**Unit 7- Industrial & Economic Geography**

**Key Terms**

**Chapter 10: Development**

Commodity Chain Developing

Gross National Product (GNP) Gross Domestic Product (GDP)

Gross National Income (GNI) Per Capita GNI

Formal Economy Informal Economy

Modernization Model Microfinance

Neo-colonialism Structuralist Theory

Dollarization World-Systems Theory

Trafficking Structural Adjustment Loans

Neoliberalism Export Processing Zones

Special Economic Zones Microcredit Program

**Chapter 12: Industry & Services**

Globalization Fordist

Vertical Integration Friction of Distance

Least Cost Theory Agglomeration

Flexible Production System Commodification

Product Life Cycle Global Division of Labor

Spatial Fix Outsource

Offshore Intermodal Connections

Deindustrialization Break-of-bulk Point

Rust Belt Sun Belt

Growth Pole Technopole

**Key Concepts**

Industrial Revolution

GDP, GNP, GNI, HDI, IHDI, PPP, VAPC, GII

Sectors of the economy (primary, secondary, tertiary, quaternary, quinary)

Characteristics of MDC v LDC

Rostow’s Development Model

Wallerstein’s World Systems Theory

Weber’s Least Cost Theory

Bulk Gaining v Bulk Reducing Industries

Hoteling & Losch Models

Spatially Fixed Costs v Spatially Variable Costs

International Trade Approach v Self-Sufficiency Approach

Renewable v Non-Renewable Energy Sources

Alternative Energy Sources- hydroelectric, solar, geothermal, nuclear, wind

Major Manufacturing Regions of the U.S. & World

Fordist/Post-Fordist

Agglomeration, Deglomeration, Backwash Effect

Maquiladoras

Export Processing Zones

Sustainable Development

**Key Content**

**Chapter 10: Development**

* A **developed country**, also known as a more developed country (MDC) and referred to by the U.N. as a very highly developed country, has progressed further along the development continuum.
* A **developing country**, also frequently called a less developed country (LDC), has made some progress toward development, though less than the developed countries.

The U.N. classifies developing countries into high, medium, and low developing categories.

**Human Development Index** The United Nations compares levels of development on an index called the **Human Development Index** (HDI). The U.N. has computed HDIs for countries annually since 1980. The highest HDI possible is 1.0, or 100 percent. The HDI considers development to be a function of three factors: ***a decent standard of living, a long and healthy life, and access to knowledge.***

The **Gender-related Development Index (GDI)** measures the gender gap in the level of achievement for the three dimensions of the Human Development Index. Countries are ranked based on their deviation from gender parity in the three factors of the HDI. If females and males had exactly the same HDI scores, the GDI would be 1.000. The lowest scores are in South Asia, sub-Saharan Africa, Southwest Asia, and North Africa.

The **gross national income** (GNI) is the value of the output of goods and services produced in a country in a year, including money that leaves and enters the country.

The **purchasing power parity** (PPP) is an adjustment made to the GNI to account for differences among countries in the cost of goods. By dividing the GNI by the total population, it is possible to measure the contribution made by the average individual towards generating a country’s wealth in a year. Per capita GNI measures the average (mean) wealth, not the distribution of wealth.

Other studies refer to **gross domestic product** (GDP), which is also the value of the output of goods and services produced in a country in a year. The GDP does not account for money that leaves or enters the country. Per capita GNI (or any other single indicator) cannot measure perfectly the level of a country’s development.

**Economic Structure** Jobs fall into three categories:

**Primary sector** jobs include activities extracting materials from the Earth through agriculture, mining, fishing, and forestry.

