

CHAPTER 20

Changing Global Economy and Sustainability

Topics 7.7–7.8

Topic 7.7 Changes as a Result of the World Economy

Learning Objective: Explain the causes and geographic consequences of recent economic changes such as the increase in international trade, deindustrialization and growing interdependence in the world economy. (PSO-7.A)

Topic 7.8 Sustainable Development

Learning Objective: Explain how sustainable principles relate to and impact industrialization and spatial development. (IMP-7.A)

Anyone who believes in indefinite growth of anything physical on a physically finite planet is either a madman or an economist.

—Kenneth Boulding, economist, 1953



Source: Wikimedia Commons

Women complete the labor-intensive manufacturing of clothing in a maquiladora in Mexico. (See Topic 7.7 for maquiladoras and other changes in the global economy.)

Changes as a Result of the World Economy

Essential Question: What are the causes and geographic consequences of recent economic changes such as the increase in international trade, deindustrialization, and growing interdependence in the world economy?

Globalization is firmly entrenched as part of daily life, largely due to vast improvements in transportation and communication technologies. People no longer depend solely upon products made close to home or decisions made by local, or even national, politicians. The world is so interconnected that a any decision can have significant implications for people across the globe. In addition to the growing interdependency of countries and their economies, the types of jobs, in core, periphery, and semiperiphery countries has changed. The economic landscape has transformed from local to global scales.

The Changing Global Economy

To take advantage of improved transportation and communication, and in search of lower labor costs, companies have changed spatial distribution of manufacturing and business services. At the global scale, many companies have moved manufacturing plants from highly developed core countries, such as the United States, to less-developed periphery and semiperiphery countries, such as the Malaysia and Brazil. At the regional scale, factories in the United States have moved from the Northeast and Midwest to the Southeast and Southwest.

Outsourcing and Offshoring

To reduce costs, many companies use **outsourcing**, contracting work to noncompany employees or other companies. The contracted company might be less expensive because it specializes in the work and does it more efficiently. Or, it might pay workers lower wages or provide fewer benefits. Companies often outsource manufacturing work and administrative functions such as handling payroll and paying taxes.

As with multinational manufacturing companies, some tertiary and quaternary sector companies move their back offices to other countries, a process known as **offshoring**. Companies will locate services or manufacturing in other countries if the costs of doing business are lower and worth the risk of moving some operations overseas. Many software and manufacturing companies in the United States and Europe locate facilities in India and China to take advantage of the highly skilled but lower-cost labor.

Labor unions and government officials have pressured some companies into reshoring, returning jobs to the business's home country. Because of the multiplier effect (see Topic 7.2), this benefits others in the country as well.

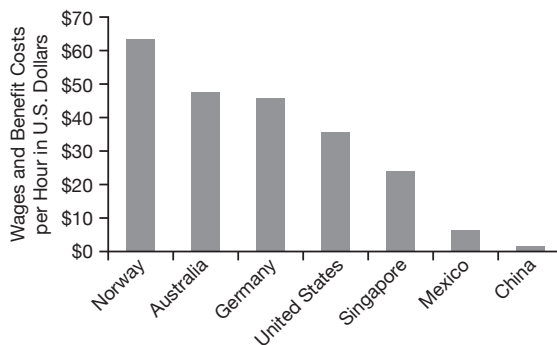
Sometimes companies will both offshore and outsource, as Boeing did with the 787 Dreamliner airplane. Boeing designed the planes in Seattle, the nose section was outsourced to a company in Kansas, wing tips were made in South Korea by Korean Air, wings were assembled by Boeing in Canada, and final assembly was done by Boeing outside of Seattle. The final product demonstrated outsourcing, offshoring, globalization, and the international division of labor.

Economic Restructuring

Globalization has increased competition among companies based around the world. In response, many have adopted new technology that needs fewer employees to operate. They also have shifted jobs from core countries to the periphery and semiperiphery ones with lower wages. As a result of these changes, many workers in core countries have lost jobs or had their wages cut.

While workers have suffered, consumers have benefitted. Lower production costs have resulted in lower prices for retail goods.

MANUFACTURING COSTS, 2012 (for selected countries)

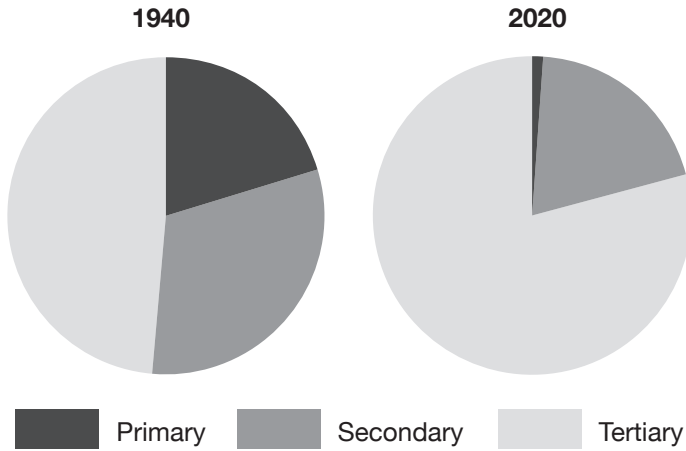


Based on the graph, how much more expensive are wages and benefits in Norway than in China? Wages and benefits are much cheaper in Mexico and China than in the United States. With the costs much less in China, why have so many U.S. companies chosen to locate in Mexico?

