

Chapter 4 Key Terms

nation
state
country
nation-state
stateless nation
multinational state
multistate nation
autonomous region
modern nation-state
Conference of Berlin
tyranny of the map
superpowers
lame-duck president
seats of government
parish, province
territoriality
internal boundaries

international boundaries
The Demilitarized Zone
boundary disputes—definitional, locational, operational, allocational
territorial seas
Exclusive Economic Zone (EEZ)
high seas
unitary state
federal state
supranationalism
economics of scale
trade agreements
military alliances
United Nations
European Union
devolution of states

CHAPTER 5

Agricultural and Rural Land Use

Next let's explore the topics of agricultural and rural land use (then later in the book we'll head into the city and explore urban land use). This chapter will cover assorted agricultural revolutions and their resultant negative and positive effects, farming and crops, food production, settlement patterns, and more. Let's head out to the country!

First Agricultural Revolution

10,000 B.C.E.—2,000 B.C.E. !

Throughout history, **agricultural revolutions** are periods of time in which significant innovations in farming occur. Such innovations were important as they often reduced the amount of labor needed to produce goods and increased the amount of goods harvested per unit of land.

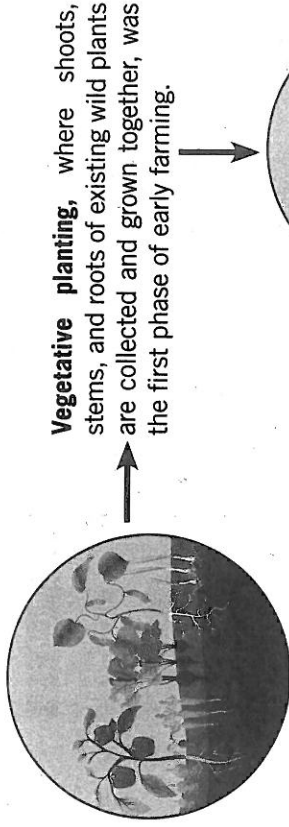
The **First Agricultural Revolution**, also known as the **Neolithic Revolution**, refers to the period of time when people transitioned from hunting and gathering for food, to an organized system of farming.

Keep in mind that this transition did not occur all at once. Instead, agriculture evolved in various geographic locations and successful processes diffused around the world over time.

Limitations of Diffusion

Growing areas of crops and livestock expanded as domesticated varieties were traded and diffused across the landscape. However, growing areas are limited by climate, weather, and culture.

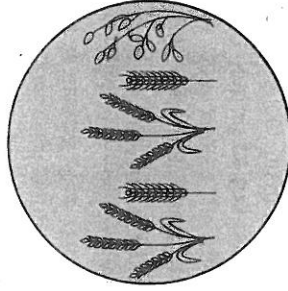
Agricultural Innovations



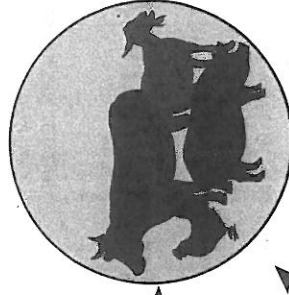
Vegetative planting, where shoots, stems, and roots of existing wild plants are collected and grown together, was the first phase of early farming.



This led to **seed agriculture**, where fertilized seed grains and fruits of plants are collected and replanted together.



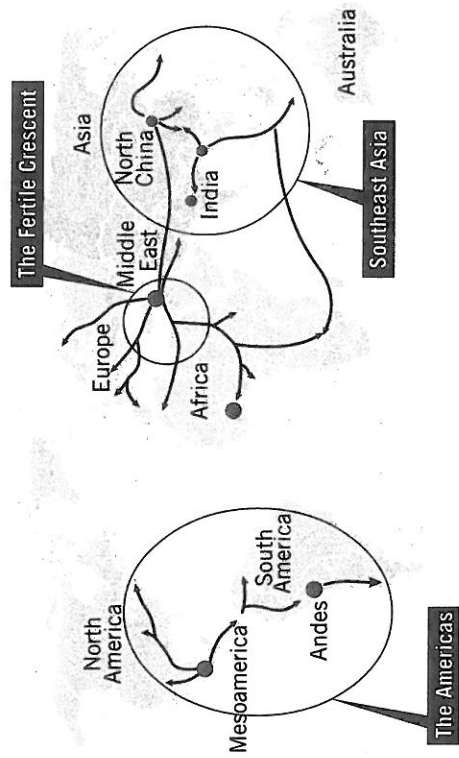
Over time, farmers reject poorly growing crops and took cuttings and seeds from productive, heartier crops to grow future generations. This **domestication of plants** led to early forms of **horticulture**.



Animal domestication, the process in which selected animal populations become accustomed to human provision and control, was established as an alternative to hunting and fishing.

