

AP[®] HUMAN GEOGRAPHY 2016 SCORING GUIDELINES

Question 3

A. Identify the grain crop shown in each photo: (1 point total)

(1 point for identification of both)

Photo Y

Rice (wet or paddy rice is OK)

Photo Z

Wheat, oats, barley, rye, flax, millet, triticale,
canola, rice (only upland or dry)

B. Discuss TWO economic differences between subsistence agriculture and commercial agriculture. (4 points total)

4 points (2 points for a difference and a corresponding comparison) + (2 points for a difference and a corresponding comparison)

	Subsistence	Commercial
Labor/mechanization/technology	High inputs of human labor or intensive Hand tools/limited mechanization Low technology	Low inputs of human labor or extensive Machinery/mechanization High technology
Economic purpose	Family or communal For households With surplus to local markets	Profit drive/agribusiness For trade Large scale markets (reg./nat./global)
Size or scale of farm	Small plots	Large farms
Level of Economic development	Predominant in LDCs/less developed	Common (but not limited to) MDCs/developed
Financial investment	Low levels of financial/capital investment	High levels financial/capital investment, loans
Inputs	Lower use of chemical fertilizers and pesticides	Higher levels of chemical fertilizers and pesticides
Percent labor in agriculture	Countries have higher percent of labor force in agriculture	Countries have lower percent of labor force in agriculture
Gender	Large percent of farm workers are female	Small percent of farm workers are female

C. Identify ONE environmental impact resulting from the type of agriculture shown in Y. (1 point total)

1. **Habitat loss:** Destruction of natural wetlands, lakes, streams, forested regions; loss of species (aquatic/terrestrial plants and animals)
2. **Water quality:** Pesticides and fertilizers used in paddy farming or to control mosquitoes can affect bird reproduction and downstream aquatic ecology
3. **Increased wetlands:** Increased water surface areas for migratory birds, reptiles, sedentary fish, or other water-dependent species.

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Question 3 (continued)

4. **Changes to natural systems by landscape modification:** Specific to rice farming: terracing, diversion of streams, rivers, deforestation, increase in arable land and wetlands; and increased CH₄ emissions from organic decomposition in rice paddies adds to the greenhouse effect.
5. **Disease:** Increases water borne disease, mosquitoes, malaria, and other diseases.
6. **Soil quality:** Improvement from burning rice straw, deposition/sedimentation.
7. **Air quality:** Smoke from burning rice paddies/straw; CH₄ (methane) from organic decomposition.

D. Identify ONE environmental impact resulting from the type of agriculture shown in Z. (1point total)

1. **Air quality:** Degradation from spraying agricultural chemicals (herbicides, pesticides, fertilizers), vehicle exhaust, and dust:
2. **Water quality:** Downstream effects of water diversion, increased sedimentation, and chemical pollution; dead-zones in lakes and oceans at or near the mouths of rivers.
3. **Soil quality:** Erosion, nutrient loss, moisture capacity loss, salinization, land exhaustion, accumulation of agricultural chemical (herbicides, pesticides, fertilizers)
4. **Modified biodiversity:** Destruction of natural grasslands, wetlands, plains' fauna and flora; super pests; decreased crop variety from monoculture Airborne or other mechanized pesticide spraying damages natural insect ecology and harms animals that prey upon insects; agricultural chemicals and vehicle exhaust contribute to greenhouse effect.
5. **Water availability:** Depletion of streams, groundwater, and aquifers from irrigation in dry regions or during dry climate cycles.

3A: The grain crop shown in Photo Y is rice, specifically wet rice. The grain crop shown in Photo Z is wheat

3B: Subsistence agriculture is that which is done in order to provide food to a farmer, and their family, whereas commercial agriculture is done with the intention of producing products for sale and earning a profit. An economic difference between the two is the amount of money put into the farming effort. For subsistence farming, there is little to no money being put into the farming. Subsistence farmers use little machinery and tend to do most work by hand. Alternatively, commercial farming is a very expensive activity. Money invested into the farm and machinery and other products (pesticides and herbicides) can sometimes cost millions of dollars. Some single combines can cost hundreds of thousands of dollars alone. Another economic difference between subsistence and commercial farming is the amount of profit each makes. As with money put into the process, subsistence farming makes little money, whereas commercial farming makes large profits. In subsistence farming, most of the harvested food is eaten by the people who farmed it. On the occasion that a farmer has a surplus of crops, they may sell it, but the amount of profit is very small. On the other hand, commercial farmers don't eat the food they've produced, and instead sell the large amounts to large businesses that convert the food into goods bought at stores. This higher profit will help farmers to afford the expensive costs to

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produce the goods. Governments also give farmers subsidy to help them buy products and earn a profit. Subsidies are a way to keep the very small number of people in developed countries that do farm to continue farming.

3C: Subsistence farming tends to have a smaller impact on the environment than commercial farming. Photo Y specifically shows intensive subsistent wet-rice farming, commonly practiced in areas of Eastern and Southeastern Asia. One change that is commonly made to the environment for this type of farming is terracing. In order to have flat land suitable to farm on, step-like ridges are made into mountain sides, greatly increasing the amount of available land to farm. Terracing impacts the environment, changing the natural appearance of the landscape. It may also cause soil erosion, a negative impact. Other forms of subsistence farming have other impacts, such as soil degradation from shifting cultivation and slash and burn agriculture, or desertification from pastoral nomadism.