**Secondary sector** jobs process, transform, and assemble raw materials into manufactured products.

**Tertiary** **sector** jobs involve the provision of goods and services to people in exchange for payment.

The **Inequality-adjusted Human Development Index (IHDI)** was created by the U.N. to measure the extent of inequality in the world. HDI is modified to account for inequality within a country, producing the IHDI. HDI and IHDI are the same when a country achieves perfect equality. If the IHDI is lower than the HDI, the country has some inequality; the greater the difference between the two measures, the greater the inequality. The highest levels of inequality are seen in sub-Saharan Africa and South Asia.

**Gender Inequality Index** The UN created the **Gender Inequality Index (GII)** to measure the extent of each country’s gender inequality. The GII combines multiple measures: reproductive health, empowerment, and the labor market. A score of 0 would indicate that men and women fare equally, and a score of 1.0 would indicate that women fare as poorly as possible in all measures. The higher the GII, the greater the inequality between men and women. The GII is higher in developing countries than developed ones.

**Reproductive Health** The reproductive health factor of the GII is based on two indicators:

* The **maternal mortality rate** is the number of women who die giving birth per 100,000 births. The ratio is 16 deaths of mothers per 100,000 live births in developed countries and 171 in developing countries.
* The **adolescent fertility rate** is the number of births per 1,000 women ages 15 to 19. The rate in developed countries is 19 births per 1,000 women ages 15 to 19, while the rate is 53 in developing countries. The lowest teenage pregnancy rate is in Europe where it is below 10 per 1,000. In sub-Saharan Africa the teenage pregnancy rate is 110.

Developing countries are confronted with two fundamental obstacles in attempting to stimulate more rapid development:

* Adopting policies that successfully promote development.
* Finding funds to pay for development.

**Two Paths to Development** Developing countries can choose one of two models to promote development: self-sufficiency or international trade.

**Self-Sufficiency Path** In the self-sufficiency model, countries encourage domestic production of goods, discourage foreign ownership of business and resources, and protect their businesses from international competition. Key elements of the self-sufficiency path to development include the following:

* Barriers limit the import of goods from other places (using tariffs or quotas).
* Fledgling businesses are nursed to success by being isolated from competition with large international corporations.
* Investment is spread as uniformly as possible across all sectors of a country’s economy and in all regions.
* Incomes in the countryside keep pace with those in the city, and reducing poverty takes precedence over encouraging a few people to become wealthy consumers.

**Case Study: India** For several decades after it gained independence from Britain in 1947, India was a leading example of the self-sufficiency model. Limiting foreign companies from importing into India and exercising strong control over companies operating in India were policies followed in this model by India.

**International Trade Path** International trade became more popular beginning in the late twentieth century. The sale of raw materials, food, or manufactured products in the world market brings funds into the country that can be used to finance development.

**Rostow Model** This approach is idealized in W.W. Rostow’s five-stage model, where countries fit into one of the five following stages: traditional society; preconditions for takeoff; takeoff; drive to maturity; age of mass consumption. *(See Models Review or Lecture Slideshow for a visual)*

**International Trade Examples** Rostow’s model appears to have been followed by the four Asian dragons (South Korea, Singapore, Taiwan, and Hong Kong) and petroleum-rich Arabian Peninsula states (Saudi Arabia, Kuwait, Bahrain, Oman, and the United Arab Emirates).

**World Trade Organization** The World Trade Organization (WTO) works to reduce barriers to international trade in two principal ways. First, through the WTO, countries negotiate reduction or the elimination of international trade restrictions on manufactured goods, such as government subsidies for exports, quotas for imports, and tariffs on both imports and exports. The WTO also promotes international trade by enforcing agreements. Critics of the WTO maintain that the decisions made behind closed doors increase the bottom lines of large corporations at the expense of those suffering from poverty. Conservative critics charge that the WTO undermines the power and sovereignty of individual countries because it can order changes in taxes and law that it deems unfair trading practices.

