

## 1. Details of Module and its structure

Module Detail	
Subject Name	Geography
Course Name	Geography 03 (Class XII, Semester - 1)
Module Name/Title	Secondary Activity-Manufacturing – Part 1
Module Id	legy_10601
Pre-requisites	Basic Knowledge about Secondary Activity Manufacturing
Objectives	After going through this lesson, the learners will be able to understand the following: <ul style="list-style-type: none"><li>• Manufacturing</li><li>• Characteristics of Modern Large Scale Manufacturing</li><li>• Classification of Manufacturing Industries</li><li>• Factors influencing the location of Industries; Geographical and Non-Geographical Factors</li></ul>
Keywords	Manufacturing industry, Cottage or household industries, Large scale industries

## 2. Development Team

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2. Characteristics of Modern Large Scale Manufacturing
3. Classification of Manufacturing Industries
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Fig No. 01 An industrial worker amidst heavy steel semi-products (KINEX BEARINGS, Bytča, Slovakia, c.

Source : [https://upload.wikimedia.org/wikipedia/commons/f/ff/Worker\\_9.JPG](https://upload.wikimedia.org/wikipedia/commons/f/ff/Worker_9.JPG)

With industrial revolution, the use of inanimate power by harnessing energy of water, coal, and petroleum brought tremendous changes in the primary sector. It helped in the evolution of large manufacturing system, which utilised products of the primary sector and hence, called secondary. Production of raw materials for both domestic and industrial uses grew. As a result, the purchasing power of the people engaged in primary activities increased and it led to the growth in the demand for manufactured goods. It thus, promoted growth of the secondary activities.

At the outset, it would be useful to explain what do we mean by the terms ‘industry’ and ‘manufacturing’. We, very often, use terms like film industry, fishing industry, steel industry and tourism industry, but each of these represents a different kind of economic activity. However, geographers usually use the term ‘industry’ to describe those activities which are concerned with processing, fabricating and manufacturing of primary produces obtained from agriculture, forestry, fishing and mining. Industry is called a secondary activity to distinguish it from primary activities. The secondary sector includes those economic sectors that produce a finished, usable product or construction. This sector generally takes the output of the primary sector and manufactures finished goods or where they are suitable for use by other businesses, for export, or sale to domestic consumers. Secondary activities

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add value to natural resources by transforming raw materials into valuable products. Cotton in the boll has limited use but after it is transformed into yarn, becomes more valuable and can be used for making clothes. Iron ore, cannot be used; directly from the mines, but after being converted into steel it gets its value and can be used for making many valuable machines, tools, etc. The same is true of most of the materials from the farm, forest, mine and the sea. Secondary activities, therefore, are concerned with manufacturing, processing and construction (infrastructure) industries

### **Manufacturing**

*Manufacturing* literally meant ‘making by hand, but now it also includes goods made by machines. It is a process, which involves transformation of raw materials into finished goods of higher value. For example, cotton is an agro-product. It is used as a raw material in the manufacture of cotton textiles, which may further be transformed into garment. Cotton textiles and garments are products of manufacturing

Manufacturing involves a full array of production from handicrafts to moulding iron and steel and stamping out plastic toys to assembling delicate computer components or space vehicles. In each of these processes, the common characteristics are the application of power, mass production of identical products and specialized labor in factory settings for the production of standardized commodities. Manufacturing may be done with modern power and machinery or it may still be very primitive. Most of the Third World countries still “manufacture” in the literal sense of the term. It is difficult to present a full picture of all the manufacturers in these countries. More emphasis is given to the kind of “industrial” activity which involves less complicated systems of production

The United Nations defines manufacturing as ‘the mechanical and chemical transformation of inorganic or organic substance into new products, whether the work is performed by power-driven machinery or by hand, whether it is done in a factory or in the worker’s home, and whether the products are sold wholesale or in retail.’ This is, however, a very broad definition. Usually modern *manufacturing industry* is characterised by complex organisation, specialised labour, use of machinery and inanimate power and mass product.



