



Environmental degradation and hazards caused by manufacturing industries

Brief Note...

- Industrial accidents or hazards may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation.
- **Accident release:** Occurring during the production, transportation or handling of hazardous chemical substances
- **Chemical explosion:** Violent destruction caused by explosion of combustible material, nearly always of chemical origin.
- **Nuclear explosion/Radiation:** Accidental release of radiation occurring in civil facilities, exceeding the internationally established safety levels.
- **Mine explosion:** Accidents which occur when natural gas or coal dust reacts with the air.
- **Pollution:** Degradation of one or more aspects in the environment by noxious industrial, chemical or biological wastes, from debris or man-made products and from mismanagement of natural and environmental resources.
- **Acid rain:** A washout of an excessive concentration of acidic compounds in the atmosphere, resulting from chemical pollutants such as Sulphur and nitrogen compounds. When deposited these increase the acidity of the soil and water causing agricultural and ecological damage.
- **Chemical pollution:** A sudden pollution of water or air near industrial areas, leading to internal body disorders with permanent damage of the skin.

Causes of Industrial Pollution

1. Lack of Policies to Control Pollution:

- Lack of effective policies and poor enforcement drive **allowed many industries to bypass laws** made by the *pollution control board*
- which resulted in **mass scale pollution** that affected the lives of many people.

2. Unplanned Industrial Growth

- In most industrial townships, **unplanned growth** took place wherein those companies flouted rules and norms and polluted the environment with both air and water pollution.

3. Use of Outdated Technologies

- Most industries still rely on old technologies to produce products that generate a large amount of waste.
- To avoid high cost and expenditure, many companies still make use of traditional technologies to produce high-end products.

Causes of Industrial Pollution

4. Presence of a Large Number of Small Scale Industries

- Many small scale industries and factories that don't have enough capital and rely on government grants to run their day-to-day businesses **often escape environment regulations** and release a large number of toxic gases in the atmosphere.

5. Inefficient Waste Disposal

- **Water pollution** and **soil pollution** are often caused directly due to inefficiency in the *disposal of waste*.
- Long term exposure to polluted air and water causes *chronic health problems* and can causes many *respiratory disorders*.

6. Leaching of Resources from our Natural World

- Industries do require a large amount of raw material to make them into finished products.
- This requires the extraction of minerals from beneath the earth.
- The extracted minerals can cause soil pollution when spilled on the earth.
- Leaks from vessels can cause oil spills that may prove harmful for marine life.

Effects of Industrial Pollution on our Environment

1. Water Pollution

- Most industries require large amounts of water for their work.
- When involved in a series of processes, the water comes into contact with *heavy metals*, harmful *chemicals*, *radioactive waste*, and even *organic sludge*.
- These are either *dumped* into *open oceans or rivers*.
- As a result, many of our water sources have a high amount of industrial waste in them which seriously impacts the health of our ecosystem.
- The same water is then *used by farmers* for irrigation purpose which affects the *quality of food* that is produced.
- Water pollution has already rendered many *groundwater resources* useless for humans and wildlife.
- It can at best be recycled for further usage in industries.

2. Soil Pollution

- Soil pollution is creating problems in **agriculture and destroying local vegetation**.
- It also causes chronic health issues to the people that come in contact with such soil on a daily basis.

3. Air Pollution

- Release of toxic gases by industrial plants

4. Wildlife Extinction

- *Habitats* are being *lost*, *species* are becoming *extinct* and it is harder for the environment to recover from each natural disaster.
- Major industrial accidents like *oil spills*, *fires*, *the leak of radioactive material* has not only affected humans badly but also various biotic members of the environment too.

5. Global Warming

- *Smoke* and *greenhouse gases* are being released by industries into the air which causes an increase in global warming.
- Melting of glaciers, extinction of polar bears, floods, tsunamis, hurricanes are few of the effects of global warming.
- *Better technology* is being developed for the disposal of waste and recycling as much polluted water in the industries as possible.
- *Organic methods* are being used to clean the water and soil, such as using *microbes* that naturally use heavy metals and waste as feed.
- *Policies* are being pushed into place to prevent further misuse of land.

