

Past-paper walk-through

The Global System of Agriculture ■ 5.9

eXercise

Questions in this set

- 2025 Set 1 Q3
- 2024 Set 1 Q1
- 2023 Set 1 Q2

Reading the mark scheme

- **B1** a mark that stands on its own – the point is either made or not.
- **M1** a *method* mark: the right approach, even if the number is wrong.
- **A1** an *answer* mark, and it usually needs its M mark first.
- **C1** a working mark on the way to the answer.
- **//** separates answers the examiner accepts equally.
- **ecf** = error carried forward: a later part is marked on your own earlier answer.
- **owtte** = “or words to that effect” – the wording need not match.

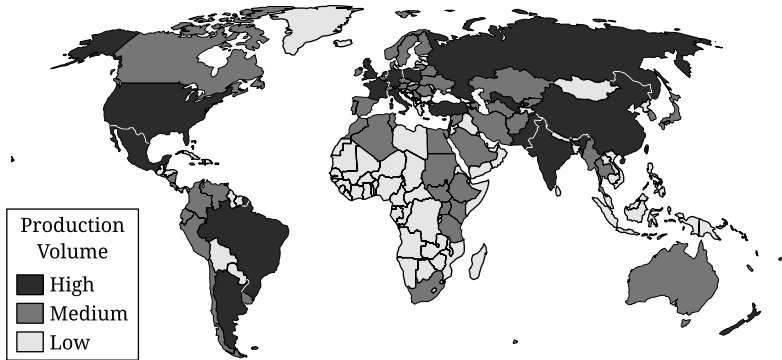
Question 3

2025 Set 1 ■ Q3

The global production of cow's milk and pork results in distinctive spatial patterns of contemporary agriculture and land use.

- (a)** Identify an example of a culture trait.
- (b)** Describe the spatial pattern of cow's milk production in Africa, shown in Map 1.
- (c)** Based on Map 1 and Map 2, compare the spatial patterns of cow's milk production and pork production in Asia. (Response must include both maps in the comparison.)
- (d)** Describe one environmental effect of agricultural land use such as commercial animal farms.
- (e)** Explain how the globalization of agriculture may affect local culture traits.
- (f)** Explain why regions of agricultural production may become interdependent.
- (g)** Explain how domesticated animals such as pigs spatially diffused to create the spatial pattern shown on Map 2.

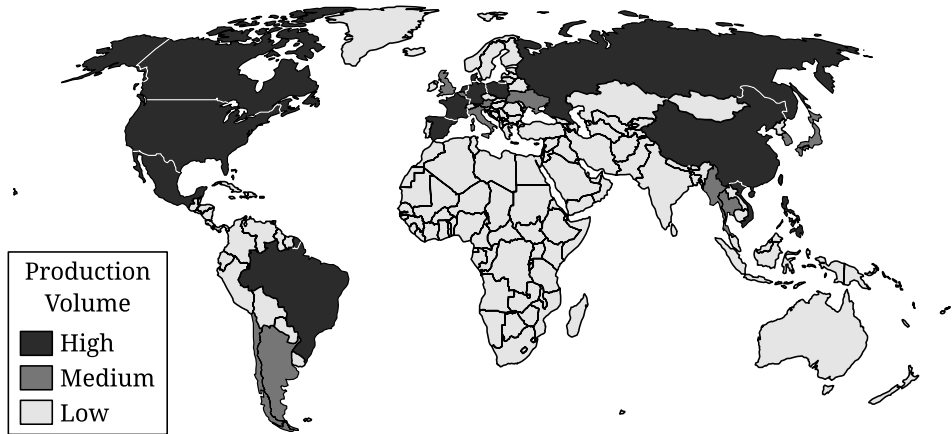
Question 3



Source: Food and Agriculture Organization

Map 2: Pork Production, 2018

Question 3



Solution 3

(a)

Mark scheme

- - Culture traits include such things as food preferences, art, architecture, language, religion, music, clothing, media, technology, and/or land use.

