Agriculture
Agricultural Origins and Regions

• Origins of agriculture
  – Hunters and gatherers
  – Invention of agriculture

• Location of agricultural hearths
  – Vegetative planting
  – Seed agriculture

• Classifying agricultural regions
  – Subsistence vs. commercial agriculture
  – Mapping agricultural regions
There were several main heaths, or centers of origin, for vegetative crops (roots & tubers, etc.), from which the crops diffused to other areas. Carl Sauer suggested that Southeast Asia was a primary hearth.
Seed agriculture also originated in several hearths and diffused from those elsewhere.
Locations of the major types of subsistence and commercial agriculture.
Clustered Linear Rural Settlements
Clustered Circular Rural Settlements
Geography of Agriculture

- Around ten to twelve thousand years ago, human began to domesticate plants and animals for food.
- Before this first agricultural revolution, people relied on hunting and gathering to obtain food supplies.
- While there are still groups of hunters and gatherers in the world, most societies have switched to agriculture.
- The beginnings of agriculture did not just occur in one place but appeared almost simultaneously around the world, possibly through trial and error with different plants and animals or by long term experimentation.
- Between the first agricultural revolution thousands of years ago and the 17th century, agriculture remained pretty much the same.
Geography of Agriculture

• In the seventeenth century, a second agricultural revolution took place which increased efficiency of production as well as distribution which allowed more people to move to the cities as the industrial revolution got under way.

• The eighteenth century's European colonies became sources of raw agricultural and mineral products for the industrializing nations.

• Now, many of the countries which were once colonies of Europe, especially those in Central America, are still heavily involved in the same types of agricultural production as they were hundreds of years ago.

• Farming in the twenty-first century has become highly technological in more developed nations with geographical technologies like GIS, GPS, and remote sensing while less developed nations continue with practices which are similar to those developed after the first agricultural revolution, thousands of years ago.
Geography of Agriculture

• About 45% of the world's population makes their living through agriculture.
• The proportion of the population involved in agriculture ranges from about 2% in the United States to about 80% in some parts of Asia and Africa.
• There are two types of agriculture, subsistence and commercial.
• There are millions of subsistence farmers in the world, those who produce only enough crops to feed their families.
Many subsistence farmers use the slash and burn or swidden agricultural method.

Swidden is a technique used by about 150 to 200 million people, and is especially prevalent in Africa, Latin America, and Southeast Asia.

A portion of land is cleared and burned to provide at least one and up to three years of good crops for that portion of land.

Once the land can no longer be utilized, a new patch of ground is slashed and burnt for another round of crops.

Swidden is not a neat or well-organized method of agricultural production but it is effective for farmers who don't know much about irrigation, soil, and fertilization.
Terra Preta Agriculture

- **Terra preta** ("dark earth" in Portuguese) refers to expanses of very dark, fertile anthropogenic soils found in the Amazon Basin.
- It owes its name to its very high charcoal content.
- It is also known as "Amazonian dark earth" or "Indian black earth".
- Terra preta soils are of pre-Columbian nature and were created by humans between 450 BC and AD 950.
- The soil's depth can reach 2 meters (6 feet).
- Thousands of years after its creation it has been reported to regenerate itself at the rate of 1 centimeter per year by the local farmers in Amazonian basin, and they seek it out for use and for sale as valuable compost.
Terra Preta sites have been found mainly along the major rivers of the Amazon basin. Prehistorically modified soils of central Amazonia: a model for sustainable agriculture in the twenty-first century.
A layer of rich, black *terra preta* lies atop a layer of light brown, nutrient-poor rainforest soil.
**Geography of Agriculture**

- The second type of agriculture is **commercial agriculture**, where the primary purpose is to sell one's product at market.
- This takes place throughout the world and includes major fruit plantations in Central America as well as huge agribusiness wheat farms in the Midwestern United States.
- Geographers commonly identify two major "belts" of crops in the U.S. The wheat belt is identified as crossing the Dakotas, Nebraska, Kansas, and Oklahoma.
- Corn, which is primarily grown to feed livestock, reaches from southern Minnesota, across Iowa, Illinois, Indiana, and Ohio.
A large proportion of workers in most LDCs are in agriculture, while only a small percentage of workers in MDCs are engaged in agriculture.
Tractors per 1000 hectares of cropland. Use of machinery is extensive in most MDC agriculture, but it is much less common in LDCs.
Agriculture in Less Developed Countries

- Shifting cultivation
  - Characteristics of shifting cultivation
  - Future of shifting cultivation

- Pastoral nomadism
  - Characteristics of pastoral nomadism
  - Future of pastoral nomadism

- Intensive subsistence agriculture
  - Intensive subsistence with wet rice dominant
  - Intensive subsistence with wet rice not dominant
Asian farmers grow over 90% of the world’s rice. India and China alone account for over half of world rice production.
Agriculture in Developed Countries

- Mixed crop and livestock farming
- Dairy farming
- Grain farming
- Livestock ranching
- Mediterranean agriculture
- Commercial gardening and fruit farming
- Plantation farming
- Access to markets
The U.S. accounts for about 40% of world corn (maize) production. China is the 2nd largest producer. Much of the corn in both countries is used for animal feed.
Milk production reflects wealth, culture, and environment. It is usually high in MDCs, especially production per capita, and varies considerably in LDCs.
Milk production has grown more rapidly in LDCs than in MDCs since the 1960s.
China is the world’s leading wheat producer, but the U.S. is the largest producer of wheat for sale and the largest exporter.
Meat Production

