arab settlements, not only for the Friday prayer but also to serve as social gathering places to bring communities closer together. With the death of the prophet in 632, Islam spread over North Africa and by 9th century A.D. extended from Egypt to Morocco, most of Spain and Portugal and a unified realm encompassing Arabia, the Middle East, Iran and most of Pakistan, At the end this Arab empire extended from Morocco to India and from Turkey to Ethiopia. The original capital was at Medina in Arabia, but in response to these strategic successes it was moved first to Damascus and then to Baghdad.

The Islam is again divided into two sects, the Sunnis and the Shias. Sunnis are much larger in number comprises over 90 percent of muslim population (almost five times as that of Shias), while Shias are concentrated in Iran and are ail important minority in bordering areas of Iraq, some in India, Pakistan, Syria, Lebanon etc. The total population of Muslim in 2000 was about 1000 millions. Muslim population accounts for 17,5 percent of world population. The major concentration of Muslim population are in Asia (570 million) and Africa (255 million). Bangladesh and Indonesia are also the countries of Islam people. Others are less in importance, like Europe, North America, Latin America and Oceania.

Distribution of Islam Population (2001)

Countries	Roman Catholics	% of Total Population
Africa	412,324,632	27·23
Asia	1,023,564,005	69·34
Europe	44,090,366	2·98
America	9,830,503	0·822
Oceania	372,968	0·025

LANGUAGE

Language is a vital element of culture. Language is a great force of socialization.

What is language? The term has been defined in numerous different ways. Webster defines it as 'a systematic means of communicating ideas or feelings by the use of conventionalized signs, gestures, marks or especially articulate vocal sound'.

But there are also special uses and accents that have regional expression. These are dialects. The two main types of dialect are the geographic dialect, spoken by the people of the same area or locality, and the social dialect used by people of the same social class, educational level or occupational group.

In general, the greatest language diversity occurs in heterogeneous societies where the extent of most people's communication is restricted to a local area. Often these people are bilingual or multilingual because knowledge of neighbouring languages are essential for trade and other socio-economic and cultural interactions.

So depending on these definition there are 255 to 3500 languages are in use in the world today of which 1000 of them in Africa only.

In the classification of languages– (i) Languages grouped in a family are thought to have a shared origin; (ii) in the subfamily their commonality is more definite. These are divided in to language groups, which consist of sets of individual languages.

The spatial distribution of the languages of the world is most complex. Over 95 percent of the world population, however speak at least one of the most common 100 languages. In fact 50 percent of the world population speak at least one of the ten major languages.

The spatial distribution of languages has two main characteristics : (i) the areal size of the regions are not consistently proportional to their population size. (ii) The language region do not necessarily coincide with the national boundaries.

The 10 major languages of the World is shown in the table below :

Rank	Language	Population(m)
1.	Chinese	1015
2.	English	360
3.	Spanish	265
4.	Hindi	230
5.	Arabic	165
6.	Bengali	165
7.	Portuguese	150
8.	Russian	147
9.	Japanese	120
10.	German	100

Source : *Fellmann et al. (Human Geography, p.128)*

Here are 29 dominant languages in the world, each of which is spoken by more than 40 million people.These are :

- Mandarin (China)
- Hindi (India)
- Arabic
- Bengali (Bangladesh, India)
- Malay-Indonesia
- German
- Urdu (Pakistan, India)
- Korean
- Tamil (India, Sri Lanka)
- Cantonese (China)
- Wu (China)
- Vietnamese
- Min (China)
- Ukrainian
- Swahili (East Africa)
- English
- Spanish
- Russian
- Portuguese
- Japanese
- French
- Punjabi (India, Pakistan)
- Telugu (India)
- Marathi (India)
- Italian
- Javanese
- Turkish
- Thai
- Polish

Language Families of the World

1. **Indo-European**
   - A. Germanic
   - B. Romanec
   - C. Slavic
   - D. Baltic
   - E. Celtic
   - F. Albanian
   - G. Greek
   - H. Armenian
   - I. Indo-Iranian
2. **Afro-Asiatic**
3. **Niger-Congo**
4. **Saharan**
5. **Sudanic**
6. **Khoisan**
7. **Ural-Altaic**
8. **Sino- Tibetan**
9. **Japanese and Korean**
10. **Dravidian**
11. **Austro-Asiatic**
12. **Malay- Polynesean**
13. **Papuan and Australian**
14. **American Indian**
15. **Others**
    - A. Basque
    - B. Caucasian
    - C. Andamanese
    - D. Vietnamese
    - E. Paleo-Asiatic
    - F. Eskimo-Aleut

