

Answers

1 Distribution of tectonic hazards

- (a) Nazca (oceanic) and South American (continental)
- (b) In the diagram of distribution patterns, complex plate boundaries are found on the western edge of the Nazca plate, and also where microplates are found.
- Most tsunamis are linked to destructive (convergent) plate boundaries. In the diagram, these are found along the west coast of South America and part of the north-west, Alaska in the USA and the west coast of Central America.

2 Intra-plate processes

- (a) Movements along ancient faults that build up stress; isostatic uplift of the crust after melting of ice sheets.
- (b) Any two: pushing crust down by covering it with a large weight of water in a reservoir; forcing gas out of shale rocks (fracking); setting off large explosions.
- Volcanoes are found a long way from plate boundaries because there are hot spots, mostly associated with mantle plumes, which force molten material through thinner parts of the crust or where the crust is cracked.

3 Plate tectonic theory

- Convection occurs in the mantle of the Earth because considerable heat is radiated through it from the core (where temperatures reach 7000 °C). The material of the mantle (peridotite) is under pressure and with the heat, it behaves like a viscous liquid, slowly convecting. When these convection cell currents move along underneath the Earth's crust there is friction and the tectonic plates are dragged along in the same direction as the current.
- Knowledge of the Earth's structure and composition are important because it shows that (a) there is a source of heat from the inner core that radiates outwards through other layers; (b) the mantle material must behave as a viscous liquid and so can convect; (c) the outer core is hot liquid iron and is convecting to generate a magnetic field, which changes direction regularly.

4 Tectonic processes

There is subduction of the Nazca plate under the South American plate with seawater causing hydration melting, and the mixing of lithospheric mantle and continental rock minerals creating a high silica and gas content in the magma. Viscosity is high and eruptions are explosive. In contrast, Hawaii is at a hot spot plume in the centre of the Pacific plate and the magmas are basaltic with low silica and gas content, eruptions are therefore gentle and effusive. Cross-sections of the relevant plate boundaries should be labelled or annotated to support written answer.

5 Earthquake waves

- L surface waves arrive after the S body waves. S waves have a long wavelength and travel relatively slowly (4 km/s) keeping a large amplitude even away from the epicentre. They move the ground, including solid rock, up and down many times. Many structures are weakened by this movement. Then L waves arrive with a very strong horizontal (lateral) movement, different from other seismic waves, and buildings cannot respond fast enough to this movement, especially if weakened by the body waves, and may be completely destroyed.
- Seismic waves shake the ground in many ways, moving it in all directions during the short duration of an earthquake. In urban areas there are many buildings of different ages and sizes in a small area; some may have aseismic designs but if not they are vulnerable to the waves and may suffer damage or destruction; this can then block streets and make it difficult for people to evacuate or receive aid.

6 Volcanic hazards

- Pyroclastic flows can be considered the most serious of the volcanic hazards because of the extremely fast speed they travel from the volcano into surrounding areas. They are not limited to the sides of the volcano. There is a wide range of ways in which they can damage property, infrastructure and people; such as superheated material which burns and starts fires, the suffocating and poisonous gases that kill people and farm animals, the large material (even boulders) that smash buildings, and the vast number of smaller particles that bury things.
- Eruptions of ash can have global impacts because ash is ejected to a high altitude by violent eruptions

and it is light so it is carried by atmospheric circulation systems (e.g. jet streams) around the world. Ash eruptions can therefore disrupt the flight paths of aeroplanes.

7 Causes of tsunamis

- (a) 22 hours. (b) Distance between epicentre and Hawaii is 10810 km and the time taken was 15 hours. $10810 \div 15 = 720.67$ kilometres per hour.
- Three features of a tsunami include: several waves; first wave not the largest; very fast speed in open sea but much slower in shallow water; low height in open sea but up to 20 times higher in shallow water; long wavelength in open sea but short in shallow water.

8 Disaster and vulnerability

Vulnerability would be greatest where:

- the settlement is in the most hazardous zone
- people have no knowledge and understanding of the natural hazard, its possible impacts and how to prepare themselves to mitigate a disaster
- people are unable to prepare or react to a hazardous event due to poverty
- there are no advance warning systems or ineffective ones
- people have not been involved in the planning and preparation for a hazardous event and so do not know what is going on, what the risks are and what to do when the hazard occurs.

9 Social and economic impacts

- All aspects of development:
 - Economic aspects show the level of poverty and the lack of ability of people to afford mitigation measures.
 - Social aspects show education levels and the lack of understanding and knowledge that people have of their situation.
 - Political aspects show how involved people are in decision-making and planning, and the level of understanding of what to do to reduce impacts of a hazard.
 - Environmental aspects show the extent to which people are keeping natural systems intact so that they help to protect them, particularly from secondary tectonic hazards.
- Three reasons linked to higher vulnerability, such as:
 - lower level of knowledge and understanding of hazards and what to do
 - lack of access to technology and resources that would help protect them
 - lack of warning and evacuation systems
 - health care and rescuing services are less well developed
 - proliferation of shanty towns with poor construction standards.

10 Measuring tectonic hazards

Only four earthquakes have ever been recorded at 9.0 or higher. This is the top of the energy scale and therefore it is most likely that the intensity will be at the top of the Mercalli scale (XII) and that the largest tsunami (VI) will be created.

11 Tectonic hazard profiles

Social impacts are more severe in developing countries because people are more vulnerable. For example, they lack knowledge and understanding of hazards and therefore cannot prepare themselves, the countries lack technology to create warning systems and effective communications. Therefore usually more people are killed or injured. Economic impacts are more severe in developed countries in terms of total costs because there are more expensive buildings and infrastructure to be damaged and more GDP-earning businesses to be affected. However, poor people in developing countries may struggle due to loss of jobs or to replace even low-cost buildings. Emerging countries may experience combined severity, as they have growing cities to be damaged but still many vulnerable people.

12 Vulnerability and resilience

- The lack of money, people or governments, reduces the ability to prepare for hazards because buildings will be weaker, understanding and planning will be missing, access to health care will be difficult, and the ability to obtain and store resources will be lacking.
- Cities in developing countries will have a lot of poor people, often living in slum conditions. Population density is very high, especially in the poorest areas. Many people only have informal jobs which do not provide a regular income. There is a lack of ability to

prepare for, withstand and recover from the impacts of natural hazards.

13 Physical factors and context

Physical factors cause the hazard, such as magnitude of ground shaking, size of tsunami wave or amount of ash fall, and greater magnitude events have larger impacts. However, the differences in human context factors appear to determine the scale of the impacts. For example, population density and distribution; strength and design of buildings and other constructions; presence or absence of warning systems; scale of health-care system; amount of disruption and damage to economic activities (e.g. farming, tourism); the spatial extent of impacts; the success of evacuation and other emergency measures; the amount of construction and infrastructure affected. These context factors modify the hazard impacts so that usually more people are killed in poorer countries with less costly damage, while the opposite is so for richer countries.

14 Tectonic disaster trends

It is necessary to be cautious when using data to interpret trends because:

- accurate recording and reporting have only existed for a few decades and previous disasters may not have been recorded
- short timescales ignore the fact that natural hazard trends are linked to geological timescales
- data from developing countries, especially remote isolated areas, are often inaccurate and incomplete.

15 Significance of mega-disasters

- A mega-disaster has larger impacts (measured in terms of deaths, homelessness, economic losses and disruption). For example, the UN suggests that between 500 and 2000 deaths is a disaster and over 2000 is a mega-disaster.
- Some large-scale tectonic hazards become mega-disasters because of global geographical processes. For example, atmospheric circulation is able to distribute ash over huge areas, and ocean shapes and depths direct tsunamis. The ability of people to travel easily around the world places different nationalities in hazardous zones. Globalisation has linked world economies together, so an impact in one location may have knock-on effects in other world regions.

16 Multiple-hazard zones

- Suggested possible deadly hazard combinations where a tectonic hazard may be made worse (any two):
 - Landslides after earthquakes may block river valleys, ponding back water until it breaches the blockage causing flooding downstream.
 - Coastal flooding could be made worse if a tsunami combines with the storm surge of a tropical cyclone.
 - Earthquakes may shake unstable slopes so much that they move rapidly downhill as a landslide.
- The Philippines has experienced combinations of physical processes to produce a natural hazard that has the potential to be a disaster, therefore the monitoring and management of just one process is not enough to reduce the overall risk. The density of population and poverty increase the vulnerability of people in the multiple-hazard country, and these human aspects require management as well to improve resilience.

17 Prediction and forecasting

- Suggested possible rank order: volcanoes, tsunamis, earthquakes. Volcanoes are in a fixed location and can be monitored. Tsunamis are linked to a certain earthquake location and can be tracked. Earthquakes occur anywhere on plate boundaries or faults and monitoring these reveals no useful information for prediction.
- Developed countries have the wealth and technology to be able to establish monitoring stations, the scientific expertise to collect and analyse data, and the ability to communicate quickly with populations. However, often these things are lacking in developing countries, for example at the time of the 2004 Indian Ocean tsunami there was no warning system.

18 Hazard management stages

Developing countries are often less prepared for a hazardous event because their planning may lack the expertise and availability of technology that a developed country has. Communities may not have emergency plans in place, especially in remote rural areas of developing countries, which many developed countries will have. A developing country, or region/

community within it, may be dependent on external help and this may take time to arrive. Search and rescue may initially be left to people in local communities and medical care may not be available, contrast to developed countries where these services are available, contrast to developed countries where these services are available. A developing country may lack the money and materials necessary for the 'build back better' recovery stage.

19 Strategies to modify events

Any choice possible but probably not earthquakes. Possible suggested answer for volcanoes:

- Fast-moving hazards like pyroclastic flows can only be avoided by hazard zoning and keeping people out of risky areas.
- More predictable and slower moving hazards such as lava flows can be modified by diverting them or slowing them down by artificial cooling with water.
- Some lahars can be avoided by draining crater lakes, which could be the source of water to mix with tephra.

20 Mitigation and adaptation strategies

- 1 Hi-tech monitoring involves the latest electronic equipment. This includes the technology to monitor hazards, through use of satellites or buoys in open ocean, which enables warning systems to be established. Modern communications enable instant messaging around the world so warnings can reach planners and officials; increasingly people have mobile phones through which to receive warnings. Construction also involves advanced designs using latest technologies, such as computer-controlled counter-weights in the top of tall buildings. Computer modelling of hazards leads to the production of hazard zones, which assist planners. Rescue teams have the latest heat- and noise-sensing equipment when they are searching collapsed buildings. However, hi-tech is not always necessary, for example buildings can be made aseismic by strengthening corners of houses, putting on lighter roofs and reinforcing walls with bamboo or plastic netting.
- 2 It is often said that it is better if people can help themselves, so communities that are prepared through knowledge and understanding, and with local experts to help in an emergency, will be able to direct people on where to evacuate to or where to get food, water and shelter. It may take time for external help to arrive, so the first people to start rescuing are local volunteers. External groups such as NGOs have more and better equipment and organisational skills, so can get more done such as setting up camps with proper sanitation and shelter with medical aid. External rescue groups will have the latest technologies to be able to find people better.

23 Exam practice 1

- 1 (a) The VEI scale uses (any one): volume of ejected material, height of ash column, and length of eruption phases.
(b) Suggested possible answers:
 - (i) They are close to plate boundaries where there are weaknesses in the Earth's crust allowing molten magma to reach the surface. They are close to subduction (destructive) plate boundaries, where melting of subducted oceanic plates creates instability, with molten magma forcing its way to the surface.
 - (ii) Cartographic skills: add a second bar alongside the VEI scale drawn to a scale; or proportional circles (using log scale) over location of volcanoes to show damage costs. Must be some explanation to get the second and third marks.
- 2 Suggested possible **plan**: Social vulnerability arises when a household or community lack access to an essential during a hazard event or afterwards. Health care is one of these. Without immediate medical aid people may die of their injuries. Without medical care after an event disease may cause further deaths. People are therefore not prepared and lack resilience.
- 3 Suggested possible **plan**: Plate tectonic theory has only existed since the 1960s, when it was established that radiated heat from the Earth's core must be causing the viscous mantle, which is under pressure, to convect. Your answer should cover how convection explains what is happening to plates and tectonic processes, then introduce other factors such as palaeomagnetism, seismic waves, sea floor spreading, intra-plate processes and mantle plumes, and knowledge of Earth's structure and composition. Not all of these need to be covered, just enough to be able to make an accurate assessment of the significance of mantle convection.

24 Exam practice 2

- 1 Suggested possible answer: All three stages are important in their own way. Pre-disaster actions can reduce risk or prevent a disaster, saving lives and protecting property and infrastructure, but cannot stop a tectonic hazard event and if it is of large magnitude then it may overwhelm preparations. Quick responses once a hazard has occurred can save lives. For example, warnings can lead to successful evacuations and aid can look after people; however, damage to property could be considerable and take a very long time to rebuild. Post-disaster is an important stage if lessons can be learned from the hazard event, such as rethinking the risk assessment and mitigation measures to improve things for the future.
- 2 Resilience can be improved by having knowledge and understanding of the areas at risk and the details of the possible hazards to be faced. Plans should be drawn up to help cope with a hazardous event if it occurs; this may include building standards, land-use zoning, evacuation procedures, and stockpiling of essential resources and building supplies. There should also be a flow of information and good communications between the authorities and all people, so that there is awareness of a hazard occurrence and plans can be implemented effectively.
- 3 Major earthquakes are most common at destructive (subduction) plate boundaries, therefore the energy released is very likely to move the crust (and therefore the seabed) upwards or downwards (as well as sideways) a significant amount very quickly. This displaces a water column leading to the creation of a tsunami. Earthquakes at constructive plate boundaries under the ocean have less energy and cause much less movement, and the other causes, such as volcanic islands exploding, are rare events.
- 4 Suggested possible **plan**: The processes that combine to produce hazardous lahars include erupted material (tephra), a source of water and valleys to confine the mixture into a flow. To be hazardous there must also be the presence of human activity. Without valleys lahars would disperse, and without unconsolidated erupted material or sufficient water they would not happen. If nobody lived in their path, they would not be a hazard. Perhaps the water supply is the most important, as without a sudden large amount, like the emptying of a crater lake, the water would not pick up tephra or be fast or travel long distances.
- 5 Suggested possible **plan**: No one correct answer, but each process should be considered so that the relative importance can be shown. For example, convection in the mantle could be regarded as the most important process as it moves the large plates, both oceanic and continental, in various directions, so creating the different types of plate boundary. Once this has taken place then slab pull (and slab push) add their influence on movement. Palaeomagnetism is just a record of movement. Mantle plumes may be part of the convection system, but if they are separate then they could also be important in splitting the crust.
- 6 Suggested possible **plan**: All of the strategies are important in their own way, so there is not one correct answer to this question. It could be argued that modelling and creating hazard-zone maps and then land-use regulations are best because then people are moved out of risky areas. Or that construction techniques are most important because most people in earthquakes, for example, are killed by buildings collapsing onto them, or tsunamis wash buildings away with people inside them, and it is not possible to be 100% certain where a tectonic hazard will hit. Also, that having good communications to all the people in a community and an efficient evacuation procedure with fast routes away are most important, because then people have the chance to get away from the risky zones.