Fig. No. 2 Industrial Sites

Source: <https://www.agtinternational.com/wp-content/uploads/2013/11/Chemical-Plant.jpg>

### **~Manufacturing Industry and ~Manufacturing Industry**

Manufacturing literally means ~to make by hand. However, now it includes goods ~made by machines. It is essentially a process which involves transforming raw materials into finished goods of higher value for sale in local or distant markets conceptually, an industry is a geographically located manufacturing unit maintaining books of accounts and, records under a management system. As the term industry is comprehensive, it is also used as synonymous with ~manufacturing” When one uses terms like ~steel industry and chemical industry one thinks of factories and processes. But there are many secondary activities which are not carried on in factories such as what is now called the ~entertainment industry and Tourism industry, etc. So for clarity the longer expression ~manufacturing industry is used.



Fig .No : 03 Large-scale manufacturing.

Sources: [https://en.wikipedia.org/wiki/Manufacturing#/media/File:Robocrane\\_Project.jpg](https://en.wikipedia.org/wiki/Manufacturing#/media/File:Robocrane_Project.jpg)

### **Characteristics of Modern Large Scale Manufacturing**

Modern large scale manufacturing has the following characteristics

#### **Specialization of Skills/Methods of Production**

Under the ‘craft’ method factories produce only a few pieces which are made-to-order. So the costs are high. On the other hand, mass production involves production of large quantities of standardized parts by each worker performing only one task repeatedly.

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## **Mechanisation**

Mechanisation refers to using gadgets which accomplish tasks. Automation (without aid of human thinking during the manufacturing process) is the advanced stage of mechanisation. Automatic factories with feedback and closed loop computer control systems where machines are developed to 'think', have sprung up all over the world.

## **Technological Innovation**

Technological innovations through research and development strategy are an important aspect of modern manufacturing for quality control, eliminating waste and inefficiency, and combating pollution.

## **Organizational Structure and Stratification**

Modern manufacturing is characterized by:

- i. A complex machine technology
- ii. Extreme specialization and division of labour for producing more goods with less effort, and low costs
- iii. Investment of huge capital
- iv. Large organizations
- v. Executive bureaucracy

## **Uneven Geographic Distribution**

Major concentrations of modern manufacturing have flourished in a few numbers of places. These cover less than 10 per cent of the world's land area. These nations have become the centres of economic and political power. However, in terms of the total area covered, manufacturing sites are much less conspicuous and concentrated on much smaller areas than that of agriculture due to greater intensity of processes. For example, 2.5 sq. km of the American corn belt usually includes about four large farms employing about 10-20 workers supporting 50-100 persons. But this same area could contain several large integrated factories and employ thousands of workers. Industries maximize profits by reducing costs.

## **The location of Industry**

The location of industry at a particular place is governed by many factors. Traditionally, these were grouped under geographical and non-geographical factors. While geographical

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factors included relief, climate, raw materials, energy sources, labour market and means of transportation, non-geographical factors comprised of governmental policies, capital, market and management.

This view is highly deterministic because location cannot be explained in absolute terms. For example, the location of cotton textile in Lancashire (UK) cannot be explained only in terms of the presence of the humid climate, soft water, abundant coal and the position of Liverpool in the Atlantic trade. Similar conditions were present at many other places including South Wales. Lancashire, therefore, had the relative rather than the absolute advantage of time and space. To get over this shortcoming, industrial location is now explained in terms of factors associated with assembly, processing and distribution, government policies, environment, industrial inertia and the human factor. These factors do not operate in isolation, but in a complex system of interrelationships. The relative importance of these factors varies with time, space, type of industry and also the economy. It is important to remember that not all factors at a particular time are favourable, and that most of the good locations have been those where the number of favourable factors has outweighed the unfavourable ones. In fact, an optimum location is a relative term. Therefore, industries should be located at points where the production costs are minimum. Some of the factors influencing industrial locations are as under:-

### **Access to Market**

The existence of a market for manufactured goods is the most important factor in the location of industries. ~Market “means people who have a demand for these goods and also have the purchasing power (ability to purchase) to be able to purchase from the sellers at a place. Remote areas inhabited by a few people offer small markets. The developed regions of Europe, North America, Japan and Australia provide large global markets as the purchasing power of the people is very high. The densely populated regions of South and South-east Asia also provide large markets. Some industries, such as aircraft manufacturing, have a global market. The arms industry also has global markets.