Languages of Europe :

The language map of Europe shows the Indo European language family to prevail over the region with pockets of the Ural-Altaic family occurring in Finland and Hungary and adjacent areas. Subfamilies include Germanic language (English, German Swedish) the Roman languages (French, Spanish, Italian) the Slavic languages(Russian, Polish, Bulgarian) and others. The Indo-European language family dominates not only in Europe but also in much of Asia (the Soviet Union and India), North and South Amcrica, Australia and in parts of Southern Africa. Indo European languages are spoken by about half the world's people, and English is the most widely used Indo-European language today

Languages of Africa :

The languages of Africa are mostly of the Niger-Congo family, which extends from West Africa all the way to the south. Tlns Niger-Congo family is sub divided into five sub families. One of these is the Bantu subfamily, whose languages are spoken by most of people near and south of the Equator. In West Africa, the languages are of'.the Atlantic,Voltaic, Guinea, and Hausa subfamilies.The oldest language of Black Africa are the Khoisan languages, which includes Bushman languages;

In fact the various language family in Africa are—

16. **Indo-European family**
    - 1a. Germanic subfamily
    - 1b. Romance subfamily
17. **Afro-Asiatic family**
    - 2a. Semitic subfamily
    - 2b. Berber subfamily
    - 2c. Cushitis subfamily
18. **Niger-Congo family**
    - 3a. Atlantic subfamily
    - 3b. Voltaic subfamily
    - 3c. Guinea subfamily
    - 3b. Hausa subfamily
    - 3c. Bantu subfamily
19. **Saharan family**
20. **Sudanic family**
    - 5a. Central and Eastern subfamily
    - 5b. Nilotic subfamily
21. **Khoisan family**
22. **Malay-Polynesian family**
    - 7a. Indonesean subfamily

Multilingualism :

In many countries a linguistic fragmentation reflects a strong cultural pluralism as happened in Asia and Africa, This also occurred in America too.

Countries never colonized in comparable ways, but people from different cultural sources may also display multilingualism. Canada's Quebec Province is the heart of that country's French speaking sector, and Canada's multilingualism mirrors a cultural division of considerable intensity.

Countries like, India, Nigeria and Switzerland are multilingual countries in which several languages are spoken.

India :

India is the home of a very large number of languages. In fact, so many languages and dialects are spoken in India that it is often described as a 'museum of languages'.

In popular parlance it is often described as 'Linguistic pluralism'. According to the Linguistic Survey of India there were 179 languages and as many as 544 dialects.

The linguistic heterogeneity can be grouped into four language family,

1. Sino-Tibetan (Tibeto-Burman)
2. A ustro-Asiatic
3. Dravidian
4. Indo-European

Broad classification of Modern Indian Languages :

Family	Subfamily	Branch-Group	Speech Area
Austric	Austro-Asiatic	Mon-Khmer	Meghalaya, Nicobar Islands West Bengal, Bihar, Orissa,
	Austro-nesian	Munda	Assam, Madhya Pradesh, Maharashtra Outside India
Dravidian		South Dravidian	Tamil Nadu., Karnataka, Kerala
		Central Dravidian	Andhra Pradesh, Madhya Pradesh, Orissa, Maharashtra
		North Dravidian	Bihar, Orissa, West Bengal, Madhya Pradesh
Sino-Tibetan	Tibeto-Myanmari	Tibeto-Himalayan	Jammu and Kashmir, Himachal Pradesh, Sikkim Arunachal Pradesh
		North Assam Assam Myanmari	Assam, Nagaland, Manipur, Mizoram, Tripura, Meghalaya, Outside India
Indo-European	Indo-Aryan	Iranian	Outside India
		Dardic	J ammu and Kashmir
		Indo-Aryan	Jammu and Kashmir, Punjab, Himachal Pradesh, Uttar-Pradesh, Rajasthan, Haryana, Madhya Pradesh, Bihar, Orissa, West Bengal, Assam, Gujarat, Maharashtra, Goa

Source: *Social Geography by Aijazuddin Ahmed, p282*

Bilingualism :

Bilingual countries are those in which two languages are spoken to the practical

exclusion of all others. It is necessary to qualify this definition, for even in the prototype of bilingual countries, Belgium, there is a tiny minority of German speakers– and so it is in Canada, in Czechoslovakia, in Guyana all bilingual countries as well. Canada is perceived as an English speaking country reflects the subordinate position of French community. But the population sector that is of British origin constitute well under 50 percent of Canada's people; just over 30 percent are French speaking, and some. 20 percent are those other European stock. Quebec was 'French Canada', while it was British and the European people who opened Canada's western interior and these people merged into a Canadian culture whose language was and remains English.