25 Causes of climate change

Glacials happened relatively regularly throughout the Pleistocene, which suggests that whatever caused them was happening cyclically/in a cycle. Glacials happened roughly every 100 000 years, which is the timescale over which Milankovitch's eccentricity cycle operates.

26 Distribution of ice cover

Temperature declines by 1 °C for every 100 m of altitude, meaning that high-altitude areas can be cold enough to allow snow to persist from year to year, enabling layers of snow to accumulate and be compressed into ice. The distribution of high-altitude glaciated upland landscapes in the map shows that these areas are largely confined to the world's highest mountain areas, for example the Himalayas, the Rockies and the Alps.

27 Periglacial processes

If continuous permafrost is associated with very low mean annual temperatures, sporadic permafrost occurs in areas where mean annual temperature is only just above freezing and less than half the landscape has permafrost. This suggests that local factors will also be important in sporadic permafrost distribution. For example, vegetation cover will insulate the ground and prevent permafrost formation. Water retains heat better than the soil so areas with lakes may have less permafrost under and around the lakes. Slope orientation could also affect permafrost development, with north-facing slopes (in the northern hemisphere) experiencing the least solar radiation.

28 Periglacial landforms

The formation of an open system pingo begins with a discontinuous permafrost layer including a talik – an area of unfrozen ground below the permafrost. The next step is the formation of an ice 'lens' under the active layer overlying the talik, which starts to push the ground surface up. The ice lens grows as water moves towards it from the talik, forming a pingo. The formation of a closed system pingo begins with continuous permafrost, with a pocket of unfrozen ground underlying a lake. Next the lake disappears, with an ice lens forming beneath what is left of the lake. The permafrost then advances on the unfrozen pocket of ground, expanding the ice lens to create a closed system pingo.

29 Glacial mass balance system

An 'unhealthy' glacier is one that is retreating and thinning over a longer time period, for example 10 years. Glacier mass balance is the total accumulation of the glacier minus the total ablation for a year, and an unhealthy glacier will be retreating and thinning because it is cumulatively in negative mass balance.

30 Glacial movement

- 1 Polar glaciers move by internal deformation because they are frozen to their bedrock as a result of low temperatures, meaning the ice at their base does not reach pressure melting point. Temperate glaciers do reach the pressure melting point at their base and consequently their movement is lubricated and accelerated by basal slip. It is basal slip that means temperate glaciers move faster than polar glaciers.
- 2 There are a range of factors that could explain the difference (any three):
 - slope gradient (steeper slopes mean faster movement)
 - bedrock permeability (meltwater is lost to permeable bedrock, reducing basal slip and slowing movement)
 - precipitation level (higher snowfall means more accumulation and faster movement)
 - rate of ablation (more ablation means more meltwater which means more basal slippage and more movement)
 - ice temperature (colder ice deforms less and stays stuck to the bedrock more)
 - ice thickness (greater thickness – over 50 m thick – means thick plastic flow, though the heavier the ice, the more force is needed to overcome increased friction caused by more mass).

31 The glacier landform system

- 1 (a) Sub-glacial environments are below a glacier or ice sheet, where the environment is under great pressure from the weight of the overlying ice, producing erosion by abrasion and plucking. For temperate glaciers this environment may also have a lot of meltwater present, which can create sub-glacial deposition landforms. Ice marginal environments are at the sides of the glacier/ice sheet, or at its end. Processes operating here are dominated by weathering and deposition.
(b) Proglacial environments are at the front of glaciers and ice sheets, and are dominated by fluvio-glacial processes, while periglacial environments are at the edges of glaciated areas (and in areas unaffected by glaciation) and are dominated by freeze-thaw processes and meltwater, and are not characterised by moving ice.
- 2 Periglacial environments are often very extensive and involve processes operating over a wide scale to produce macro-scale landforms such as patterned ground and blockfields.
- 3 The concept of a glacier landform system links characteristic landforms to particular glacial processes so that it is possible to see not only how far ice extended in the past but also what glacial processes were dominant at different places in the landscape at different times. For example, the presence of terminal moraines indicates the extent of past glacial advances.

32 Glacial erosion and cirques

- 1 Glacial abrasion would be increased by factors including: the mass of the glacier because the greater the pressure of the ice against the bedrock, the greater the pressure of the abrasion on that bedrock; the speed of the glacier as a faster-moving glacier will transfer more energy to the abrasion process; the amount of basal debris since the more debris there is, the more material is embedded in the ice to abrade with; the nature of the abrading material because harder/more angular debris will be a more effective; the nature of the bedrock since less resistant bedrock will be abraded more rapidly; the presence of basal meltwater under pressure since this may protect the bedrock from abrasion.
- 2 In a cirque glacier, accumulation is greatest at the 'back' of the glacier, closest to the cirque headwall. This means this part of the glacier is thicker and heavier. Ablation is greatest at the 'front' part of the cirque glacier, closest to the cirque lip. This makes this part of the cirque glacier relatively thinner and lighter. This difference means the glacier rotates in the cirque hollow to redistribute its weight. The rotational movement intensifies abrasion of the cirque hollow, over-deepening it.

33 Valley glacier landforms

Cirque: dominant process is erosion (plucking and abrasion), macro-scale, mainly sub-glacial environment, upland landscape, both active and relict. Glacial trough: dominant process is erosion (plucking and abrasion), macro-scale, mainly sub-glacial environment, upland landscape, both active and relict. Ribbon lake: dominant process is erosion (plucking and abrasion), meso-scale, mainly sub-glacial environment, upland relict landscape.

34 Ice sheet scouring

Differential geology means that the underlying geology of the landscape is not uniform or all the same, but includes some rocks that are less resistant to erosion and some that are more resistant. This can be to do with differential weathering of a single rock type as well as to there being different rock types of varying resistance. Both roches moutonnées and crag and tail are examples of landforms that form because of a more resistant rock outcrop surrounded by less resistant rocks (usually these are already outcrops before glaciation). Knock and lochan are perhaps the best example, because here the glacier is responsible for eroding less resistant rock (lochan) more than more resistant rock (knock).

35 Ice contact depositional features

- 1 (a) Terminal moraine, because this is deposited at the glacier's furthest extent (and will not have been reworked by subsequent advances).
(b) Drumlins with a high elongation ratio, because the faster the ice was flowing, the more elongated the drumlins (if any were formed).
(c) A recessional moraine, because these are created as glacial retreat pauses.
- 2 One theory for drumlin formation is that they are formed by deposition when glacier ice becomes overloaded with debris when exiting an upland area. The deposits are streamlined and shaped by the moving ice.

Other theories:

- Drumlins are formed when deposition occurs in the lee of an obstacle, which then forms the core of the drumlin as moraine is deposited and moulded around it. Some drumlins (but not all) have been found to have a rock core.
- Drumlins are formed from irregular deposits left by meltwater floods, which are then moulded by advancing ice.

36 Lowland depositional features

(a) clasts; (b) rock flour; (c) unstratified; (d) measuring the orientation of clasts

37 Reconstructing past glaciation

- 1 (a) Place tracing paper over the map or image and trace the outline of an appropriate number of drumlins. Draw a line along the long axis and record the orientation of the long axis for each drumlin to record evidence for direction of ice movement.
(b) For relative speed of ice flow, calculate the elongation ratio by dividing the length of the drumlin by the width of the drumlin: the greater the ratio, the faster the ice was moving.
- 2 The BGS Geology of Britain viewer has a 'superficial only' setting which displays superficial deposits (previously called drift), including diamicton (non-stratified) till and glacial sand and gravel. Using this setting, the limits of glacial deposits can be viewed to indicate the extent of ice coverage in the UK.

- 3 First the deposit would be photographed with a metre rule for scale, for use in supporting subsequent data analysis and interpretation.
A random sampling technique would be used to sample 100 clasts (a 100-m tape measure randomly placed along the deposit and a random number generator used to generate 20 random sample sites along that 100 m with the clasts positioned on the tape measure at those 20 numbers sampled. Once complete, another random location on the deposit would be sampled in the same way until 100 clasts had been randomly sampled.
Each clast would be measured in situ for orientation by placing the long side of a compass along the long axis of each clast and recording the orientation of each end (180° apart) in degrees to give two recordings for each clast.
- 4 Calculating the mean orientation would enable any trend in orientation while calculating the standard deviation would give an indication of any dispersion from the mean.

38 Glacial meltwater processes

- 1 The higher the Cailleux Index value, the flatter or more angular the clast; as a result, glacial till would have higher values, as its clasts have been frozen into ice and not rounded by meltwater attrition in the way fluvioglacial deposits have been.
- 2 Meltwater has the greatest power closest to the snout (proximal zone) and so deposits here will be large, coarse particles. In the medial zone, particle size is smaller as meltwater here has less energy and is also more affected by variability in flow (both daily and seasonally). In the distal zone, furthest from the snout, deposits are small and well sorted.

39 Fluvioglacial landforms

Ice-contact fluvioglacial landforms result from deposition of material carried by the ice or within/beneath the ice. Proglacial landforms result from deposition by meltwater beyond the glacier's snout

40 Value of glaciated landscapes

Answers could include:

- unique and endemic species/animals and plants that live nowhere else
- wilderness areas – an increasingly rare opportunity for humans to experience true wilderness
- traditional lifestyles and culture of indigenous peoples, which will disappear if not preserved
- fragile ecosystems that should be protected from damage because of the very long time it takes them to recover from damage
- contribution to natural systems (water cycle, carbon cycle), which only continues in a positive form as long as the environments are protected from the threat of climate warming.

41 Direct threats

Avalanche risk is increased by human activities, especially deforestation and soil erosion, as this can increase the likelihood of underlying layers being too weak to support the weight of heavy snowfall by reducing slope stability. Vibrations from transport and construction can also trigger avalanches. Risks of hazards inevitably increase when humans are active in a glaciated landscape, as it is the humans and their property that are at risk.

42 Indirect threats

There are a range of possible explanations, which could include (assuming no actual knowledge of the specifics of Patagonia):

- a greater-than-average increase in temperatures in the part of the world where Patagonia is located
- a contribution of ocean currents (or perhaps El Niño/La Niña fluctuations) to glacial melting or snow supply
- Patagonia's glaciers may be lower level glaciers, which makes them more vulnerable to ablation than high level glaciers
- Patagonia's glaciers may calve as icebergs into the sea, which makes glaciers more vulnerable to rapid recession
- changes to precipitation, which may have meant a reduction in snow accumulation in winter, and more frequent and more intense rainfall in summer.

43 Managing glaciated landscapes

Heating could change from reliance on fossil fuels to renewable energy, for example solar, wind, biofuel and geothermal.
Transport could change from individual car, ATV and snowmobile use to more walking, cycling and transportation by electric vehicles. For example, Zermatt in the Swiss Alps has banned cars and brought in electric buses and electric taxis (helicopters are still permitted, however).

Slope damage in ski resorts comes from the removal of vegetation, rocks and soil to create the broad, smooth pistes that skiers want, and from the construction of roads, ski lifts and other infrastructure around the pistes. Pistes are also groomed overnight to pack the snow and create a good surface for skiing, snowboarding and snowmobiling. Slope damage can be reduced by revegetating slopes using plants that are native to the area (ski resorts often sow grass seeds that are not adapted to the conditions, increasing soil erosion), maintaining the vegetation cover in summer to get it as dense as possible. Netting (made of sustainable jute) adds stability to slopes. Forest reserves around the pistes can further stabilise the soil. Rotating pistes and limiting the numbers using pistes can also reduce slope damage.

44 Managing climate warming

Global scale: the Paris Agreement (2015) is intended to be a global commitment to limit global temperature rises to below 1.5 °C, to which 184 countries plus the EU have signed up.

National scale: governments switch national economies to low-carbon sources of energy (more renewables).

Local scale: people make their homes more efficient in how they use energy (e.g. through insulation).

47 Exam practice 1

- 1 (a) Precession cycle
(b) Two from:
 - The eccentricity cycle: changes in orbit over a 100 000-year cycle. When the Earth's orbit takes it further from the Sun, it receives less solar energy.
 - The obliquity cycle: changes to the Earth's axis over a 41 000-year cycle. This changes how much solar energy is received at the Earth's poles.
 - The precession cycle: 'wobbles' in the Earth's axis over a 21 000-year cycle. This affects how cold or warm seasons are.
- 2 Evidence for reconstructing Pleistocene ice sheet extent could include: depositional evidence such as erratics, drumlins, moraine; erosional evidence such as glacial troughs, corries, roches moutonnées, knock and lochan landscapes; meltwater evidence such as till, meltwater channels, eskers.
- 3 **Plan:** When and what? Little Ice Age as a period of cooling during the Holocene, which lasted from around 1300 to 1870 (disputed). Characteristics? Cold winters: frozen rivers (ice fairs); glacial advances; sea ice increases; changes to climate in rest of year meaning poor harvests. Causes? Uncertain. Volcanic activity? Sunspot activity?
- 4 **Plan:**
 - What is mass balance? How it explains glacial movement – accumulation greater than ablation = glacial advance; ablation greater than accumulation = glacial retreat. Significant on macro-scale; significant in understanding and explaining widespread glacial retreat today due to climate warming.
 - However, other factors also important: polar vs temperate glaciers (also macro-scale), altitude, slope, lithology (meso-scale); extent of basal slip, regelation creep, internal deformation (micro-/meso-scale).
 - Conclusion: significant at the largest scale and main driver, but necessary to consider other factors too in order to get full understanding.