Globalization has created a **new international division of labor**, a changed system of employment in the various economic sectors throughout the world:

- In core countries, people design and develop products for the global market. Tertiary, quaternary, and quinary jobs have increased in the core.
- In semiperiphery countries, people often manufacture goods that are marketed in core countries. Consequently, employment in the secondary sector has increased. Employment in the primary sector has declined.
- Periphery countries, such as Bangladesh, Angola, and Papua New Guinea, have large primary sectors and export minerals and resources to core and semiperiphery countries for further processing and consumption.

STRUCTURE OF THE U.S. LABOR FORCE, 1940 AND 2020



The percentage of employees in all three sectors of the labor force has changed tremendously since 1940. Why has the percentage of workers involved in the primary sector dropped so drastically?

Basic and Non-basic Activities

Actions that create new wealth for a region are considered a **basic economic activity**. Most manufactured goods and commercial farm products are examples of basic activities. These products are usually sold beyond the area where the factory or commercial farm is located, so money from outside the area is used to purchase the products. This outside money is considered new money which makes the areas where the goods were produced wealthier and leads to additional growth through the multiplier effect. For this reason, basic activities are sometimes referred to as *city-forming activities*.

A grocery store is an example of a **non-basic economic activity** because it does not generate new money for the area. Instead, it allows for recirculation of the existing money in the area. Most people buy groceries near where they live, so the money spent is not new to the region. Non-basic activities are important since they provide services or goods such as food and clothing. However, they do not play a significant role in bringing money into the local economy, so non-basic activities are also referred to as *city-serving activities*. There is a limited multiplier effect for non-basic activities.

Community leaders in core countries are concerned about the loss of manufacturing jobs since they are often basic activities and generate new wealth. If a company relocates offshore, often the displaced workers find replacement jobs in the tertiary sector, which contains primarily non-basic jobs, and the community will lose out on much-needed new money.

Quaternary sector jobs are more desirable since they have higher salaries and are more likely to be basic activities with a greater multiplier effect. Consider a software developer or a research scientist. The products or information these workers produce will generate income from far beyond their own community, and thus, generate new money which leads to economic growth.

Transnationals, Multinationals, and EPZs

Businesses that operate in multiple countries are known as **transnational corporations** (TNCs) and **multinational corporations** (MNCs). Because of the jobs and wealth these corporations can bring to a country, governments compete with each other to entice them to their shore. Over 100 countries in the world have attracted TNCs and MNCs by using special manufacturing zones, commonly referred to as **export-processing zones** (EPZs).

These EPZs offer foreign corporations major tax savings, inexpensive labor, fewer environmental regulations, well-serviced industrial sites, and proximity to good transportation networks that allow for easy delivery of raw material and shipping of finished products. EPZs are often near international airports, seaports, or land borders from where the products can be exported easily.

Tax Incentives One incentive that countries use in EPZs is tax breaks. Transnationals typically do not pay taxes on any item they import into an EPZ as long as these items are re-exported or used to make products for export. This regulation protects existing businesses that cater to the local market. For example, if a resident entrepreneur employs 20 people producing T-shirts to sell locally, a new T-shirt factory in the EPZ will not drive the resident owner out of business with cheaper products. The existing jobs in the locally owned factory will remain in addition to the jobs added by the foreign-owned factory.

Functions Initially, most of these special zones were occupied by factories that manufactured goods. However, some also acted as *transshipment* points (transfer containers) and recently, as sites for tertiary and quaternary sector activities. For example, the largest share of businesses established by TNCs and MNCs in India offer professional, scientific, and technical services.

EPZs first appeared in the 1960s, and by 2015, 130 countries were home to 4500 of these special zones and employed an estimated 68 million people worldwide. Special manufacturing zones are known by different names—**special economic zones** (SEZs) in China, **maquiladoras** in Mexico, and **free-trade zones** (FTZs) in Singapore—but have similar functions.

In China, the original SEZs were situated in coastal cities near major ports, allowing easy access to international markets. First created in 1979, the Chinese government has increasingly used the incentives of SEZs to attract foreign trade and businesses.

Changes in Maquiladoras There was a surge of American-owned maquiladoras factories after the North American Free Trade Agreement (NAFTA) was signed in 1994. Maquiladoras are now the second-largest source of income in Mexico after petroleum. The maquiladoras were originally all positioned in a single district in northern Mexico, near the United States-Mexico border to minimize transportation costs into the United States.

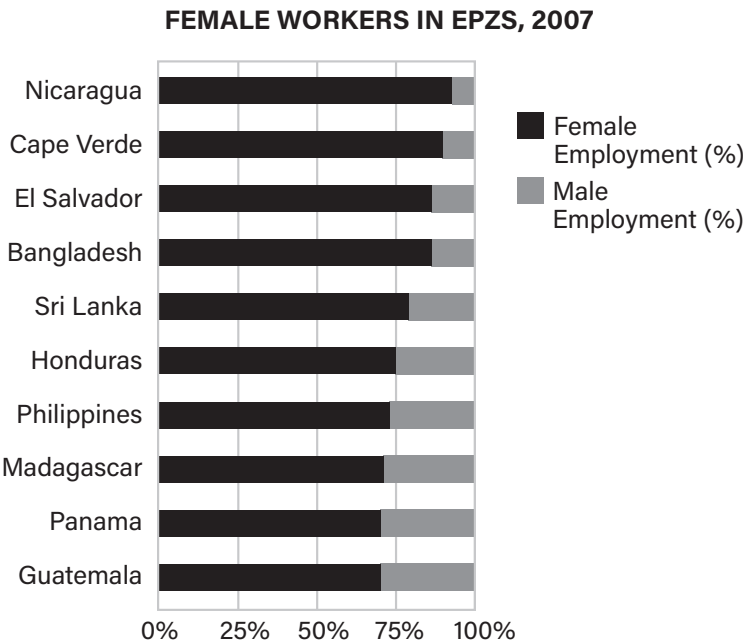
In recent years, the number of maquiladoras has decreased due to the increased competition for these international corporations as more countries adopt the creation of EPZs as a development strategy. Despite the decrease, there are still approximately 3,000 foreign-owned factories and over 1 million employees working in Mexican maquiladoras.