Fig .No : 04 Packaged food aisles at an American grocery store

Sources [https://en.wikipedia.org/wiki/Food\\_industry#/media/File:Fredmeyer\\_edit\\_1.jpg](https://en.wikipedia.org/wiki/Food_industry#/media/File:Fredmeyer_edit_1.jpg)

### **Distance**

It is one of the most important factors explaining the location of industries. It is not simply a question of physical distance in terms of km, although it is not unimportant. It is a question of cost and time involved in moving goods. It is therefore, appropriate to talk in terms of economic distance, which is determined by the mode of transport, the type of commodity and freight rates. The prime concern of a manufacturer is to reduce the economic distance and hence, transport plays a crucial role in location of industries.

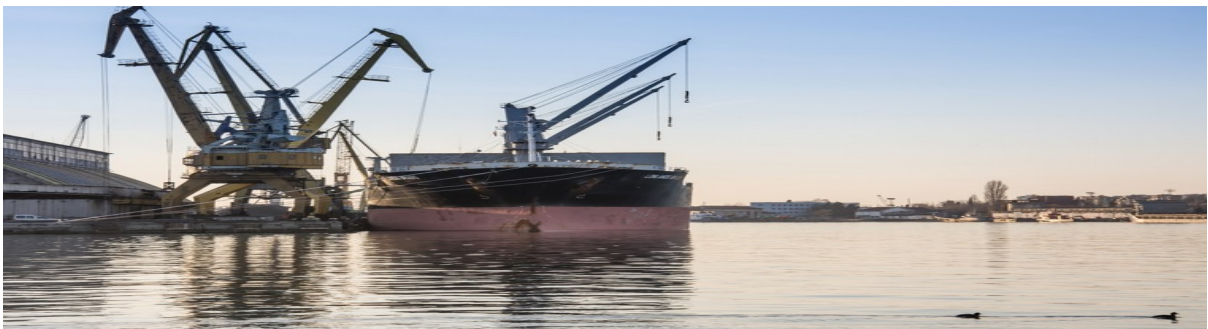


Fig .No : 05 Industrial harbour

Sources <https://pxhere.com/en/photo/1276193>

### ***Access to Raw Material***

Raw material used by industries should be cheap and easy to transport. In early times, location of industries was tied to the location of raw materials. With improvements in transportation and handling facilities, the movement of raw materials has become easier. Industries are becoming more and more specialised and complex. As a result, fewer and fewer firms are directly based on crude and bulky raw materials. In countries like USA and Japan, most of the manufacturing industries use semi-produced products. Technological

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advancements have intensified the use of raw materials by reducing waste in manufacturing and also improving them at the source itself so that they can be easily transported. Industries based on cheap, bulky and weight-losing material (ores) are located close to the sources of raw material such as steel, sugar, and cement industries. Perishability is a vital factor for the industry to be located closer to the source of the raw material. Agro-processing and dairy products are processed close to the sources of farm produce or milk supply respectively. Nevertheless, there are certain industries in which raw materials play an important role. For example, industries which lose either bulk or weight in the manufacturing process such as copper smelting or in industries where the raw material is perishable such as fruit canning; the processing takes place near the raw material.

### **Access to Labour Supply**

Labour supply is an important factor in the location of industries. Some types of manufacturing still require skilled labour. Increasing mechanisation, automation and flexibility of industrial processes have reduced the dependence of industry upon the labours.

