

## **S5 GEOGRAPHY**

### **INDUSTRIALISATION IN GERMANY**

Germany is one of the most industrialized countries in Europe. The Ruhr industrial region is the largest industrial complex or conurbation in Germany where it lies in the northern margin of the Rhenish uplands on the both sides of the river Ruhr or where it lies within tributaries of the Rhine River such as Ruhr, Lippe and Emscher. It is located in the western part of Germany and owes much of its development to the presence of the Ruhr coal fields. For long it has been an important iron and steel producing centre in Europe.

The industrial region is enclosed by rivers Lippe in the North, the Rhine in the west, Wupper in the south and river Ruhr itself runs through the conurbation. It covers an area of about 80km from Duisburg to the west of Dortmund in the east where over 18 manufacturing industries support a dense population of 10 million people.

It attracted industries such as textile industries, chemical industries, engineering, paper, rubber, pottery, glass ware and iron and steel. The region has well developed transport and communication network to enable easy and cheap transportation of the bulky raw materials such as the Dortmund-Ems canal, the Lippeseite canal, the Rhine-Herne canal etc.

Other industrial centers in Germany include Bremen, Hamburg, Frankfurt, Duisburg and Stuttgart with industries mainly dealing in iron and steel, engineering, textiles and chemicals.

#### **MAJOR INDUSTRIES IN THE RUHR CONURBATION.**

- **Iron and steel industry.** This is the most important industry in the conurbation. The early iron and steel industry was based in the south, continued to the land surrounding the Ruhr and Wupper river valleys. The iron and steel industry now lies in the banks of the river Rhine and between river Ruhr and Emscher. Major producing towns include; Essen, Dortmund, Duisburg, Dusseldorf and Bochum.
- **Coal mining industry.** It has two parts that is the exposed coal field in the south which was the first to be mined and got exhausted and the Concealed parts in the North extending up to valley of river Lippe. This is what supplies the coal required in the iron and steel industry. It was favored by the presence of large reserves of good quality coal and of different types that is gas coal, flame coal and coking coal.
- **The chemical industry.** These are located around Dusseldorf, Bochum, Cologne, Leverkusen etc. The major raw material was and still is oil for the petrol chemical industry as well as coal, salt, potash deposits. Products from these include drugs, synthetic fibres, detergents and dyes.
- **Engineering industry.** These are based at Essen, Dortmund, Rheinhausen, Oberhausen, Gelsenkirchen etc.

- **The petroleum industry.** It has refineries at Essen, Duisburg, Cologne, etc. The main oil refineries have been built by BP oil Company while those along river Rhine are owned by Shell oil Company.
- **The textile industry.** This comprises several industries each having its own specialty. They include those producing cotton, woolen cloths, silk and linen products. There are also those specializing in production of foot ware. Important towns include; Krefeld and Wuppertal.
  - **NB.** Other industries include those making cutlery and musical instruments.

## **FACTORS ACCOUNTING FOR THE CONCENTRATION OF INDUSTRIES IN RUHR REGION.**

The presence of Ruhr coal fields with different types of coal suited for coking attracted iron and steel industries together with other related industries in the Ruhr. Most of the industries use coal as a source of power from the shaft mines and the Rhenish valley especially as fuel to process the iron into steel and then to manufacture products from steel.

The availability of other raw materials for agro based industries such as grapes for the wine industry, livestock products for the dairy industry, imported cotton for the textile industry and the chemical industries led to the development of industries in the region such as wool, flax and bi-products of the coal mining industry. Today, the chemical industry is oil based.

The existence of rivers bordering and crossing the Ruhr region have provided ample quantities of water in the different industries especially in the textiles and food processing industries to work as a raw material, important in cooling and processing. Such rivers include the Rhine, Wupper, Ruhr and Emscher.

The region is blessed with easy and cheap water transport allowing the importation of raw materials in bulk such as iron ore from Sweden and France as well as the shipment of manufactured products. The construction of canals along the water ways has made water transport more dependable such as the Rhine-Herne canal, the Lippeseite canal, Dortmund-Ems canal, Wesel- Datteln canal and the Datteln-Hamm canal.

The supportive government policy towards industrialization of constructing infrastructure and improving the existing roads, railway lines and the water ways easing the transportation of industrial raw materials and finished goods. It also encouraged the merging of industries such as the iron and steel industry making it more efficient and economical.

The large population of over 83.02 million people in the country and the 10.5million people in Ruhr region provided the required man power for a wide range of industrial activities for instance in engineering, transportation and management. These are highly skilled and trained producing high quality products widely demanded hence encouraging more production.

The Ruhr region and Germany as a whole provided a large market for industrial products especially the consumer goods. The Ruhr alone has a population of over 10.5 million people who enjoy high standards of living while other goods are exported to neighboring countries such as France and USA hence promoting more industrialization.