Monolingual Countries :

Few of the countries are noted as monolingual, and use only one language. If Brazil is a monolingual country despite the existing mosaic of Indian languages, then Australia is in the same class with a little bit of black minority (speaking a set of indigenous languages), Japan speaks overwhelmingly the same language, again with a minor exception of the Hokkaido based Ainu minority, Several Arab countries are monolingual.use Arabic language including Egypt and Libya.

Linguistic Heterogeneity :

Indian society is ethnically variegated and consists of numerous racial strand and a host of tribes and castes. Superimposed on this is the linguistic pluralism. In fact, the spoken languages are so diverse that India is often described as a distinct socio-linguistic area. The communication network through spoken language unifies the people into a single identity and evidently the geographical distribution of languages and dialects has contributed to a distinctive pattern of cultural regionalism. From Kashmiri and Punjabi in the north to Tamil and Malayali in the south, and from Gujarati and Marathi in the west to Bengali and Assamese in the east–all language groups have their unique cultural identity. It is commonly known that these dominant languages became the basis of state formation in India after independence. All ecological setting, a shared history, common folklore and literary tradition and contiguous geographical territory are essential elements of this identity.

ETHNICITY

This is one of the most difficult concepts in the social sciences to define. The etymology of this term dates back to ancient Greece, where the word ethos was used to refer to a distinct 'people'. The word ethnic originally entered the English language as an adjective applied to non-Judeo Christian peoples. The first instance of the word ethnicity used as a noun occurred in the early 40s, when researchers sought to find a replacement for the word 'race'. In contemporary usage, ethnicity is as both a way in which individuals define their personal identity and a type of social stratification that emerges when people form groups based on their real or perceived origins.

Members of ethnic groups believe that their specific ancestry and culture mark them as different from others.

There is much confusion regarding the concept 'ethnicity'. Two misconceptions are particularly common. First, many use the term only to refer to minority groups assuming that people in the majority are 'normal' while everyone else is 'ethnic'. While this usage was considered acceptable in the nineteenth century but at present it no longer accepted. Secondly, ambiguity arises when the term ethnicity and race are used interchangeably or when they are seen as valiants of the same classification system.

For example, it is often thought that the people can be divided into three or four broad racial groups and that each has a number of ethnic sub-divisions (e.g. race = Caucasian, ethnicitye—Italian.)

Once defined, such boundaries are extremely difficult to cross. Racialized minorities become ethnic groups when they achieve social solidarity on the basis of their distinct culture and background.

However, ethnicity is not uniformly important to all people; the degree of ethnic identity and attachment varies strongly between and within societies.

Acknowledging the variability of ethnic affiliation, theorists have long debated the causes of ethnic identity and division. Two distinct views dominate the literature; ethnicity as primordial or absolute, vs. ethnicity as constructed, as the outcome of other social processes (Jenkins, 1996). Those advocating the former see ethnicity as a basic form of affiliation that naturally emerges as people are socialized into cultures with long histories; children are born into ethnic groups and develop deep-seated attachments to them.

Researchers advocating constructionist views, conversely assert that ethnic attachments arise in specific contexts, for specific reasons. For example, a person can legitimately identify her/himself as English in the United Kingdom, British in other European countries, European in Asia and 'white' in Africa.

Geographers have shown a long standing interest in documenting the causes and consequences of urban ethnic segregation. Much of the work stems from the conceptualization of HUMAN ECOLOGY articulated by Robert Park of Chicago School in early twentieth century. During the 60s attention focused on plotting the ethnic 'ghettos', devising the way of measuring the degree of ethnic segregation. By the end of the decade, a concern for ethnic residential patterns entered the mainstream of urban theory and increasingly sophisticated models of urban land use were devised.

Geographers have also begun to examine the intersections between ethnicity and other forms of personal identity and stratification notably, 'Class' and 'Gender'

Global Scenario :

There are more than 260 million indigenous people over the world. They constitute about 4 percent of the total population of the world living in almost seventy countries. The greatest number however found in Asia of which India and China represents the most The indigenous people are termed as 'Fourth World'. These people are the descendents from a country's aboriginal population and who today are completely or partly deprived of the light to their own tenitory.

Indigenous people are strikingly different and diverse in their culture, religion, social and economic organizations. They are still being exploited by the outside world. But today, development has brought changes in their traditions and culture, livelihood and to their society. Tribes like Red Indians of North America, Andamanese have faced this development stages and resisted. Many of the tribes are at the verge of extinction. In the Amazon Basin alone there were 170 tribes of which 54 lives ill unexplored zone of Amazon.