Free-Trade Zones (FTZs) These are locations where a foreign company can store, warehouse, transfer, or process without additional taxation or duties if goods are exported. Major seaport cities like Singapore, London, Amsterdam, and Hong Kong have FTZs. Similar to FTZs, but on a larger scale, are free-trade regions such as the European Union.

Ethics and Societal Changes Related to EPZs

People disagree about whether EPZs are ethical. Critics charge that the transnational corporations are taking advantage of the workers and paying them a fraction of what they would pay workers in their home countries. Proponents of EPZs believe that the wages are reasonable for the region and thousands of people, mainly women, have access to paid employment at better wages than would otherwise be available to them. In addition, low wages keep the cost of manufactured items low, which allows lower-income people to purchase them.

One of the most significant changes related to the development of EPZs is the role of females in society. Typically, the majority of workers hired in EPZs are female. As women earn wages, they become less dependent upon men and are more likely to be heard by government. In addition, birth rates decline as more women gain employment.



Source: United Nations

Women dominate the labor force in most EPZs. Why are women much more likely to be employed in EPZs than men?

The Postindustrial Landscape

As the types of economic activities that exist in a region evolve, so does the economic landscape. Many wealthier core countries now have a **postindustrial economy**, one that no longer employs large numbers of people in factories but has people who provide services and process information. The shift from an industrial to a postindustrial economy changes the landscape of a country.

Post-Fordist Methods of Production

In the 19th century, production increased with the shift from a system of cottage industry to factory production with machines powered by water or coal. However, most products were still made individually.

Early in the 20th century, Henry Ford advanced productivity by developing the **assembly line**—in which an item is moved from worker to worker, with each repeatedly performing the same task. The use of assembly lines allowed companies to rapidly produce more standardized products and with less-skilled workers than ever before. This system of mass production, known as **Fordism**, changed manufacturing and became standard practice across industries.

As globalization increased, so did the need for flexibility from industries in the production process. In modern factories, the **substitution principle**, in which businesses maximize profit by substituting one factor of production for another, has been applied to the labor force. In the late 20th century, increased automation, or replacing workers with machines, allowed assembly line production to greatly increase. However, automation, also known as mechanization, has also forced many workers to become unemployed. The remaining workers are often trained to do more than one job, so they can rotate among a few different workstations during a day, reducing the risk of injuries. This industrial adaptability was the basis of the **post-Fordist** system.

Economies of Scale

Although expensive to install, mechanization saves a company money over the long term and creates *economies of scale* (see Topics 4.9 and 5.11) by allowing business owners to increase output with improved efficiency. Machines can work 24 hours a day without breaks or vacations, and they produce consistent, high-quality work. For example, U.S. industrial output doubled between 1984 and 2015, but industrial employment declined by one-third.

Just-in-Time Delivery

Auto assembly plants make use of **just-in-time delivery**, a system in which the inputs in the assembly process arrive at the assembly location when they are needed. This system reduces the expensive storage costs of extra inventory—but at the risk of running short on inputs. It works only if a factory owner has confidence in his or her suppliers, communications and transportation systems, and ability to accurately predict production needs.

Agglomeration Economies

In some cases, the location decision for one factory is dependent upon the location of other related factories, referred to as **locational interdependence**. Being near similar factories allows businesses to use the same services, such as transportation companies or accounting firms that might specialize in providing service to the industry. It also allows businesses to observe their competition and to occasionally hire away talented young employees from another company.

In addition, the finished product from one factory could be an input at another factory. In this case, it is a market-dependent situation. For example, an auto assembly plant is the market for the output from an auto parts factory. Consequently, the location of the parts factory is very dependent upon the location of the assembly plants.

Most businesses, whether they are secondary, tertiary, or quaternary businesses, locate in proximity to similar businesses to take advantage of **agglomeration economies**. (See Topic 7.2.) Large shopping districts are an example of agglomeration and the *gravity model*. (See Topics 3.3 and 6.4.)

Certain stores locating close together can be more attractive to customers because they have easy and efficient access to many products. The larger the mall, the more pull, or gravity, it will have to draw customers from farther away. Fast-food restaurants will often agglomerate, or cluster, on the corners of busy road intersections because each wants to be visible and accessible to potential customers. For factories, agglomeration is usually close to transportation systems, parts suppliers, or near available skilled workers.

Technopoles

Just as agglomeration economies can encourage the spatial grouping of manufacturing plants, stores, and offices, the same principles can apply to technology companies. A **technopole** is a hub for information-based industry and high-tech manufacturing. The proximity of companies allows for benefits such as the sharing of certain services and attracting highly skilled workers to the area. Often these technopoles are located near universities well known for their computer, mathematics, engineering, science, and entrepreneurial business programs:

- Silicon Valley, near the Universities of California-Berkeley and Stanford
- Route 128, near Harvard University and the Massachusetts Institute of Technology
- The Research Triangle, near Duke University, North Carolina State University, and the University of North Carolina, Chapel Hill
- The Technology Triangle near the University of Waterloo and the University of Guelph in Ontario, Canada

Because of the economic stimulus associated with the technopoles, they often act as **growth poles**, or **growth centers**. The concentration of high-value economic development in the growth pole attracts even more

economic development. Once the process starts, the cumulative causation effect means it tends to feed upon itself. Each time new businesses are attracted to the growth pole, the “magnet” becomes even stronger and attracts more businesses.

