UNIT FIVE
AGRICULTURE:
PRIMARY ECONOMIC ACTIVITIES

ADVANCED PLACEMENT
HUMAN GEOGRAPHY

Session 1
Overview
A crucial influence on the organization of the earth’s surface is the way that people make a living.

Economic activities can be organized as follows:

* primary
* secondary
* tertiary
The primary sector is the part of the economy that draws raw materials from the natural environment.

Examples:
- agriculture
- raising animals
- fishing
- forestry
- mining
The primary sector is the largest sector of the economy in low-income, pre-industrial nations.
The secondary sector is the part of the economy that transforms raw materials into manufactured goods.

Examples:
• Refining petroleum into gasoline
• Turning metals into tools and automobiles
THE SECONDARY SECTOR GROWS QUICKLY AS SOCIETIES INDUSTRIALIZE.
The tertiary sector is the part of the economy that involves services rather than goods.

- Construction
- Trade
- Finance
- Real estate
- Private services
- Government
- Transportation
The quaternary sector is often seen as a subset of the tertiary sector.

It includes jobs concerned with:
- research and development
- management and administration
- processing and disseminating information
The tertiary sector grows with industrialization and comes to dominate post-industrial societies, or countries where most people are no longer employed in industry.
## COMPARATIVE ECONOMIC SECTORS
(as percentage of labor force by occupation)

<table>
<thead>
<tr>
<th>Country</th>
<th>Primary (agriculture)</th>
<th>Secondary (industry)</th>
<th>Tertiary (service)</th>
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<tr>
<td>China</td>
<td>38%</td>
<td>46.9%</td>
<td>43%</td>
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<tr>
<td>Iran</td>
<td>25%</td>
<td>31%</td>
<td>45%</td>
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<tr>
<td>Mexico</td>
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<td>23.4%</td>
<td>62.9%</td>
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<td>Nigeria</td>
<td>70%</td>
<td>10%</td>
<td>20%</td>
</tr>
<tr>
<td>Russia</td>
<td>10%</td>
<td>31.9%</td>
<td>58.1%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>1.4%</td>
<td>18.2%</td>
<td>80.4%</td>
</tr>
<tr>
<td>United States</td>
<td>.7%</td>
<td>20.3%</td>
<td>79%</td>
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</table>
ECONOMIC ACTIVITIES

For thousands of years agriculture was the main economic activity of most people on earth, until the Industrial Revolution transformed economies first in Europe and North America, and eventually influenced most countries in the world.
Because the sectors represent necessary economic activities, most countries today have some people employed in ALL economic sectors.
The Origin and Spread of Agriculture
Agriculture is the deliberate tending of crops and livestock in order to produce food and fiber.
Agricultural production in the world today is at an all-time high, mainly because the nature of farming has changed with:

* mechanization
* farm consolidation

*These changes have had the most impact in industrial and post-industrial countries.*
In **ALL** countries, the processes that determine the production, distribution, and consumption of food form an **important part of culture**.

**Other cultural factors affect agriculture:**
- the ways that land is distributed
- functions of livestock
- consumption of food from crops and animals
Example:

- Hindus do not eat beef and Muslims do not eat pork.
- Therefore, the two religions greatly impact the nature of agriculture in regions where they have many adherents.
HUNTERS AND GATHERERS
The first humans probably emerged in eastern Africa as a result of:

- availability of food
- domesticable animals
- favorable climate
Hunters and Gatherers

- **Hunters** gained skills in capturing and killing animals.
- **Gatherers** learned which plants and fruits were edible and nutritious.
Generally, technological inventions supported the activities of hunters and gatherers:

- Stone
- Metals
The groups traveled frequently, establishing new home bases or camps.

Their migration patterns depended on the movement of game and the seasonal growth of plants.
By 8000 B.C.E., humans had migrated to many areas, probably following herds and other food sources.

Major migrations include:
- Eastern Africa to Australia, the Middle East, Europe, and Asia
- Asia across the land bridge to the Americas
THE NEOLITHIC REVOLUTION
When and how did people give up their wandering and settle to live in one place?
The ability to settle was based almost entirely on the cultivation of plants and the domestication of animals.

These drastic changes in human life are known collectively as the NEOLITHIC REVOLUTION (8000 B.C.E.).
Agricultural hearths developed independently in several regions of the world over a long period of time.

From these agricultural hearths, farming practices diffused across the earth.
Changes that resulted from the Neolithic Revolution

- Increase in reliable food supplies
- Rapid increase in total human population
- Job specialization
- Development of distinction between settled people and nomads
- Widening of gender-specific activities
  - Men → agricultural production and domestication of animals
  - Women → child-rearing, food preparation, care of home
Sauer, a cultural geographer, believed that the earliest form of plant cultivation was **vegetative planting**, in which new plants were produced from existing plants, such as cutting stems and dividing roots.
People first learned to farm by deliberately dividing and transplanting plants that were already growing wild.

Seed agriculture, or the production of plants through annual planting of seeds, came later.

Most farmers TODAY practice seed agriculture.
Carl Sauer believed that vegetative planting probably originated in the diverse climates and topography of Southeast Asia.