The acquisition by Germany of the Lorraine iron ore field and Alsace coal field from France in 1871 after the Franco-Prussian war enabled Germany to acquire a population with great skills in iron working and coal mining. This boosted production of steel in the Ruhr and elsewhere in Germany.

In the early days, land was available for the establishment and expansion of industries in the region which was possibly due to the low population. Today, this factor is getting less important since land is more increasingly getting scarce which is as a result of the developing and expanding industries.

The initiative of early investors such as Krupp family at Essen, Mayer at Bochum, Tryssen and I.G Froben attracted many other industries especially around Essen to enjoy the economies of scale because it was the headquarters of the Krupp family.

Germany's geographical position along the Rhine as well as in the centre of Europe favored industrialization. It was easy to acquire raw materials and export her manufactured goods via the Rhine water way. Her position further widened market potentials with neighboring European countries such as France, Netherlands and Switzerland.

Availability of iron ore attracted the early iron and steel industry which specialized in agricultural implements to feed the agriculturally potential region that demanded machines to mechanize the sector. Originally iron ore used to come from the nearby Sieger land plateau.

The industrial revolution which had its origin from England and later spread to Germany contributed to her industrial process. It meant a change from economies dominated by agriculture and home crafts to economies dominated by machine manufactured goods. This involved the invention of machines which made work faster and more efficient.

Germany is politically stable and this has attracted large scale investors because of the ideal conditions for investment.

Germany was part of the European Economic Community (EEC) which stimulated production for a wider market.

### **IMPORTANCE OF THE INDUSTRIAL SECTOR IN GERMANY**

Employment opportunities have been created for a large percentage of the German's population working directly in the various industries and secondary social service industries like banking, insurance etc from which income is earned used to raise their standards of living. For example,

Howaldtswerke (HDW) is one of the biggest ship building industries in Germany and employees more than 1500 workers.

Germany earns foreign exchange after the exportation of aircrafts, wine, vegetable oils, vehicles and guns to foreign markets in Japan, USA, Belgium, France, Switzerland etc which is used in the development of other sectors of the economy especially infrastructure development and also creating favorable balance of trade.

Industries are source of domestic revenue through issuing licenses to new industrial establishments, taxing of workers and industrial related activities all contributing to the country's revenue collections which is used in development of infrastructure.

Economic diversification has been realized in Germany offering more sources of revenue for example widening the range of exports i.e. in addition to minerals, agricultural, forest products etc to industrial manufactured goods leading to economic development.

Infrastructural development has been realized in form of better port handling facilities, canals, roads, international airports, water transport on the Rhine water way all to create access to market centers and industrial sites, recreation centers for industrial workers promoting tourism hence contributing to the country's development.

Urbanization has been realized with the coming up of industrial centers, ports and towns such as Bremen, Hamburg, Frankfurt, Duisburg, Essen etc. Some of these act as processing centers and export ports for the country's products with developed infrastructure, modern social service centers and improved standards of living.

Industries have provided ready market to a number of sectors in Germany such as the wine factories providing market for vine growers especially in Rhine rift valley, textile industries providing market for the cotton growers and livestock keepers providing market for foot ware thus encouraged multi sector development.

Industries have encouraged self reliance whereby the country can afford to manufacture its own necessities instead of importing food stuffs, oil products, machinery and textiles. It has therefore helped the country save some foreign exchange.

Better international relationships have been realized between Germany and the importers of her manufactured goods such as Japan, China, Belgium, etc. This has helped in widening market for her products, borrowing technology and the technical human resource.

The country has been able to effectively utilize her natural resources especially minerals acting as raw materials, land providing space for establishment and expansion for industries as well as providing the necessary agro related raw materials such as cotton and vines.

The people of Germany have acquired on job skills like operating machines from the technical human resource brought in by foreign companies. This has helped the Germans to be more efficient increasing industrial output and further industrial development.

The growth of industries and towns, social services established to cater for the needs of the increased population in the various industrial centers or towns further led to the development of more services such as schools, hospitals, electricity and safe drinking water.

It has promoted education, tourism and research. Oktoberfest attracts millions of visitors in Munich. The festival has been held annually in the city since 1810. During the festival, throngs of people crowd into beer tents to socialize, listen to live music and sing traditional drinking songs.

It has attracted foreign investments from all over the world to Germany hence increasing inflow of foreign capital and promoting economic development.

Industrialization encourages technological advancement for high quality and quantity and better methods of production.

Industrialization enhances both local and international trade. A large proportion of German exports such as products like iron and steel, cement, chemical products, electronics, food and beverages, machinery and machine tools and motor vehicles are with other EU countries such as France, the UK, the Netherlands and Italy.