Growth poles often have **spin-off benefits**, or **spread effects**, which are positive economic outcomes beyond the growth pole. For example, farmers that are 100 miles away from a growth pole should have expanded markets in which to sell their produce, resulting in increased sales and profits. The *multiplier effect* (see Topic 7.2) of job creation is also another potential benefit.

The possible downsides of growth poles are the **backwash effects**, or negative effects on one region that result from economic growth in another region. A typical backwash effect is the loss of the highly educated young people from distant communities who migrate to growth poles for employment. As a result, the distant communities can face depopulation, loss of tax revenue, and the closure of various services.

In China, the impressive growth in prosperity for people in large urban areas in the eastern part of the country has pulled in people from rural areas in the west. One backwash effect of this has been that the rural western areas sometimes face a shortage of working-age people and those who care for elderly family members.

The Fate of Brownfields

The stereotyped image of a postindustrial landscape is one of deteriorating buildings surrounded by weeds, marked by broken or boarded-up windows, and rusting metal. These sites of abandoned factories are known as **brownfields**. Because of the rusting metal, the region of the United States hit hardest by deindustrialization—the Northeast and lands around the Great Lakes—is often called the **Rust Belt**. In reality, old buildings are usually torn down, so brownfields are often empty. (See Topic 6.11 for more on brownfields.)

Corporate Parks and Campuses

It is not just the existence, removal, or repurposing of old factories that typifies a postindustrial landscape. New service sector jobs also help to shape the postindustrial landscape. As a result of this growth, office buildings and other commercial spaces are more likely to be evident on the landscape. Increasingly, these office buildings congregate in **corporate parks**, or **business parks**, where they can take advantage of agglomeration economies.

Some very large corporations create their own corporate parks where they are the only tenant. Samsung has its headquarters, known as Samsung Digital City, in a park 13 miles south of Seoul, South Korea. The campus covers an area about equal to 40 city blocks. About 35,000 people work there, and it includes 135 buildings, of which four are large office towers. Other facilities include research laboratories, gymnasiums, swimming pools, medical offices, a heliport, daycare facilities, and housing for guests and visiting employees.

Working Remotely and COVID-19

The work people do and how they do it determines where they do it. While people in primary and secondary sector jobs often need to be present at their jobsite to tend crops or build homes, many workers in the tertiary sector do not. They can do their jobs anywhere they have a computer and an internet connection. As the U.S. economy has changed, more and more people have begun working from home.

This trend of working from home picked up momentum when the COVID-19 pandemic struck. By the spring of 2020, more people were working from home than ever before. If the trend to remote working continues, the built environment will change to reflect it:

- Central business districts will include fewer large office buildings, fewer parking lots for commuters, and fewer diners for workers eating lunch.
- Retail companies will close stores and replace sales clerks with online representatives and delivery people.
- Residential houses will identify areas dedicated to office space.

REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *What are the causes and geographic consequences of recent economic changes such as the increase in international trade, deindustrialization, and growing interdependence in the world economy?*

Causes of Global Economic Changes	Consequences of Global Economic Changes

KEY TERMS

outsourcing	export processing zones	locational interdependence
offshoring	(EPZs)	agglomeration economies
reshoring	special economic zones	technopoles
new international division of labor	(SEZs)	growth poles (growth centers)
basic economic activity	maquiladoras	spin-off benefits (spread effects)
non-basic economic activity	free-trade zones (FTZs)	backwash effects
transnational corporations (TNCs)	postindustrial economy	brownfields
multinational corporations (MNCs)	assembly line	Rust Belt
	Fordism	corporate parks (business parks)
	substitution principle	
	post-Fordist	
	just-in-time delivery	

Sustainable Development

Essential Question: How are sustainability principles related to and impact industrialization and spatial development?

In the 21st century, many people, businesses, organizations, and governments around the world have begun to recognize and act on the dangers development poses to the environment. In 2015, the United Nations adopted a new vision that acknowledges resources are necessary for human life but also for economic prosperity. Some of the goals of this vision were to eliminate poverty, create prosperity, promote equality, and preserve the earth and its resources.

Sustainable Development

Using the earth's resources without doing permanent damage to the environment is **sustainability**. The goal of **sustainable development** is to address problems caused by depletion of natural resources, mass consumption of goods, pollution of air and water, and the impact of climate change. People can apply the concept at any scale:

- At the household scale, individuals might set thermostats to use less energy heating and cooling their homes.
- At the local level, city and town governments might operate composting programs and shopping malls might reduce unneeded lighting.
- At the country scale, the government might fund research into products that use less energy and industries might recycle their waste.
- At the global scale, countries might cooperate to protect ocean habitats for marine life.

Ecological Footprint and Consumption

A small percentage of the earth's population uses most of the resources and generates most of the waste products. For example, 7 percent of the world's population produces 50 percent of the carbon dioxide. In general, people with more wealth have a larger **ecological footprint**, or impact on the environment. One measure of an ecological footprint is how much land is needed to provide one person with resources and to handle the person's garbage.

For example, the ecological footprint per person in the United States is 20.0 acres. An American football field is 1.3 acres in size, so 5 billion football fields of productive land are needed to support consumption of the U.S. population. The world average is 6.4 acres.