The people there did more fishing than hunting and were probably more settled. Therefore, they were more likely to experiment with plants.
Vegetative Planting

Sample plants that were domesticated in Southeast Asia:

- taro
- yams
- bananas
- palm trees
The first vegetative planting diffused from the Southeast Asian hearth:

- northward and eastward to China and Japan.
- westward through India, Southwest Asia, tropical Africa, and the area around the Mediterranean Sea.
The earliest hearth was probably Southeast Asia, with other early hearths in West Africa and South America.
The first domesticated animals were probably dogs, pigs, and chickens.
Vegetative Planting

- Other early hearths:
  - **West Africa:** palm trees and yams
  - **Northwestern South America:** manioc, sweet potatoes, and arrowroot
Carl Sauer identified three hearths for seed agriculture in the Eastern Hemisphere.

Those hearths were:
- western India
- northern China
- Ethiopia
Seed Agriculture

- Hearth of crops:
  - **Southwest Asia:** barley and cattle
  - **Ethiopia:** millet and sorghum
The cultural hearth of rice is unknown, but it probably was Southeast Asia.
Seed Agriculture

- Two independent seed agriculture hearts originated in the **Western Hemisphere**:
  - southern Mexico
  - northern Peru
Seed Agriculture

- **Origin of crops**
  - **Southern Mexico:** squash and maize (corn)
  - **Peru:** beans, cotton, squash
Over the years many innovations increased the chances of success for seed agricultural practices.
These innovations included:

- **irrigation** (the channeling of water to fields)
- **plowing** to loosen and turn the soil
- **fencing** to keep animals out of fields
- **building terraces** to provide level field on hillsides
- **fertilizing** with plant and animal waste
- **weeding**
The diffusion of both vegetative planting and seed agriculture from their multiple hearths created a wide variety of food raised and consumed around the world.
THE COLUMBIAN EXCHANGE
Food in the Western and Eastern Hemispheres was almost completely different until the Columbian Exchange during the late 15th and 16th centuries.

Products were carried both ways across the Atlantic and Pacific Oceans.
The European exploration and conquest of the Western Hemisphere during the late 15\textsuperscript{th} and 16\textsuperscript{th} centuries led to the exchange of products between Western and Eastern Hemispheres, with new trade routes across the Pacific and Atlantic Oceans connecting to established trade routes. For the first time in world history, trade routes encircled the globe.
# The Columbian Exchange

## NEW EXCHANGES IN THE COLUMBIAN EXCHANGE

<table>
<thead>
<tr>
<th>The Americas</th>
<th>The Eastern Hemisphere</th>
</tr>
</thead>
<tbody>
<tr>
<td>beans, squash, tomatoes, sweet potatoes, peanuts, chilis, chocolate, maize (corn), potatoes, avocados, pineapple, manioc</td>
<td>wheat, rice, olives, grapes, bananas, rice, citrus fruits, melons, figs, sugar, coconuts, horses, cattle, pigs, sheep, goats, chickens, rabbits, rats</td>
</tr>
</tbody>
</table>
THE SECOND AGRICULTURAL REVOLUTION
A second agricultural revolution began in Western Europe in the 1600s.

It promoted higher yields per acre and per farmer.

It preceded the Industrial Revolution, making it possible to feed rapidly growing cities.
Innovations included:

- increased use of *fertilizers*
- **improved collars** for draft animals to pull heavier plows
Wealthy landowners in England began to enlarge their farms through **enclosure**: fencing or hedging blocks of land for experiments with new techniques of farming.

Previously, the land had been held in “**common**” and shared by all.
These scientific farmers:

- improved **crop rotation**, which carefully controlled the nutrients in soil
- bred **better livestock**
- invented such machines as the **seed drill** for more effectively planting seeds (Jethro Tull)
Farmers pushed out of their jobs by the enclosure movement either became tenant farmers or they moved to cities.
Better nutrition boosted England’s population, creating the first necessary component of the Industrial Revolution: LABOR!
Once the Industrial Revolution began, farming methods became more efficient.

Examples:
- Tractors for plowing soils
- Reapers for cutting crops
- Threshers for separating grain from stalks
- Motors for pumping water
Transportation for and storage of crops improved, especially with the invention of refrigerated cars and ships.

Industrially-produced chemicals for fertilizers, weed killers, and pesticides were also introduced in the 20th century.
KEY TERMS TO REVIEW FROM THIS SESSION

- Primary activity
- Secondary activity
- Tertiary activity
- Pre-industrial societies
- Quaternary activities
- Post-industrial societies
- Agriculture
- Hunters and gatherers
- Neolithic Revolution

- Agricultural hearths
- Vegetative planting
- Seed agriculture
- Plant and animal domestication
- Irrigation
- Yields
- Enclosure movement
- Hedging
- Crop rotation
- Seed drill
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Session 2
MAJOR AGRICULTURAL PRODUCTION REGIONS
Agricultural practices vary widely across the globe.

The most basic distinctions in agricultural products are made between less developed countries (LDCs) and more developed countries (MDCs).
Subsistence agriculture is the production of only enough food to feed the farmer’s family with few or no surpluses to sell.