48 Exam practice 2

- 1 Reasons could include:
 - uniqueness of some plants and animals found in glaciated landscapes, especially polar landscapes
 - fragility of glaciated landscapes which increases their value as they are so easily damaged
 - Polar scientific research that has been vital in understanding Earth's climate history and in detecting atmospheric changes
 - wilderness recreation, which allows people access to the distinctive environmental qualities of glaciated landscapes.
- 2 Answers could include developments of the following points:
 - regulation of the carbon cycle – the major carbon stores provided by periglacial environments
 - regulation of the hydrological system – for example, glaciers providing meltwater that is important in maintaining flows in river systems
 - regulation of climate through albedo effect.
- 3 **Plan:** Glaciers contribute to river flow through meltwater: the larger the volume of ice in the ablation zone, the larger (in principle) the volume of meltwater reaching river systems. Reductions in flow could therefore be related to reduced volumes of ice in ablation zones – glacial retreat, reduced levels of melting, perhaps due to cooler summer temperatures.

Links to climate through climate warming (consider natural as well as anthropogenic) and glacial retreat, also possibility of other climate factors such as reduced rainfall and increased evaporation from rivers. Human factors: human activities link to enhanced greenhouse effect and climate change. Human activity also likely to be a factor in over-abstraction of water from rivers for agriculture (irrigation), industry, power generation.

- 4 **Plan:** What is the influence of geology? Influences of differential resistance, permeability, jointing to specific landforms. What other factors are also important? Glacier type (cold-based or warm), glacier movement (fast or slow), glacier advance or retreat (is geology less important for landscapes of deposition than of erosion?). Consider the complex nature of glacial landscape formation and time as a factor: multiple glaciations and their influence. There is no single correct answer: consider each factor so the relative importance can be shown, then come to a substantiated judgement that is backed up by evidence from your answer.
- 5 **Plan:** Avoid dismissing one viewpoint and declaring your support for another right from the start: consider the alternative views and then make your own substantiated judgement. It is useful to consider a themed approach, as this provides more depth to your answer than a 'on the one hand this, but on the other hand that' approach. For example, what is meant by threat and how should we evaluate its severity to glaciated landscapes? Are natural hazards more of a threat in the short term while human activities have longer-term impacts? Is the location of the glaciated landscape important to the severity of the impact: polar glaciated landscapes compared with Alpine valleys, for example? Is there a difference in threat between active glaciated landscapes and relict glaciated landscapes? Considering these questions will help you to take a balanced approach.

49 Classifying coasts

- The foreshore, between the high- and low-tide marks. The backshore may be affected by wave action during very high tides and very powerful (usually winter) storms.
- High-energy coasts would fit on the retreating coast (sea gaining) and erosion section of the advancing and retreating coasts classification, while low-energy coasts would fit with the outbuilding section of the advancing coast (land gaining) side. One problem with the combination could be that some coasts can be high energy in winter but are generally low energy in summer, with a dynamic equilibrium meaning that the coast is neither eroding/retreating nor outbuilding/advancing, except on a short timescale.

50 Geological structure

On a discordant coast, less resistant rocks are eroded differentially forming bays while the more resistant rock layers form headlands. Waves bend as they enter bays – refraction. Refraction focuses wave energy on headlands, so that waves erode the headlands not only head on but also from the sides. This erosion exploits points of weakness (e.g. a joint) so that they are enlarged, which in some cases may eventually become a sea cave: sea caves that erode right through the headland (sometimes on both sides of the headland) form an arch; subaerial weathering of the arch causes its collapse to leave a stack.

51 Coastal erosion factors

Embryo dunes form first and, once established, they collect more sand and become larger. Pioneer plants such as sea rocket are then able to colonise the stable dunes and help to bind the sand together and trap more sand.

Yellow dunes are usually the highest dunes in a dune sequence, and may form a ridge near the dune front with marram grass. These are not fully vegetated and can be altered by the wind and waves ('blow outs' can see dunes eroded, forming gaps in the line of dunes). At high tide or under storm conditions, seawater may reach the dips in the sand dunes, called slacks, allowing other plants such as marsh orchids to grow here.

Mature dunes are known as grey dunes because their humus content is higher, and the climax vegetation is either pine forest (where soil acidity is high) or oak forest (where shell deposits neutralise the soil a little).

52 Marine erosion processes

Destructive waves have a wave frequency of 13–15 waves per minute, while constructive waves have a wave frequency of 6–8 waves per minute.

You would time the frequency of the waves by using a stopwatch to time the gap (in seconds) between

the arrival of each wave crest, using a fixed point on the beach as your reference point (e.g. the end of a groyne). Doing this for a fixed period of time (say, 10 minutes) would give you the data for a measure of central tendency. The mean frequency of the waves over this period would then tell you if they were constructive (6–8 per minute) or destructive (13–15 per minute).

53 Landforms of coastal erosion

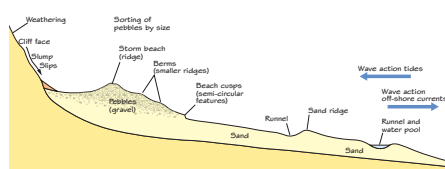
Softer, unconsolidated lithography is not strong enough to support features like arches and stacks, which is why the cave-arch-stack-stump sequence is associated with stronger rocks that can support these features. Joints and bedding planes are important for the formation of caves, especially caves that extend through a headland, and this is why they are most associated with sedimentary rocks that have these features. Igneous rocks often have cracks and joints (caused by shrinkage as the rock cools), and where these run horizontally, like a bedding plane, then arches, stacks and stumps may form, too.

54 Sediment transportation

Your example of negative feedback could explain how the negative feedback returns the system to balance (dynamic equilibrium); for example, where wave erosion causes rock falls, which then protect the base of the cliff from further erosion.

55 Transport process landforms

Your cross-section should look something like this:



56 Weathering and mass movement

- Salt crystallisation probably contributed to the rock fall on these chalk cliffs, due to saltwater penetrating the pores in the rock, evaporating and leaving salt in the rock that expands as crystals, degrading the rock. A daily cycle of freezing and thawing is not present in Kent, on the south coast of England. As chalk is mostly calcium carbonate, it is affected by carbonation – a chemical reaction when slightly acidic rainwater falls onto and penetrates into the chalk, creating soluble substances that can be washed away by water.
- Weathering makes rocks weaker, making them less resistant to erosion or to mass movement processes. When some cliff strata are less resistant to weathering than others, this may contribute to the formation of a wave-cut notch and undercutting of the cliff, which leads to recession when the overhang, exposed to mechanical and chemical weathering, collapses due to gravity.

57 Mass movement landforms

Factors include:

- when permeable strata are on top of impermeable strata, such as sandstone over clay
- when the bedding plane between the permeable and impermeable strata dips towards the sea
- when heavy rain saturates the permeable strata, increasing its weight
- when water percolates through the permeable strata to the bedding plane between them, creating pore pressure within the permeable strata
- when wave erosion undercuts the cliff from below.

58 Sea level change

Your answer could make the following points:

- Tides cause sea level changes on a short timescale as these happen twice daily (approximately).
- Spring tides are higher than average tides caused monthly by the Earth, Sun and Moon being in alignment, while lower tides, neap tides, occur monthly when the Sun and Moon are at right angles.
- Very low pressure weather systems can produce storm surges that temporarily raise sea levels at the coast by heights of several metres: these weather systems often have a seasonal nature, for example winter storms in the UK.
- At the scale of decades and centuries, tectonic activity can cause tsunamis and raise or lower the land locally relative to the sea.
- On longer timescales are the eustatic and isostatic changes due to glaciation and interglacials.
- Sea level rises due to global warming appear to be a short-term change that really began in the 1980s.

59 Rapid coastal recession

Changes in wind direction could increase the rate of recession if winds change to those with a long fetch compared to winds with a short fetch (which might be the prevailing winds). Seasons will affect the rate of recession since erosion is likely to be most effective in winter when winter storms (low pressure weather systems) bring the most powerful destructive waves to UK coastlines. Tides will also influence the rate of recession, since high tides may mean the waves reach the backshore, eroding cliffs, while at low tide waves may have all their energy absorbed by the beach.

When winter storms coincide with high tides, the rate of recession will also increase. Weathering and mass movement are likely to have stronger effects during the winter, when there is more rainfall (and possibly a freeze-thaw cycle) than in summer.

60 Coastal flooding

Mangroves reduce the height of waves by an average of 40% within the first 100 m of forest, so removing mangroves would mean higher waves reaching the coast, causing more erosion and reaching further inland, increasing the risk of coastal flooding. Mangroves are especially important at reducing the impact of storm surges. Their impact in reducing storm surge levels by 0.5 m for every 1 km of forest that the seawater passes through can have a very significant effect in lowering the surge by the time it reaches the coast.

61 Coastal flooding examples

Physical reasons could include: low-lying (coastal plains, deltas, estuaries); falling land level (isostatic sinking); rising sea level (eustatic); removal of vegetation, e.g. salt marsh, mangroves; frequent tropical cyclones; low pressure systems; funnel-shaped coast and sloping shallow sea bed which intensify storm surge height. Human influences are also potentially significant: the Aswan Dam example shows how reducing inputs into a sediment cell can increase the risk of coastal flooding; coastal management in one area could increase the risk of flooding down drift; and human activities reducing sand dune vegetation could increase the risk of 'blow out', creating a gap in a sand dune barrier leading to flooding.

62 Consequences

While most countries, especially developed countries, will be able to reduce the threat of coastal flooding as sea levels rise/tropical cyclone intensity increases by building sea walls and other defences, the challenge is especially great for low-lying island developing nations such as the Philippines or the Maldives. One risk factor is therefore having a lot of coastline to defend, which is difficult for the Philippines since its large population (100 million) is spread out over 2000 islands. The lack of higher elevation land to relocate communities to is a second risk factor, compounded by the high population densities that characterise some developing countries.

In the case of the Philippines, settlements by the coast are subsiding, in many cases due to the extraction of groundwater, which increases the risk/vulnerability.

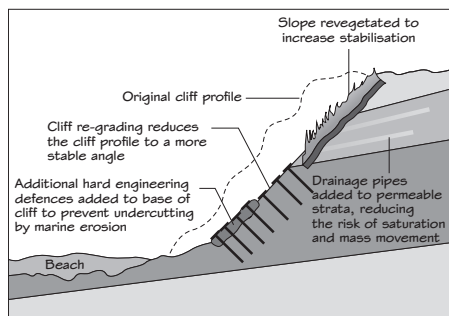
Hard engineering defences are very expensive both to build and to maintain, which may be a factor for some developing countries. Coastal communities in developing countries are often heavily dependent on fishing, which makes their economies vulnerable to disruption by coastal flooding/storm surges. Rapid urbanisation may mean that settlements have been constructed in areas prone to coastal flooding before city governments were able to restrict construction in these areas, or potentially these areas at risk of coastal flooding are settled unofficially by recent migrants to the city.

63 Hard engineering

For example: groyne. Groynes alter the process of longshore drift as the barriers block the transfer of sediment. This creates a broader beach that absorbs wave energy that might otherwise have reached the backshore and eroded it, increasing the supply of sediment. Obstructing the transfer of sediment along the coast by longshore drift has consequences for beaches down-drift, which may become starved of sediment and narrow, reducing the protection provided to the backshore, which may then be eroded.

64 Soft engineering

- For example: dune stabilisation. Embryo dunes form around obstacles – dune stabilisation often uses old Christmas trees to provide suitable obstacles to encourage deposition. Dunes are replanted with plants such as marram grass that naturally colonise dunes, working with the natural process of succession.
- Your cross-section diagram will look something like this:



65 Managing future threats

Sustainability is not only about use of resources but who benefits. Because the coast is a complex system used in many different ways by different groups of people, new developments that benefit one group of stakeholders will inevitably displease or cause losses to others. Sustainable management recognises the potential for conflict and seeks to meet the differing needs of as many stakeholder groups as it can.

66 ICZM strategies

- A wind farm might not cause too much disturbance to sediment transfers once the initial construction phase was completed, but there might be disruption to local wild bird populations, possibly also to offshore habitats for sea life; there might be concerns from the local tourist board about a wind farm spoiling the sea view; local sailing clubs might object to a wind farm if it restricted their area of operations.
- Offshore dredging is damaging to local habitats and it can also interrupt or disrupt the physical processes of sediment transfer within the coastal system, which would have potentially serious consequences for coastal management.
- A golf course might be a popular addition to the coast for local businesses and the council, but there might be objections if, say, the course was to be built among sand dunes which formed a part of the natural sea defences of the area, if the golf course would block access to the sand dune area for other recreational users of the habitat. Golf courses also use a lot of water and this might potentially be considered unsustainable.

67 Coastal policy conflicts

Your message might contain some of the following points:

- A statement expressing your sympathy with the situation faced by residents of Happisburgh (using local knowledge such as the name of the main road affected, caravan park, etc. to demonstrate that you know the local details).
- An explanation of how policy decisions are reached: cost-benefit analysis, consideration of sustainable management principles.
- A paragraph explaining how coastal defences at Happisburgh would, by creating a headland or promontory, have wider impacts on the whole littoral cell down drift of Happisburgh, including the risk of increased erosion for other communities.
- A concluding paragraph recommending adaptation strategies that the community could fund itself.

70 Exam practice 1

- Glacial/ice sheet melting
 - Using the two from the diagram is fine, as long as you provide an explanation of how they each cause long-term change (sea level rise or fall). In the case of glacial or ice sheet/ice cap melt, then it is the release of water on the land into the sea that raises levels, while for thermal expansion it is warming of the oceans that increases the amount of space between water molecules that is the cause. Other factors could include ice formation/glaciation and sea level falls.
 - The specification mentions raised beaches with fossil cliffs, and rias, fjords and Dalmatian coastlines in this context.
- Plan:** Changes in the rate of recession that happen over short timescale: tides (twice a day), wind strength/wind direction and fetch; over a medium timescale: seasonal factors such as winter storms and other weather system changes; longer-term changes: influence of weathering and mass movement, climate change, tectonic changes.
- Plan:** What is coastal development? – The way coasts develop. Reference Valentin's classification of coasts: advancing coast (land gaining); emergence and outbuilding (deposition); retreating coasts (sea gaining) submergence and erosion. Geological

structure influences erosion and deposition but emergence and submergence: other factors. On other scales geological structure is significant, e.g. rocky cliffs vs sandy beaches (resistant geology), headlands vs bays, concordant and discordant coasts. Geological structure is an important influence on morphology and erosion rates. However, geological structure is not the only factor: wave energy is equally important, which is related to wave size and shape, length of fetch, depth of water, dominant wind direction.