ECOLOGICAL FOOTPRINT PER PERSON, 2017	
Qatar	36.1
United States	20.0
Germany	11.6
Brazil	6.9
Madagascar	2.2

Source: footprintnetwork.org

There is a wide range between countries. What factors account for the differences? Describe a reason why Qatar has such a high ecological footprint compared to other countries.

Resource Depletion

When people overuse resources, development becomes unsustainable. For example, farmers traditionally maintained the fertility of land by regularly allowing a field to lie fallow (unused). In recent decades, farmers have often used all available land every year. As a result, land has become less productive, a trend that cannot be sustained. To counter the loss of natural fertility, farmers have become more dependent on chemical fertilizers.

Similarly, people have depleted resources such as fossil fuels (coal, oil, and natural gas), forests, and fish in either particular regions or the world in general. This has prompted people to develop alternatives, such as solar and wind energy, tree farms, and fish farms.

Pollution

Pollution contaminates air and water with smoke, chemicals, and waste products. It has numerous causes:

- Some, such as volcanic eruptions, are natural events that humans do not influence.
- Some are a mixture of natural events and human actions. For example, dust storms occur naturally in some dry regions. However, they are more likely to occur after farmers have removed the deep-rooted natural vegetation that holds soil in place.
- Some are completely the result of human actions. For example, people pollute the air when they burn wood, coal, or oil. They pollute water when they dump waste from industries or allow farm chemicals to flow into rivers or lakes.

The Impact of Pollution Pollution has large impacts on plants, animals, and humans. According to the Global Alliance on Health and Pollution, in 2015, pollution caused 16 percent of deaths worldwide. Over 90 percent of these deaths occurred in low- or middle-income countries, and most who died were children. Pollution strains the economies of countries by increasing health care costs and causing people to miss school and work because they are ill or taking care of someone who is. The worldwide costs of pollution are estimated to be \$4.6 trillion annually, or around 6 percent of global economic output in a year.

Efforts to Control Pollution One reason pollution is difficult to control is because it spreads so easily. Often, the person or business causing the pollution is not the one who suffers its effects. The people who feel the affects of pollution might live hundreds of miles away from where it originates. In addition, pollution travels across political boundaries. Hence, one government has an interest in letting the pollution continue and a different government wants to stop it.

In the mid-1900s, pollution released by factories in the Midwest drifted eastward and mixed with water in the atmosphere. When it fell as “acid rain” it began destroying forests in New York and New England. The companies causing the pollution had no incentive to stop. The problems caused by the pollution were far from their factories. If one company voluntarily took the costly steps needed to pollute less, its production costs would increase, as would the prices it charged for its products. In a competitive market, it would risk losing sales and possibly going out of business.

The solution was to force every company to reduce emissions. Under pressure from organized citizens, the federal government passed stricter laws on air pollution. With the passage of the Clean Air Act in 1970 and its subsequent amendments, the country reduced the emission of six major types of air pollution by over 70 percent. Besides helping protect the forests, the act resulted in fewer premature deaths, fewer hospitalizations, and fewer days of school missed because of breathing ailments. Similarly, government regulations have made lakes, rivers, and drinking water cleaner than they once were.

Climate Change

Between 2011 and 2020, worldwide temperatures were the warmest on record. Organizations such as NASA, and the National Academy of Science, and the Intergovernmental Panel on Climate Change agreed that human actions were a major cause of climate change. Scientists also concluded that the rise in temperature contributed to more frequent and more destructive wildfires, hurricanes, floods, and droughts. They predicted that climate change would have widespread consequences in the future:

- Diseases once confined to areas around the equator could spread to new areas.
- Ocean levels could rise as glaciers melt, which will threaten the homes and safety of the 40 percent of the global population that lives near coasts.
- Refugee crises could become more common as more frequent floods and droughts cause millions of people to move in search of food, water, and safety.

At the current rate of greenhouse gas emissions, temperatures could be 3.2°C (5.8°F) warmer by the end of this century. Scientist believe that increase could be a low as 1.5°C if countries reduce emissions to levels based on international agreements. In general, core countries has been more able to reduce emissions than have non-core countries. Core countries have greater wealth to pay for cleaner technology and higher standards of living so they can

better absorb changes. In addition, many of the world's manufacturers have moved from core countries to non-core countries, which resulted in these countries increasing their greenhouse gas emissions.

Ecotourism

One example of sustainable development is **ecotourism**, travel to a region by people who are interested in its distinctive and unusual ecosystem. The money spent by ecotourists and the jobs created can provide incentives to people to protect these rare areas rather than convert them to agriculture or industry. It can also fund conservation efforts to protect these regions from damage by developments elsewhere. Some popular ecotourism sites include:

- rainforest wildlife in Costa Rica
- mountain gorillas of Rwanda
- coral reefs in Australia
- whale watching in Kaikoura, New Zealand
- new species of marine and terrestrial life on the Galapagos Islands
- fire and ice landscape (volcanoes and glaciers) in Iceland

Ecotourism is designed to be sustainable. However, carries risks. If too many people visit a fragile ecosystem, they can damage it even as they learn to appreciate it.

UN Sustainable Development Goals

In 2000, the United Nations identified the most challenging barriers to development and eight key steps to overcoming them. Known as the Millennium Development Goals (MDGs), they helped countries with low levels of human development improve the lives of their citizens.

The UN released an analysis of progress toward meeting these goals, the Millennium Development Goals Report, in 2015. The report found that by focusing on very specific and globally accepted goals, countries had cooperated to lift nearly one billion people out of extreme poverty, reduce hunger, and increase the number of girls attending school. This global effort was the most successful anti-poverty program in history.