It is most prevalent in LDCs.
Commercial agriculture is the production of food surpluses with most crops destined for sale to people outside the farmer’s family.

It is practiced primarily in MDCs.

Commercial farmers generally do not sell produce directly to consumers but to food processing companies.
Agribusiness occurs when big companies sign contracts with commercial farmers to buy their grain, cattle, pigs, chickens, and other products that they, in turn, package to sell through food outlets to consumers (e.g. grocery stores).

Agribusiness is found primarily in MDCs.
A Comparison... Percentage of Farmers in the Labor Force

**Subsistence Agriculture**
- A **high percentage** of people are engaged in farming.
- With **no surplus**, all people produce their own food to survive.
- **Example**: Many countries in Africa
  - 60% of citizens are engaged in agriculture.

**Commercial Agriculture**
- A **smaller percentage** of people are farmers.
- **Surplus** is available to sell.
- **Examples**: U.S. and Canada
  - Less than 2% of citizens are farmers.
Commercial Agriculture in MDCs

- Machinery is used to speed up production.
  - tractors
  - combines
  - planters
Use of Machinery

- Commercial Agriculture in MDCs
  - Transportation is important to facilitate the ability to get goods to consumers.
    - Railroads
    - Highways
    - Rapid sea travel
    - Air travel
Use of Machinery

- **Commercial Agriculture in MDCs**
  - *Scientific advances* boost crop yields and the health of animals.
    - Fertilizers
    - Herbicides
    - News breeds of plants and animals
A Comparison... Farm Size

Subsistence Farms
- The farms are small in size.

Commercial Farms
- Commercial farmers have equipment that helps them to manage farms that are very large in size.
SUBSISTENCE FARMING: SUBREGIONS
Subsistence farming varies according to adaptations to varying climates.
Subregions for subsistence farming include:

- intensive subsistence agriculture
- shifting cultivation
- pastoral nomadism
Intensive subsistence agriculture yields a large amount of output per acres through concentrated farming but still only provides a subsistence living for farmers.

Sometimes farmers may sell a little to others, but usually they raise crops for their own consumption.
Intensive subsistence farming is found in heavily populated areas of East and South Asia.

A little less than half of the world’s people are engaged in this type of farming.

Population densities are high.
Intensive Subsistence Agriculture

- **East and South Asia**
  - Wet, or low land, rice is dominant in many areas.
  - *Wet rice* is planted on dry land in a nursery and then moved as seedlings to a flooded field to promote growth.
  - The crop requires much attention and time but it can produce large amounts of food.
Intensive Subsistence Agriculture

- Labor intensive agriculture employs large numbers of people and requires relatively little capital to produce food.
- Most work is done by hand.
- Although the crops the farmers raise form the basis of their diets, they often link to other regions for specialized products.
Shifting cultivation is often referred to as “slash and burn” or swidden agriculture.

This farming method exists primarily in rain forest zones of:

- Central and South America
- West Africa
- Eastern and Central Asia
- much of southern China and Southeast Asia
Shifting cultivation still consumes a large percentage of arable land on the planet.

People who practice shifting cultivation generally live in small villages and grow food on the surrounding land.
Shifting Cultivation

- **Intertillage**—the growing of various crops—is common with shifting cultivation.
- Farming is done almost exclusively by hand, and plows and animals are generally used.
- The main fertilizer is **potash** from burning the debris when the site is cleared.
Shifting Cultivation

- When *nutrients are depleted* from the soil after a few years, villagers identify another site and clear it.
- They allow the old site to return to its natural vegetation, although they do not entirely abandon it.
- Villagers return to the original site after a few years to resume their farming.
Shifting cultivation is best suited to rain forest regions, where farmers fertilize the relatively infertile rain forest soils by burning the undergrowth and using the ash to allow cultivation of crops.
Pastoral Nomadism

- **Pastoral nomadism** is characterized by following the herds, just as earlier hunters and gatherers did.
- Today, domesticated herds consist of:
  - sheep
  - goats
  - cows
  - reindeer
  - camels
  - horses
Nomadism is the practice of moving frequently from one place to the other, as dictated by the need for pasture for the animals.
This life style first developed across the grassy plains of central Eurasia and nearby desert areas of the Arabian Peninsula and Sudan.
The animals provide subsistence for the herders with:

- milk
- cheese
- meat
- hair, wool, and skins for clothing and shelter
The herds follow **seasonal availability** of pasture.

**Extended stays** by herders are neither possible nor desirable.
Both shifting cultivation and pastoral nomadism are referred to as extensive subsistence agriculture.

They involve large areas of land and minimal labor per land unit.
A major issue for subsistence farmers today is the need to intensify farming because of rapidly growing populations.
Ester Boserup

- Boserup was an economist who believed that subsistence farmers
  - intensify production by leaving land fallow for shorter periods.
  - adopt new farming methods.
In order to farm land more efficiently,
- plows must be used.
- more weeding must take place.
- more ditches for irrigation must be dug.
The increase in population provides more people for weeding and digging ditches, so yield per acre increases, and land may be left fallow for shorter periods of time.
COMMERCIAL FARMING: SUBREGIONS
Commercial farmers are part of a large, complex economy that includes industrial and service sectors as well.
Commercial Agriculture: Categories

Intensive Types
- Dairy farming
- Truck farming

Extensive Types
- Large grain farms
- Livestock farms
Mixed crop and livestock farming is the most common form of commercial agriculture in:
- the United States west of the Appalachian Mountains.
- much of Europe from France to Russia.
Farmers **grow crops and raise livestock** on the same land spread, with most of the crops fed to animals rather than people.