71 Exam practice 2

- Reasons could include: sea level rise, increased frequency of storms, increased magnitude of storms.
- Answers could include:
 - Wave-cut notches are a distinctive coastal landform caused by abrasion and hydraulic action where destructive waves meet cliffs at high tide.
 - Cliffs are caused by waves eroding (undercutting) at the base of a slope, with gravity then causing mass movement and the exposure of a steep cliff face.
 - The cave-arch-stack-stump sequence of distinctive coastal landforms in which erosion is a dominant factor: hydraulic action and abrasion first forming caves, which may develop into an arch that is extended by further erosion and, weakened by weathering, eventually falls to create a stack which is gradually eroded into a stump.
- AO1:** consequences likely to be mainly economic and social. Economic: losses affecting housing, business, agriculture and infrastructure (refer to table for AO2 application of understanding), which are connected (AO2) by their disruptive effects on national GDP and, especially, to regional and local economic losses – not just in terms of the cost of repair and mitigation strategies but also the national impact of rising insurance costs. **AO1:** social losses relating to these: people forced to/choosing to relocate (loss of community, dislocation), loss of livelihood (farms that have been in families for generations are part of identity), loss of amenity value.
- Plan:** Describe the Sediment Cell concept: coast as a system. How it explains the coast as a dynamic equilibrium, ways in which this is important, e.g. important to understand role of negative feedback, such as wave erosion causing rock falls, which then protect the base of a cliff from further erosion, and positive feedback, such as damage to a sand dune during a storm then leading to a 'blow out' and further erosion, in order to explain landforms in a dynamic context. Important too in evaluating coastal defences and coastal management – the impact that intervention at one part of the coast can have on others through its influence on the transfer of sediment. Ways in which the Sediment Cell concept is limited: the idea of each sediment cell being closed is possibly simplistic – transfers of sediment between cells may be important. How well does the Sediment Cell concept deal with change over time as a second limitation?
- Scale of challenge** = the range of players involved makes management very challenging: for example landowners and farmers, resident associations, parish groups, councils, wildlife associations, recreation and leisure organisations, business and infrastructure, e.g. tourist boards, power companies, port managers, railway companies. Their interests are not always compatible. Consider SMPs as an attempt to make sure as many players' needs as possible are considered when managing coastlines. Evaluate success: generally speaking they are successful: coastline management plans are accepted and SMPs give the opportunity for all players to give their views. Consider flashpoints: where SMPs face greater challenges often where physical factors mean coastlines are especially dynamic, e.g. where rates of recession are rapid. That leads to conflicts over holding the existing shoreline against no active intervention or managed retreat. Use example of Happisburgh for opportunity for compromise: no active intervention policy went against the wishes of local residents (Beach Road), lowered house values, etc. However, Happisburgh example shows coastline management can be flexible: local campaigning led to £3 million grant from government to manage the problem, move people to safer locations, etc.

72 Global connections

There are global flows, except Africa and South America are not connected to Singapore. The largest exports of services from Singapore are to the main economies of the world (USA over 10%, China and Japan) regardless of distance from the country.

This is because modern services, such as finance, involve communications using the internet so distance is not important and Singapore can easily link to the wealthiest countries of the world. There is also a significant flow to nearby countries in SE Asia and Australia, the shorter distance making it easier to export. Three countries in Europe feature despite the considerable distance away and this is because of well-developed communications to and from this area and specialisms in services (e.g. financial). India (2.1% to 3%) also features, probably because of the relatively short distance from Singapore and the emerging economy of that country needs services.

73 Governments and organisations

- Both international and national political decision-making have influenced the globalisation process. National governments adopt free-market economy policies that extend beyond their own country, and join international trade blocs (e.g. the EU) or make agreements with nearby countries (e.g. ASEAN), which makes it easier to link into global economic and political systems.
- There are large international economic organisations. For example, the WTO promotes free trade on a global scale, while the EU does the same for 28 European countries. The World Bank and IMF link the global banking system to provide financial help for countries. Governments of countries assist by encouraging and allowing FDI, usually from TNCs, into their country.

74 Economic globalisation

- Possible suggested answer for customs duties: No customs duties means that a business or industry that is involved with importing and exporting can reduce their costs as it is cheaper to import or export raw materials, components or finished goods. Time will also be saved as the materials or goods do not need to go through a customs checking process. Therefore TNCs can locate in many countries to get the advantages of the best locations for each part of their business.
- China has a positive attitude towards FDI as it started an 'open door policy' to help link the economy of the country to global trading, and obtaining investment from other countries (through TNCs) helps to make those links with the global networks, as well as providing employment and new skills for the population which can then be passed on to domestic industries. China has also gained by learning about new technologies and copying them. There are strong links to nearby developed countries such as Japan, Singapore, South Korea and to another economic superpower – the USA – so it has been able to integrate itself well.

75 Global Indices and TNC role

- The 'global core' countries generally have the highest rank positions and highest Index scores compared to other categories. The 'downward transition' countries generally have the lowest rank positions and lowest Index scores. 'Resource frontier' countries generally have a higher rank and Index score than the 'downward transition' countries. The Globalisation Index means confirm the division into the core-periphery model. Index means for the groups of countries shown are: Global core = 86.36; Upward transition = 75.86; Resource frontier = 69.48; Downward transition = 62.96. Index rank position means confirm this: Global core = 9.8; Upward transition = 36.8; Resource frontier = 56.6; Downward transition = 81.4. The resource frontier does better than expected, probably because of the strong influence of trade and other direct links to the global cores. So global core countries are the most globalised, linked the most to global socio-cultural, political and economic systems, with downward transition zones being the least globalised. Resource frontier countries are perhaps higher than expected, but the wealth gained from resources and the trading links that are necessary raise their position. It is worth noting that some countries in reality are in more than one category, for example Brazil has an upward transition region (south-east), a downward transition region (north-east) and a resource frontier region (north-west) but data on globalisation of regions is not available.
- TNCs link into globalisation systems by dividing their production stages between different countries, wherever is the best advantage; they seek out new markets and so take their contacts and brands into new countries; they take their products and modify them to suit the markets of other countries so that they can still sell their brands there; they use the liberal 'free-market' policies of governments to establish different types of operations in other countries.

76 Degree of globalisation

- 1 Suggested possible answers: Physical distance from economic centres can leave a country isolated (e.g. Chad); climate can create difficulties for working and operating machinery, with survival the main option for people and governments rather than making links with the rest of the world.
- 2 Suggested possible answers: Corruption within government and authorities makes it difficult to trust rules and stability in the country, so FDI is not attracted; national governments may decide to follow isolationist or protectionist policies to keep control rather than allow development of external links (e.g. North Korea).
- 3 Suggested possible answers: A country with high debt will have difficulty attracting FDI and lack trust in the validity of government fiscal policies (e.g. Kazakhstan); some countries may not have any resources or products to sell, so they cannot engage in trade with other countries.

77 Benefits and costs

- 1 Suggested possible best benefit: investment in infrastructure as this enables those industries already established to lower their costs and improve their competitiveness in global trade. It also stimulates further growth (a multiplier effect).
Suggested possible worst cost: the degradation of the natural environment is the result of uncontrolled air, water and land pollution which kills wildlife but also harms the health of people as they will breathe polluted air and drink contaminated water.
- 2 No one correct answer. Suggested possible answer: Emerging countries such as China and India wish to be involved with global trade because this is the main way of the country becoming wealthier, earning foreign currency. They seek to develop a comparative advantage in the world of trade, by offering a unique, high-quality or cheaper product or service. The money they earn can be used to improve the global standing of the country, giving it more power, but also to improve the lives of the population through higher wages and the ability of the government to provide better infrastructure and services such as health care and education. A healthier skilled workforce will then give the country an advantage in the future to develop further.

78 Global shift: issues

Global shift of manufacturing industries to developing and emerging countries was fast and many governments and systems were unprepared for this. For example, some countries did not have regulations to control the operations of factories, especially waste disposal. Economic priorities were put above the natural environment. The impacts of large-scale rural to urban migration were also not anticipated and so lacked controls. Therefore the natural environment was damaged by resource exploitation, factory emissions (air, water and land) and urban sprawl – especially in the form of urban slums (shanty towns).

79 Rural–urban migration

- 1 Globalisation has enabled megacities to establish strong links with the rest of the world; this has attracted FDI, especially from TNCs, and increased the exposure of the population to ‘western’ lifestyles (e.g. branding). This creates a perception that the megacities represent a microcosm of the developed world; people living in rural areas experiencing problems move to the city looking for a better life.
- 2 The flow of people (internal migration) into Maharashtra shows that it receives people from more areas (nine) than any other Indian state. The largest movements are from Uttar Pradesh and Karnataka with over 300 000 people in one year and over 200 000 from Bihar and West Bengal. The distances travelled include from neighbouring areas and from the other side of the country. There is only one movement out of Maharashtra, going to neighbouring Gujarat. The city of Mumbai is one of the main pull factors (jobs) with its population predicted to nearly double between 1995 and 2035 (14 million to 27 million). Mumbai is also attracting a lot of people from inside the state of Maharashtra (70% of all immigrants), from both other urban areas and rural areas; from beyond the state it is mostly poor farmers and farm labourers moving to the megacity (20% of total).

80 International migration

Source areas may lose the low-wage workforce, which has an important role in the economy of the country, while elite migrations may take considerable sums of money with them out of the country. The low-wage diaspora usually send remittances back to the source

country, supporting families and the economy there but with elite migrations it is often the opposite. Low-wage migration consists of larger numbers and so may have a social impact if it is a certain age or gender group, while elite migrations are much smaller in number. Both groups may cause social and political problems if they return home with new cultural beliefs.

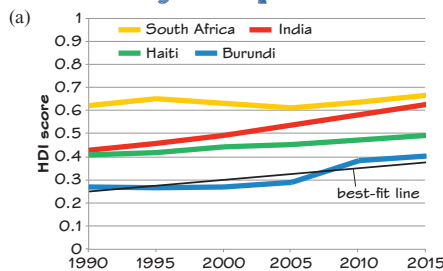
81 Cultural globalisation

- 1 TNCs are one mechanism by which cultural diffusion has taken place. The media, especially via the internet, has enabled people with electronic devices or access to TV to see different cultures or the portrayal of them. The USA and ‘western’ cultures have a strong appeal as they seem to suggest opportunities, freedom and wealth. TNCs spread these cultures through their brands, which are seen as a sign of prosperity, and also through providing a product or service that symbolises wealth or freedom to choose. The factories in which people are employed will be organised along the lines of ‘western’ principles. Other global organisations, such as the Olympic movement, are also important in promoting disadvantaged groups.
- 2 USA brands dominated in terms of the number of top 12 brands in the world from that country (i.e. 9), but also in terms of the total value, with both Apple and Google dominating and having a value about three times greater than the first non-USA brand (Samsung of South Korea). Amazon is catching the top two brands up fast.

82 Cultural impacts

- 1 Cultural erosion is caused when a local or national culture is exposed to new ideas through globalisation (e.g. media, brands) that are perceived to be better (or in some cases they may be forced). The aspects of culture perceived to be better replace traditional elements and are incorporated into the local or national culture. This is visible through the wearing of branded clothing or designing weddings around the westernised ‘white wedding’.
- 2 The natural environment may be damaged when rapid urbanisation takes place due to people moving to cities looking for better jobs; expansion is often into natural areas and the disposal of wastes from industries and people are put into the air, land or water, which contaminates the natural environment. There is often a greater exploitation of resources to support the growth of industries (such as Rio Tinto in PNG) and their extraction and transport removes natural ecosystems, and the industries and power stations add their damaging pollution. Intensification of farming to support large urban centres adds pesticides to the natural environment, damaging food webs.

83 Measuring development



- (b) India is an emerging economy and has the fastest increase of the four countries, increasing by about 0.2. Despite being an emerging economy, South Africa's HDI has fluctuated and is the only one to have decreased (between 1995 and 2005), but it still has the highest HDI. Haiti and Burundi are both poor developing countries, with Haiti increasing at a steady rate, improving by about 0.1. Burundi has had the most dramatic change, between 2005 and 2010, when it improved by 0.1, narrowing the gap with Haiti.

84 Inequality and trends

During the developing stage, a country may be mainly an agrarian economy with relatively low incomes, so income distribution is more equal – although big landowners and traders may have considerably more. As a country emerges economically and manufactures more valuable products, the gap between company or resource owners and the low-wage workforce increases the income distribution gap (e.g. India and China today). In developed countries, the income gap should narrow, but this depends on the ethos of the country: if it emphasises providing opportunities (e.g. USA) then income inequality may still be significant.

85 Mixed cultures and tensions

- 1 Any one, such as open borders. Possible suggested answer: Sometimes the economic situation within a country needs either more workers to complete low-wage manual jobs or provide skills in a service (e.g. health care), or an influx of money from wealthy foreign elites to boost the financial sector or FDI from TNCs to boost employment. National governments may make it easier for people to move into the country at these times. If a country is a member of a bloc of countries, there may be a legal open border policy to allow freedom of movement (e.g. the EU).
- 2 Tensions may arise in a host country if numbers of immigrants are large and threaten the traditional national culture. Threats may be real or perceived; usually immigrants do not take jobs away from people but they may place pressures on schools or the health service as they get older. Immigrants do bring with them a different culture, including language, religion, shops, entertainment and ways of doing things, some of which may contrast with the national culture.

86 Controls on globalisation

Some countries may wish to control the spread of globalisation because they see real or perceived threats to their ideology, culture or industries and businesses. For example, information shared on the internet may lead to civil unrest and calls for significant changes in the way that a country is governed, or immigrants from contrasting cultures may start to dilute the national culture, or industries may be declining because of competition from products produced more cheaply (or better) in other countries.