Productive breeds were purposely interbred or hybridized for reproduction through a process known as **animal husbandry**. The diffusion of animal hybrids was specialized by region.

Early Centers of Plant & Animal Domestication



Among this map of early centers of plant and animal domestication is the "Fertile Crescent" which may be a new term to you. The Fertile Crescent is the nickname of a region in the Middle East that stretches from the Persian Gulf through regions that are now known as Iraq, Syria, Lebanon, Jordan, Israel, northern Egypt. It's known as the birthplace of agriculture, urbanization, writing, trade, science, history, and organized religion.

The Columbian Exchange

With the conquest of mainland Central and South America in the early 1500s, a number of domesticated New World crops made their way to the rest of the world through **relocation diffusion**. We call this the **Columbian exchange**, as it is historically symbolized by diffusion that occurred after the voyages of Christopher Columbus. And by "diffusion" we mean the spreading of plants and animals from the New World to the Old World (via trade ships) and vice versa. Animals also diffused during this time, but mostly in the opposite direction of plants: Many Old World animals made their way to the New World. Explorers took animals to the New World and brought plants back with them.

New World to Old World

- Rubber trees
- Turkeys
- Pumpkins
- Corn
- Avocados
- Strawberries
- Papayas
- Pineapple
- Tobacco
- Tomatoes
- Yams
- Parrots
- Beans
- Peppers
- Peanuts
- Potatoes

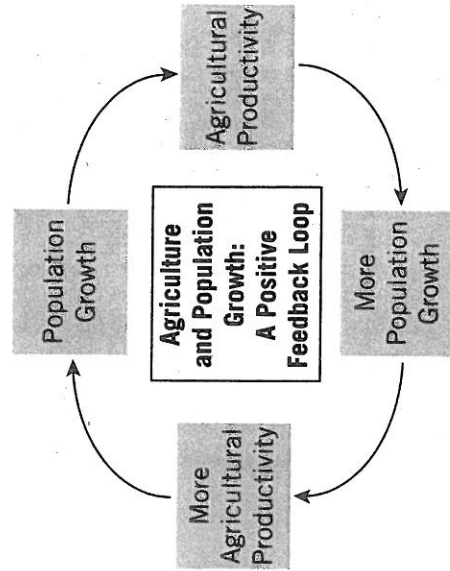
Old World to New World

- Olives
- Honey bees
- Oranges
- Bananas
- Wheat
- Turnips
- Lemons
- Pears
- Tea
- Oats
- Barley
- Chickens
- Cows
- Sheep
- Horses

Second Agricultural Revolution

Late 1700s AD—Mid 1900s AD

The **Second Agricultural Revolution** came about from technological innovations in agriculture and manufacturing that drastically reduced labor requirements and increased the scale of farm production. This revolution introduced specialized **hybrid crops**, artificial **chemical fertilizers**, early **chemical pesticides**, and **mechanization**. **Tractors**, **combine harvesters**, and other mechanized foodprocessing devices made vast improvements in crop yields for farmers.

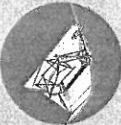
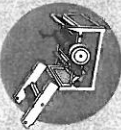


Advances from First Agricultural Revolution

1.

Innovations in

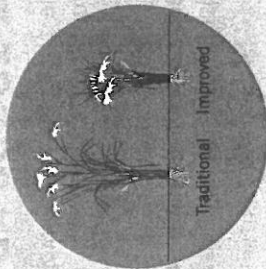
farming **technology**, such as devices like Eli Whitney's cotton gin (1793) and the McCormick reaper (1830s), reduced labor requirements and increased farm production. Such technological innovations, coupled with tractors and combine harvesters, improved both the quality and quantity of crop production.



2.

The 2nd agricultural revolution heralded massive advances in horticulture and chemistry. Scientific horticulture uses laboratory techniques to develop plant and animal hybrids that grow larger or under certain climatic conditions to meet the needs of farmers in different regions.

Dwarf varieties were an important plant hybrid innovation. Shorter breeds of both wheat and rice were found to be heartier and more productive because the plant spent less time and energy growing a stalk, resulting in more and larger grains on each head.

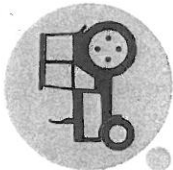


3.

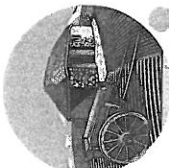
German chemists developed both artificial **fertilizers** and chemical **insecticides** such as ammonium nitrate, the first mass-produced as a fertilizer designed to replace lost nitrogen in soils. **Pesticides** were developed from natural sources and from synthetic chemicals. Developments included insecticides, fungicides, herbicides, rodenticides and nematocides, which kill harmful worms either in soils or within foods.

Impact of the 2nd Agricultural Revolution

The mechanization of agriculture led to a decreased need for labor and an increased dependence on machinery. While mechanization had a massive impact, such innovations did not diffuse to Third-World countries until much later.