### **Access to Sources of Energy**

Industries which use more power are located close to the source of the energy supply such as the aluminium industry. Historically, energy sources have had considerable effect on the location of industry. Even today there is a strong correlation between industry and coalfields. Industries using large amount of energy such as electro-chemical and electro-metallurgical industries, are still located near the sources of electricity generation. But it is declining in importance as a location factor because fuel efficiency has been improving considerably. While in the eighteenth century, more than 8-10 tonnes of coal were required for smelting 1 ton of pig iron, but today hydroelectricity and petroleum are also important sources of energy for many industries.

### **Water**

It is used in most industrial plants for processing, steam raising or cooling. As such, water supplies both in terms of quantity and quality are important in considering the location of industry. Water requirement of industries varies considerably. While some need more such as iron and steel industry (200,000 litres to produce one ton of steel), others like electronics need less. Yet, shortage of water in an area can be a serious deterrent for locating and industry.





Fig .No : 06 Industrial basin in Zlín.

Sources: [https://upload.wikimedia.org/wikipedia/commons/7/73/Water\\_basin%2C\\_industry%2C\\_Zl%C3%ADn.JPG](https://upload.wikimedia.org/wikipedia/commons/7/73/Water_basin%2C_industry%2C_Zl%C3%ADn.JPG)

### ***Access to Transportation and Communication Facilities***

Speedy and efficient transport facilities to carry raw materials to the factory and to move finished goods to the market are essential for the development of industries. The cost of transport plays an important role in the location of industrial units. Western Europe and eastern North America have a highly developed transport system which has always induced the concentration of industries in these areas. Modern industry is inseparably tied to transportation systems. Improvements in transportation led to integrated economic development and regional specialisation of manufacturing. Communication is also an important need for industries for the exchange and management of information.

### **Environment**

Physical attraction of an area is an important factor. Congenial living conditions are preferred while setting up industries. For example, in the USA, the aircraft industry has moved to the south western part of the country because of climatic advantage. Due to warm climate, hangar heating costs are less in this region.



Fig .No : 07 physical environment

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[https://pixabay.com/p-2049211/?no\\_redirect](https://pixabay.com/p-2049211/?no_redirect)

### **Industrial Inertia**

Many industries remain at a particular location even after the disappearance of initial advantages. Availability of infrastructure facilities such as transport and services, and immobile physical capital such as building encourage inertia and new industries are attracted. Some industries are location leaders, either because they provide raw materials for other industries, or because they require specialist firms to supply parts.

### **The Human Factor**

Among several considerations, the ultimate decision is taken by the humans. Their personal choices thus influence locational decisions.

### **Government Policy**

Governments adopt regional policies to promote balanced economic development and hence set up industries in particular areas. Governments encourage or restrict developments in certain areas. Economic and social considerations are important factors influencing the government's decision. It is the duty of a government to ensure that the country's resources are used to the best advantage and that there are no great inequalities in the distribution of wealth. Similarly political and strategic considerations also have strong influence on industrial location. In order to reduce regional imbalances, many countries and regions demarcate certain areas for location of industries

### ***Access to Agglomeration Economies/ Links between Industries***

Many industries benefit from nearness to a leader-industry and other industries. These benefits are termed as agglomeration economies. Savings are derived from the linkages which exist between different industries. These factors operate together to determine industrial location.

### **Access to Labour market**

It is also an important locational factor. Differences are found not only in the quantity of labour available but also the quality of labour as represented by the skills that an area can offer. For example, diamond cutting and polishing need skilled workers. It explains the concentrations of diamond cutting and polishing in Surat (India)

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### **Access to Good Management**

It is an important factor in the choice of sites. For example, it is vital to know whether the selected site will be able to attract good managers.

### **Capital**

It is yet another important locational factor because it is less mobile internationally. Unstable areas with high risk and uncertain returns are likely to be less favoured. However, with the development of banking services money capital has become much more mobile within a country.

### **Classification of Industries**

Industries can be classified in many ways: size, nature of products and raw materials, and ownership.

### **Classification by Size**

The amount of capital invested, number of people employed and the volume of production determine the size of an industry. Accordingly, industries may be classified into the following groups: cottage or household, small scale and large scale industries.