87 Attitudes to globalisation

- 1 Indigenous groups can protect their culture and physical resources by forming a collective government that can act as a pressure group, representing the interests of all. This pressure can be used to get cooperation with governments, national laws or international help through organisations such as UNESCO, and bring pressure through negotiations on companies exploiting resources.
- 2 Indigenous groups or native peoples may experience isolation and deprivation in terms of lack of services or job opportunities. In this situation these groups may wish to embrace the benefits of economic globalisation to different extents. Money from contracts with companies, jobs for native people and compensatory payments bring money into communities, which can be used to improve the quality of life for families and provide important services such as better education for children and better health services for all.

88 Localism

There is a range of costs associated with local sourcing and they are of varying importance. Local small-scale production is often less efficient because of ‘economies of scale’ and therefore products are more expensive for consumers, while the efficient production methods elsewhere can easily offset transport costs and pollution emissions. Local production reduces consumer choice and some products may not be available or are more expensive, certainly at certain times of the year due to seasonal production or work practices. External economic links are greatly reduced and interactions beyond the local area become rarer. The importance of these may depend on the viewpoint – as a consumer there would be concern about expensive products and less choice, while producers may be concerned about the inability to expand production methods or make beneficial external links. A national government may be concerned about not being able to interlink local production and markets to benefit the whole country, especially if external products are in fact more environmentally friendly. The benefits of local sourcing include reducing transport costs and pollution emissions because products have fewer miles to travel. Farming and other production is likely to be smaller scale and so is better for the natural environment as there are fewer commercial pressures to be intensive, and self-sufficiency becomes achievable. Local people can change their consumer habits and improve their local social and cultural connections, as well as supporting the economy of the local area and helping to make it prosperous.

89 Fair and ethical processes

- 1 Fair trade is a certification process that shows that a farm or other product has not unduly degraded the natural environment and that the producer has received a fair price for the product. The production point is monitored by NGOs, such

as Fairtrade Foundation, to ensure farmers, for example, are using organic methods as much as possible, replanting trees and using sustainable farming practices generally. In return, farmers are helped to work together in cooperatives to negotiate directly with buyers to get a fair price for their products based on world markets; this cuts out the intermediary, who would often take a large share of profits, and makes trade more equal.

- Many ethical consumption schemes are run by NGOs, who monitor environmental and working situations in emerging and developing countries. These schemes are important because without them consumers would not know of situations and therefore not be able to choose ethical products if they wished to. For example, the Rainforest Alliance monitors the management and use of tropical rainforests to see that they are not degraded; in return they certify products that come from areas where sustainable practices are found. Human Rights Watch has broadened its remit to include working conditions and labour rights; they conduct interviews with workers in formal and informal work situations – although the latter are more difficult to research. They help workers to achieve more rights through union membership and improved working conditions.

90 Blue of recycling

Recycling improves the management of resource consumption by reducing the demand for new raw materials to be extracted. By doing this, the damage to natural environments and landscapes is reduced as, for example, mining, deforestation and oil sands mining would not expand. Less energy will be used for processing of new raw materials so this reduces the use of fossil fuels and the need for their extraction. Fewer resources are needed now and so resources, especially finite ones, will last longer into the future. The amount of land space is also reduced as there is less waste going into landfill.

93 Exam practice 1

- A business makes a contract with another company to complete part of the work on a product or service
- Several possible answers; one is: Satellite communications enable almost instant communication around the world; this allows people in different countries to see on television or hear on the radio news and events from other parts of the world, making people more familiar with global issues and other cultures.
- Several possible answers; two are:
 - Air pollution is very high in some cities of the developing world, such as Beijing in China and Kolkata in India. This is because of poorer controls of emissions of particulates from vehicles (especially in traffic jams) and factories.
 - Water is contaminated, especially by untreated sewage and factory wastes, which greatly affects human health as these sources are often used by poor people, as there is no sanitation and water supply infrastructure, especially in shanty towns.
- No one correct answer; one is: Global understanding of climate change may help poorer people living in areas experiencing the greatest change, such as islands (e.g. Tuvalu) facing rising sea levels, as New Zealand has agreed to resettle them. Globalisation has helped raise issues of human rights through faster reporting of issues around the world, such as the plight of the Kurds in northern Iraq, prompting international action to help them. Economic globalisation has spread job opportunities to poorer people in developing countries, such as factory workers in China or India, as the increasing wealth of people has created new markets for exports.
- Plan:**
 - Economic development and processes require resources to sustain them. What are the types of resources? Where do these resources come from?
 - Pollution and environmental degradation may result; examples such as Niger Delta in Nigeria, Canadian oil sands, Gulf of Mexico.
 - Tensions between economic motives and environmental motives. Tensions between different groups, governments of countries and local and international environmental and human rights groups.
 - Future tensions and conflict, for example Middle East, Arctic Ocean, Black Sea area.
 - Conclusion: economic globalisation has spread environmental tensions around the world, and some outcomes are severe.

94 Exam practice 2

- Downward transition countries have higher mean rank position and lower mean scores (76.3 and

64.5) on the KOF Globalisation Index than upward transition countries (31.5 and 77.7). This shows that they are the least globalised. This is because they are found in less accessible locations, away from global cores, so are not connected by transport or communications networks, or have governments that are authoritarian and/or corrupt so that there are political barriers to the spread of globalisation into the country.

- Any two, such as:
 - Recycling is concentrated on dry wastes, especially glass, paper, metals and a few plastics, because some wastes are not easily recycled.
 - Some recycling technologies do not yet exist and some are more expensive than extracting and using the original raw material.
- Plan:**
 - Inequality exists around the world in economic and social terms.
 - Globalisation has benefitted some but not all, so gap between groups has increased.
 - Examples include income inequality; some countries have become linked to global economic systems quicker than others, so some have emerged economically while others have remained poor.
 - There are differences within countries, with rich people getting richer and poorer groups getting poorer (as shown by Gini coefficient or index) (example of billionaires in India compared to poverty and bustees).
 - Social inequalities, such as on the basis of gender, as those with education are able to access opportunities while those without are left in poverty. Inequalities between regions within countries, such as in the UK where the London region has benefitted from links to the world financial system, while northern regions have experienced deindustrialisation due to global shift.
 - However, some countries have decreased inequalities (e.g. Brazil). Theories suggest that benefits will spread to all given sufficient time.
- Plan:**
 - Global influences on indigenous cultures, e.g. economic and resource links, communication and cultural links, political integration.
 - Threats include loss of land ownership rights, extraction of resources from tribal lands, lack of equality in terms of services, degradation of local environments, and cultural influences to change way of life.
 - However, there are benefits, such as alternative jobs, share of wealth from resources (leading to improved quality of life), increasing political recognition, international laws protecting human rights.
 - Examples from First Nations peoples in Canada and Alaska, Aboriginal and Torres Strait Islander peoples in Australia, native people in Amazon Basin.
 - Conclusion: threats exist but there can be benefits.

95 Classifying economic activity

- Advantages of the gig economy could include: people who work in the gig economy can be more flexible, fitting in work as and when they need to among other commitments; some temporary contract jobs pay more than doing the same job on a permanent basis; short-term temporary contracts are a good way of getting experience in different types of employment; short-term temporary contracts can be more interesting and varied than doing the same job year after year. The main disadvantages of the gig economy are that workers do not have the same rights as employees of the companies that they work for. For example, they are not protected by laws about unfair dismissal, which means they can be sacked for unfair reasons, they have no rights to redundancy payments if they lose their jobs, no right to paid holidays (if they go on holiday or have a day off, they are not paid) and no right to sick leave (which means many people in the gig economy continue to work even when they are not well).
- Impacts for places: whereas people often had strong links to the main employers in those places (e.g. shared experiences of many people leaving school to work for the same factory), the gig economy means that companies can recruit people to provide services for them all over the country or even the world, and may have much less of a link to the places in which they are located.

96 Economic inequalities

- Income is related to health, life expectancy and education indices – people with higher income generally enjoy longer healthy lives and have higher educational achievement, and income does have some connection with the economic sector, with

primary sector jobs such as seasonal farm work receiving low pay, and quinary sector jobs such as consultants and chief executive officers (CEOs) receiving very high pay.

- Employment type includes permanent and temporary employment, employed and self-employed, part-time and full-time. One possible connection/reflection could be a relationship with age: people may choose to switch from permanent full-time jobs to permanent part-time jobs as they need more flexibility in their lives to look after elderly parents perhaps, or because they feel their own quality of life is under pressure due to the demands of a full-time permanent job. On the other hand, most students need to earn money to live on as they study, without which their quality of life would suffer, and more flexible temporary contracts (gig economy) fit their needs in a way that permanent full-time jobs could not.

97 Changing places

- Location has been an important reason why places have changed; for example, places near natural harbours may have developed into important ports. If these ports were located near industrial centres, as Liverpool was, for example, and located on the right side of the UK which is most beneficial for trade with the USA, as Liverpool also was, then this location could mean a place changed significantly during the 19th century. When a location no longer has the functions required, such as a deep water port for container ships or a location near to growing European markets, then a place (such as Liverpool, for example) may decline and require regeneration to, for example, a regional retail destination.
- Over time, changes in retail have caused major changes in places. For example, over the last 50 years, shopping has moved from specialist local shops (a stationer selling pens and paper, a chemist, a greengrocer, butcher, fishmonger, etc.) to supermarkets located in high streets, then hypermarkets located out of town, causing changes in high streets, then internet retailing putting pressure on retailers and the rise of retail experiences and high street functions that cannot be ordered online, such as barbers, tattooists and coffee shops.

98 Measuring change

- No. The IMD can compare a place's deprivation with all other places, but that does not provide an actual measure of deprivation. An LSOA with a rank position of 1000 is not half as deprived as one with a rank of 500.
- No. The domain of income deprivation measures people on low incomes who receive benefits and tax credits, it doesn't measure how much income all the people in the area get. So a place with no people on low incomes might have everyone living on high incomes, or no one living on high incomes – or anything in between; the IMD doesn't measure it.

99 Past and present connections

- This answer will depend on your chosen places and the results of your place studies. Deindustrialisation, for example, might have had an influence on the paths students are working towards when they leave school. If, in the past, many people went on to work in a place's main industrial employer, that may now have changed and future pathways be more uncertain.
- Internet connectivity might be something you have considered, for example, with its impact on students' connections globally and to your chosen places.

100 Successful regions

This answer will depend on the example you have studied in class. For Berkshire an answer might include the following factors:

- Location: close to London and Heathrow airport.
- Physical factors: the wide flat floodplain of the Thames Valley has allowed for extensive development of higher-quality residential and commercial properties.
- Accessibility and connectedness: Berkshire has the M4 motorway running through it, providing fast access to London and Bristol; it is close to Heathrow, Britain's principal airport.
- Economic development: Berkshire has high rates of employment because of its successful transition to a post-industrial economy, with high concentrations of major ICT companies such as Microsoft and Oracle, and major TNC headquarters, including BMW, O2, Dulux Paints, Waitrose, NFER, Vodafone and Bayer AG.
- Workforce: Berkshire has a highly skilled workforce, with a 2008 ONS survey showing that

roughly 50% of all workers in the region were employed in knowledge-based, managerial and professional occupations.

- There is high demand for skilled workers that is not being met by internal migration. It is expected that Berkshire will need an additional 70 000 well-qualified workers by 2020. Many companies are looking overseas and in 2011 alone they recruited between 7000 and 11 000 workers from outside the EU.

101 Declining regions

This answer will depend on the example you have studied in class. For Middlesbrough the details would include the information that between 2010 and 2015, six wards (LSOAs) improved their IMD ranking but 14 got worse. Around 30% of Middlesbrough is in the most deprived 1% in England, 35% in the most deprived 3%, and 50% is in the most deprived 10%. One Middlesbrough ward, North Ormesby, was ranked the second most deprived ward in England in 2015.

102 Regeneration priorities

This answer will depend on the declining region that you studied in class. For Middlesbrough, specific priorities could include:

- sink estates, for example in East Middlesbrough and Grove Hill
- the gap in educational achievement: for example, that half of all secondary schools 'require improvement'
- more employment opportunities: the closure in 2015 of the SSI steelworks in Redcar was another major employment blow to the region.

103 Lived experience

Voters are motivated to vote in national elections by many different factors, some of which (e.g. allegiance to a Party leader, concern about foreign policy decisions) might bear little relation to the voter's engagement with the place where they live. This would reduce its reliability as a measure of engagement in place. However, a decline in voter turnout is usually accepted to have a good correlation, with distrust of politicians' willingness to bring in changes that will improve the lived experience of the place where voters live, or to understand that lived experience in the first place. That makes voter turnout more reliable, at least in terms of measuring a sense of disengagement with the main democratic method of kick-starting regeneration of places.

104 Conflict

Different lived experiences of place can provide some reasons: for some residents the police are not perceived in a positive way, perhaps because lived experience is of police harassment of the community. The police's actions in shooting and killing a man therefore crystallised feelings of anger and disengagement with the authority structures controlling behaviour in London's places, resulting in riots. For other residents, the riots were perceived as an attack on the things holding a community together: local shops and businesses and a sense of helping each other, which resulted in action to clean up and repair their place following the riots. Both sets of residents could be equally deprived in terms of income, employment and economic opportunity, though it seems possible that rioters perceived themselves as having less but deserving more than some others living in London, such as the super-rich. For others, deprivation might be relatively less important than their engagement with a community constructed by themselves and people like them, which deserved to be protected.

105 Evaluating regeneration

This answer will depend on your own chosen place or places. Statistical evidence might be crime statistics for your chosen place, perhaps correlated with statistics on employment, environment or multiple deprivation.

106 UK government policy

- 1 Your three ways could include:
 - Infrastructure: Decisions to implement major infrastructure projects can provide stimulus for regeneration of regions that were previously underperforming due to, primarily, accessibility and connectedness factors. For example, the government intends high-speed rail infrastructure in the UK to have a similar beneficial effect to the introduction of the TGV infrastructure in France, which promoted economic development in declining regions.
 - Planning laws: The UK government may prioritise national needs over local opinions in regards to issues such as energy (fracking, nuclear power) or availability of housing, or transport infrastructure. This can have the effect of speeding up the rate of development, and also the type of development that might otherwise have been a non-starter due to local NIMBY-ism.