The Pygmies of Congo Basin :

The pygmies are the simplest people and the most primitive. The best known Pygmy groups are those who live in Tropical Africa. The various tribes of African Pygmies are classified into the eastern, central and western groups.

Classification and Distribution of African Pygmies :

Eastern Pygmies	Mabuti	Lived in Ituri forests of Zaire
Central Pygmies		Congo Republic
Westem Pygmies	Bongo	Found in Gabon

Stature :

Generally, the stature of Pygmies varies from 1.33 metres to 1.49 metres. The colour of the skin ranges from yellowish or reddish brown to very dark brown. They have prognathic jaws, broad flat nose, large eyes and dark woolly hair. They live on hunting, trapping and gathering wild fruits and forest products. They live in small communities.

Habitat :

The Congo Basin situated on both sides of the Equator ha shot and humid climate throughout the year which favours luxurious growth of plants. These forests consist of broad leaved evergreen trees. TIle forest canopy is almost complete has an average height of 50 meters or more. There is wide variety of epiphytes too. The Pygmies obtain firewood, tannin extracts, dyes, rubber, bamboo, resin, timber various medicines, like quinine, cocaine, camphor etc from the forests.

Food :

Pygmies are food gatherers and hunters who live in small groups in the forests of Congo basin. They live in isolation. The Pygmies depend mainly on vegetable foods, hunting and occasional fishing. Usually they hunt rats, squirrels, birds, lizards, and occasionally monkeys and wild pigs.

Clothes :

Because of extreme climate of humid hot they prefer to live without clothes. What they wear is made of bark strip or vegetable fibres. The Pygmies build their hut at tree top.

Tools :

The tools of Pygmies are few and simple. Woods, animal bones bamhoo are usually used.

Trade :

The Pygmies of Congo basin practice 'silent trade'. The Pygmy hunters go by night to their neighbours with meat in a wrapped leaves and in return they find with grains at their home. The transacted goods are almost of equal value.

The Pygmies are still in primitive stage of civilization. Pygmies live close to nature. Many of them are attached to the Negro village and engaged in the barter system of trade. The Pygmies are therefore free people who are not at any cost degrading the environment.

4.2 TRIBAL INDIA

India today displays a very high degree of social and ethnic diversity. The population of India comprises of a multitude of caste and tribal groups, representing different stages in the social evolution of the humankind.

It can be said broadly that the contemporary Indian society comprises of two mutually exclusive and differentiated social categories–a class based social order with an implicit social hierarchy and a tribal segment by and large unstratified and egalitarian in both appearance and content.

Indian society use the word 'tribe' to denote a state of tribalism which is ethnic (ethnically defined) and political (revealing tile definitional status as scheduled tribes).

It is known that the earlier societal formation was a tribal formation. The early human depends for their survival on the immediate surroundings. These ancient hunters and food gatherers organized themselves in groups based on extended kinship principle.

An elderly person often a male, enjoyed authority over the rest of the group. With growth in population the group expanded in size and with it the territory expanded and the tribal chief became an important instrument in maintaining internal cohesion. It may be postulated thatdespitc the commanding status, the institution of tribal chief did not disturb the egalitarian .character of the group.

The tribes evolved a simple technology to deal with the natural situations. Anthropologists have discovered evidence of the primitive tools and techniques which were commonly employed by the ancient hunters in their studies of the modem tribes in Africa, Latin America, and South and Southeast Asia. The primitive tools based on stone cores or flakes, or when stone was combined with wood or bones of animals constituted the material culture of the tribal society. They have a common practice of their own, particularly in worshipping the evil spirit.

This social organization has certain basic distinguishing traits. The social organization is simple, without any stratified or hierarchical social order.

However, in terms of social evolution, tribal groups did not display a uniform pattern anywhere in the world. The tribe as a society with a political, linguistic and a somewhat vaguely defined cultural boundary; further as a society based upon kinship, where social stratification is absent.

Defmition :

Conventional anthropology treated all people as tribes who were backward in one sense or the other, lived in the remote, inaccessible areas—backward areas. According to Andre Beteille (1977), 'A tribe is in an ideal state, a self contained unit. It constitutes a society in itself.' The process by which tribes have been transformed is a historical process. When one goes by antecedents of a group one can say with confidence whether or not it should be considered as a tribe. India's tribal world is diverse and ethnically differentiated. As per the official agencies, there are at least 285 different communities living in different regions of the country in their own specific ecosystems.