Cattle, sheep and goats are the main meat animals raised on ranches.
Economic Issues of Agriculture

• Economic issues of commercial farmers
  – Access to markets
  – Overproduction
  – Sustainable agriculture

• Economic issues of subsistence farmers
  – Population growth
  – International trade

• Increasing food supply
Most countries are net importers of grain. The U.S. is the largest net exporter.
The Von Thunen Model

- J.H. Von Thunen developed a model in 1826 (which wasn't translated into English until 1966) for the agricultural use of land.
- It has been utilized by geographers since that time. His theory stated that the more perishable and heavier products would be grown closer to urban areas.
- By looking at the crops grown within metropolitan areas in the U.S., we can see that his theory still holds true.
- It is very common for perishable vegetables and fruits to be grown within metropolitan areas while less-perishable grain is predominantly produced in non-metropolitan counties.
- Agriculture uses about a third of the land on the planet and occupies the lives of about two and a half billion people.
- It's important to understand where our food comes from.
Von Thünen's model shows how distance from a city or market affects the choice of agricultural activity in (a) a uniform landscape and (b) one with a river.
Four Rings of Agricultural Activity Surrounding the City

- Dairying and intensive farming occur in the ring closest to the city.
- Since vegetables, fruit, milk and other dairy products must get to market quickly, they would be produced close to the city (remember, we didn't have refrigerated oxcarts!)
- Timber and firewood would be produced for fuel and building materials in the second zone.
- Before industrialization (and coal power), wood was a very important fuel for heating and cooking.
- Wood is very heavy and difficult to transport so it is located as close to the city as possible.
Four Rings of Agricultural Activity Surrounding the City

• The third zone consists of extensive fields crops such as grains for bread. Since grains last longer than dairy products and are much lighter than fuel, reducing transport costs, they can be located further from the city.
• Ranching is located in the final ring surrounding the central city.
• Animals can be raised far from the city because they are self-transporting. Animals can walk to the central city for sale or for butchering.
• Beyond the fourth ring lies the unoccupied wilderness, which is too great a distance from the central city for any type of agricultural product.
The Application of Von Thunen Today

- Even though the Von Thunen model was created in a time before factories, highways, and even railroads, it is still an important model in geography.
- The Von Thunen model is an excellent illustration of the balance between land cost and transportation costs.
- As one gets closer to a city, the price of land increases.
- The farmers of the “Isolated State” balance the cost of transportation, land, and profit and produce the most cost-effective product for market.
- Of course, in the real world, things don't happen as they would in a model.
Food Distribution

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<th>% of Population Undernourished</th>
<th>Daily Calories Per Person</th>
<th>Daily Grams of Protein Per Person</th>
<th>Daily Grams of Fat Per Person</th>
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<tbody>
<tr>
<td>---</td>
<td>---</td>
<td>3-9%</td>
<td>10-18%</td>
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<tr>
<td>3-9%</td>
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<td>301-3394</td>
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Percentage of population that is undernourished

Daily grams of protein per person

Daily calories per person

Daily grams of fat per person
Stunting does not come easy – it takes time. It means a child has endured painful illness, hunger, inadequate care. Many do not survive. Many who do have deficits in mental capacity along with losses in stature. Typically, its effects become permanent.

Stunting also occurs because the mother was poorly nourished or because she herself was stunted. This vicious cycle is a result of poverty, a lack of clean water supply...or a long distance between home and health clinic.

In the developing world, 39% of children under five are stunted — around 209 million children.
About 2 billion hectares of soil, equivalent to 15 per cent of the Earth’s land area (an area larger than the United States and Mexico combined), have been degraded through human activities. Over the past 40 years, approximately 30% of the world’s cropland has become unproductive.
Causes of Soil Degradation

- During the past 40 years nearly one-third of the world’s cropland (1.5 billion hectares) has been abandoned because of soil erosion and degradation.

- About 2 million hectares of rainfed and irrigated agricultural lands are lost to production every year due to severe land degradation, among other factors.

- It takes approximately 500 years to replace 25 millimeters (1 inch) of topsoil lost to erosion. The minimal soil depth for agricultural production is 150 millimeters.

- From this perspective, productive fertile soil is a nonrenewable, endangered ecosystem.
In 1960, when the world population numbered only 3 billion, approximately 0.5 hectare of cropland per capita was available, the minimum area considered essential for the production of a diverse, healthy, nutritious diet of plant and animal products like that enjoyed widely in the United States and Europe.
1. 10 kilocalories (kilogram-calories or ‘large calories’) of exosomatic energy are spent in the U.S. food system per calorie of food eaten by the consumer.

2. Put another way, the (US) food system consumes ten times more energy than it provides to society in food energy.
The Sahel

The Sahel, which is south of the Sahara frequently faces drought and food shortages, as does the Horn of Africa.
Key Concepts

- Agribusiness
- Clustered rural settlement
- Cereal grain
- Commercial agriculture
- Crop rotation
- Dispersed rural settlement
- Intensive subsistence agriculture
- Mediterranean agriculture
- Pastoral nomadism
- Plantation
- Seed agriculture

- Subsistence agriculture
- Green revolution
- Ranching
- Ridge tillage
- Shifting agriculture
- Swidden
- Slash-and-burn agriculture
- Truck farming
- Von Thunen model
- Commercial gardening & fruit farming
- Vegetative planting