Small farms were no longer profitable, leading to the decline of individual farms and the rise of commercial farming. Not only did this lead to a decline in the number of individual farmers, but it also led to the rise of the large, industrial farm.



Agricultural chemicals, hybridization, and large-scale highly mechanized farms have enabled the global population to expand from two billion to more than seven billion. Furthermore, average human life expectancy increased dramatically due to an improved diet resulting from increased access to quality, affordable food.

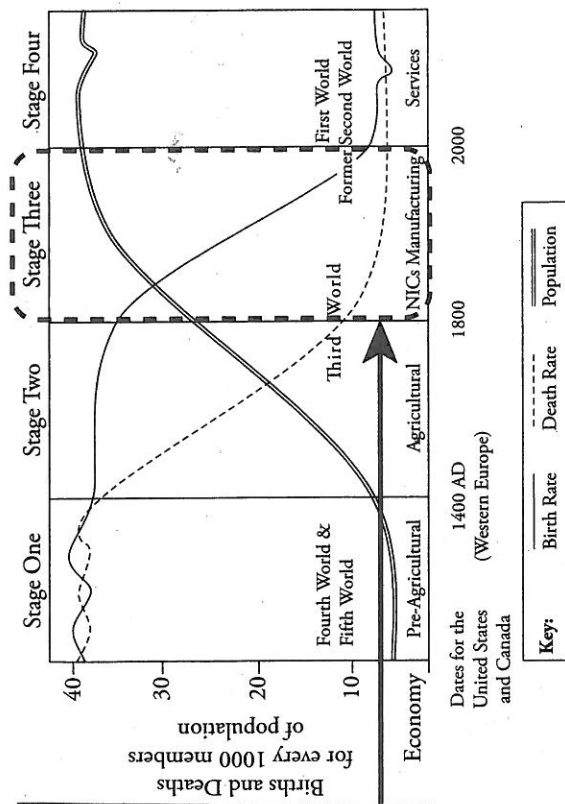


During industrialization in the 1800s and the early 1900s, there was a rapid rural-to-urban migration as agricultural work opportunities declined and manufacturing jobs increased.



Link to the Demographic Transition Model

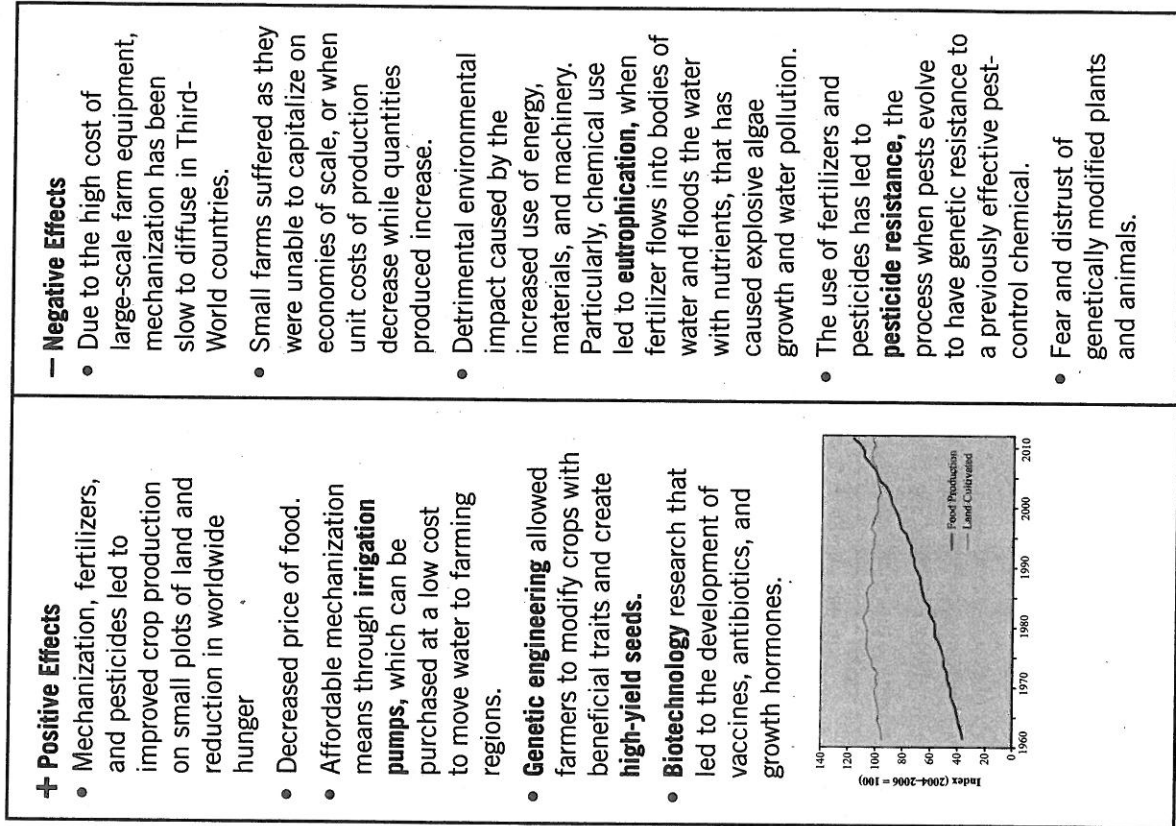
The 2nd Agricultural Revolution aligns with early stage three in the Demographic Transition Model. Stage three was achieved in Europe and the Americas during this revolution, but was not achieved in Third-World countries.