*Cottage or household industries* are the smallest manufacturing units. The craftsmen of the artisans with the help of their family members manufacture goods within their home using local raw material and simple tools. The skills of production are passed on from one generation to the other. The scale of operation is small. The tools and equipments are ordinary. The goods produced are generally, sold locally. Thus potters, carpenters, weavers and blacksmiths produce goods in the household sector. In many countries of Asia and Africa, this sector is quite important and some of the handicraft items are in the great demand in the developed countries.

Small scale industries are differentiated from the former by the technique of production. They use modern power driven machines and employ labour as well. The raw materials are also obtained from outside, if not available locally. These industries are larger in size than cottage industries. Their products are sold through traders beyond local markets. In many developing countries, the roles of these industries are crucial as they provide employment to

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a large number of people. In countries like India and China, a large number of goods such as clothes, toys, furniture, edible oil and leather goods are produced by small scale industries.

*Large scale industries* included mainly heavy and capital intensive industries, which use heavy machineries, employ large number of workers and produce goods for a bigger market. The management is hierarchy-based and complex. Emphasis is laid on quality control and production specialisation. Such industries require a very large resource base and hence, raw materials are obtained from various places. The production of goods is also various places. The production of goods is also on a large scale, which is sent to distant markets. These industries, therefore, require good infrastructure facilities such as roads, railways, and power supply. Iron and steel industry, petro-chemicals, textiles and automobiles fall under this category.

Some geographers prefer to divide manufacturing industries on the basis of size of operation and the nature of products together. Accordingly, there are two classes. *Heavy industries* are of large-scale. They deal in bulky products and are heavily dependent on the raw materials and hence, tend to be located near the source of raw material e.g. iron and steel industry. Light industries are usually small-scale in operation. They deal in lighter and compact products. For them, accessibility is the most important factor. The electronics is one example of this kind.

### **Classification by Outputs**

Industries whose products are used to produce other goods are called basic industries. Iron and steel industry is one of the basic industries because steel produced by this industry is used in many other industries as a raw material. Some basic industries produce machines which are used to produce other goods.

Industries which produce goods for direct consumption such as tea, bread, soap and television are known as non-basic or *consumer goods industries*.

### **Classification by Inputs**

Depending upon the raw materials used for the industries, they may be classified as agro-based, forest-based, mineral-based industries, and chemical industries.

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Agro-based industries are those which utilise agricultural products as raw materials. Cotton Textiles, tea, sugar and vegetable oil industries are its examples. Forest-based industries are those which utilise forest products as raw materials e.g. paper and furniture industry. Mineral based industries are those which use minerals as raw materials. Industries based on metals are known as metallic industries. These are further divided into ferrous and non-ferrous industries. Industries based on metals having iron content are called ferrous industries e.g. iron and steel industry. On the other hand, Industries based on metals without iron content fall into the category of non-ferrous industries e.g. copper and aluminium. Industries based on chemicals are called chemical industries e.g. petrochemicals, plastics – synthetic fibres and pharmaceuticals. Some of these industries use raw materials found naturally e.g. minerals such as mineral- oil, salts, sulphur and potash, and vegetable products. Some chemical industries use the by-products of other industries.

### **Classification by Ownership**

On the basis of the ownership pattern and management practices, industries can be classified into government or public, private and joint sectors. When the ownership and management of an industry is in the hands of the state, it is called a public sector industry. The state establishes and runs these units. Industries owned and managed by an individual or a corporate body belong to the private sector. Individuals invest their own capital to establish these industries and they manage them as private enterprise. Sometimes individuals join together under partnership to establish industries. The share of partners, both in the capital investment and profits, is pre-decided. Industries are also established by corporations. Such a body is formed by individuals or organisations to fulfil pre-determined objectives and goals. Capital for the industry is collected by selling shares. The large multinational corporations such as Pepsi, Hindustan Lever and General Electric have set up industries in several countries across the globe. An industry own and managed jointly by the state and private initiatives falls in the Joint sector.