**Most income comes from the sale of animal products such as:**
- beef
- milk
- eggs
Most farmers practice **crop rotation** where each field is planted on a planned cycle.

Different crops take different nutrients from the soil.

**Commercial farmers make efficient use of soil.**
At any given time, commercial farmers will have almost half of their fields planted but with different crops from previous years.
Example of crop rotation:

- One cycle might consist of cereal grains (e.g. oats).
- A second cycle might feature a root crop (e.g. turnips).
- A third cycle would be a “rest” crop such as clover. It restores the field but may be eaten by cattle.
- Then the farmer can start over with a cereal grain.
Dairy farms must be closer to market than other products because milk spoils quickly.

A ring of milk production called a milkshed surrounds a major city.
Today refrigerated rail cars and trucks have extended the reach of the milksheds so that nearly every farm in the U.S. Northeast and Northwest Europe is within the milkshed of at least one urban area.
Dairy farms also produce **butter and cheese**, with many specializing in one product or another.

Since cheese and butter keep fresh longer than milk, farms further away from **urban centers** tend to favor these products over milk.
A Look at New Zealand...

- New Zealand is the world’s largest producer of dairy products.
- New Zealand farmers devote only a small share of their work to liquid milk because they are too far away from North America and Western Europe to hold the milk market.
Dairy farmers usually do not sell their products directly to consumers but to wholesalers or to butter and cheese manufacturers.
The number of dairy farms has decreased significantly since 1980.

Dairy farmers cite long work and too little profit as reasons for giving up their farms.

HOWEVER, overall dairy production has risen, indicating that farms still in existence are producing more.
A disadvantage of dairy farming is the expense of feeding cows in winter.

Dairy farmers must purchase all feed, making it less likely that they will make a profit.

Dairy farming is also labor intensive. For example, cows must be milked twice daily.
The most important grain-producing areas in the world are in three regions in the United States.
Region One: winter wheat area

- Kansas, Colorado, Oklahoma
- The crop is planted in the autumn, survives the winter, and ripens the following summer.
Region Two: spring wheat area
- The Dakotas
- Montana
- In this region, winters are too severe for winter wheat.

Region three: the Palouse Region
- Washington state
Other grain-producing countries:
- Canada
- Australia
- Argentina
- France
- United Kingdom
Large-scale grain production, like other forms of commercial agriculture, is heavily mechanized on large farms.
Much wheat finds its way into the international market, where it serves as the world’s leading export crop.

As a result, the prairies of North America are often referred to as the “world’s breadbasket.”
States like Wyoming and Nebraska that lie between regions often are able to produce both winter and spring wheat.

Major Grain-producing Regions of the U.S.
Ranching is the commercial grazing of livestock over an extensive area.

It is often practiced in arid or semi-arid regions where climate conditions make crop production impractical.
Cattle ranching extends over much of the western United States, where the patterns of life associated with it have shaped the popular image of the West through stories of cowboys, round-ups, and trail-herding.
By the late 19th century, cattle ranching became more sedentary as more railroads covered the landscape and farmers claimed more western lands.
In South America, a large portion of the pampas (prairie) of Argentina, southern Brazil, and Uruguay are devoted to grazing cattle and sheep.
The shaded area on the map shows where livestock ranching is prevalent in South America.
Ranches in the following places are more likely to raise sheep than cattle:

- Australia
- New Zealand
- Middle East
- South Africa
Irrigation has allowed conversion of ranch land to crops, with the remaining ranches experimenting with new methods of breeding, feeding, and watering in order to stay profitable.
While livestock raised in the U.S. is sold primarily in the domestic market, livestock raised in other areas is more likely to be exported to high consumption developed countries.
Mediterranean agriculture is practiced in the following places:
- lands that border the Mediterranean Sea
- California
- Central Chile
- southwestern part of South Africa
- southwestern Australia
These areas share a similar physical environment.

They:

- border seas.
- are on the west coasts of continents.
- have moisture provided by prevailing sea winds.
- have moderate winter temperatures.
- have hot and dry summers.
Horticulture is the growing of fruits, vegetables, and flowers.

Horticulture forms the commercial base of Mediterranean agriculture.
The most important cash crops for this region are:

- olives
- grapes

Two-thirds of the world’s wines are produced here.

This region produces grapes, (wine), citrus fruits, and tree nuts.

This region produces a wider variety of crops because of the extensive use of irrigation.
Commercial Farming: Commercial Gardening and Fruit Farming

- Commercial gardening and fruit farming predominate in the U.S. Southeast, a region with a long growing season and humid climate.
- The region also has accessibility to the markets of the Northeast.
This type of agriculture is often called truck farming.

“Truck” originally meant “bartering” in the English language.