An investment made by a foreign company in the economy of another country is known as **foreign direct investment (FDI)**.Foreign direct investment grew rapidly during the 1990s, from $130 billion in 1990 and $1.5 trillion in 2000 to $16.4 trillion in 2013.In 2013, nearly one-third all FDI destined for developing countries went to China and another one-third went to Brazil, Russia, Mexico, and Singapore. The major sources of FDI are transnational corporations that invest and operate in countries other than which the company headquarters are located.

An alternative source of loans for would-be business owners in developing countries is **microfinance**. Microfinance is the provision of a small loan to individuals and small businesses that are unable to get a loan from commercial banks.

**Fair Trade** has been proposed as an alternative to the international trade model of development that promotes sustainability and provides greater equity to workers, small businesses, and consumers. Fair trade products are made and traded according to standards that protect workers and small businesses in developing countries.

**Fair Trade for Producers** Fair trade is a set of business practices designed to promote a number of economic, social, and environmental goals. These include:

* Raising the incomes of small-scale farmers and artisans by eliminating some of the intermediaries.
* Distributing the profits and risks associated with production and sale of goods more fairly among producers, distributors, retailers, and financiers.
* Increasing the entrepreneurial and management skills of the producers.
* Promoting safe and sustainable farming methods as well as working conditions, such as by prohibiting the use of dangerous pesticides and herbicides and by promoting the production of certified organic crops.

**Fair Trade for Workers** Fair trade regarding workers’ rights requires the following:

* Workers must be paid fair wages – at least enough to cover food, shelter, education, health care, and other basic needs.
* Workers must be permitted to organize a union and to have the right to collective bargaining.
* Workers must be protected by high environmental and safety standards.

**Fair Trade for Consumers** Most fair trade products are food. Fair trade products reach consumers primarily through cooperatively owned groceries. A **cooperative store** is a member-owned, member-governed business that operates for the benefit of its members according to common principles agreed upon by the international cooperative community. The consumer-owned cooperative movement originated in the nineteenth century, as a result of poor working conditions and inequalities during the Industrial Revolution.

**Sustainable Development Goals** To reduce disparities between developed and developing countries, the 193 members of the U.N. adopted 17 Sustainable Development Goals in 2015. All U.N. members agreed to achieve these goals by 2030. The **Sustainable Development Goals** replaced eight **Millennium Development Goals** adopted in 2002 with the goal of achieving them by 2015.

**Chapter 11: Industry & Energy**

**The hearth of modern industry** – meaning the manufacturing of goods in a factory – was in ***northern England and southern England*** during the second half of the eighteenth century. From these two locations, industry diffused to Europe and to North America in the nineteenth century and to other regions in the twentieth century.

**The Industrial Revolution** was a series of improvements in industrial technology that transformed the process of manufacturing goods. Prior to the Industrial Revolution, people made household tools and agricultural equipment in their own homes or obtained them in the local village. Home-based manufacturing was known as the **cottage industry** system.

Biomass remains an important source of fuel in some developing countries, but during the past 200 years, developed countries have converted primarily to energy from fossil fuels. A **fossil fuel** is an energy source formed from the residue of plants and animals buried millions of years ago. Five-sixths of the world’s energy needs are supplied by three fossil fuels: coal, petroleum, and natural gas.

Industry is concentrated in **Europe, North America, and East Asia.** European industrial areas tend to be located in regions with abundant energy, raw materials such as iron ore, and labor concentrations. North American industrial areas are located in a band from the Great Lakes to the East Coast and the California Coast. East Asia’s industrial areas are in China along the coast and in Japan.

Geographers try to explain why one location may be more profitable for a factory than others. A company typically faces two costs centered around geography:

* **Situation factors** involve transporting materials to and from a factory. A firm seeks a location that minimizes the cost of transporting inputs to the factory and finished goods to consumers.
* **Site factors** result from the unique characteristics of a location. These labor, capital, and land.

A **bulk-gaining industry** makes something that gains volume or weight during production. To minimize transport costs, a bulk-gaining industry needs to locate near where the product is sold. A prominent example of a bulk gaining industry is the fabrication of parts and machinery from steel and other metals. Beverage bottlers also locate near large markets to cut down on the cost of shipping.