The Green Revolution

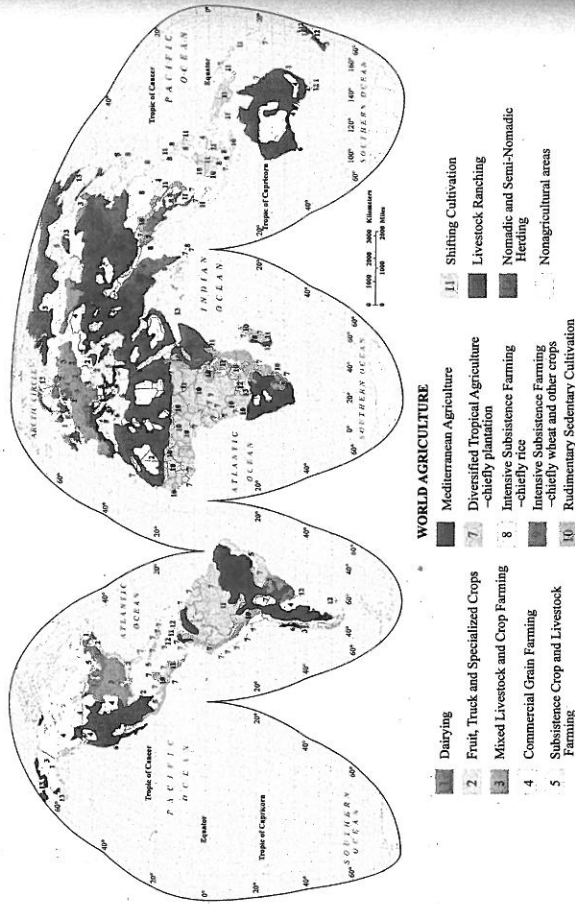
The **Green Revolution**, which occurred in the 1950s and 1960s, was when increased technologies, pesticides, and fertilizers led to the development of higher-yield and faster growing crops. Such innovations allowed farmers in the Third World to increase crop production on small plots of land.

The technology transfer from First to Third World also led to population growth in Third-World countries. Without expanded food production, the growing populations in the post-World War II developing world would have led to disastrous global food shortages, as opposed to periodic regional famines that occur due to drought or civil war.



Agricultural Production Regions

Modern commercial agriculture relies on a more inclusive way of farming and the internationalization of industrialized farming that we'll cover later in this chapter, but for now look into the way that climate conditions dictate the agricultural products of a given region.



The trends in shading show a way that a region's method of agricultural production is directly linked to a region's climate!

Mediterranean Agriculture

The areas of Africa, Asia, and Europe that surround the Mediterranean Sea have a warm, dry climate with short periods of rain in winter and spring. In this region, the domestication of plants has specialized certain varieties of crops that today bring significant value to farmers. Here is a short list of **Mediterranean agriculture** crops that have been domesticated and continuously grown in the region: citrus, nuts, palms, olives, artichokes, avocados, and grapes. Other parts of the world with climates similar to the Mediterranean have also adopted these specialized crops. These places include Southern and Central California, Central Florida, South Texas, Southern and Central Brazil, Southern China and Southeast Asia, Hawaii, Northern Argentina, Uruguay, Central Chile, Black Sea Coastal Areas, South Africa, and Southern Australia.



Specialized Agriculture

In order to survive the fall of the family farm, many individuals started to produce **specialized farm products**. Unlike staple grain farming, specialized crops play an important role in the diversity of foods in terms of both farm economy and the cultural specificity of consumers. Specialized crops bring much higher amounts of money per acre than basic grain staples. While these farms tend to be smaller than grain farms, specialized crops can still be produced in large-scale operations. Be aware of the following examples of specialized agriculture for the AP Human Geography exam.

Natural Food

- Those resistant to **genetically modified organisms (GMOs)**, skeptics of artificial hormones, and people concerned about **animal welfare** have rejected many of the farming practices used by agribusiness and other farmers. In turn, a large market for so-called **natural food products** has emerged. In most places, to be labeled **organic**, crops and animals must not be grown using genetic engineering, must be free of pesticides, antibiotics, and synthetic hormones, must not use artificial fertilizers, and must feed on completely organic crops.