## **PROBLEMS FACING THE INDUSTRIAL RUHR REGION**

Pollution mainly of air, noise and land resulted into respiratory problems hence deaths of valuable labour, poor visibility during morning hours as a result of smoke leading to accidents and asthma.

There is shortage of land for further industrial establishments and expansion due to very large populations and competition from other land uses such as settlement, farming, and recreation.

Coal was a major source of power especially in steel and iron industry and this got exhausted rising cost of production since it had to be imported from the Lorraine region in France and this led to the closure of some industries in the region.

They are face with competition from other modern industrial nations especially USA, China, France and Japan who are producing similar and relatively cheaper products reducing market for her manufactured goods.

The region faces shortage of raw materials especially iron ore necessitating its importation from France rising costs of production that impacts on the final prices and reduced profits.

They are faced with stiff competition with other sectors from the economy such as transport and communication, health, defence and security for government funding.

Accidents are common in the industries and mining grounds leading to death of workers affecting industrial output.

The growth of urban centers such as Dusseldorf, Mainz, and Dortmund led to increased population and subsequent growth of slums and associated evils such as unemployment and prostitution.

The region is faced with a problem of traffic congestion due to over concentration of industries in the Ruhr causing delays in supplying raw materials to various industries as well as manufactured goods to various consumption centers and markets.

Once a country of thick forests, Germany has had this natural vegetation cleared to establish industries and the associated infrastructure for example, the Rhine- Ruhr area, the centre of Germany heavy industry is a vast population hub with five large cities like Dusseldorf, Duisburg, Dortmund, Essen and Cologne.

## **INDUSTRIALISATION IN ASIA**

Despite its large size and natural resources, the continent is generally less industrialized than Europe and North America. Inadequate technical knowledge, inadequate financial resources and conservative attitudes towards industrialization explain the above case. The major industrial countries in Asia are found in the monsoon region in the middle east, east Asia and the south east with countries like China, Japan, India, Burma, Thailand, Indonesia, Malaysia etc. The Middle East countries major in oil refining such Iran, Iraq and Kuwait. Manufacturing industries in Asia include agro based industries processing cereals, oil palm and rubber, timber based industries producing pulp and paper, glue, ply wood and veneer. Oil refineries and petro chemical industries based on local oil reserves in Iran, Burma, Indonesia and Iraq, iron and steel in Japan and China, engineering industries dealing in tools, electrical engineering, ship building, and automobiles especially in Japan, textile industries in India, Taiwan, Thailand, Korea, Indonesia, China and Japan.

## **INDUSTRIALISATION IN JAPAN**

Although Japan has very many minerals and other raw materials, they are too little and of less quality to feed all the industrial requirements. Her industrial growth has therefore depended on

imported raw materials and the use of high level technology that minimize the need for abundant raw materials. There are a number of types of industries in Japan that include;

- ✓ Automobile manufacture with a variety of vehicles being produced. It ranks the third in the world.
- ✓ Ship building where it is the leading producer in the world.
- ✓ Iron and steel manufacture and it is the 5<sup>th</sup> in the world.
- ✓ Machinery and electronics manufacture where it produces steel cuttings, rolling stock, machine tools, television sets, radios and washing machines.
- ✓ Aircraft manufacture where rockets and aeroplanes are produced.
- ✓ Light industries such as textiles, optical and photographic equipment such as cameras, binoculars and microscopes.
- ✓ Food processing industries where fruit canaries are dominant.

### **INDUSTRIAL REGIONS IN JAPAN**

- ❖ **Kitakyushu region.** This region covers Yawata, Kokura, Tobata, Moji, Wakamatsu etc. it is the major center for iron and steel works, chemicals, coal products, cement, glass and pottery ware. These depend on large deposits of limestone and clay found in the region. Food processing is also done dealing in wheat milling, rice processing and canning of food stuffs.
- ❖ **Isebay-Nagoya region.** It is located on the Mino-Owari plain at the head of Isebay where the main town is Nagoya. Industries in this region include textiles from local silk, imported cotton and wool, also use of synthetic fibres as raw materials. it is also important in the manufacture of auto mobiles, locomotives, aircrafts and it is the largest producer pottery products from clay.
- ❖ **Keihin region.** This lies on the Kwanto plains to the East of Honshu. It comprises Tokyo, Yokohama and Kawasaki. Tokyo majors in electrical engineering producing television sets, computers, refrigerators and washing machines. Yokohama is known for ship building, oil refining, petrochemical products manufacture while Kawasaki is for marine engineering, cement and glass works. A few iron and steel industries are centered in the towns of Chibo.
- ❖ **Hanshin region.** This comprises Osaka, Kobe and Tokyo. Osaka majors in textiles, Kobe deals in ship building, oil refining and petro chemical products while Tokyo majors in aircraft manufacture porcelain, toy and ornamental ware. This region is also important for iron and steel manufacture.