**Single-Market Manufacturers** A single-market manufacturer is a specialized manufacturer with only one or two customers. The optimal location for these factories is often close proximity to the customers. An example of a single-market manufacturer is a producer of buttons, zippers, clips, pins, or other specialized components attached to clothing.

**Perishable-Products Companies** To deliver their products to consumers as rapidly as possible, perishable-product industries must be located near their markets. Because few people want stale bread or sour milk, food producers such as bakers and milk bottlers must locate near their customers to assure rapid delivery. The daily newspaper is an example of a product other than food that is highly perishable because it contains dated information.

An example of a **Bulk-Reducing Industry** is **Steel** Because of the need for large quantities of bulky, heavy iron ore and coal, steelmaking traditionally clustered near sources of the two key raw materials. However, the increasing importance of proximity to markets is demonstrated by the recent growth of steel minimills. Rather than iron ore and coal, the main input into minimill production is scrap metal. Minimills are less expensive to operate than traditional steel mills and they can be located near their markets because their main input—scrap metal—is widely available.

**Truck, Train, Ship, or Plane?** Inputs and products are transported in one of four ways: via ship, rail, truck, or air. Shipping costs are variable depending on the mode of transport used.

* Trucks are primarily used for short-distance delivery because they can be loaded and unloaded quickly and at low costs.
* Trains are often used to ship to destinations that take longer than one day to reach, such as between the East and West coasts of the United States. Loading trains takes longer than loading trucks, but once under way, trains aren’t required to make daily rest stops like trucks.
* Ships are attractive for transport over very long distances because the cost per kilometer is very low. Ships are slower than land-based transportation, but unlike trains or trucks, they can cross oceans.
* Airplanes are most expensive for all distances, and are usually reserved for expedited delivery of small-bulk, high-value packages.

Industries which use a number of different shipping modes tend to locate at **break-of-bulk points**,which is a location where transfer among transportation modes is possible. Important break-of-bulk points include seaports and airports. **Containerization** has facilitated transfer of packages between modes. Containers may be packed into a rail car, transferred quickly to a container ship to cross the ocean and unloaded into trucks at the other end.

**Just-in-Time Delivery** is the shipment of parts and materials to arrive at a factory moments before they are needed in the production process. Just-in-time delivery is especially important for delivery of inputs, such as parts and raw materials, to manufacturers of fabricated products, such as cars and computers.

**Site Factors in Industry** Site factors are industrial location factors related to the costs of factors of production inside a plant. For some companies, site factors are more important than situation factors in deciding the location of a plant. **Land, Labor, and Capita** are three production factors that vary among locations.

Demand for **energy** comes from four primary types of consumption in the United States:

* Industries. Factories use approximately 40 percent natural gas and 30 percent each coal and petroleum.
* Transportation. Almost all transportation systems run on petroleum products.
* Homes. Natural gas and coal provide approximately equal shares of home needs.
* Commercial. Stores and offices have uses and sources similar to those of homes.

Developing countries comprised more energy usage than developed countries for the first time in 2006. China is currently the world’s leader in energy demand. The highest per capita consumption of energy remains in developed countries.

**Proven Reserves** Developed countries have historically possessed a disproportionately high supply of the world’s proven fossil fuel reserves:

* Coal. World reserves are approximately 1 trillion metric tons. At current demand, proven coal reserves would last 130 years. Developed and developing regions each have about one-half of the supply of proven reserves.
* Natural Gas. World reserves are approximately 200 trillion cubic meters. At current demand, proven natural gas reserves would last 56 years. Less than 10 percent of proven reserves are in developed countries, primarily the United States.
* Petroleum. World reserves are approximately 1.6 trillion barrels. At current demand, proven petroleum reserves would last 55 years.