9 of The World's Worst Industrial Disasters

1. Tianjin, China, explosions 2015

- ✓ At least 50 people were killed and hundreds injured in a series of massive explosions at a warehouse where hazardous chemicals were stored in the Chinese port of Tianjin. The cause is not yet known, but the tragedy is the latest in a long and bloody history of industrial disasters that have killed thousands of people.

2. Chernobyl nuclear accident, 1986

- ✓ The worst nuclear power plant disaster in history happened on April 26, 1986, when an explosion at Reactor 4 of Ukraine's Chornobyl power plant spewed a cloud of radioactivity over Europe and the Soviet Union.
- ✓ The explosion killed 31 people, but the long-term effects are still unknown.
- ✓ About 4,000 people, most of whom were children in 1986, developed thyroid cancer as a result of the incident. The United Nations estimated the death toll had climbed to 56 in 2005.

3. Halifax explosion, 1917

- ✓ The deadliest industrial disaster in *Canada* happened on Dec. 6, 1917, when a French cargo ship loaded with wartime explosives collided with a Norwegian vessel in the Halifax Harbor, causing a massive explosion that devastated Halifax.
- ✓ About 2,000 people were killed and
- ✓ more than 9,000 injured by debris, fires and collapsing buildings.

4. Centralia mining disaster, 1947

- ✓ On March 25, 1947, a coal mine near Centralia, Ill., exploded and killed 111 people. It happened when an explosive detonation ignited coal dust.
- ✓ The disaster prompted the U.S. Congress to enact more comprehensive safety regulations, including regular inspections, in America's coal mines.

5. Bhopal Gas Tragedy, 1984

- ✓ Early on Dec. 3, 1984, a **pesticide plant** run by Union Carbide in Bhopal, India, spewed about 36 tonnes of deadly methyl isocyanate gas into the city's air, quickly killing about 4,000 people, according to local government estimates.
- ✓ Activists insist the real number is almost twice that, and say the company and government have failed to clean up toxic chemicals at the plant, which closed after the incident.

6. Phillips disaster, 1989

- ✓ On Oct. 23, 1989, a series of explosions killed 23 people and injured 314 at the Phillips *Petroleum Company* plant in Pasadena, *Texas*.
- ✓ The blasts were sparked by an ethylene leak, which the U.S. Occupational Safety and Health Administration blamed on inadequate safety procedures.

7. Rana Plaza collapse, 2013

- ✓ More than 1,100 workers died and about 2,500 were injured on April 24, 2013, when the dangerously built eight - storeys Rana Plaza garment factory in Dhaka, Bangladesh, collapsed.
- ✓ The tragedy drew international attention on the poor working conditions in Bangladesh, where much of the world's big brands make their clothes. It led to unprecedented change, including widespread safety inspections, wage increases and the legalization of labor unions.

8. Benxi colliery disaster, 1942

- ✓ The April 26, 1942, *gas and coal dust explosion* inside a *Japanese-run*, forced-labor mine in Benxi, *China*, is believed to be the deadliest coal mining disaster in history.
- ✓ More than 1,549 Chinese workers, many of them prisoners of war, were killed.

9. Oppau explosion, 1921

- ✓ On Sept. 21, 1921, a tower silo storing 4,500 tonnes of ammonium sulfate/ammonium nitrate fertilizer mixture exploded at the BASF plant in Oppau, now part of Ludwigshafen, *Germany*.
- ✓ Death toll estimates vary, but between 500 and 600 people were killed, and 2,000 injured.