Truck farms usually rely on:
- machinery
- fertilizers
- migrant workers
Products from truck farms include:

- apples
- asparagus
- cherries
- lettuce
- mushrooms
- tomatoes

Some produce is sold fresh to consumers but most is sold to large processors for canning or freezing.
A plantation is a large farm that specializes in one or two crops and is found today in:
- Latin America
- Africa
- Asia
Almost all crops are raised for export to high-consumption developed countries.

These exports are called cash crops because they are raised to make money for their owners.
Crops that are usually grown on plantations include:

- cotton
- sugarcane
- coffee
- rubber
- tobacco
Plantations are colonial legacies that persist in poorer, primarily tropical, countries along with subsistence farming.

Until the 19th century, slave labor was employed, but today the workers are paid, although their room and board constitutes a large part of their salaries.
Today many **plantations in former colonies** are still owned by Western corporations or individuals.
Key Terms to Remember from this Session

- Less developed countries
- More developed countries
- Subsistence agriculture
- Commercial agriculture
- Agribusiness
- Intensive subsistence agriculture
- Wet rice
- Labor intensive agriculture
- Shifting cultivation
- “slash and burn”
- Swidden agriculture
- Intertillage
- Potash
- Pastoral nomadism
- Nomadism
Key Terms to Remember from this Session

- Extensive subsistence agriculture
- Intensive commercial agriculture
- Extensive commercial agriculture
- Mixed crop and livestock farming
- Crop rotation
- Dairy farms
- Milkshed
- Grain farming
- Livestock ranching
- Mediterranean agriculture
- Horticulture
- Truck farming
- Plantations
UNIT FIVE
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Session 3
RURAL LAND USE AND SETTLEMENT PATTERNS
THE VON THÜNEN MODEL

- Johann Heinrich von Thünen, a German farmer, developed a famous model for rural land use in the early 19th century.
- He studied the space around Rostock, Germany.
Von Thünen’s model was the FIRST effort to analyze the spatial character of economic activity.

Von Thünen published his model in *The Isolated State* in 1826.
Von Thünen noticed a pattern on the landscape as one crop gave way to another. There was no visible change in:

- soil
- climate
- terrain
Each town was a market center surrounded by a set of roughly concentric rings that featured different crops.

- Central City
  1. Market Gardening and Dairy
  2. Forest
  3. Field Crops
  4. Animal Grazing

Von Thünen identified four rings that surrounded market centers.
RING ONE: Market gardening and dairy
- Nearest to the town
- Perishable products
- Expensive to deliver and must reach market quickly
- Examples:
  - garden vegetables
  - milk
RING TWO: Forest

- Source of fuel and construction
- Trees heavy to transport
RING THREE: Field crops

- Used for less perishable crops
- Crops rotated yearly
- Examples:
  - wheat
  - other grains
RING FOUR: Animal Grazing

- The outermost ring was devoted to livestock grazing.
- Grazing requires much space.
- Beyond this ring, it generally became unprofitable to farm commercially because the transportation costs became too high.
Intensive Agriculture

- Intensive agriculture methods need to be applied in the rings that are closest to the market center.
- Land closer to the market center is subdivided into relatively small units.
- Dairy and truck farmers sought smaller plots of relatively expensive land close to cities.

Extensive Agriculture

- Land far from markets in rings three and four may be farmed extensively and in larger units.
- Grain farmers and ranchers settled on larger, less expensive land farther away from urban areas.
Location theory explains how an economic activity is related to the land space where goods are produced.

Von Thünen identified the interplay of transportation costs and value of the products on rural land use. This connection is still at the heart of location theory.
Von Thünen’s model comes in to play in assessing rural land use for organic foods.

Example:
- On a regional level, fresh organic chicken served in a New York City restaurant would most likely have a more limited area of profitability than chicken that is non-organic.
Von Thünen’s model is useful for understanding broad patterns of land use.

Factors that affect rural land use include:

- varying climate
- various soil conditions
- farming methods
- technology
- historical influences
Many poor countries today still grow commercial crops – such as coffee and bananas – on soil that might be used for food for their own consumption.

The historical roots of this practice are in colonial times, when plantations were used for commercial agriculture by European countries and/or the U.S.
PATTERNS OF SETTLEMENT
What affects density of housing in rural areas?

- **Dispersed settlement patterns**
  - These patterns are found in areas where extensive agriculture is practiced.
  - Individual farmhouses lie far apart.
  - They may also exist in areas where machinery makes intensive cultivation of large areas possible.
What affects density of housing in rural areas?

- Nucleated settlement patterns
  - Villages are located close together with small surrounding fields.
  - Land use is intense, but people and animals do the work.
  - This is the MOST common pattern of agricultural settlement.
What affects density of housing in rural areas?

- **Nucleated settlement patterns**
  - Here you will find houses grouped together in **hamlets**, or small clusters of buildings.
  - Slightly larger settlements are called **villages**.
  - These settlements reflect the historical need to band together for **protection**.
HOUSING STYLES AND GEOGRAPHY
Geography has always influenced the types of houses that people build for shelter.