Solution 3

(b)

Mark scheme

- - Medium and/or high amounts of cow's milk production are concentrated or clustered in the north, east, and/or south.
- - Low amounts of cow's milk production are concentrated or clustered in west, central, and/or southwest Africa.

Solution 3

(c) Mark scheme

- - Map 1 shows that cow's milk is produced in most Asian countries at high or medium volumes, whereas Map 2 shows that pork is produced at high or medium volumes in East Asia and/or parts of Southeast Asia, or in low volumes in South and/or Southwest Asia.
- - Cow's milk is produced in most Asian countries, whereas pork is not produced in regions with large Islamic populations, such as the Middle East (Southwest Asia), Central Asia, South Asia, and/or parts of Southeast Asia.
- - Cow's milk production and pork production are low in insular Southeast Asia (e.g., Indonesia, Malaysia, East Timor, Papua New Guinea).

Solution 3

(d) Mark scheme

- - Environmental effects of agriculture land use include pollution (e.g., air, water, waste), land cover change (e.g., soil erosion), nutrient depletion, desertification, and/or soil salinization.
- - The reduction of water supplies for agricultural purposes, such as depleting reservoirs, lowering the local water table, and/or draining aquifers.
- - The reduction of biodiversity from changes in land cover (e.g., deforestation, grassification, feed-crop monoculture).
- - The spread of disease between domestic and wild animal populations or between animal populations and humans.

Solution 3

- - Climate change and/or global warming because such farms produce greenhouse gases (e.g., carbon dioxide, methane, water vapor).
- - Agricultural land use can promote the survival or the growth of environmentally beneficial species (e.g., pollinators, working animals, heirloom varieties).

Solution 3

(e) Mark scheme

- - Globalization of agriculture and/or the global system of agriculture may lead to changes in food preferences.
- - Globalization may lead to people preferring to eat foods imported from other countries that were not previously available to them (e.g., tropical fruits in temperate climates).
- - Globalization may lead to the availability of less expensive imported foods that are substituted for more expensive local foods (e.g., imported wheat replacing locally grown corn).

Solution 3

- - Consumers may resist the globalization of the food supply and in response buy domestically produced food, local food, and/or purchase food from community-supported agriculture.
 - - Globalization of agriculture may lead to a reduction in the number of small family farms, which can affect local cultural traits (e.g., settlement patterns by prompting rural-to-urban migration, social roles by having fewer people working in agriculture).
 - - Globalization may lead to changes in agricultural land use or agricultural production methods through the implementation of new technologies, architecture, and/or equipment (e.g., data analytics, drones, vertical farming, autonomous tractors), affecting local culture traits (e.g., crops, farming practices).
- F Explain why regions of agricultural production may become interdependent.

Solution 3

(f) Mark scheme

- - Some regions and/or countries have become highly dependent on one or more export commodities, which causes different regions to depend on one another for specific agricultural commodities.
- - Regions of agricultural production are connected through global food distribution networks that are affected by political relationships, infrastructure, and/or patterns of world trade.
- - Global patterns of food-processing facilities and markets, economies of scale, distribution systems, and government policies all contribute to greater interdependence among agricultural production regions.

Solution 3

- - Countries may develop comparative advantages, complementarity, specialty crops, and/or consumer markets that establish trade relationships and increase interdependence between two or more countries.
- - Countries in a region may form trade relationships that result in increased trade in farm products (e.g., EU, ASEAN, MERCOSUR).

Solution 3

(g) Mark scheme

- - Domesticated animals such as pigs diffused from their hearths of domestication through relocation diffusion (e.g., settlers bringing animals to new areas).
- - Domesticated animals such as pigs diffused from their hearths of domestication through the Columbian Exchange.
- - International trade, imperialism, and/or colonization introduced domesticated animals such as pigs that were transported to other regions of the world.
- - Domesticated animals such as pigs spread through migration or expansion diffusion, altering food preferences and/or increasing demand for diverse animal products domestically and/or internationally.