- Open door policies: The UK government may decide on open or closed door policies to, for example, international immigration or deregulation of controls on foreign investment in UK businesses and markets (which had significant impacts on the London property market, for example). These decisions can be important indirectly in regeneration, by opening (or closing) the door to investment in places (e.g. foreign investment in London) or the movement of people to declining areas, boosting local populations and economies.
- 2 Increased immigration into a place is seen as a positive multiplier for economists – it is when populations stagnate or decrease that places may start a downwards spiral of decline. More people, especially more younger people, means a larger working population, which provides a boost to local industries and services, especially since new migrants are often prepared to work for lower wages than longer-term residents. More working people means a larger tax base for local government, enabling regeneration projects that make the place more attractive to new residents.

107 Local government policy

- 1 Retail-led plans for regeneration involve changing or adding new retail spaces that mix popular clothing and homeware shops (e.g. TK Maxx, Tiger) with lifestyle facilities (cinema plus a range of restaurant chains, for example Nando's, Wagamama) to create an attractive and interesting shopping and leisure experience that pulls people into the place from a wide area. Increased numbers of people coming to the place means more money in the local economy, an improved image for the place, and a multiplier effect in the local area as more people want to live there.
- 2 Increasing tourism can be a successful regeneration strategy in some cases, for example rural regions with a strong literary tradition such as Haworth in Yorkshire where the Brontë family of writers lived. However, there needs to be a strong enough tourism attraction to compete with all the other places that tourists already have on their itineraries, which would mean a tourism-led strategy might not be appropriate for all places. Also, tourism can cause congestion in places, making them less convenient places to live for non-tourists; services in places popular with tourists tend to be geared towards tourists rather than local residents; popular tourist hotspots tend to see property prices increase rapidly as people buy second homes or property to rent out using Airbnb or similar services, and tourism is often highly seasonal, meaning there is little money to be made in tourist areas in winter, for example. This might mean that fewer people benefit from tourism-led regeneration than could be achieved with other strategies.

108 London Olympics 2012

The main advantage perhaps has been that the Olympic Games is such a showcase for a country to the world that the UK government was always going to spend a very large amount of money to make sure the area chosen looked good, was well connected to the transport network so large numbers of people could get to the Games, and had world-class sporting facilities. All of these were things that would regenerate an area: improving the built environment for the Olympics included decontaminating the site of the Park from years of industrial pollution, which had prevented it previously from being developed, and also made the local area more attractive to new residents. Improving the transport connections to the area meant that it became a much easier area to commute from into central London after the Games, which was good for regeneration as many more people then wanted to live there. Sport and recreation are increasingly popular in the UK and having world-class sporting facilities in an area will attract many people to the area and allow new sports and leisure businesses to grow up around them, while the accommodation for the Olympic and Paralympic athletes could be designed with repurposing into housing after the Games in mind.

109 Regeneration in Powys

- 1 Powys' strategy relies heavily on local stakeholders coming forward and planning and delivering regeneration plans for their own towns, voluntarily. The London regeneration strategy was part of a multi-million pound bid for the Olympics, and while it has involved local stakeholders, the regeneration is centrally organised. While the London regeneration strategy is based upon high cost, large-scale infrastructure (rail, housing, sporting and retail – Westfield shopping centre), the Powys strategy is based on very focused expenditure (the council has to make extensive funding cuts) and small-scale,

place-specific (niche) regeneration. Another contrast is that while Powys covers a very large area (approximately half of Wales), the area of regeneration in London is much smaller.

- 2 Advantages could include: low cost, place-specific, based on community needs, sustainable, future-proof (green energy, carbon storage and low carbon technologies are all likely to be growth areas in the future), achieves a good balance between desires to preserve what makes Powys special (natural environment) with the need for economic growth in this rural area (broadband investment). Disadvantages could include: expects a lot from local communities – their responsibility to regenerate their own places alongside their other commitments; other infrastructure is also important in regeneration apart from internet access, such as improved road and rail links that would make Powys less isolated; the diversification suggested by the strategy may be growth areas but they may not currently deliver the higher wages that the region requires to compete with cities such as Cardiff, Swansea or Birmingham.

110 Rebranding strategies

- (a) Three ways of rebranding a deindustrialised city could include: use its distinctive industrial history to create an image attractive to tourists, convert old industrial buildings into attractive, atmospheric and accessible commercial spaces (e.g. apartments, with shops and cafes below), integrate industrial history with retail to create an exciting, distinct-feeling retail space with plenty of opportunities for enjoyable and distinctive experiences, encourage tourism with museums, local history tours, galleries, cafes and restaurants.
- (b) Three ways of rebranding a 'post-production' rural area, where farming production is no longer the only or main focus for the rural area, can also be based on heritage (Victorian farms) and literary associations (Beatrix Potter, the Brontës, the Hay Festival). Farm diversification, especially into tourism, is a strategy, or farms can produce specialist, distinct products (drinks, cheeses, meat, etc.) which people will travel to buy, see made or learn to cook with. Outdoor pursuits and adventure in both accessible and remote rural areas are often successful in encouraging people to visit rural areas and spend their money there.

111 Rebranding examples

The *Titanic* is a world-famous ship, with a powerful story connected to its disastrous journey that has been the subject of many media representations. That makes the association of this area of Belfast with the *Titanic* a positive one – connecting it to a famous story that has been given romantic, elegant and tragic connotations by media representations. The re-imagining of Belfast's Titanic Quarter has successfully represented a deindustrialised area of the city as positive industrial heritage, instead of it being associated with the decline of an industry, and removed some of the negative associations of Belfast from the time of the Troubles (the Northern Ireland conflict).

112 Measuring success

The changes possible to identify could include: where buildings have been demolished and replaced by new buildings or new land use; gentrification (e.g. graffiti on buildings that is painted over, boarded-up properties that become renovated apartments, local shops replaced by trendy cafes); where old industrial buildings have been renovated; where buildings have changed their use (e.g. from a factory to a media production company); where landscaping has been added to improve the built environment (e.g. trees planted or cut back, play parks added or upgraded).

113 Urban regeneration

Some reasons for the different stakeholders' views could be:

- Differences between new residents and longer-term residents: long-term residents may feel that distinctive characteristics of the area (e.g. favourite pubs) have been lost while new residents may only have moved to the area once they were confident that its character has changed to something more acceptable to them.
- Differences between those involved in consultation and those who were not: those who were involved could feel their views have been incorporated into the regeneration, while those who were not might feel excluded. Alternatively, people who became involved in the consultations because of strong feelings about how regeneration should occur might feel that the regeneration did not take their concerns into account.

- Differences between those who are employed and those who are not: the regeneration is designed to make Devonport a more attractive place for investors and visitors and principally on providing a better range of attractive housing, but for people who are unemployed the regeneration does not offer new job opportunities.

114 Rural regeneration

Different views can result from many reasons, with a common theme perhaps being the different expectations of visitors to the centre, the objectives and aims of the managers of the centre (the National Trust), residents of the area, and local and national governments. For local and national governments and the managers of the site, the aim of increasing the numbers of national and international visitors coming to the Giant's Causeway means that these stakeholders would see a 30% increase in visitors as making the centre a success (economic – increased revenue; social – promotion of the region and educational opportunities). Visitors to the centre seem generally to feel it offers good facilities but at too expensive a price, and that the centre makes the site too busy (encouraging too many tourists) – despite these visitors themselves being part of this problem! Great efforts have been made to minimise the impact of the new centre on the landscape, which seems to have been a success with visitors (environmental and social factors). Residents of the area will have benefitted from increased tourism to the area and there are also 150 jobs connected to the centre, which is important in a rural area (economic factors; possibly demographic factors too if it means more opportunities for younger people living in the region). However, there are likely to be issues with increased congestion on the roads leading to the centre (where parking is limited). The National Trust has attempted to reduce this through bus travel and also by incentivising people to travel to the site by bike or electric car (environmental factors). Many residents who do not benefit directly from tourism may feel that the expenditure of £18 million on the centre is money that could have been spent on improving services for rural transport, for example (social factors). The National Trust is also the manager of the site and the money that visitors pay to enter the centre goes to the National Trust, rather than coming to the local community (economic and social factors).

117 Exam practice 1

- 1 A The process of reducing or removing rules governing economic activity
- 2 Spearman's rank correlation coefficient, because this is a statistical test to check whether any correlation is a significant one (strength of correlation), and also the direction of the relationship between the two variables (i.e. positive or negative). Your answer could have explained how a scattergraph tests the strength of a relationship. If you answered scattergraph, make sure you develop your answer in order to get the full 3 marks.
- 3 Two from:
 - Age – for example a teenager's experience of place will be different from an adult's, and that will produce different levels of attachment.
 - Length of residence – a person who has lived somewhere for a long time would be expected to have a greater attachment to the place than someone who has recently moved there.
 - Level of deprivation – someone who is struggling to find work or to earn sufficient amounts to achieve a reasonable standard of life is likely to have a different attachment from someone who does their dream job in the same place and has a very comfortable and rewarding place.
 Other reasons could include: gender identity, ethnicity, religion – if you gave those as answers, remember to develop each for the full 2 marks per reason.
- 4 There is no single correct answer. Your response should make three supported points, which could include three from the following:
 - Unemployment might have increased following deindustrialisation in places where people formerly relied on one or two major employers such as a steel mill, which increases social deprivation because people have less money to spend, houses are worth less money, local businesses earn less money and may close, which means even fewer jobs. In Middlesbrough, for example, the unemployment rate is twice the national average and 30% of its households have no one in employment.
 - Education may be affected by economic restructuring as schoolchildren no longer feel sure what job they will get after school and may

come from homes where no one has a job. Lack of motivation may mean education achievement in the place is lowered, making it less attractive for businesses to locate in because the population is low skilled. In Middlesbrough, for example, half of all secondary schools in 2014 'required improvement' according to Ofsted, which is a low rating.

- Because of a lack of jobs, low educational achievement and low motivation to get a job elsewhere, crime may increase in the place as people turn to dealing and using drugs for a way of earning money and as something to do. This can increase other forms of crime, which in turn makes the place feel unsafe, which means people who can leave do so, increasing the spiral of decline. For example, 20,000 people have left Middlesbrough since 1990.
- 5 This answer will depend on your place studies.
 - AO1 points your answer could make: increasing roles of TNCs, international migration, increases in international tourism visits, increasing roles of IGOs.
 - AO2 impacts to consider: economic and social changes in your two places; how these changes in your chosen places have influenced people's identities.
 - AO2 judgement: which of the impacts have been most significant in each place? Support your answer with evidence from your place studies.

118 Exam practice 2

- 1 A positive view is expressed by the writer when they say (for example) that the slogan made an 'effective link' that connected businesses in Herefordshire. Effective could be positive in terms of the rebranding works well in achieving its aims, and effective could also mean the rebranding is good value for money. (Your answer should make three linked points.)
- 2 You would need at least two reasons for this question and these reasons would need to be detailed and fully developed. For example:
 - One reason for difference could be between interest groups that are looking to preserve a particular aspect of a place from being changed, for example a historic building or an area of environmental value, and those who are keen to see change, for example local residents who want access to better shopping opportunities with bigger brands.
 - A second reason for difference could be different lived experiences of a place, for example between groups representing those who feel excluded from a place or marginalised, perhaps because of ethnicity, who may want different priorities for regeneration than those whose lived experience of place is based on high levels of access to economic benefits of place, and high levels of engagement in local politics regarding place.
- 3 This answer will depend on your named example. Make two or three points developed in detail, which could include:
 - The London Olympics and Paralympics used sport and leisure as a key part of the urban regeneration of Stratford. Advantages included the huge investment that comes with staging the Olympic and Paralympic Games: £9 billion. This is much more than regeneration strategies would usually be able to access.
 - Some of the facilities that were developed for the Olympic and Paralympic sporting events were designed to be converted into facilities for local residents and visitors after the Games had finished. World-class sporting facilities encourage local people to be more active and take part in more sport and leisure, which reduces health inequalities and deprivation.
 - People have positive associations with sport and this makes regeneration based around sport and leisure effective at changing perceptions of places such as Stratford, which was a deprived area before the Olympics. Now people associate Stratford with very positive feelings about the London Olympics.
 - However, sport and leisure are not enough on their own to make regeneration successful: retail and infrastructure (such as improved rail links, more affordable transport) are also key to success.
- 4 This answer will depend on your place studies. There are many other factors that influence perceptions of places to consider (for both your places), including: migration (internal and international) and low levels of multiple deprivation (unpacking the economic and social factors for this relating to income, including child income deprivation and deprivation of income

relating to older people), education, health, access to services, crime levels, living environment. Other factors from across the option can also be considered: place function, physical factors, demographic changes, regional and national influences, international and global influences, cultural factors such as cultural erosion and cultural enrichment. Remember to consider the possibility that high employment might not be related to positive perceptions of place in some areas, for example if employment is high but this is because a place is dominated by zero-hours contract employment, or employment is high but the place is a commuter town with little community involvement in the place.

119 Population distribution

- 1 The benefits of rapid population growth are mainly economic: employers have many more people to employ, including more skilled people, which enables businesses to expand. A lot of people living in an area create a bigger market for products and services, which creates increased demand for the businesses making and providing those products and services. More people with more jobs, buying more things means more money for the government from tax payments (including VAT on the products and services people buy), which means more opportunities for the government to spend on benefits for places, such as improved infrastructure, which creates more opportunities for businesses and makes places more attractive, increasing population growth further.
- 2 The costs of rapid population growth are mainly social. There are suddenly many more children in a place who need a place at nursery, school and college. Health-care providers have many more people to treat, which means hospitals can become overcrowded or waiting lists increase in time. Places become more congested, which may make them less attractive for businesses (that can't move people or products around quickly) and for residents of the place. When population growth is associated with increased migration, resident populations often become alarmed by rapid cultural changes to places that they had become used to thinking of in a certain way. People can start to feel that their values and their opportunities are under threat.