Examples:
- People in flood-prone areas learned how to build houses on stilts.
- People in areas with lots of snow learned to build steep-sided roofs.
Lifestyles have also determined house styles.

Examples:
- Light-weight transportable materials are used by nomadic people for shelter.
Until recently, people were limited by their physical environments in their building materials for housing.

Example:

Early settlers in the Midwestern U.S. built sod houses because trees were not readily available.
Today migrations have carried housing styles far away from their origins.

Building materials are shipped for long distances.

As a result, many areas have mixed housing styles.
Rural areas tend to have more traditional housing than urban areas do.

Villages have mixtures of traditional and modified housing.
Examples:

- Sod-covered roofs in Scandinavia
- Hand-cut stone houses in the Andes Mountains
- Mud-walled houses in China
Wood

- Historically, the use of wood has been linked to close proximity to forests.
- Wood is now shipped to most corners of the globe.
Wood

- The log house probably originated in northern Europe where forests were plentiful.
- The use of wood spread to North America when Europeans first settled there.
Brick

- In the U.S. bricks are oven-baked blocks of cement.
- In other parts of the world, brick is made from different materials.
- Today brick is a major element of modern construction all over the world.
Brick

Sun-dried brick, wet mud mixed with straw, is used in many parts of the world including:
- the Middle East
- Northern China
- Mexico
- the southwestern U.S.
Stone

- Natural stone has long been used in home construction.
- Typically, natural stone is built with cement mortar.
- However, in the Andes Mountains buildings have no mortar and are stacked like puzzle pieces.
Wattle

Wattle consists of poles and sticks woven tightly together and then covered with mud.

Many African houses are constructed with wattle and a thatched roof.

Other regions, such as Southeast Asia, may use bamboo, sticks, bark, and leaves for building.
VILLAGES
The definition of a village varies throughout the world.

It usually describes a small number of people who live in a cluster of houses in a rural area.

Other structures found in villages include:

- government buildings
- markets
- places for religious gatherings
Another way to define a village is by the occupation of its people.

Most people work in the primary economic sector as:

- farmers
- herders
- fishers
- specialized workers
Village Forms

- **Round village**
  - This type features houses that circle around a central corral for animals with fields extending outside the ring of houses.
  - Round villages are found in
    - East Africa
    - Parts of Europe
- **Why was this design developed?**
  - To protect domesticated animals
Walled village

This type was developed in ancient days in order to protect villagers from attack.

In Europe the villages were often surrounded by moats as well.
Remains of a Village Wall

• This photo shows the **remains of the wall** and an old city gate that led to the city of Die in France.

• The wall provided protection from attack, and the gate was heavily fortified.
Grid village

- The grid village is more modern and is laid out in straight street patterns that run in parallel and perpendicular lines.
- It works best in areas with flat land.
Village Forms

- **Linear village**
  - This modern settlement follows major roads.
  - There is often one single thoroughfare lined with:
    - houses
    - businesses
    - public buildings
Cluster village

This type of settlement may have more than one major road that inhabitants build along.

It may also have housing that clusters around large public buildings such as:

- churches
- temples
- mosques
- grain bins
- livestock corrals
THE INFLUENCE OF LAND OWNERSHIP AND SURVEY TECHNIQUES
One of the most important influences on land settlement patterns is land ownership.

Property lines divide one person’s land from another’s.

Rules about property inheritance often determine land distribution.
Primogeniture

Primogeniture is practiced in areas where all land passes to the eldest son, resulting in land parcels that are large and tended individually.

Primogeniture is found in:
- Northern and southern Europe
- the Americas
- South Africa
- Australia and New Zealand
Survey methods

Surveys were first used in areas where settlement was regulated by law.

Example: The U.S. government used the rectangular survey system to encourage settlers to disperse evenly across interior farmlands.

These grid-like patterns that were formed during this process are still found in the U.S. today.
Other survey systems

The metes and bounds approach uses natural features to mark irregular parcels of land. This approach has been used along the eastern coast of the U.S.
Other survey systems

The long-lot survey system divides land into narrow parcels that extend from rivers, roads, or canals.

This system has been used in:

- Quebec
- Louisiana
- Texas
Key Terms to Remember from this Session

- Von Thünen Model
- concentric rings
- perishable crops
- commercial crops
- dispersed settlements
- nucleated settlements
- hamlets
- villages
- primary economic sector

- round villages
- walled villages
- grid villages
- linear villages
- cluster villages
- primogeniture
- survey methods
- metes and bounds approach
- long-lot survey system
UNIT FIVE
AGRICULTURE:
PRIMARY ECONOMIC ACTIVITIES
ADVANCED PLACEMENT
HUMAN GEOGRAPHY

Session 4
MODERN COMMERCIAL AGRICULTURE
Modern commercial agriculture has its roots in the commercial revolutions started during the 18\textsuperscript{th} century in Europe.
Mercantilism, an economic system, was developed by the British and Dutch, with private companies under charter from the governments carrying out the trade.

The main goal was to benefit the mother country by trading goods to accumulate precious metals and enrich the country.
The Role of Mercantilism

- **Major products included...**
  - Cotton from Egypt, Sudan, and India
  - Tobacco and cotton from the American colonies
  - Sugar from the plantations in the Caribbean and Brazil
These goods were marketed mainly in Europe, but sometimes they were manufactured in European factories and then sold back to the colonists.
Modern global agricultural patterns still follow colonial patterns.