Solution 3

- - Domesticated animals such as pigs spread to areas where consumption of these animals was culturally acceptable and/or did not spread to areas where consumption of such animals was culturally unacceptable.

Question 1

2024 Set 1 ■ Q1

The availability of food in the context of a growing world population is influenced by many social, environmental, and economic factors.

(a) Define the concept of carrying capacity.

Question 1

2024 Set 1 ■ Q1

The availability of food in the context of a growing world population is influenced by many social, environmental, and economic factors.

(b) Describe ONE way that humans have altered the environmental sustainability of agricultural lands.

Question 1

2024 Set 1 ■ Q1

The availability of food in the context of a growing world population is influenced by many social, environmental, and economic factors.

(c) Explain how transportation technology has increased economies of scale in the agricultural sector of less developed countries.

Question 1

2024 Set 1 ■ Q1

The availability of food in the context of a growing world population is influenced by many social, environmental, and economic factors.

(d) Explain a likely negative economic outcome of Green Revolution agricultural practices on rural communities.

Question 1

2024 Set 1 ■ Q1

The availability of food in the context of a growing world population is influenced by many social, environmental, and economic factors.

(e) Explain ONE weakness of Malthusian theory in predicting the relationship between food production and population growth in contemporary society.

Question 1

2024 Set 1 ■ Q1

The availability of food in the context of a growing world population is influenced by many social, environmental, and economic factors.

(f) Explain how surplus food production has changed the global market for local agricultural products.

Question 1

2024 Set 1 ■ Q1

The availability of food in the context of a growing world population is influenced by many social, environmental, and economic factors.

(g) Explain the degree to which Green Revolution agricultural practices were effective in reducing hunger in less developed countries. (Response must indicate the degree [low, moderate, high] and provide an explanation.) and fill in the appropriate circle at the top of each page to indicate the question number. Selected Asian Ethnic Neighborhoods in Los Angeles County, California Source: United States Census Bureau

Solution 1

(a)

Mark scheme

- - The number of people a particular place, area, and/or the Earth can support.
- - Population size, distribution, and/or density affects how many people the environment and its natural resources can support.
- - The number of living organisms that an area or habitat can support without environmental degradation.
- - Changes in population density and/or population distribution may affect the capacity of the environment to meet the population's needs.

Solution 1

(b) Mark scheme

- Accept ONE way (either a decrease OR an increase in environmental sustainability).
- Decreased environmental sustainability:
 - - Overuse of synthetic fertilizers, pesticides, and/or herbicides that harm ecosystems (water, air, soil) and/or increase pollution.
 - - Overuse of resources (e.g., water, air), reducing productivity.
 - - Overuse, erosion, or nutrient depletion of soil, reducing productivity.
 - - Overuse of irrigation, depleting water resources, reducing soil nutrients (via runoff), or contributing to soil salinization.

Solution 1

- - Agricultural practices (e.g., monocropping, commercial agriculture, high-yield seeds, GMOs, biotechnology) that reduce biodiversity and/or deplete soil nutrients.
- Increased environmental sustainability:
- - Improved management of farm resources (water, soil, fertilizers, pesticides) that helps ecosystems.
- - Use of organic agricultural practices, including natural fertilizers, pesticides, and/or herbicides.
- - Restoration of environmentally damaged areas through sustainable agricultural practices.

Solution 1

- - Crop rotation that supports soil health/fertility and/or avoids large-scale environmental damage.
- - Decreased irrigation and/or extraction of water from aquifers or groundwater.
- - Conservation of farmland (e.g., fallowing, erosion control) and/or local resources (water supplies, native species).

Solution 1

(c) Mark scheme

- - Trucks, trains, and/or shipping containers can move large and/or larger quantities of crops, increasing production and/or consumption.
- - Farm machinery (e.g., tractors, harvesters) has helped reduce the amount of human labor and/or increased the amount of production.
- - Farm machinery has allowed farms to increase the amount of farmland with reduced labor costs and/or improved efficiency.
- - Chemical herbicides, pesticides, and/or fertilizers applied by transportation technology (e.g., tractor, airplane) have reduced labor and/or increased crop yields.