Role of Globalization on Manufacturing Sector in Less Developed Countries

Globalization: Key features

- Globalization refers to the *integration of markets in the global economy*, leading to the increased interconnectedness of national economies.
- The key features of globalization:
 1. All societies have become *interconnected*
 2. International economic integration with global *production*
 3. Transnational media systems creating a global culture, global consumerism to create a *global village*
 4. Global *tourism*
 5. Media *imperialism*

- Globalization is where the *power of national boundaries are becoming less significant.*
- Global communication systems *enables consumers to purchase goods from almost anywhere in the world*, for example Amazon, eBay.
- *This shift has moved economies from local to global processes*
- **Economic globalization** has seen the growth of **transnational companies/corporations (TNCs)**
- Transnational corporations such as **Ford, Apple** are seen to have more power than **nation-states**.
- *They can move production and investment to any country* where economic conditions best suits them,
- TNCs use **countries of convenience** like *China* to produce their goods because labor costs are low
- *Individual nation states no longer have the power to control the activities* of TNCs and so have lost a significant amount of power over their own economies
- **Political globalization**: European Union; United Nations and the North Atlantic Treaty Organization
- **Cultural globalization**: Platforms such as Facebook; Twitter, YouTube, etc. This is seen to be creating a global culture

Why has Globalization Increased?

- **Increased trade** which has become **increasingly free**
- Following the **collapse of communism**, which has opened up many former communist countries to inward investment and global trade.
- Over the last 30 years, **trade openness**, which is defined as *the ratio of exports and imports to national income*, has risen from **25% to around 40% for industrialized economies**, and from **15% to 60% for emerging economies**.
- The **emergence of footloose multinational and transnational companies** (MNCs and TNCs) and the **rise in the significance of global brands** such as Microsoft, Apple, Google, Sony, and McDonalds, has been central to the *emergence of globalization*.
- The drive to **reduce tax burdens and avoid regulation** has also meant the establishment of complex international business structures.

The Advantages of Globalization

Globalization brings a number of potential benefits to international producers and national economies, including:

1. Providing an incentive for countries to *specialize and benefit from the application* of the principle of **comparative advantage**.
2. **Access to larger markets** means that firms may experience *higher demand* for their products, as well as benefit from *economies of scale*, which leads to a *reduction in average production costs*.
3. Globalization enables **worldwide access to sources of cheap raw materials**, and this enables firms to be cost competitive in their own markets and in overseas markets.
4. Seeking out the **cheapest materials from around the world is called global sourcing**. Because of cost reductions and increased revenue, globalization can generate increased profits for shareholders.
5. **Avoidance of regulation** by locating production in countries with *less strict regulatory regimes*, such as those in many *Less Developed Countries*.
6. Globalization has led to **increased flows of inward investment** between countries, which has created benefits for recipient countries. These benefits include the *sharing of knowledge and technology* between countries.
7. In the long term, **increased trade** is likely to lead to the creation of **more employment** in all countries that are involved.

The Disadvantages of Globalization

1. The **over- standardization of products** through global branding is a common criticism of globalization.
2. **Large multinational companies can also suffer from diseconomies of scale**, such as difficulties associated with coordinating the activities of subsidiaries based in several countries.
3. The **increased power and influence of multinationals** is also seen by many as a considerable disadvantage of globalization.
4. **MNCs can operate as local monopsonies of labor**, and push wages lower than the free market equilibrium.
5. Critics of globalization also highlight the **potential loss of jobs in domestic markets** caused by increased, and in some cases, **unfair, free trade**.
 - ✓ This view certainly accounts for the some of the rise in nationalist movements in many developed economies, along with the push for increased protectionism.
6. Globalization can also **increase the pace of deindustrialization**, which is the slow erosion of an economy's manufacturing base.

The Disadvantages of Globalization...

7. Increased risk associated with the interdependence of economies.
8. **Over- specialization, such as being over-reliant on producing a limited range of goods for the global market, is a further risk associated with globalization.**
 - ✓ A sudden downturn in world demand for one of these products can plunge an economy into a *recession*.
 - ✓ Many *developing countries* suffer by ***over- specializing*** in a limited range of products, such as agriculture and tourism.
9. Globalization generates winners and losers, and for this reason it is likely to **increase inequality**, as richer nations benefit more than poorer ones.

Impact on Manufacturing sector in less developed countries

Globalization continues to make possible the worldwide exchange of new technologies, finished goods and even new ideas:

- **Technological support to the countries**
- **Free trade agreements between nations**
- **Capital investment & Infrastructure development**
- **Contributing to the host country's economy**

One of the main factors in choosing to manufacture abroad is a cheaper cost in both production and labor.