3D: The large amounts of chemicals used in commercial agriculture, shown in Photo Z, have large and negative impacts on the environment. In the image, one can see the chemicals being sprayed onto the field as the combines harvest. These chemicals can include pesticides to kill bugs that eat the crop, or herbicides that kill unwanted

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plants that can take nutrients away from the main crop. Those chemicals can be washed by rain into natural rivers and lakes, poisoning the natural life and resulting in water pollution. Also, the chemicals can be damaging to the air and atmosphere, called air pollution. For these reasons countries have seen a rise in organic farming that uses no chemicals in an attempt to stop pollution.

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There are two forms of agriculture that is commonly used - subsistence and commercial. Photo 4, which exemplifies the simpler type, are planting wheat crops. In photo 2, the machines are plowing through.

The two types of agriculture are very different economically. One difference is their purpose. Subsistence agriculture is done to provide food, materials, and products privately - typically to a farmer's family. The main goal/purpose for a subsistence farmer is that themselves and their family have sources for survival (food, water, clothing, etc). Contrary to the exclusiveness of subsistence agriculture, commercial agriculture has a different motive for their work. This type typically grows crops and makes products with the intent of selling it for money. It is grown in mass quantities on large farms and is sold to different companies that will give them a profit. Commercial agriculture definitely benefits the economy and is used by the majority of farmers in the current times. In addition to the two reasonings for each type of agriculture being different, the way they work on the farm also separates the two apart as well. Subsistence agriculture is more traditional - the crops are planted and picked by hand, and it requires a lot of effort, time, and energy. Farms that do commercial agriculture have a more modern approach. They use machinery and technology to maintain their crops - it reduces the workload that the farmer would have tremendously.

Photo 4 impacts the environment in a positive way because it is natural and doesn't require any products, chemicals, and machinery that is considered to be harmful.

Photo 2 is the easier form of agriculture, but can have a negative effect on the environment. The machines are wasting a lot of energy, they can put on natural chemicals and gases onto the crops, and they can pollute the air.

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(A) The grain crop in photo Y is rice, and the grain crop shown in photo Z is ~~grain~~ wheat.

(B) Differences are that commercial agriculture is solely for large-scale selling, and subsistence agriculture is solely for the consumption ~~and~~ of the farmer, and maybe their family. (if they have one) Commercial crops are grown so they can be sold, and subsistence crops are grown so they can be eaten.

(C) An environmental impact in photo Y is that a lot of water is wasted for this farming practice. The rice requires a lot of water to be grown, which affects the environment.

(D) An environmental impact in photo Z is that the pesticides seep into the Earth and ~~to~~ eventually runoff into the water, contaminating it. This affects all organisms that drink from the contaminated water source, negatively affecting the environment. These organisms may begin to die, throwing off the biodiversity of the area.

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2016 SCORING COMMENTARY

Question 3

Overview

This question assessed the degree to which students could use qualitative geographic data, specifically photographs of wet rice and wheat, to structure a comparison between subsistence and commercial agriculture. In part A identification of the two crops shown in the pictures was followed by a discussion on differences in economic geography in part B. Students were required to identify different environmental impacts of subsistence and commercial agriculture (the agricultural types to which wet rice and wheat farming belong) in parts C and D.

This question was drawn from Part V (Agriculture, Food Production, and Rural Land Use) of the AP Human Geography course outline, which requires students to “examine major agricultural production regions of the world, which are characterized as commercial or subsistence operations.” As a foundational learning objective for this question, however, Part I (Geography: Its Nature and Perspectives) acknowledges the necessity of learning to “use landscape analysis to examine the human organization of space.” Photography and visualization were specifically utilized in part A to test whether students had mental images of two classic agricultural landscapes.

Sample: 3A

Score: 7

This response earned full credit and demonstrates a comprehensive understanding of grain farming landscapes, differences between subsistence and commercial agriculture, and the potential environmental impacts of rice farming and wheat farming. The response earned 1 point in part A for properly identifying photo Y as wet rice and photo Z as wheat. The essay earned 2 points in part B for identifying that subsistence farming is done to provide food for the family, while commercial farming is done for profit (B2). The essay earned an additional 2 points in part B for describing the dependence upon human labor in subsistence farming, whereas commercial farming uses highly expensive machines (B1). The essay earned 1 point in part C for identifying landscape modification, including terracing, as an environmental impact of wet rice farming (C4). The essay earned 1 point in part D by explaining that the soil quality of commercial wheat fields may be affected by the accumulation of agricultural chemicals such as pesticides and herbicides (D3).

Sample: 3B

Score: 5

This response earned full credit in part B and full credit in part D. The essay earned 2 points in part B for discussing how subsistence farming provides food for the family, while commercial farming crops are sold to make money (B2). The essay earned an additional 2 points for discussing how subsistence farming depends upon manual labor, while commercial farming depends upon machinery and technology (B1). The essay earned 1 point in part D for identifying that an environmental impact of commercial wheat farming is air pollution, caused by emissions from farm machinery (D1).

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Question 3 (continued)

Sample: 3C

Score: 4

This response earned full credit in part A, partial credit in part B, and full credit in part D. The response earned 1 point in part A for properly identifying photo Y as rice and photo Z as wheat. The essay earned 2 points in part B for identifying that subsistence farming is done to provide food for the family, while commercial crops are grown to be sold. (B2). The essay earned 1 point in part D by explaining that an environmental impact of commercial wheat farming is soil and water contamination, caused by agricultural pesticides (D2).