Despite the success of the MDGs, world leaders still had concerns over the environmental unsustainability of many practices. In 2015, after extensive consultation with representatives of the 193 member states, academics, scientists, private sector leaders, and humanitarian organizations the UN created a new set of goals to replace the MDGs. The 17 new goals were called the **Sustainable Development Goals** (SDGs). The SDGs were intended to finish the job that the MDGs has begun, but with more awareness of environmental challenges and ways to overcome them. As with the MDGs, the UN gave countries 15 years to achieve the goals.

The SDGs targeted all countries, whereas the MDGs had focused on periphery and semiperiphery countries. As summarized in the table below, countries did not make as much progress in the first five years as people in 2015 hoped for. When the COVID-19 pandemic hit in 2020, progress toward many goals virtually stopped. In several cases, gains made during the first four years were nullified as countries redirected funds to battle the pandemic. With hopes that progress would resume, officials began referring to the period starting in 2021 as the Decade of Action.

UN SUSTAINABLE DEVELOPMENT GOALS, 2016–2030	
Goal	Changes 2016–2020
1. End poverty in all its forms everywhere	Decline in poverty from 10 percent to 8.2 percent worldwide
2. Achieve food security, improve nutrition and promote sustainable agriculture	Increase of 60 million people who suffer from food insecurity since 2016
3. Ensure healthy lives and promote well-being for all at all ages	Increasing life expectancy and reducing common diseases but limited by COVID-19
4. Ensure inclusive and equitable quality education for all	Increasing access to education but 260 million school-age children not in school in 2018
5. Achieve gender equality and empower all women and girls	Fewer child marriages and more women in politics
6. Access to clean water and sanitation for all	Slight increase in percentage of people who have clean water and safe sanitation
7. Access to affordable, reliable, sustainable and modern energy for all	More access to electricity in poorer countries and more renewable energy use worldwide
8. Economic growth, productive employment and decent work for all	Stagnating or declining per capita income for 1 in 5 countries worldwide in 2019
9. Increase investment in infrastructure to achieve sustainable development	More investments in research, infrastructure, and mobile connectivity in non-core countries
10. Reduce inequalities within and among countries	Fewer inequalities at the national scale but within countries vulnerable populations at risk
11. Make cities and human settlements inclusive, safe, resilient, and sustainable	More people live in slums than ever before—up to 828 billion people in 2020
12. Ensure sustainable consumption and production patterns	Some progress globally but as population increases, current trends will not be enough
13. Combat climate change and its impacts	Minor reductions in emissions in core countries and increased emissions in non-core countries
14. Conserve and sustainably use oceans and marine resources	Progress in reducing illegal fishing but fewer sustainable fishing practices put species at risk
15. Protect and restore terrestrial (land) ecosystems and halt biodiversity loss	32 percent of countries on track, 50 percent making limited progress, 8 percent no progress
16. Promote just, peaceful, and inclusive societies	More than 70 million refugees in 2018—highest number in nearly 70 years
17. Improve global partnership for sustainable development	Increasing global partnerships in trade but limited by COVID-19

Sustainable Development Goals in Action

Each SDG addressed a major problem facing Earth’s population, and the problems were seen as interconnected. Success or failure in meeting one goal would shape success or failure in meeting others. For example, achieving Goal 3 (ensure healthy lives and promote well-being for all) would require success in Goal 1 (poverty), Goal 2 (hunger), Goal 4 (education), Goal 5 (gender equality), and Goal 6 (clean water and sanitation).

Each SDG was broken down into more focused targets. For example, Goal 11 was to make cities and human settlements inclusive, safe, resilient, and sustainable. The writers of this goal recognized that development of public transportation projects was essential to meeting the goal. Only half of the world’s population had convenient access to public transportation.

In many Latin American cities, many of the poorest people who most needed public transportation resided at the edge of the city where public transit often did not travel. Yet most of the potential jobs for these people were in the downtown area. If impoverished people had no public transportation, overcoming poverty became much harder.

An additional target of Goal 11 was to reduce the environmental impact of cities, specifically to improve air quality. Mexico City, one of the world’s most polluted cities, opened a bus-based rapid transit system (BRT) in 2005 that used low-emission or electric buses. The stations were designed like train stations and the buses could be boarded like a subway, increasing capacity and efficiency. In addition, the buses had the flexibility of using dedicated bus lanes and roads so they cost less to develop and could reach many more people. Cities around the world began modeling their mass transit systems after Mexico City’s.

REFLECT ON THE ESSENTIAL QUESTION

Essential Question: *How are sustainability principles related to and impact industrialization and spatial development?*

Sustainability Principles	Impact of Sustainability Principles

KEY TERMS

sustainability	ecotourism
sustainable development	Sustainable Development Goals
ecological footprint	



GEOGRAPHIC PERSPECTIVES: ARGENTINA AND SOUTH KOREA

The economic fortunes of Argentina and South Korea have been influenced by their physical locations as well as their roles within global trading networks. Argentina is situated along the Atlantic Coast of South America, so trade with the East Coast of the United States is convenient. Korea is between China and Japan, two large markets.

Conditions in the Early 20th Century

A century ago, Argentina was a much wealthier nation than Korea (the country was not divided between North and South Korea then). Argentina's income per worker made it one of the top 10 economies in the world. Its industrial growth created significant pull factors, and migrants poured in from Europe, particularly Italy. Korea was a heavily agricultural country, and its income per worker ranked it toward the bottom quarter of all countries.