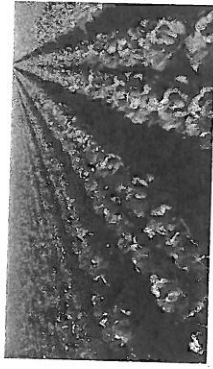
Dairy

- **Dairying** is done mainly with cows but can also be a specialized agricultural activity using goats and buffalo for cheese production. Dairying is today a massive global operation that yields milk for drinking, cheeses, yogurt, butter, and cream. With the development of pasteurization, the amount of area that could be served by dairies expanded; the region around a city to which fresh milk is delivered without spoiling is known as the **milkshed**. Multiple large dairies are necessary to supply large cities. Processed dairy has continually moved westward over the last 150 years to "America's Dairyland," Wisconsin, and other parts of the upper Midwest.

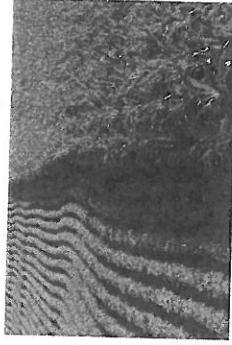
Subsistence Agriculture

Intensive mixed farming that provides all of the food and material needs of a household is commonly called **subsistence agriculture**. A single farm can produce staple grain crops, fruits, and vegetables along with meat, eggs, milk, wool, and leather, having animals pull plows during planting and loads during harvest. This allows people to settle permanently and subsist without having to migrate seasonally. **Extensive subsistence agriculture** occurs when there are low amounts of labor inputs per unit of land.

Monoculture is the agricultural practice of cultivating a single crop or livestock species on a piece of land (remember that MONO is more than just the nickname of that sickness that everyone is scared of getting in their high school and college years—it means "one"). Monoculture became common in the era of early political civilizations, when farms produced a **staple crop** in large order to feed whole societies and armies.



Multi-cropping was more secure than monoculture. If one crop failed or was damaged, another crop would provide a backup food supply. Today, most subsistence agriculture is usually very intensive and done on small plots of land. In much of the Third World, the **physiologic density**, or number of people per unit of **arable land** (farmable land), is very high compared to the First World; i.e., more people have to be fed off of less land in the Third World.

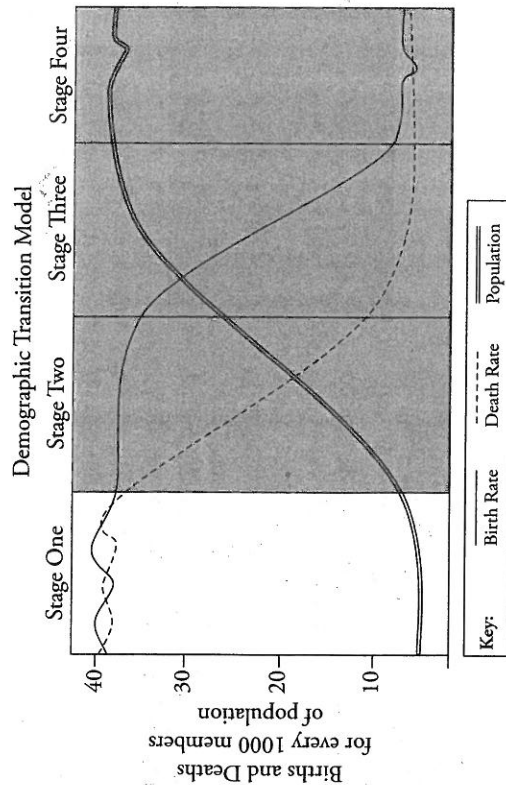


Subsistence practices require farmers to have innate knowledge of plants, animals, soils, and climate and the ability to preserve foods for long-term consumption and for times of need. **Food preservation** via drying, pickling, cooking, and storage jars has been a necessity for survival for thousands of years.

As a result, many **specialized crops** were grown for both immediate consumption and preservation. For example, cabbages spiced with red pepper and soaked in vinegar were buried in clay storage jars to make kimchi in Korea starting eight thousand years ago. Likewise, cucumbers were grown in Eastern Europe and preserved in either lime or salt water to make pickles. Meats are preserved by drying, smoking, sugarcuring, or salting for long-term preservation.

Subsistence Agriculture & the Demographic Transition Model

You can also relate agricultural practices to specific stages of the Demographic Transition Model. Historically, stage one of the model was characterized by pre-agricultural societies engaged in **subsistence farming** and **transhumance**, that is, the seasonal migration for food and resources or owning livestock. Based on current demographic data, there are no stage one countries in existence today. However, Third-World countries that engage in long periods of warfare exhibit late stage one characteristics.