TRIBAL GROUPS IN INDIA

Tribes are mostly rural phenomenon. It is estimated that about 90 percent of tribal people have rural origin. Bihar, Uttar Pradesh, Arunachal Pradesh, Orissa, West Bengal, Madhya Pradesh, Rajasthan, Kerala, Assam, Himachal Pradesh and Tripura are the states which represents tribal population. The tribes of Tripura are mostly of rural origin as they are concentrated in villages. The tribal people of Tamilnadu, Nagaland, Maharashtra, Meghalaya and Karnataka are also largely rural with a range of 85-87 percent. The only exception is Mizoram where the tribal people have been drawn into an urban way of life.

Again urban tribes are also noticed in Maharashtra, Madhya Pradesh, Gujarat and Bihar, but in Mizoram the urban proportion is high. There is evidence that the urban

economies have accommodated the tJibes only marginally. TIley are unskilled labourers engaged in low paid jobs and living in squatter colonies.

Distribution of Tribal Communities :

The Gonds :

Gonds are one of the most numerous tribal groups of India. Gonds have been living for ages in a vast region in the peninsular interior but at present major concentration is found in the Bastar plateau and in the upper reaches of the Narmada, Godavari and the Mahauanda rivers.

Habitat :

Today Gonds are concentrated in Bastar region of Madhya Pradesh. Due to its physical characteristics a portion is covered by a dense growth of tropical forest.

Physical Features :

The Gonds are a people with dark skin and medium height. Hair is dark, and face is broad with thick lips. They are slenderly built.

Affinity :

The racial position of the Gonds is still uncertain. According to Majumdar, Gonds a people of the aboriginal type mixed with the Mediterranean stock of Europe, while others like, Risley, they are Dravidians and by Dalton as pro- Dravidian.

Language :

Formerly Gonds spoke a language known as 'Gondi' which is related to Tamil and Kanarese; but at present they speak a dialect of Hindi known as 'Gondwani'.

Material Culture :

Majority of the Gonds are cultivators; they are found to be engaged in food gathering, shifting cultivation to sedentary cultivation. The traditional systems being the Shifting cultivation known as 'bewar' in Mandla and 'dippa' in Bihar. Nowadays, plough cultivation is in regular practice though shifting cultivation is still practiced in the hilly areas. As a subsidiary occupation Gonds practice hunting and fishing.

Food :

The staple diet of the Gonds is formed by two varieties of small millet known as 'kodo' and 'kutki'. At night they prefer a dish of rice. At times of scarcity they also consume 'mohua' flowers. Gonds like all sorts of meat. The distilled liquor of the mohua flower I staken in large quantity by the Gonds. This liquor is not only an addiction but also indispensable in all religious and ceremonial performance.

House :

A Gond house often consists of four huts—one for dwelling, one stable,one shed for various purpose and another for occasional guests. Goud prefer to build houses on cliffs or on high lands.

Household Utensils :

The various utensil sused in a Gond house consist those related to grains, such as grinding mills, grain pestle and winnowing scoop; for storage and cooking like, baskets, pots and pans; an dthose related to economic activities, such as, axes, picks and furniture.

Dress and Personal Decoration :

The Gonds male wear a short loincloth between legs fitted with waist string. A woman wears a long sheet of cloth.

Gond male wear wristlets made of tin or silver and ear rings, while Gond women wear various types of ornament, mostly made of silver or brass. Like other aboriginals, Gonds also love tattoo.

Gonds are concentrated in a geographically contiguous belt extending over south-eastern parts of Madhya Pradesh, eastem part of Maharashtra and northern Andhra Pradesh.

The spatial pattern of concentration is evident from the fact that at state level 72 percent of the country's total Gond population is found in Madhya Pradesh only. About 16 percent of the Gonds live in Maharashtra while Orissa accounts for 8 percent of the country's Gond population. Again about 14 percent of this Gond population live in the Bastar district of Madhya Pradesh. Bastar is followed by Mandla and Chaudrapur which share 7 percent and 6 percent respectively.

However the development programmes launched in the Gond region since independence and which have affected the process of growth and redistribution.

4.3 IMPACT OF GLOBALISATION ON REGIONAL CULTURE

India has entered in the phase of open door policy which raising the base of its economy. People are more prone to education, professional degrees. India has made provision for its private sector growth and likewise change in the look of the culture. Planning, development, privatization-liberalization-globalization has its impact not only in the economy but also on its culture.

It is very interesting that model village concept came accordingly with wide expansion in IT field, as for example in Punjab, a rural village can avail the Email facilities. While Bangalore has achieved a special status of IT based economy and it has opened wide vistas by establishing intemational law institution.

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