Solution 1

- - Airplanes and/or ships are used to transport perishable products (e.g., flowers, fruits, vegetables), increasing their sales in other markets.

Solution 1

(d) Mark scheme

- - Pollution of water, air, and/or soil resources harms economic productivity or livelihoods.
- - Smaller farms may close, and/or farmers may sell land because they cannot compete with larger farms that can afford Green Revolution technologies.
- - Loss of agricultural jobs and/or loss of access to farmland may result in loss of income or migration (e.g., rural-to-urban).
- - Expensive farm inputs (e.g., high-yield seeds, agricultural chemicals, fossil fuels) increase the cost of agricultural production and/or reduce profits for farms.

Solution 1

- - Changes in land ownership (tenure), land use patterns, and/or agriculture-related jobs may economically disadvantage subsistence farmers.

Solution 1

(e) Mark scheme

- - Population growth has not outpaced food production, and/or populations have not run out of food.
- - Malthusian theory did not consider changing social, political, and/or economic factors that decrease fertility.
- - Improvements in agricultural technology (e.g., mechanization, Green Revolution) increased food production at a rate that outpaced population growth.
- - Advances in transportation have improved the global distribution of food.

Solution 1

- - The challenges of feeding the world's population have led to the opening of new agricultural lands or the development of new technologies that overcome the constraints of the environment and/or produce more food.
- - Farmers learned to farm more intensively with new agricultural practices and/or technologies to increase yields, increase carrying capacity, or increase the amount of cultivated land.
- - Growing populations have more resources to problem-solve and/or develop new methods of increasing food supplies.
- - Growing populations can move to areas with food surpluses or move away from areas of food insecurity.

Solution 1

(f) Mark scheme

- - Consumption patterns, changed diets, and/or increased popularity of certain foods (e.g., local foods, seasonal crops, specialty crops) have expanded the global sales of these foods.
- - Surplus food drives global prices down, resulting in less expensive items, higher sales or exports, and/or increased competition with other goods.
- - Increasing global sales of popular crops can increase local farm profitability, increase local investment, and increase or decrease the number or type of local products for sale (e.g., value-added products, value-added specialty crops).

Solution 1

(g) Mark scheme

- To earn the point, state a DEGREE (high, moderate, or low) to which the Green Revolution was successful in providing food AND support it with a valid justification.
- For a HIGH degree (successful):
 - - Food production increased due to high-yield seeds, chemical fertilizers, pesticides, irrigation, and/or mechanization.
 - - Crop surpluses reduced food prices, making food more accessible and/or affordable.
 - - More agricultural land came under cultivation, increasing food production.

Solution 1

- For a MODERATE or LOW degree (limited success):
 - - Green Revolution inputs (fertilizers, pesticides, high-yield seeds, irrigation, mechanization) were too expensive for many farmers, resulting in fewer farms and/or lower yields.
 - - Irrigation systems led to soil salinization, reducing food production.
 - - Inputs (chemicals, fossil fuels) and/or land-management techniques caused environmental degradation and/or abandonment of productive land, decreasing food production.

Question 2

2023 Set 1 ■ Q2

One stimulus.

PER CAPITA PRODUCTION OF STAPLE FOOD CROPS IN HEARTH-OF-DOMESTICATION COUNTRIES

Country	Corn/maize (lb per capita)	Potato (lb per capita)	Rice (lb per capita)	Yam (lb per capita)	Cassava/manioc (lb per capita)
Brazil	1,056	39	108	3	183
China	412	145	333	0	52
Mexico	471	31	4	0	0
Nigeria	121	15	93	549	618
Peru	107	362	216	0	13

Question 2

Hearths of domestication: corn/maize = Mexico; potato = Peru; rice = China and Mali; yam = Niger River basin; cassava = Amazon River basin. Source: Food and Agriculture Organization of the United Nations.