Conditions Today

Currently, about 60 percent of the workers in each country are employed in the service sector. Beyond that, the economies differ greatly.

Argentina, like many countries in Latin America over the past half century, suffered periods of massive inflation, military dictatorships, and heavy foreign debt. These factors combined with massive loan defaults and a poor development plans resulted in a collapsed economy in the 1990s from which the country is still trying to recover. Today, Argentina is a semiperipheral state that relies heavily on agricultural exports such as beef, fruit, and grains.

In contrast, Korea has been a success story of modern economic development, as have many countries in East Asia. Through a combination of intense education, heavy government subsidies, tough trade restrictions, and strong corporations, Korea focused on making products it exported. The plan worked. Today, Korea is a high-tech industrialized economy and exports—mostly manufactured goods—account for nearly half of its GDP. Its levels of health, wealth, and education rank it as a core state, with about 2 percent of its population involved in primary activities and about 40 percent in secondary activities.

1. Describe THREE reasons why Argentina dropped from being a core country to a semiperiphery country.
2. Explain South Korea's plan to improve their economic development.
3. Using one of the SDGs describe a process that South Korea could use to make their development sustainable into the future.



THINK AS A GEOGRAPHER: INDUSTRIAL GROWTH AT DIFFERENT SCALES

One way to understand the process of industrialization at different scales is to analyze the opening or closing of a factory. At the local, national, and global scales, starting up a new factory or shutting down an existing one will have economic, social, political, and environmental effects (ESPN). Consider potential impacts you have learned in this chapter and unit.

1. Review the chart and note the effect at each scale. Identify each effect as either economic, social, political, or environmental.
2. Describe an additional effect for each scale of analysis and identify it using ESPN (economic, social, political, natural/environmental).

IMPACT OF AN AIRCRAFT FACTORY		
Event	Effect	Additional Effects
Aircraft Factory Closes	Local: The amount of empty space in the community's industrial area increases.	1. Local
	National: The federal government funds a program to retrain unemployed workers.	2. National
	Global: The supply of aircraft decreases, which causes airplane prices to increase.	3. Global
Aircraft Factory Opens	Local: The unemployment rate decreases, and total income in the community increases.	4. Local
	National: Total federal tax revenue increases.	5. National
	Global: The supply of aircraft increases, which causes airplane prices to decrease.	6. Global

CHAPTER 20 REVIEW

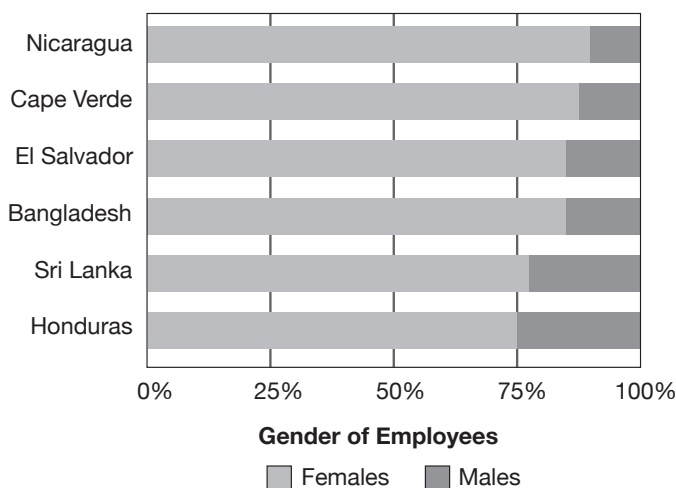
Changing Global Economy and Sustainability

Topics 7.7–7.8

MULTIPLE-CHOICE QUESTIONS

Question 1 refers to the following chart.

EMPLOYMENT IN SELECTED EXPORT PROCESSING ZONES



Source: International Labor Organization, 2007.

1. Which statement about the employment of men and women in EPZs is most clearly supported by the graph above?
- (A) Unemployment is probably an acute issue for men in these countries.
 - (B) Women make up the vast majority of each country's secondary sector employees.
 - (C) Men generally prefer to work in quaternary sector positions than in the positions found in these EPZs.
 - (D) The governments of these countries will be more likely to listen to the concerns of the women.
 - (E) Resource consumption by women working in EPZs will surpass that of men in these countries, causing great social change.

2. Silicon Valley is an example of a technopole because it
- (A) takes its name from the material used to make microchips
 - (B) demonstrates the concept of agglomeration economies
 - (C) is a center for developing new ideas that generate growth
 - (D) has attracted new universities to locate in the region
 - (E) reuses brownfield sites that were once industrial factories

Question 3 refers to the map below.

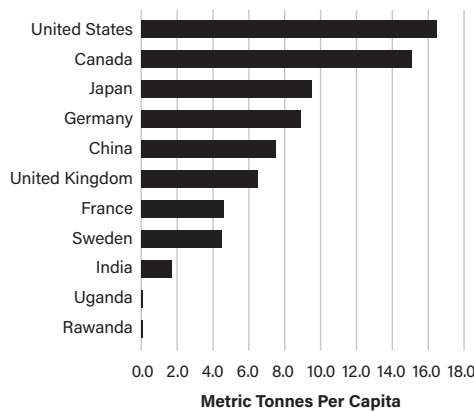


3. Which statement best describes the darker shaded region in the above map?
- (A) Growing prosperity in this region over the past several decades has had a spin-off effect on nearby regions.
 - (B) Industries in the region have a comparative advantage over ones in the South and Southwest regions in recent years.
 - (C) Brownfields are one sign of the economic recovery occurring in the region.
 - (D) The region is known as the Rust Belt because of the many closed factories in it.
 - (E) The region has always had a shortage of jobs in the secondary sector.
4. Which is most responsible for deindustrialization in highly developed countries?
- (A) Easy capital financing available in developing countries
 - (B) Low wages in developing countries
 - (C) Labor shortages in developed countries
 - (D) The lack of strong unions in developed countries
 - (E) The shortage of raw materials in developed countries

5. The main benefit for countries that host export processing zones (EPZs) is that these zones
- (A) create thousands of relatively high-paying jobs for their citizens
 - (B) increase availability of manufactured products for their citizens
 - (C) attract thousands of foreign workers, which results in millions of extra dollars in tax revenue
 - (D) increase opportunities for the citizens to work for American companies and to learn English
 - (E) provide an efficient way to increase imports from the United States

Question number 6 refers to the graph below.