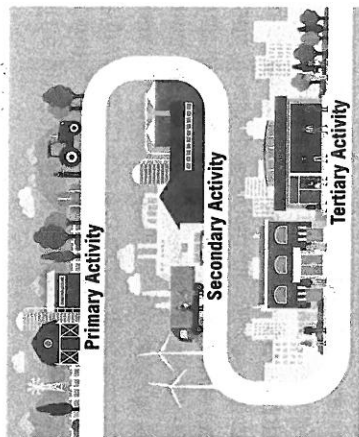
Commercial Agriculture

The opposite of intensive subsistence farming is **cash-cropping** to sell farm goods at market. This is a form of extensive agriculture in which harvested crops are exchanged for currency, goods, or credit. The credit is then used to buy equipment or seed for the next planting season and in part to buy food, clothing, and other necessities for the farm family. The **commercial crops** are transported, sold at other markets, and finally preserved or processed into other goods for sale. That describes small-scale cash-cropping, but large-scale corporate operations also engage in nonsubsistence farming. Modern commercial agriculture has radically changed the organization of farming. The dominant form today is **corporate agriculture**, or **agribusiness**, where large-scale extensive farms of several thousand acres or several thousand animals are controlled by a single regional business.

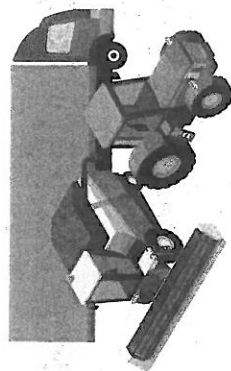
The Most Lucrative Food Crop by State (2012)

WHEAT	Oregon, Nevada, Montana, Utah, Colorado, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Texas, Minnesota, Iowa, Illinois, Missouri, Indiana, Michigan, Ohio, Kentucky, North Carolina, Virginia, Maryland, Delaware.
RICE	Arkansas, Mississippi
POTATOES	Idaho, Alaska, Maine, Wisconsin
APPLES	Washington, West Virginia, New Hampshire, New York
PEANUTS	South Carolina, Georgia, Alabama
SUGARCANE	Hawaii, Louisiana
ORANGES	Florida
GRAPES	California
MAPLE SYRUP	Vermont
MUSHROOMS	Pennsylvania
CRANBERRIES	Massachusetts
BLUEBERRIES	New Jersey
SWEET CORN	Rhode Island, Connecticut
PECANS	New Mexico
BEANS	Wyoming
LETTUCE	Arizona

Hallmarks of Modern Commercial Agriculture

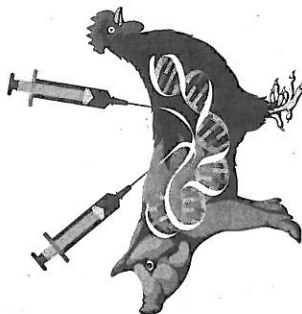


1. Modern commercial agriculture involves broad economic activity. Farmers now produce one or more crops (primary economic activity), process the crop (secondary economic activity), and advertise and market it through a farmer's co-op or other market, as well (tertiary economic activity).



2. Modern commercial agriculture also involves the use of large, powerful agricultural machinery. Use of more powerful equipment started to replace both man and beast in the early 20th century in America and then, after World War II, in Europe.

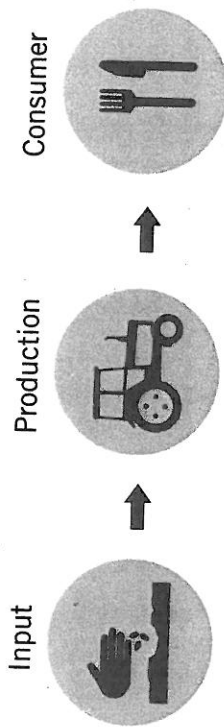
3. Research in biotechnology and food processing has made agribusiness a truly "big business." Higher-yield hybrid seeds, used in conjunction with new, improved chemical pesticides, fertilizers, and herbicides, gave farmers in other regions of the world the ability to greatly increase crop yields. Coupled with genetic engineering and biotechnology research, these innovations have increased the productivity of global agriculture, while reducing farm animal mortality rates. All of the aforementioned have combined to enable industrial agriculture, known as factory farming.



Family Farms, Agribusiness, and Complex Commodity Chains, Oh My!

Commodity chain analysis explains the links between producers and consumers in the production and distribution of a commodity. **Commodity chains** exist from the small-scale, family-based producers selling directly from the farm or through local farmers' markets to transnational supply networks selling to an international customer base.