120 The rural-urban continuum

- (a) An overspill town is a place near a large urban centre that has become almost a suburb of the large urban centre: people who couldn't afford to live in the big city have 'overspilled' it and gone to live here. Its characteristics would be that it would appear very urban in character with health and leisure facilities, retail, schools, etc. Population density would be high and age structure young.
- (b) A suburbanised village still has some rural characteristics (e.g. older village properties in its core) but has become surrounded by a ring of newer housing used by commuters into the large urban centre. There may be a split in the village population structure between older residents living in the old village core, and working-age residents of the newer housing. There will also be a lot more suburban residents than the older residents in the old village core.
- (c) Old core is the original village, which is now surrounded by newer housing or has newer housing nearby on several sides. The old core will retain rural characteristics: perhaps an old church, pub and village green. It may be difficult to combine these with the needs of newer residents, such as parking for large cars, home deliveries by vans.
- (d) Second homes are properties bought, usually in attractive remote rural locations, by people who live elsewhere but use them for their own holidays or rent them out (e.g. Airbnb). The village keeps its rural characteristics but loses population outside of holiday season, which may cause economic and social problems – village shops may close, ditto pubs, schools, churches, because there aren't enough full-time residents to provide a viable market for them.

121 Population structure

- 1 There are three main differences: a higher than average percentage of under 10s, a higher than average percentage of 20–39-year-olds (significantly higher for 25–34-year-olds) and a lower than average percentage of people over 45 years.
- 2 A higher birth rate would explain the higher than average percentage of under 10s; this higher birth rate could itself be explained by the higher proportion of young adults in the population structure (so more people of the age when people have most children), and possibly by increased fertility within the population structure related to

ethnicity and culture – cultural traditions among recent migrants of having more children. Migration (both international and internal) could explain the higher than average percentage of 20–39-year-olds, as younger people are the most likely to migrate to another region or internationally. Another explanation could be a ‘baby boom’: a period of increased fertility in the recent past that produced more babies than average, who then grew into more adults.

The lower than average percentage of people over 45 could be explained by increased mortality, though this is unlikely to be the main reason since Newham residents have the same access to the NHS as people across the rest of the UK. While a lower life expectancy would explain some of the lower than average result, it is possibly more likely that some older people have migrated (internal migration) out of Newham, possibly as a result of increasing property prices or negative perceptions about changes to the area, such as perceptions of increases in crime and anti-social behaviour.

122 Population characteristics

1 Your answer could consider several reasons.

For example:

- Rural areas are less accessible to migrants: large cities are much more accessible. This could decrease the cultural diversity of rural areas.
- Migrants go to where there are good employment opportunities. Rural areas typically have fewer employment opportunities so migrants would not tend to settle there, reducing cultural diversity.
- Social clustering means that migrants of the same ethnicity often form communities in places where the original migrants from their ethnic group first settled. Since original migrants are most likely to settle in large cities, that is where subsequent migrants settle too, rather than in rural areas.
- Government policy has encouraged migration to fill labour shortages, for example in industry last century, or in services such as the NHS more recently. Due to mechanisation of farming, the need for labour in farming (except for short-term seasonal work) has decreased.

2 (a) Because international migrants tend to be young adults, fertility rates often increase in places characterised by higher rates of international immigration: so Newham has the highest birth rate in England (113.9 live births per 1000: the average for England is 65.5).

(b) The rise of places that are popular with retirees means that internal migration of older people from cities to, for example, the south coast of England, is increasing mortality rates in some places because of the higher proportion of the population who are elderly. (Since women have longer life expectancy in the UK than men, these places may have a higher proportion of women than men – gender characteristics.)

123 Connections shaping places

(a) This answer will depend on your chosen places and the results of your place studies. Deindustrialisation, for example, might have had an influence on the paths students are working towards when they leave school. If in the past many people went on to work in a place’s main industrial employer, but that may now have changed and future pathways could be more uncertain, impacting on people’s feelings about place and their own identity.

(b) This answer will depend on your chosen places and the results of your place studies. Internet connectivity might be something you have considered, for example, with its impact on students’ identity possibly replacing, amending or enhancing identity from the place they live in.

124 Change in UK urban areas

This answer will depend on your own view – which you should explain. Some would see culture as an expression of economic change and would say that cultural changes are responses to economic changes, while others see culture as independent of economic change, or even that culture influences economics.

125 Change in UK rural areas

1 The pie chart shows there are more part-time farmers than full-time ones, which suggests that some farmers have to do other jobs alongside farming in order to make a living. The reasons for this could include the low prices that some supermarkets pay for some UK farm produce, for example milk, because of the supermarkets’ need to offer cheap prices to customers in order not to lose business to other supermarkets. There is also global competition

for some farm products, which can make it difficult for farmers to stay in full-time business. Perhaps in some cases, what started out as farm diversification, for example marketing a quad bike course on a farm field, led into a new part-time job opportunity in marketing for a farmer that took them away from farming.

2 Demographically, seasonal workers must give a short-term boost to local population numbers in the rural area in which they work. Presumably the demographic impact is not longer-lasting than that, in that if seasonal workers become pregnant, they do not stay in the UK to have their baby, as they only have a short-term work visa.

Culturally, seasonal workers who are non-British nationals will increase the cultural diversity of the rural areas in which they stay. This increase will be significant because most rural areas in the UK are not very culturally diverse at other times of the year. It may become part of the sense of place that seasonal workers return at set times of the year, which residents may welcome or find challenging, depending on attitudes. Local shops may change some of the food and drink they supply to cater for seasonal workers, residents may hear different languages as they do their shopping in villages and market towns, all of which may influence place meaning and shape identity.

126 Perception of places

(a) The older man may have a perception of the place based on how it has changed over time, while the younger people may perceive it just as it is now. The older man may perceive the place in terms of the challenges it presents for older people (e.g. high kerbs), while the younger people may not have this perception and may hardly consider this aspect of the place at all. It is possible that both the young people and the older man think of the place as belonging more to their sort of people (younger/older) and may find the presence of other types of people annoying in some way. Equally, it is possible that the young people and/or the older man consider this to be a shared, public space that should be used by different groups in different ways.

(b) Change over time is an important factor for perceptions of place, and an older man may possibly have a complex perception of this place based on many different experiences of it over his lifetime – perhaps as a younger person himself just like the group walking past him. So lived experience will be important. Both individuals from the group of younger people and the older man may have had pleasant or unpleasant experiences in the place, which will shape their perception of it. Accessibility will be a big factor for someone who uses a walking frame, as the older man is doing – this place may be a welcome part of his route because it is flat and unencumbered by obstacles, or it might be a place he dreads because of the challenges of accessing it. Environmental factors such as pollution or perception of crime could also be significant in explaining differences between the groups.

127 Perceptions of urban places

There is no single correct answer to this question.

Arguments that perceptions have changed a great deal could make points such as there is no longer such a strong class system as in Victorian times and people from any social background are able to make successful careers for themselves. Repressive Victorian ideas about gender roles and their racist perceptions have also changed significantly, meaning that perceptions of who urban places are for and what it is permissible to do in them has changed substantially too. There are also environmental perceptions of the city that Victorians would not recognise: the idea that cities are better when they are sustainable, for example. The Victorian religious view of the city has also changed, with places of worship being less attended.

Arguments that perceptions have not changed that much could make points such as that some wealthier people today still view poorer areas of London as a threat to them, with perceptions including that poor people are more likely to commit crime, that their wealthier residences need to be protected from poorer criminals, that poor people are in some way to blame for their poverty due to having too many children, that it is the responsibility of the poor to improve themselves through hard work. The Victorian idea of civic duty – that it was a good thing to improve cities for the enjoyment and convenience of everyone (or everyone thought to be deserving of them – e.g. city parks) – could be said to live on in regeneration, social housing and infrastructure

improvement, as could the similar idea that the main purpose of cities was to organise trade in such a way as to enable some people to get very rich.

128 Perceptions of rural places

Older people could find accessibility a problem in remote rural areas: for example, distance to supermarkets, to access health care (a key issue for rural areas is often distance people have to travel to access ongoing hospital treatment, for example for cancer), and possible isolation and lack of social interaction in small communities without community centres. Older people without access to a car would struggle if public transport were not available. Local banks and post offices have often closed, making it difficult or expensive to get cash for those without debit or credit cards.

Middle-aged people could also find accessibility a challenge for buying food shopping, problems with accessing services, for example builders, takeaways, childcare, financial services. Petrol is often more expensive (where it is available) in remote rural locations. Housing may be cheaper, but maintaining older rural properties can be expensive and problematic. Young people are often dependent on others (parents) for transport, or infrequent bus services (which may have early return times from local towns making nightlife difficult to arrange); leisure and entertainment services are often lacking or limited in remote rural locations, job opportunities also limited and low paid, access to reasonable broadband speeds can be patchy or non-existent, ditto mobile network services so online services can be far from adequate. Local banks have often closed making it difficult to get cash.

129 Evaluating people’s views

Your example or examples will be specific to the places you have studied. One example could be using local property prices to identify areas with high property values compared to lower property values and then survey people’s perceptions of those places to identify whether property prices are a good proxy (stand in) measure for positive and negative perceptions of place.

130 UK diversity

It might suggest that people are motivated by the fear of something happening as much (if not more) than the reality of change, where it is perhaps possible to see both positives and negatives of the changed situation. It shows the power of perception, as people were projecting onto a place they knew a representation of immigration that might have had something to do with national newspaper coverage of immigration from the rest of the EU.

Alternatively, it might suggest that areas that voted Remain rather than Leave were influenced by demographic changes, so that many more voters were themselves not born in the UK or were descended from people who had been immigrants themselves, in which case their perception of immigration would be influenced by strong positive associations.

131 UK diversity examples

London emigrants might cause tensions by having more money to spend on housing, causing house prices to rise, which could make it difficult for local people to buy or rent housing (especially first-time buyers).

If London emigrants continued to work in London but live outside it, this could add to pressure on the transport system, adding to delays for existing commuters and other road and rail users.

London councils moving homeless families out of the capital to new places could cause tensions because the families might not want to move away from places they have strong connections to, and there might be tensions between them and local families who also need council support.

132 Levels of segregation

Assimilation is the process by which an immigrant community or a minority culture becomes more and more like the society it has immigrated into or the majority culture. So while the original immigrants from Punjab lived together and their culture influenced the place they were living in, assimilation might happen when their descendants decided to leave Southall and moved to lots of different better-off areas in which they lived less like their parents and more like the non-Punjabis they now lived among.

133 Change, tension, conflict

Challenges often relate to the affordability of housing once regeneration increases the perceived attractiveness of an area for investment. Developers wanting to maximise the return on their investment will be inclined to maximise the amount of more expensive housing they think they can sell in an area

and minimise the amount of affordable housing, while long-term residents of a regenerated or gentrified area will usually be people who lived there because housing used to be affordable for them. Opportunities for local people often relate to: better employment opportunities, perhaps in service jobs that increase in number as more wealthy residents move into an area; opportunities relating to increasing property prices if local people own their own homes; improved leisure and entertainment opportunities resulting from regeneration; improvements to schools and health services, etc., as councils receive more money from more higher-band properties in the area.

134 Measuring management

- 1 Voter turnout suggests that people are politically engaged in the UK democratic system, which suggests that they share the democratic values that are a cornerstone of the complex of shared ideas that make up British values. If an area that has experienced rapid immigration shows a change from low voter turnout in one general election to increased voter turnout in the next general election, then this could be evidence of increasingly shared values about the political process, and therefore increased assimilation.
- 2 A problem with using voter turnout as a measure of assimilation could be that there are several factors affecting turnout that are not directly related to segregation/assimilation. For example, voter turnout nationwide has been in decline for some decades, especially for local government elections, which is thought, at least in part, to reflect a general dissatisfaction with the political elite and their lack of understanding of the issues facing their constituents. In this way, a declining voter turnout among a particular ethnic group could be said to be a sign of assimilation with the rest of British society, where turnout is also in decline, than otherwise. Another factor could be that participation in the democratic system is actually a sign of distinctiveness rather than assimilation, in that it represents a minority group looking to achieve a voice in parliament or local government with which to defend their distinctive culture against assimilation. In extreme cases, high voter turnout can express a rejection of assimilation, as has been the case in Northern Ireland, where votes for Sinn Féin in republican areas are a form of protest, since the MPs elected by these votes do not take their seats in parliament.

135 Managing urban change

One difficulty might be that many UK-born people who have experienced British culture all their lives would not necessarily know the answers to the test, which makes the test more of a general knowledge quiz than a reliable indicator of assimilation. Another issue might be in deciding what 'British culture' actually is: for example, is it British to support the idea of having a king or queen? Is it therefore un-British to oppose having a monarchy, as many people born in Britain do now and have done in the past? Is it more British to like cricket or to like football? Another issue is the separate identities of the different parts of the UK: if Welsh people identify as Welsh first and British second, wouldn't assimilation be better if it focused on getting immigrants in Wales to show their knowledge of 'Life in Wales'?

136 Urban change example

- (a) There is a range of options for measuring the success of the changes in Angell Town. In quantitative terms, the area's crime rate could be measured and compared with previous years – a reduction in crime rate (especially for robbery and for knife and gun crime) would indicate success for stakeholders such as the council, police, national government and many residents of the estate who were intimidated by crime and were afraid that their children or friends could be killed in the gang violence. Qualitative measures could include interviews and surveys of local people, comparing their views of the situation in Angell Town before and after the changes. Interviews conducted by the *Evening Standard* could be used for this, for example.
- (b) However, some young people might feel that a reduction in crime represented more control and surveillance over their lives rather than successful change. Other quantitative measures of success could be an increase in life expectancy, which all stakeholders would welcome, an improvement in IMD ranking, an improvement in reading and numeracy scores for the newly reopened primary school, and reduction in unemployment, especially youth unemployment.

Also, not all stakeholders might feel their views had been recorded (the interviewers focused on community 'change makers': influencers who would have an interest in expressing the positives about changes) and some, for example providers like the council, might feel their role in the project had been misrepresented.

137 Managing rural change

Campaigners who are against the forest becoming a holiday park could be local residents (users) but probably ones without an economic stake in the rural area. The landowners of the forest (providers) are stakeholders who would presumably be keen for a holiday home development to proceed, since they will get much more money from such a development than they would earn from their land being used for forestry. Other users of the rural area might be in favour of the change because it would offer job opportunities or other opportunities to provide services to the tourists coming to the area. Governance stakeholders would probably perceive the change to a holiday home as a good thing, as it would help create rural development through tourism. Other influencers such as campaigners for rural conservation might back opposition to the development on the grounds that it jars in some way with the image of rural Britain they want to conserve.