Employment in the host countries:

Improves standard of living of people, better education, better economy, more demand:

- ✓ By providing workers with a better standard of living and more disposable income

➤ The spread of knowledge and technology across borders

- In emerging markets, the transfer of technology has helped to boost innovation and productivity even in the recent period of weak global productivity growth.
- Globalization has amplified the spread of technology across borders in two ways.
- *First*, globalization allows countries to **gain easier access to foreign knowledge**.
- *Second*, it enhances **international competition**—including as a result of the rise of emerging market firms—and this strengthens firms' incentives to innovate and adopt foreign technologies.
- The positive impact has been especially large for emerging market economies, which have made increasing use of the available foreign knowledge and technology to boost their **innovation capacity** and **labor productivity growth**.

➤ Capital investment & Infrastructure development

- *Foreign direct investment (FDI)* pertains to **international investment** in which the investor obtains a lasting interest in an enterprise in another country.
- Most concretely, it may take the **form of buying or constructing a factory in a foreign country** or adding improvements to such a facility, in the form of property, plants, or equipment.

➤ Employment in the host countries:

- The importance in studying the effects of globalization on the labor market lies in the fact that *earnings from labor represent the main source of income for the great majority of the inhabitants of developing nations* and especially of the poorer groups of workers, who lack ownership of any other material assets.



IMPACT OF INDUSTRIES ON ECONOMIC DEVELOPMENT



Intro

- “**Industrial development**” has become *synonyms* with the term ‘**economic development**’.
- *Economic development implies higher productivity per capita.*
- And per capita productivity is relatively high in the industry- based secondary sector.
- **As the productivity increases through industrialization, income increases and, as a consequence, the expenditure pattern undergoes a change, the demand for manufactured consumer goods, tends to raise rapidly.**
- Industrialization accelerates economic development through *structural transformation*.
- ✓ Industrialization involves fundamental changes in the structure of an economy both in terms of *output* and *occupational pattern* of workforce.
- ✓ Industrialization initiates a **shift away from the land based agriculture and allied activities to the man and machine based secondary and tertiary economic activities.**
- ✓ Such a shift which **moves workforce from the relatively low-productivity economic activities to the relatively high- productivity economic activities** accelerates economic development.

The Role of Industrial Sector

- As the quality and quantity of **manufacturing sector** increases, it increases the **national income of the country**.
- It increases the **production of goods and services**.
- The **labor receives higher wages**. The income of workers increase and there **living standard** also improves.
- When industrial production increase that **increase exports and revenues of the government**.
- It generates **new employment opportunities**.
- *Industrialization provides machinery* like tractors, threshers, harvesters and spray machines to increase the production of agriculture sector.
- As **the industrial sector expands**, its *production increases and cost of production decreases (Economies of scale)*
- **Industrialization increases the supply of goods for internal and external markets.**

Shift From Primary Sector is a Necessity

- *Unemployment and underemployment* is a major cause of rural poverty.
- **Another major reason for industrialization is that it may be a means to provide employment to those who are either unemployed or partially employed.**
- There is no way of distributing land equally, nor is there enough land to provide every one with an economic holding.
- Under these conditions, even if large allocations are made to agriculture, the rural poor are unlikely to be benefited because they lack command over resources.
- What is required is a diversion of rural unemployed and underemployed to other occupations.
- Huge labor surplus in agriculture where their marginal **productivity is zero** or negligible, if shifted to industry can increase labor utilization and aggregate output.
- Hence secondary *industry becomes an important means of development.*

➤ **Development of Science and Technology:**

- ✓ Industrial development encourages the development of science and technology.
- ✓ The industrial enterprises conduct research and develop new products.