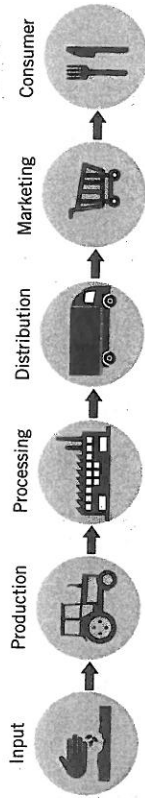
Small-Scale, Farm-to-Consumer Commodity Chain



Did You Know?

LET'S TALK TEA: Tea production employs millions of people worldwide, and most of them live in remote, poverty-stricken communities. The tea supply chain is very intricate and involves many players. Tea leaves are grown either on large estates with their own processing factories or by thousands of small farmers, who send their tea leaves to a local factory. From there, the tea moves to a broker, who auctions it off to an international trader. The international trader sells the tea to various tea companies, who then sell the product to retailing and catering companies and the consumer finally gets the box of tea bags. In this long and detailed commodity chain, only a few powerful multinational companies control the buying and retailing of tea. Most of the profits are made at the retail end of tea's commodity chain and the oversupply of tea (combined with the poverty of the producers) is a matter of great concern to international aid groups.

Agribusiness Commodity Chain



Agribusiness & the Demise of the Family Farm

The traditional, small-scale family farm has faced difficult times because of a few factors:

- low crop prices
- low profitability
- increasing fuel costs
- competition from big agribusiness firms

Beginning in the 1970s, the United States and Canadian governments extended vast amounts of low-interest loans, price supports, and other subsidy programs to aid farmers who at the time had significant political influence in agricultural states and provinces. This was a necessary bailout of farms, which would have shut down without the public supply of credit to buy seed, chemicals, and equipment at the start of planting seasons. Most banks saw farms as risky creditors, and the government had to step in as a lender of last resort.

If the government hadn't bailed out farmers, a mass closure of farms would have led to wild price swings in food, and things were bad enough with fuel prices in the 1970s at then all-time highs. Many farms' mortgages were foreclosed due to the farmers' inability to make money as a result of low **commodity prices** for crops (the prices set by market traders at mercantile exchanges for volumes of crops like bushels of corn or pork bellies). Eventually agribusiness stepped in during the 1980s and 1990s, buying up and consolidating many farms into larger holdings. As a result, some farm communities nearly disappeared as people left to find a new life in other parts of the country.

Intensive & Extensive Land Use

The type of labor and area of activity are used to classify agricultural activity. There are two main classifications:

- **intensive agriculture**, which requires many labor inputs, is focused on a small plot of land, or both
- **extensive agriculture**, which requires limited labor inputs, is spread across large areas of land, or both

Intensive Land Use

Early crop farmers added domesticated animals to their holdings, resulting in **mixed farming**. This is also referred to as **general farming**, where multiple crops and animals exist on a single farm to provide diverse nutritional intake and non-food items. Intensive mixed farming that provides for all of the food and material needs of a household is commonly called **subsistence agriculture**. (Remember that term from a few pages back?)

Market gardening is the small-scale production of flowers, fruits, and vegetables that are sold directly to local consumers. Labor is done manually, and involves growing a diverse set of crops on a small area of land over a single growing season.

Extensive Land Use

The domestication of herd animals led to **pastoralism**, or agriculture based on the seasonal movement of animals from winter to summer pastures and back again. This is known as **nomadic herding**.

Traditionally, **slash and burn agriculture** (also known as **swidden**) has occurred in tropical rainforest regions with farmers shifting from one plot of land to another every few years as soil nutrients become depleted; this is known as **shifting cultivation**. Land abandoned by farmers was allowed to **fallow**, and natural vegetation would return and increase the nutrient biomass of the area.

In the tropical and sub-tropical climates of the world, it is common to find extensive **plantation agriculture**, specialized crops intended for both **domestic consumption** and for export to other parts of the world.

Plantations tend to be large, extensive monoculture farms that are reliant upon low-wage labor and, historically in the United States until 1865, slave labor. Today, tropical plantation export crops are found mainly in Third-World locations. Some of the most common plantation crops are bananas, cane sugar, coffee, tea, rubber, cacao, and palm oil.

In the semi-arid climates of the world, extensive agricultural activity known as **livestock ranching** takes place over vast swaths of sparsely vegetated land with low soil quality. American livestock ranchers tend to focus on cows and chickens, while Chinese ranchers produce pigs.

Agricultural Activity & The Environment

Let's start off with some key terms:

- **Human Ecology:** human interactions with nature
- **Human-Environment interactions:** forestry techniques, fisheries, environmental regulation, farming practices

Farming practices can be criticized for their dependence on external inputs such as fuel, agricultural chemicals like pesticides and fertilizers, and the effects of farming on soil erosion and local water usage. As soils become depleted and water becomes the earth's most precious commodity, protecting these resources has become a major movement.