Staple food crops provide most of the carbohydrates in people's diets, and some staples are also used as animal feed or in the distillation of ethanol. Cassava is a root crop (tuber) that is the source of farinha, tapioca, and the pearls in bubble tea.

- (a)** Describe the concept of an early hearth of domestication.
- (b)** Identify the crop listed in the table that has diffused the least from its hearth of domestication to the countries listed in the table.
- (c)** Explain how food preferences can be a culture trait.
- (d)** Explain how the Columbian Exchange contributed to a crop's diffusion beyond its hearth of domestication.

Question 2

- (e) Explain how the data in the table support the concept of a crop's consumption pattern being the result of globalization.
- (f) Explain why a crop may be farmed intensively in a less developed country and be farmed extensively in a more developed country.
- (g) Explain ONE way the global supply chain links crops such as those listed in the table to consumers in other countries.

Solution 2

(a)

Mark scheme

- Describe an early hearth of domestication (1 point) — accept any: a location where new (agricultural) practices develop and/or from which they spread; a place where a plant or animal was first domesticated; sites of early civilizations that domesticated plants/animals (e.g., Fertile Crescent, Indus Valley, SE Asia, China, Andean Highlands, Amazonia, Central America); an ancient society whose farmers converted wild species into domesticated varieties over time via selective breeding.

Solution 2

(b)

Mark scheme

- Identify the least-diffused crop (1 point): Yam (yams) — it shows high production only at/near its Niger River basin hearth (Nigeria) and near-zero production in the other countries listed.

Solution 2

(c)

Mark scheme

- Explain food preference as a culture trait (1 point) — accept any: many foods have distinct ingredients/preparations indicative of a specific culture group; culture groups identify with national dishes representing their food culture; foods contain ingredients/crops local to a culture's region; foods are part of a way of life or are forbidden, as expressed in belief systems, religion, artifacts, calendars, or holidays.

Solution 2

(d)

Mark scheme

- Explain the Columbian Exchange's role in crop diffusion (1 point) — accept any: it relocated crops between world regions through conquest, ecological imperialism, colonization, and/or trade routes; it moved crops due to changing food preferences, cultural assimilation, or changing agricultural practices; it may have accidentally/unintentionally introduced a crop beyond its hearth (e.g., seeds as "stow-aways" in cargo).

Solution 2

(e)

Mark scheme

- Explain how the data show globalization of consumption (1 point): high per-capita production/consumption of a crop far from its hearth (e.g., Brazil produces 1,056 lb of corn per capita; rice grown/consumed outside China) shows the crop is globalized. Accept links to globalized food culture/media/preferences; multicultural societies and global migration; globalized trade/transport (free-trade or neoliberal policies, comparative advantage, containerization, bulk shipping); or a growing global middle class of consumers — each evidenced by production away from the hearth.

Solution 2

(f)

Mark scheme

- Explain intensive (LDC) vs extensive (MDC) farming (1 point) — accept any: LDC subsistence/intensive farming on small plots to feed a household vs MDC extensive/commercial farming on large farms for a company's consumers; LDC intensive manual labor (hand tools, animal power) vs MDC mechanized, low-labor extensive production; LDC farmers lack capital/equipment/inputs so rely on intensive human labor while MDC farmers can invest in extensive inputs; LDC farms use local resources to feed families/communities while MDC farms exploit economies of scale for large populations.

Solution 2

(g) Mark scheme

- Explain ONE global-supply-chain link (1 point) — accept any: crops are transported internationally to consumers via storing, processing, packaging, wholesaling, and/or retailing; crops feed the global restaurant/fast-food industry, cultivated/processed in one country then distributed to restaurants in another; growing global consumption of frozen/dried/canned/dehydrated foods means crops are processed into preserved forms and distributed abroad for long-term storage; crops are processed into other forms (e.g., corn for ethanol or animal feed) then shipped to wholesalers, retailers, or consumers in other countries.