➤ **Capital and Infrastructure Formation:**

- ✓ In agricultural sector, the surplus is small.
- ✓ Its mobilization is also very difficult.
- ✓ In large scale industries, the surplus is very high therefore it can get **higher profit**.
- ✓ These profits can be reinvested for expansion and development.
- ✓ *In this way capital is generated*
- ✓ It stimulates communication, training, interaction within the industry and necessitates the provision of **infrastructural facilities like transport, electricity, marketing, banking services** etc.,

➤ **Industrialization and Urbanization:**

- ✓ Urbanization succeeds industrialization.
- ✓ Industrialization in a particular region brings growth of transport and communication.
- ✓ Schools, colleges, technical institutions, banking and health facilities are established near industrial base.

➤ Importance in International Trade:

- ✓ Industrialization plays an important role in the promotion of trade.
- ✓ The advanced nations gain in trade than countries who are industrially backward.

➤ Use of Natural Resources:

- ✓ Countries rich in natural resources but lacking in capital and technology faces slow economic growth.
- ✓ Resources should be properly utilized to transform them into finished industrial products.

➤ Alleviation of Poverty and Unemployment:

- ✓ Poverty and unemployment can be eradicated quickly through rapid industrialization.
- ✓ With fast growth of industrial sector, *surplus labor* from villages can be put into use in industry.

➤ **Fast Growth of National and Per Capita Income:**

- ✓ Industrial development helps in the rapid growth of national and per capita income.
- ✓ The history of economic development of advanced countries shows that there is a close relation between the *level of industrial development* and the *level of national and per capita income*.

➤ **Sign of Higher Standard of Living and Social Change:**

- ✓ A country cannot produce goods and services of high quality in order to attain decent living standard without the progress of industrial sector.

Shifting of Industries and Its Impact on the Urban Fringe

Urban Fringe

- The rural–urban fringe, also known as the *outskirts*, *rurban*, *peri-urban* or the *urban hinterland*, can be described as the “landscape interface between town and country”
- It is the **transition zone** where *urban and rural uses mix*.
- Characteristics
 - ***Residential developments***: Housing has encroached into the rural-urban fringe, and small villages have grown as more people move out of the cities to commute to work.
 - ***Recycling and landfill***: Facilities such as recycling centres and landfill sites require large tracts of land near good transport links, both of which are characteristics of the rural-urban fringe.
 - ***Recreational***: Golf courses and leisure centres have also grown in the urban-fringe, taking advantage of the good transport links as well as the well populated nearby towns.

Urban Fringe...

- ***Business Parks / Industrial estates:*** With land in the rural-urban fringe being **cheaper**, many *factories that used to be situated in the inner city have relocated to these areas* in order to expand.
- They are also *closer to transport links* to allow for export and import of goods.
- ***Out-of-town shopping:*** With *large, open spaces* and *connections* to the motorway network, the rural-urban fringe is often associated with big shopping centres that are out-of-town.
- *Hypermarkets* also tend to be built in this area.
- ***Farming:*** Farming does still happen in the rural-urban fringe, but *farmers come under great pressure to sell their land for development*.

Shifting of industries

- Industrial *decentralization*
- Urban fringe: an attraction for industries

Advantages:

- ✓ Land prices are cheaper
 - ✓ more available in rural areas
 - ✓ Cheap labor availability
 - ✓ Industry often produce pollution so locating them away from residential areas is sensible
 - ✓ Employment opportunities for local communities
 - ✓ Reduce traffic congestion
- *Ruralization* of industries: A movement from the congested cities to the outlying areas
 - Development of industrial villages and towns

Shifting of industries ...

Disadvantages:

- ✓ The *infrastructure* is sometimes *less developed* in rural areas
- ✓ Scarcity of *communication* channel.
- ✓ Workers in rural areas may be plentiful but they might not be as skilled as those in urban centers.
- ✓ For many companies, their customers are in city tenders so moving away from their customer base is not beneficial.

Impact on urban fringe

1. To *reduce pollution* in the cities
2. To minimize the effects of possible industrial accidents
3. To *create jobs* for the *rural* people
4. To facilitate the rapid development of the rural areas
5. To *reduce production cost* in terms of cheap labor in rural areas
6. Industry may be nearer to the source of raw materials