## **FACTORS WHICH HAVE FAVOURED INDUSTRIAL DEVELOPMENT IN JAPAN**

Availability of abundant and valuable raw materials especially iron ore, copper from the province of Hitachi, zinc, sulphur, lead, rock salts and phosphates. These favored heavy industries like the iron and steel in Kitakyushu while silk favored textile industry laying a foundation for modern industry using synthetic fibres from local timber and imported oil.

Existence of plains and lowlands found mainly along the lower courses of the country's major rivers, on the lowest slopes of mountain ranges, and along the sea coast which have offered excellent sites for the establishment of industries e.g. Tokyo, Kobe, Nagoya, Yokohama etc.

The Japan's government deliberately supported the establishment of the key industries especially iron and steel manufacture. This was and still is done through granting monopolies and giving subsidies to local industries as well as improving transport facilities.

Japan's coastline has numerous bays and inlets. These provide sheltered harbours and development of many large ports like Tokyo, Chiba, etc making it easy to import raw materials from and export finished products to different parts of the world via the Sea of Japan and the Pacific Ocean.

Japan is strategically located near mainland Asia which is predominantly agricultural providing a ready market for industrial products such as fertilizers, machinery and sprays. Besides, she can export her products using cheap water transport.

Japan's large population of over 127.8 million people (2004) provides a steady supply of both skilled and semi skilled labour force for industrial activities. This has especially been provided by farmers during off season periods due to short supply of farm land.

Japan's education system is technically biased providing nationals with practical knowledge required in industrialization. Besides, its universal system of primary and secondary education made it easier to become an industrial power.

The large population provides a large market for common consumer goods like textiles, watches and electrical appliances. Tokyo alone and its metropolitan area have more than 35 million people. This is also due to their ever rising standards of living of the entire population.

Japan's products are both reliable and universally accepted in design. Manufacturing has therefore widened their overseas markets by building their assembly plants in several countries such as Nissan at Washington as well as combining foreign firms like the Honder-Rover.

The Japanese are hard working and creative and had experience in industrial work even before world war I. Japanese workers have been more willing than elsewhere in the world to accept automation now common in automobile, electronics etc leading to high productivity and efficiency. The iron and steel industry started with low grade iron from sand.



Because of its mountainous nature and high amounts of rainfall, the country has numerous rivers such as Korube, Fugi and Ishikari along which hydro electric power plants have been developed. These supply more than a quarter of the industrial power.

The scarcity of farmland forced the Japanese to direct all their efforts and resources to industrial development.

The presence of advanced technology where robots are used especially in car manufacturing increased on efficiency and industrial output. The country's successful economy is based on the export of high quality consumer goods developed with the latest technologies hence commanding high demand worldwide.

The efficient management of the industrial sector manned by the government and large combined firms known as Zaibatsu led to industrial development. These include Mitsubshi, Toshiba and Toyota where Mitsubshi alone has other sister companies such as Mitsubshi mining company for coal, Mitsubshi ship building company and engineering and Mitsubshi bank limited.

Japan's industrial process also came from the conquest of Manchuria from China in 1993 which had raw materials especially coal and limestone. It also had skilled man power with the knowledge in iron working and steel manufacture and greatly transformed the country's industries.

Japan's post war foreign policy from countries like USA enabled her install new and more efficient industrial plants. These increased competitiveness of Japanese industries since most industries in Hiroshima and Nagasaki had been destroyed in World War II.

The existence of internal competition among the industries, which gives an impetus to industrial development e.g. between Toyota Motor Corporation and Mitsubishi Group which manufacture vehicles and trucks.

### **PROBLEMS FACING JAPAN'S INDUSTRIAL SECTOR.**

Japan has a limited mineral resource base. Although there are several minerals in the country, their reserves are not large enough to support a modern industrial sector.

The country is not well endowed with fossil fuels making it heavily dependent on all imports from the Middle East raising their costs of production.

Other countries in the Far East and Southeast Asia are getting increasingly industrialized for example China, Taiwan, Korea, Singapore reducing Japan's Asiatic market for similar products.

Some industrial regions are already congested and there is limited space for expansion for example Kitakyushu industrial region, this is because Japan is an island.

Japan is threatening the balance of world trade especially in automobiles like cars which are cheap. Therefore, some industrial nations like USA have started limiting the volume of goods they import from Japan in order to paralyze her position.

Strikes are very common in the industrial centers due to poor working conditions and these have affected both output as well as infrastructure.

Japan lies in an area of crustal instabilities and her industrial plants have frequently been affected by earth quakes for instance in 1995, earthquakes destroyed many industrial plants in Kobe.

There is limited hydro electric power to feed all industrial areas due to high rates of industrial establishments compared to opening up new sites for power generation. Almost all potential hydro electric power sites have already been tapped.