Poor countries still produce raw materials, including food, for consumption by those living in richer countries.

Examples:

- Colombians still produce coffee.
- Guatemala’s economy is supported by the sale of bananas.
The production of cash crops in poor countries continues because many of them **MUST** repay loans from international organizations such as:

- The World Trade Organization (WTO)
- The International Monetary Fund (IMF)
- The World Bank
THE DIFFUSION OF INDUSTRIAL AGRICULTURE
Today **industrial agriculture** is a stage in the commercial agriculture process which is just one step in a multiphase industrial process.

The process begins on the farm and ends on the consumer’s table.
Commercial agriculture has spread to almost all areas of the world.
It has spread through global trade and exchange markets.
Almost all economies have adjusted to it in one way or the other.
Farmers not only produce for their own subsistence but for a market that is part of a complex system that includes the following:

- mining
- manufacturing
- processing
- service activities
Industrial Agriculture

Farmers must act within the constraints of the market that set prices based on *supplies and demands of the global economy*, and NOT on their own immediate needs.
Agriculture is now characterized by specialization, the growing of specialized crops because they seem to be more profitable.

Farmers must weigh the costs of production such as:
- machinery
- fuel
- fertilizer
- labor

Farmers must also deal with unpredictable weather and/or disease.
In the United States, farmers sought to minimize their risks during the 1950s by signing agreements with buyer-processors, who specified exact times and weights of products to be delivered, including:

- chicken
- cattle
- wheat
- potatoes
- other basic food
Agribusiness is now spreading to developing countries where small-size farmers are linking with foreign sources for:

- advice
- seeds
- fertilizers
- machinery
- profitable markets at stable prices
Agribusiness: Criticisms

**Poorer Countries**
- Agribusiness is seen as exploitive of small farmers who receive too little money for their products.

**Wealthier Countries**
- Farmers in these countries are also concerned that competition from farms in less developed countries will drive down market prices.

Some governments have placed controversial import taxes on foreign produce in order to protect their own farmers.
THE THIRD AGRICULTURAL REVOLUTION
The Third Agricultural Revolution

- This revolution began in the mid-20th century and is still going on today in the form of industrial agriculture.
- Modern farming refers to the industrialized production of:
  - livestock
  - poultry
  - fish
  - crops
The Third Agricultural Revolution

- **Methods of industrial agriculture include:**
  - innovation in agricultural machinery and methods
  - genetic technology
  - techniques for achieving economies of scale in production
  - the creation of new markets for consumption
  - global trade
Most of the meat, dairy, eggs, fruits, and vegetables available in supermarkets are produced using the methods of industrial agriculture.
Industrial agriculture is based on new, higher-yielding varieties of crops developed in laboratories and plant nurseries through biotechnology.

Biotechnology is the use of genetically altered crops in agriculture and DNS manipulation in livestock in order to increase production.
THE DEVELOPMENT OF MIRACLE GRAINS

The experiments began with hybrid rice initiatives in the U.S. Midwest in the 1930s.

Hybrids were developed and by the 1980s, “IR36” was developed.

This led to:

- higher quantities of larger grains
- a shorter growing cycle
- a crop that was more resistance to pests
More recently, scientists have developed new high-yield variations of corn.
THE GREEN REVOLUTION
By the 1970s, the collection of new agricultural techniques was called the **Green Revolution**, which involved two important practices:
- the use of new higher-yield seed
- the expanded use of fertilizers
The Diffusion of the Green Revolution

1. The **Green Revolution** has resulted in agricultural production outpacing population growth by the late 20th century.

2. The dramatic changes brought about by the Green Revolution have been both **praised** and **criticized**.
The Green Revolution

**Praise**

- Famines that have occurred throughout history can now be avoided, since agricultural production now outpaces population growth.

**Criticisms**

- Poor farmers cannot always afford the items necessary to get new foods to citizens such as:
  - machinery
  - seeds
  - fertilizers
The Green Revolution

**Praise**

- Nitrogen-based fertilizers have increased farm productivity in many countries of the world.

**Criticisms**

- Farmers in poorer countries cannot afford the fertilizers.
- Fertilizers have also led to groundwater pollution and the reduction of organic matter in the soil.
The Green Revolution

Praise

- Scientists continue to invent new food sources including:
  - higher-protein cereals
  - cultivating the oceans
  - improving the palatability of rarely consumed foods

Criticisms

- Many fishing areas are over-fished.
- Cultural preferences shape food consumption and production of rarely eaten foods will not change eating habits.
The Green Revolution

**Praise**

- Higher productivity is primarily responsible for reducing dependency on imports in Asia, including China and India.
- In both areas populations are balanced fairly well with food resources.

**Criticisms**

- Many people in Sub-Saharan Africa are not getting enough to eat, with millions of people facing famine.
- Green Revolution techniques have made too few inroads, and population is increasing faster than food production.
Production of most food crops is lower today in Africa than it was 40 years ago, at the same time that populations are increasing.
Traditionally, the Sub-Saharan region has supported limited agriculture, with pastoral nomadism prevailing.