**Potential Reserves** are supplies in deposits that are undiscovered but thought to exist. When a potential reserve is actually discovered, it is reclassified as a proven reserve. Potential reserves can be converted to proven reserves from fields that have yet to be developed, or from fields yet to be discovered. Extraction from both types of fields is relatively (and possibly prohibitively) expensive.

**Nuclear Energy** While nuclear power is not renewable, some view it as an alternative to fossil fuels. The large amount of energy released from a small amount of material makes it an attractive alternative. One kilogram of enriched nuclear fuel contains more than 2 million times the energy in 1 kilogram of coal. Challenges are presented by nuclear power though including; **Distribution, Potential Accidents**, **Radioactive Waste, Weaponization, Limited Reserves**, and **High Cost.**

**Renewable energy** resources have an essentially unlimited supply and are not depleted when used by people. Water, wind, and the Sun supply sources of renewable energy. Some popular alternative energy sources are; **Hydroelectric Power, Biomass**, **Wind Power,**  **Geothermal Energy, Solar Energy, and Wave Energy.**

**Climate Change** Between 1880 and 2014, the average temperature of Earth’s surface increased by 0.89°C (1.6°F). An international team of U.N. scientists has concluded that this temperature increase is directly linked to human actions, particularly the burning of fossil fuels in factories and vehicles. Carbon dioxide is released into the atmosphere when fossil fuels are burned. According to U.N. scientists, the level of carbon dioxide in the atmosphere has increased by more than one-fourth during the past 200 years. A concentration of trace gasses in the atmosphere can block or delay the return of some of the heat leaving the surface heading for space, thereby raising Earth’s temperature. When fossil fuels are burned, one of the trace gasses, carbon dioxide, is discharged into the atmosphere. The anticipated increase in Earth’s temperature, caused by carbon dioxide trapping some of the radiation emitted by the surface, is called the **greenhouse effect**. As a country’s per capita income increases, its per capita carbon dioxide emissions generally increase.

**Ozone Damage** The stratosphere contains a concentration of **ozone** gas. The ozone layer absorbs dangerous ultraviolet rays from the Sun. Were it not for the ozone in the stratosphere, ultraviolet rays would damage plants, cause skin cancer, and disrupt food chains. Earth’s protective ozone layer is threatened by pollutants called **chlorofluorocarbons**.

**Acid deposition** is the accumulation of acids on Earth’s surface. Sulfur oxides and nitrogen oxides enter Earth’s atmosphere through the burning of fossil fuels, combine with oxygen and water to form sulfuric acid and nitric acid, and are deposited on Earth’s surface.

**Acid precipitation** is the conversion of sulfur oxides and nitrogen oxides to acids that return to Earth as rain, snow, or fog. Acid precipitation damages lakes, killing fish and plants. On land, concentrations of acid in the soil can injure plants by depriving them of nutrients and can harm worms and insects. Buildings and monuments made of marble and limestone have suffered corrosion from acid rain.

**Local-Scale Air Pollution** is especially severe in places where emission sources are concentrated, such as urban areas. Urban air pollution has three basic elements:

* Carbon monoxide. Breathing carbon monoxide reduces the oxygen level in blood, impairs vision and alertness, and threatens those with breathing problems.
* Hydrocarbons. Hydrocarbons and nitrogen oxides in the presence of sunlight form **photochemical smog**, which causes respiratory problems, stinging in the eyes, and an ugly haze over cities.
* Particulates. These pollutants include dust and smoke particles. The dark plume of smoke from a factory stack and the exhaust of a diesel truck are examples of particulate emission.

**Water Pollution** Water pollution is a widespread problem because it is easy to dump waste into a river and let the water carry it downstream, where it becomes someone else’s problem. Water can decompose some waste without negatively affecting other activities, but the volume of waste often exceeds the capacity that many rivers and lakes can accommodate.