CO₂ EMISSIONS PER CAPITA, 2017 (of selected countries)



Source: World Bank

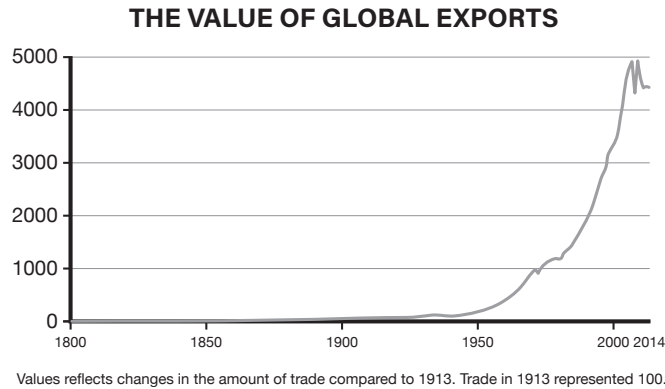
6. Based upon the graph above, which of the following factors corresponds the most closely with the amount of CO₂ emissions per capita?
- (A) Gross Domestic Product of the country
 - (B) Size of the country (mi.² or km²)
 - (C) Amount of fossil fuels extracted in the country
 - (D) Population of the country
 - (E) Longitudinal position of the country
7. Which of the following business activities will have the greatest multiplier effect?
- (A) Growing grain crops
 - (B) Manufacturing cars
 - (C) Serving fast-food
 - (D) Raising fish in a fish farm
 - (E) Repairing computers

FREE-RESPONSE QUESTION

1. Neoliberal policies and greater complementarity have caused dramatic changes in global trade since the 1950s. National governments set the rules, but companies are the most common trading partners, not countries. The values in the table below are percentages of travel and communication costs using the 1930 costs as 100 percent.

COSTS OF INTERNATIONAL TRAVEL AND COMMUNICATION					
Cost	1930	1950	1970	1990	2005
Sea Freight	100	57	45	26	22
Air Passenger Transport	100	45	23	18	15
International Phone Calling	100	20	18	2	1

Source: Organization for Economic Cooperation and Development Economic Outlook, 2007



Source: Federico, G., Tena Junguito, A. (2016). "World trade, 1800-1938: A New Data-Set," EHES Working Papers in Economic History, n. 93.

- (A) Using the concept of complementarity, explain why companies in different countries trade with each other.
- (B) Use the table to explain the pattern of global exports in the graph.
- (C) Using a specific method of transportation, describe the benefit of using this mode of transportation for trade.
- (D) Describe how export processing zones (EPZ) or special economic zones (SEZ) work to lower the cost of trade.
- (E) Describe ONE positive economic impact of increased international trade on a local community.
- (F) Describe ONE negative economic impact of increased international trade on a local community.
- (G) Explain how women in developing countries often benefit from international trade.

UNIT 7 REVIEW:

Connecting Course Skills and Content

APPLYING GEOGRAPHIC SKILLS

Applying geographic skills is critical for success on the AP Exam. For each skill listed write a one-paragraph response that illustrates your understanding of the question. Support your response with specific examples and evidence. Refer to the Unit 1 introduction (pages 3–7) for tips on how to apply geographic skills.

- 1C Explain TWO advantages of locating a car manufacturing plant in Ohio or Mexico that will sell the cars in the United States.
- 2C Using the U.S. Rust Belt as an example, explain how the multiplier effect can work in a negative way.
- 3D Using the Gini Coefficient and Human Development Index maps in Topic 7.3, describe one similar and one different spatial pattern.
- 4E Explain how the image of containers on page 446 relates to the concept of globalization and the new international division of labor.
- 5D Use examples to help explain the degree to which the concept of income inequality explains the different standards of living experienced by people at the international, national, and local scale.



WRITE AS A GEOGRAPHER: GIVE FULL EXPLANATIONS

Answers to free-response questions can be very basic—or they can be fully explained for additional credit on an exam. Consider the question, "Why did Chicago develop where it did?" The basic answer is that Chicago grew into a major city because it is located where two water transportation networks come together—the Great Lakes and the Mississippi River system. This is correct but basic. A fuller explanation would include claims that explain the context and the details to give significance to these basic facts. It would explain:

- the importance of water travel in the 1800s
- the wealth of food—wheat, corn, beef, and pork—produced in the Midwest
- the increasing demand in the East and Europe for food as industrial cities grew
- the increasing demand in the Midwest for manufactured goods produced in the East

For each question, write a basic answer in one or two sentences. Then list three additional points that would provide a fuller explanation.

1. Explain why purchasing power parity is a more useful refinement of gross national income.
2. Which criticisms of Rostow's Stages of Economic Growth model could also be made against Wallerstein's World Systems Theory?
3. What are the costs and benefits of sustainable growth?