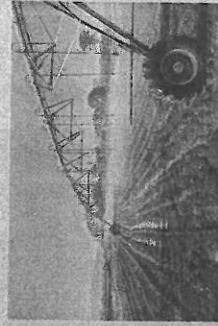
The following are environmental problems associated with agricultural activity that you should know for the AP Human Geography Exam.

Overgrazing & Desertification



Extensive pastoralism, the shifting of animal herds between grazing pastures, has remained popular in several arid parts of the world (especially Africa, Middle East, Central Asia), where dry grassland is the common landscape. This problem is similar to that of rainforest destruction, since too many people and too many animals are placing **population pressure** on too little land. **Overgrazing** has led to significant amounts of dry grassland being denuded, eroded, and as a result, desertified. **Desertification** is any human process that turns a vegetated environment into a desert-like landscape. In addition to overgrazing, deforestation and **soil salinization** can also lead to desertification.

Irrigation Agriculture



The practice of **irrigation** opens up more land to cultivation than would normally be possible in arid climates. Irrigation agriculture is responsible for close to three-quarters of world freshwater use and up to 90% of freshwater use in the most poverty-stricken countries of the world. Governments often heavily subsidize irrigation agriculture and the crops produced are often worth less than the water. The Nile Valley in Egypt is an example of heavily subsidized irrigation agriculture. Unfortunately, the water for these irrigation farms comes from underground water tables called **aquifers**. These aquifers are being depleted at a rapid rate and large-scale grain-producing countries such as India, China, and the United States are examples of those caught in this predicament.

Deforestation

Deforestation is the act of clearing, generally by cutting down or burning, a forested area of trees and other vegetation without the intention of replanting. Not only does rainfall sap the remaining nutrients from the soil, but deforestation places pressure on a valuable, natural resource—oxygen—and lessens the earth's ability to filter CO₂.



Wetland Destruction

A **wetland** is an area of land that is covered in fresh water, salt water, or a combination of the two. Wetlands include marshes, ponds, deltas, and lake or ocean edges. Wetland destruction occurs when wetland areas are drained and filled for land that can be used for small-scale farming, agribusiness, or commercial developments.

Water Pollution

Right now, the biggest source of water pollution is agricultural activities. The particular sources that are responsible for water pollution are called **point sources**, and pollution that has many sources or no definitive source are **nonpoint sources**.



One continual problem that contributes to water pollution is that runoff from farmland carries excess nutrients and pollutants to streams. This can result in **large dead zones** (areas that don't support life), as standing bodies of water such as ponds, reservoirs, and lakes do not recover quickly from the addition of pollutants. The lack of water flow prevents the pollutants from being diluted, which means that they accumulate in the water and undergo **biomagnification** in the food chain. In a similar way, groundwater does not recover well from the addition of pollutants because, again, there is very little movement of water. Furthermore, groundwater is generally very cold and low in dissolved oxygen, which makes recovery from degradable waste a slow process.

Another problem that arises from the large number of grazing animals worldwide is the large amount of **animal waste** produced. Manure is not used as fertilizer due to difficulty with transport. It has instead become the most widespread source of water pollution in America.

Soil Degradation

One of the risks of farming in dryland and desert regions is that the evaporation of water can trap **mineral salts** on the surface soil layer. High daytime temperatures cause water vapor to be drawn out of irrigated farmland. As evaporation continues over several growing seasons, the amount of mineral salt can build to toxic levels and poison crops. The land has to be either abandoned or flooded by about 18 inches of fresh water over a couple of months to draw out the salts. Fresh water, though, tends to be expensive and in short supply in these dry areas.



Chapter 5 Key Terms

agricultural revolutions	milkshed
First Agricultural Revolution (Neolithic Revolution)	subsistence agriculture
growing areas	extensive subsistence agriculture
vegetative planting	monoculture, staple crop
seed agriculture	multi-cropping
domestication of plants, horticulture	physiologic density
animal domestication	arable land
animal husbandry	food preservation
relocation diffusion	specialized crops
Columbian exchange	subsistence farming
Second Agricultural Revolution	transhumance
hybrid crops	cash-cropping
chemical fertilizers	commercial crops
chemical pesticides	corporate agriculture,
mechanization	agribusiness
tractors	commodity chains
combine harvesters	commodity prices
technology	intensive agriculture: mixed farming, general farming
dwarf varieties	subsistence agriculture
fertilizers	market gardening
insecticides	extensive agriculture
pesticides	pastoralism
Green Revolution	nomadic herding
irrigation pumps	slash and burn agriculture, swidden
genetic engineering	shifting cultivation
high-yield seeds	fallow
biotechnology	plantation agriculture
eutrophication	domestic consumption
pesticide resistance	livestock ranching
Mediterranean agriculture	human ecology
specialized farm products	human-environment interactions
genetically modified organisms (GMOs)	extensive pastoralism
animal welfare	population pressure
natural food products	overgrazing
organic	desertification
dairying	soil salinization
	irrigation