**Point source pollution** enters a body of water at a specific location. **Nonpoint source pollution** comes from a large, diffuse area. Point source pollutants are usually smaller in quantity and much easier to control than nonpoint source pollutants. Water-using manufacturers and municipal sewage are the two main point sources of water pollution.

**Nonpoint Source Pollution** Nonpoint sources usually pollute in greater quantities and are much harder to control than point sources of pollution. The principal nonpoint source is agriculture. Fertilizers and pesticides spread on fields to increase agricultural productivity are carried into rivers and lakes by irrigation systems or natural runoff.

**Solid Waste Pollution** The average American generates about 2 kilograms (4 pounds) of solid waste per day. Residences generate around 60 percent of the solid waste, while businesses account for the remaining 40 percent. Paper products account for the largest share of solid waste in the United States, especially among residences and retailers. Manufacturers throw away large quantities of metals as well as paper.

Using a **sanitary landfill** is by far the most common strategy for disposal of solid waste in the United States. Thousands of small-town “dumps” have been closed and replaced by a small number of large regional ones. Given the shortage of landfills, alternatives have been sought to dispose of solid waste. A rapidly growing alternative is incineration. Burning releases some toxins into the air and some toxins also remain in ash. Thus solving one pollution problem may increase another.

**Hazardous Waste** Disposing of hazardous waste is especially difficult. Hazardous waste includes heavy metals (including mercury, cadmium, and zinc), PCB oils from electrical equipment, cyanides, strong solvents, acids, and caustics. If poisonous industrial residuals are not carefully placed in protective containers, the chemicals may leach into the soil and contaminate groundwater or escape into the atmosphere.

Transnational corporations allocate production to low-wage countries through **outsourcing**, which is turning over much of the responsibility for production to independent suppliers. Outsourcing has led to intense scrutiny in the determination of optimal locations in the production process. Outsourcing contrasts with the approach typical of traditional mass production, called **vertical integration**, in which a company controls all phases of a highly complex production process.

**Mexico and NAFTA** The North American Free Trade Agreement (NAFTA), effective in 1994, eliminated barriers to moving goods among Mexico, Canada, and the United States. Because it is the nearest low-wage country to the United States, Mexico attracts labor-intensive industries that also need proximity to the U.S. market. Plants in Mexico near the U.S. border are known as **maquiladoras**, from the Spanish verb *maqullar*, which means “to receive payment for grinding or processing corn.” Under U.S. and Mexican laws, companies receive tax breaks if they ship materials from the United States, assemble the components at a maquiladora plant in Mexico, and export the finished product back to the United States.

**BRIC Countries** Much of the world’s future growth in manufacturing is expected to locate outside the principal industrial regions described earlier and become focused in Brazil, Russia, India, and China. The four BRIC countries together currently control one-fourth of the world’s land area and contain 3 billion of the world’s 7 billion inhabitants. Their economies rank second (China), seventh (Brazil), ninth (Russia), and eleventh (India) in the world.

**Industrial Change in Developed Countries** In developed countries, industry is shifting away from the traditional industrial areas of northwestern Europe and the northeastern United States. In the United States, industry has shifted from the Northeast toward the South and West. In Europe, government policies have encouraged relocation toward economically distressed peripheral areas.

Two location factors influence industries to remain in these traditional regions: availability of skilled labor and rapid delivery to market.Traditionally, factories assigned each worker one specific task to perform repeatedly. Some geographers call this approach **Fordist** production because the Ford Motor Company was one of the first companies to organize its production this way early in the twentieth century.

Many industries now follow a lean, or flexible, production approach. The term **post-Fordist production** is sometimes used to describe lean production in contrast with Fordist production. Four types of work rules distinguish post-Fordist lean production: teams, problem solving, leveling, and productivity.

**Recycling** is the separation, collection, processing, marketing, and reuse of unwanted material. **Remanufacturing** is the rebuilding of a product to specifications of the original manufactured product using a combination of reused, repaired, and new parts.