The land has now been overgrazed by animals, and soils have been exhausted from overplanting.

These practices have led to desertification, with the Sahara Desert claiming more land space.
Soil erosion has become a problem.
The limited number of trees have been cut for wood and charcoals for urban cooking and heating.
Government policies have traditionally favored urban populations by keeping food prices low, giving farmers little incentive to increase their productivity.
The Green Revolution

Praise

- New irrigation processes have greatly increased crop yields.

Criticisms

- Irrigation has led to serious groundwater depletion, negatively impacting water supplies for urban populations.
The Green Revolution

**Praise**
- Agribusiness has increased the productivity of cash crops.
- This increased productivity has yielded profits for farmers and raised large amounts of basic crops to feed the world.

**Criticisms**
- Agribusiness often means that land is devoted to raising one type of crop, rather than the variety needed for a balanced diet.
- This practice is especially true in poorer countries.
ENVIRONMENTAL IMPACTS OF MODERN AGRICULTURE
The industrialization and commercialization of agriculture has strengthened agriculture’s impact on the environment.
Erosion

- Lands cleared for agriculture almost immediately begin to erode.
- When the surface area has been stripped, it is subject to flooding, and loose soil clogs irrigation and drainage channels.
Changes in the organic content of soil

- Crops take nutrients from the soil.
Depletion of natural vegetation

Depletion is an increasing problem as commercial agriculture expands into marginal environments.

Example: When livestock moves into arid or semi-arid areas, the natural vegetation cannot always sustain the herds.

This depletion can lead to desertification.
Environmental Impacts of Modern Agriculture

- **Presence of chemicals in soils and ground water**
- Concern about the use of chemicals from fertilizers and pesticides has sparked a recent trend toward organic agriculture.
Organic agriculture involves growing crops without fertilizers and pesticides, ensuring that the consumer will not suffer adverse health effects from them.

Sale of organic products has increased primarily in these parts of the world:
- the United States
- Western Europe
- Japan
SUSTAINABLE AGRICULTURE
* What is sustainable agriculture?
  * It attempts to integrate plant and animal production practices that will protect the ecosystem over the long term.
  * It promotes the idea that human needs can be met without sacrificing environmental quality and depleting natural resources.
What is emphasized?

- Soil quality and water quality are emphasized!

How?

- Recycling crop waste and livestock manure
- Growing peanuts or alfalfa to enrich soil with nitrogen
- Long-term crop rotations
In areas requiring irrigation...

- Water resources may be depleted.
- Improvements in water well drilling technology and submersible pumps combined with drip irrigation have made it possible to increase crop yields.

HOWEVER...

- In some areas, these practices deplete water faster than its rate of recharge.
Sustainable Agriculture

* What steps support drought resistant farming?
  * Improving water conservation and storage measures
  * Providing incentives for selection of drought-tolerant crop species
  * Using reduced-volume irrigation systems
  * Managing crops to reduce water loss
FUTURE FOOD SUPPLIES
Today several strategies are used to ensure and improve the production and distribution of adequate food products around the world.
Expansion of agricultural land

The historical method of increasing food production has been to clear and plow land for planting. However, this method is not as likely to increase food supplies as it once was.

Only about 11% of the world’s land area is currently cultivated, but most of the remaining land is not arable.
Expansion of agricultural land

- Some land has been lost due to desertification, a deterioration of the land because of over-grazing and over-planting.
- Irrigation can also ruin land in dry areas because hard soils do not allow proper drainage.
Future Food Supplies

- Expansion of agricultural land
  - Urbanization also cuts down on available land space, as farms are replaced by:
    - homes
    - roads
    - shops
Increase in land productivity

The Green Revolution made this alternative for increasing the food supply a viable one.

New hybrids and nutrients are added to the soil through fertilizer, and more crops are produced, and more animals are supported.
Identification of new food sources

- With improved access to ocean food away from the shore, more food sources may be found.
- Many people avoid food for social reasons, but other nutritious products may become popular.
- Example: soybeans
Future Food Supplies

- Improved distribution of food
  - The top three export grains are
    - wheat
    - corn
    - rice
  - Most of those grains come from the U.S.
  - Thailand has replaced the U.S. as the leading exporter of rice.
Improved distribution of food

In countries that export, food sometimes goes to waste, either because markets are not coordinated properly or because the government subsidizes crops.

Meanwhile, countries that need food cannot buy it, either from lack of resources or poor coordination of markets.
Summary

Farming is still the major occupation in less developed countries.

In more developed countries, fewer people are farmers, but many are employed in the food business, including plants, supermarkets, restaurants, and food wholesalers.
Farming continues to alter the earth’s landscape, leaving the human imprint deeply ingrained on the land.
Key Terms and Concepts to Remember

- Commercial agriculture
- Mercantilism
- Global agricultural patterns
- Industrial agriculture
- Specialization
- Agribusiness
- Third Agricultural Revolution
- Biotechnology
- Miracle grains
- Green Revolution
- Yield
- Overgrazing
- Overplanting
- Desertification
- Organic agriculture