138 Rural change example

- 1 Reasons could include: lack of affordable housing, small range of job opportunities, low wages, lack of public transport/high dependency on car ownership (which might mean high dependency on older adult car owners), shortage of services/interesting things to do.
- 2 There are likely to be economic reasons for promoting development of Caithness and Sutherland's towns over its rural areas – it is more cost-efficient to meet housing demand across the region by concentrating new building in towns; the infrastructure for development (roads, parking, power, etc.) already exists in towns; new shops and services have a better chance of succeeding in towns because of the larger market size. Socially, encouraging people to locate in the region's towns will make it easier for the council to provide improved services such as health care and education rather than if they attempted to improve smaller scattered services across the rural area, and it will also make it easier for people to access these services in towns than if they were in scattered locations across the area. Environmentally, focusing development in towns is more sustainable and conserves more of the historic/natural environment, which is key to developing the area's tourism industry.

141 Exam practice 1

- 1 **D** When people lack the things they would expect to have in the 21st century.
- 2 Spearman's rank correlation coefficient, because this is a statistical test to check whether any correlation is a significant one (strength of correlation), and also the direction of the relationship between the two variables (i.e. positive or negative). Your answer could have explained how a scattergraph tests the strength of a relationship. If you answered scattergraph, make sure you develop your answer by explaining how a scattergraph tests the strength of a relationship, in order to get the full 3 marks.
- 3 Two reasons could include:
 - international migration, which brings different cultures into places over time, for example, changes in local food choices, changes in religious buildings and religious practices; successive waves of international immigration that sees the cultural characteristics of a place change more than once as it provides homes and work opportunities to a succession of different cultures
 - internal migration, which can bring cultural changes based on age: for example, the popularity of some of England's south coast towns with retirees, which changes the cultural characteristics towards meeting the needs and interests of older people.
- 4 There is no single correct answer. Your response should make three supported points, which could include three from the following:
 - Economic: successful places with strong economic growth attract people who want to get jobs there. Declining places with low growth and few opportunities lose people. This can be linked to deindustrialisation and the impact of the global recession after 2008.

- Examples: population growth rates are highest in the south-east of England and London in particular. Eight of the 10 fastest growing areas in England are in London. These areas are also densely populated. The 10 English regions with the slowest growth are in the north-east and north-west regions. Some areas have declined.
 - Social: immigration boosts population sizes because migrants are usually young people who go on to have families. This contrasts with areas with an ageing population, which can include rural areas (especially remote rural and possibly 'post-productive' rural areas).
 - Examples: between 2005 and 2015, the UK's population grew at between 3.5% and 4% per year. This rapid growth rate has happened with increased immigration from European countries. The most popular destinations for immigrants are London, the West Midlands, the South East, the East Midlands.
- 5 This answer will depend on your place studies.
 - AO1 points your answer could make: increasing roles of TNCs, international migration, increases in international tourism visits, increasing roles of IGOs.
 - AO2 impacts to consider: economic and social changes in your two places; how these changes in your chosen places have influenced people's identities.
 - AO2 judgement: which of the impacts have been most significant in each place? Support your answer with evidence from your place studies.

142 Exam practice 2

- 1 A positive view is expressed by the writer when they say, for example, that Russian investment has made an 'exciting boost' to London's property prices. This could mean that more people will look to buy and sell houses as prices increase, which is good for estate agents, as well as international investment, making the capital a more interesting and dynamic place to do business. (Your answer should make three linked points.)
- 2 Include at least two fully developed reasons, for example:
 - One reason for difference could be between long-term residents who are looking for continuity (for things to stay the same), perhaps because they benefit from how things are at present, and those who are keen to see change, for example, recent in-migrants, who may have different cultural characteristics and want to see changes that reflect important values for them. An example could be conflict over older buildings being converted into places of worship for immigrant populations.
 - A second reason for conflict could be over access to shared local services, such as health care and education, and increased competition over jobs. This was the case in Boston, Lincolnshire, when immigration from EU countries increased. Long-term residents felt they now had to wait much longer to get a GP appointment, while recent immigrants wanted to be able to access health care as residents of the UK who paid national insurance towards the NHS.
- 3 This answer will depend on your named example. Make sure you develop each point with detail or evidence. For example:
 - Angell Town is an estate in Brixton with 4000 people, of whom around 60% are black and minority ethnic. It is one of the 10% most deprived areas in England, crime is twice the London rate, and male life expectancy is 73 (five years below the average for men in London).
 - Young people in Angell Town do not perceive the living space as safe. They feel threatened by gangs but also under suspicion and surveillance from the police. There was little to do in Angell Town after a local youth centre was closed down in 2012 following violence.
 - Gang members in Angell Town are under threat from other gangs from neighbouring places. For them, Angell Town is their only safe place because travelling outside the area is very dangerous. Gang members resent the surveillance of the area by the police, who they see as doing nothing to protect them from other gangs.
 - Older residents are happy to accept the high police surveillance of the area (CCTV) if it means the area is safer. They do not like the gangs because they bring criminal activity into Angell Town. They are worried about the influence of gangs on their own children.

- Residents feel the local council does not do enough to give young people a chance in Angell Town. As well as closing the youth centre, a local primary school was also closed.

4 This answer will depend on your place studies. There are many factors that influence whether people have a positive or negative image of places to consider (for both your places), including: migration (internal and international) and its impacts on economic and cultural relationships. Other factors from across the option can also be considered: place function, physical factors, demographic changes, regional and national influences, international and global influences, and cultural factors such as cultural erosion. Remember to consider the possibility that inequality might not always be a factor in a place being viewed negatively, at least among some groups (those benefiting from inequality, or those aspiring to have what the wealthiest have).

143 Hydrological cycle

- Flows include: evaporation (from oceans 413×10^3 km³ per year, lakes and rivers) into atmosphere, evapotranspiration into atmosphere (from vegetation 73×10^3 km³ per year), transport of water vapour in atmosphere (40×10^3 km³ per year), land precipitation (113×10^3 km³ per year) and ocean precipitation (373×10^3 km³ per year)
- Gravitational potential energy from the mass of the Earth is turned into kinetic energy with pull and movement of all water to the lowest point (base level), so precipitation and runoff are pulled towards the centre of the Earth and the water collects in the ocean basins. They are estimated to contain $1\,335\,040 \times 10^3$ km³.
- The global hydrological cycle is considered to be a closed system because there is currently no water being added to the Earth from beyond the planet. All inputs and outputs are internal to the planet and so the amount of water stays the same.

144 Water stores, fluxes and budget

The oceans are large and are the base level to which all water moves (due to gravity) so the residency period is long (3600 years) before it is evaporated. The cryosphere has frozen water which keeps itself cold and solid, therefore evaporation is limited (although some sublimation takes place), and often it is at high altitude or near the poles where temperatures are lower, and melting will only take place when global climate warms. Once water has infiltrated the ground it is often stored in aquifers, and heat energy from the Sun cannot reach it to evaporate it; often the rock structure does not allow ground flow and so the water is trapped. Other residency periods are much shorter, surface water is pulled by gravity towards the sea and is constantly moving, moisture in the atmosphere quickly coalesces to form water droplets which fall, and plants are constantly absorbing and transpiring.

145 Hydrological cycle: processes

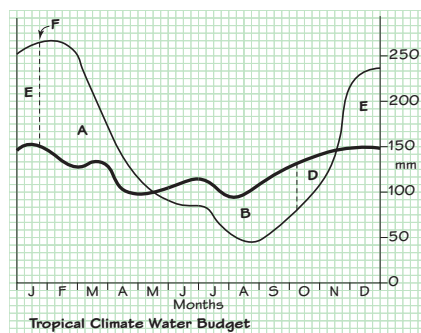
- Orographic rainfall occurs over highland areas, especially mountains, where humid air has been forced to rise upwards to a higher altitude where it is cold enough for water vapour to condense and form clouds. Processes within the clouds create raindrops large enough to be pulled to the ground by gravity. Most rain falls on the windward side or tops of the mountains while the downwind (lee) slopes are drier.
- Throughflow occurs in soil while groundwater flow occurs in rock. Both soil and rock need to have spaces for these processes to happen, with water infiltrating the soils and then percolating into a porous or permeable rock.
- Evapotranspiration is affected by temperature as higher temperatures will create greater evaporation from open water surfaces and from the leaves of plants, while plants will be transpiring more because they need greater water absorption in hot weather. The wind will assist evaporation and transpiration by allowing the air to hold more moisture. A greater forest cover will increase transpiration, because there are more trees, but also evaporation because it absorbs more heat energy.

146 Hydrological cycle: factors

- Deforestation removes trees, which intercept, absorb and transpire so more precipitation reaches the ground increasing runoff and discharge in channels will be higher. In contrast, building a dam to create a reservoir prevents the runoff and channel discharge from above that point moving downstream, so discharge downstream is reduced.
- Points include: flows within the water cycle vary naturally because the climate and weather vary

a little each year, and seasonally, so inputs of precipitation and outputs like evaporation vary. Any changes to vegetation, such as wildfires causing tree deaths, would also change water pathways.

147 Water budgets



148 River regimes and storm hydrographs

The Amazon River has a peak discharge about 15 times greater than the Yukon because it is in a tropical environment with very high precipitation, while the Yukon is in a tundra area with low precipitation. The Amazon has a peak flow in April/May at nearly 200 000 m³/s while the Yukon has a peak in May/June at just over 12 000 m³/s. The Yukon has very low flows during the winter months (December to April) due to the frozen conditions and lack of liquid water; it increases dramatically (10 times) at the end of April due to snow melt, and declines steadily after most of the snow has melted. In contrast the Amazon has a large flow for much of the year, except for the dry season, which halves its flow by September.

149 Natural causes of drought

The short-term causes are related to weather conditions. Dry spells may be caused by blocking anticyclones that are stationary over a large area for several weeks, and if this occurs after a period of below average rainfall it is enough to tip conditions into drought. Similarly, drought may exist because rainfall has been too low to support plant life, with soils becoming too dry, especially if it is the growing season.

150 Drought impacts

- Several ways to choose from; one is: over-abstraction of surface water – taking too much water from rivers, streams or lakes may cause them to decrease in volume or even dry up, so that less water is available downstream or within the region. If conditions are already dry then drought becomes worse. The Aral Sea dried up because of overuse of irrigation water from feeder rivers, and being in a desert evaporation then accelerated the process.
- Forests are an important resource, providing environmental services and resources; however, droughts can reduce their function by removing their role in the hydrological and carbon cycles. The dieback of forests also removes the timber resource and can change local conditions so that forests cannot regenerate; it can take two to four years for drought-stressed trees to recover and only then if precipitation returns to normal levels. Warmer winters are allowing pests and diseases to survive in larger numbers, instead of being killed by the cold of winter, and these then attack trees (e.g. pine bark beetle in boreal forests of the Rocky Mountains). Food web balances are changed if trees die, as habitats and food supplies for some are removed so other creatures die with the consequent knock-on effects through the food chain.

151 Natural causes of flooding

A large database can help identify trends and patterns in flooding by identifying the areas that are experiencing them most frequently; this helps to provide warnings to such areas and encourage management measures to be implemented such as land-use zoning, evacuation procedures and flood prevention engineering. This monitoring is important because of climate change, as the location, scale and frequency of floods may change and catch some areas unprepared.

152 Flooding impacts

Flooding occurs when a river channel exceeds bank-full stage and the excess water flows onto the natural floodplain. However, human activities can make this happen more frequently or at higher levels. For example, replacing natural vegetation with farmland or creating impermeable surfaces through urbanisation may

change the land uses within a drainage basin; runoff is increased and lag times shortened, so that flooding happens faster and probably with a higher water level as the channel cannot carry the extra discharge. River channels may be altered by engineering, for example, indirectly by building bridges across a river, the supports of which may narrow a channel which changes the flow of water and may block it enough to act like a dam, ponding water upstream at times of high discharge causing the river to overflow. The channel may also be directly changed by straightening it and concreting the banks and bed; this increases the velocity and capacity at that point but carries a greater discharge downstream which can increase flood risk there. Risk is also increased by human use of floodplains, which are clearly a feature created by regular floods, and these are always likely, especially with changes caused by enhanced climate change.

153 Climate change effects

- Climate change has increased temperatures and this has increased evaporation rates and humidity levels in the atmosphere; with more moisture in the atmosphere there is more water to condense when air is cooled. Once the water vapour has condensed into liquid droplets and formed clouds, they merge within the clouds becoming larger and heavier until gravity pulls them towards the Earth's surface; as there is more moisture there is more precipitation produced.
- Climate change is affecting the stores of water within the hydrological cycle. Warmer temperatures have not only melted ice masses but also reduced the amount of precipitation falling as snow in winter months, so new ice is not being created to replace ablation. The cryosphere store is therefore decreasing. Lakes and other water stores on land are shrinking as higher temperatures have increased evaporation into the atmosphere from their surfaces, and if precipitation in the area has not increased to compensate, the volume of water stored has decreased (e.g. Lake Chad). Water stored in soils is being drawn to the surface by higher air temperatures, increasing the amount of evaporation and causing soils to dry out.

154 Water security and climate change

- The ENSO cycle creates uncertainty about future water security as there are regular changes every few years from normal conditions. During an El Niño event warmer Pacific Ocean waters move closer to South America; this increases rainfall in coastal countries such as Ecuador, but decreases precipitation in Australia (July–January) and South East Asia (June–January) where droughts are usually experienced as water supplies are reduced. During a La Niña event the warm mass of water in the Pacific moves as far west as it can, bringing heavy rain to Australia and South East Asia but droughts to Ecuador (June–April) and the southern USA (October–April). The same countries and world regions are affected by this cycle, so every few years the water security situation changes.
- Global warming is creating uncertainty about future water security because the increased global temperatures are changing the hydrological cycle, and exactly how is not yet fully understood. Precipitation patterns are changing, both in terms of where it will increase or decrease but also the nature of rainfall events. Some parts of the world will become drier, especially those with a Mediterranean climate and regions that are currently semi-arid. Some will have more intense rainfall, which may limit the amount of water flowing into stores as much will run off the surface, such as South East Asia. Increased flooding and drying out of soils may cause more contamination of water, making it unavailable for use. Higher evaporation rates, due to higher temperatures, also reduce effective precipitation as the water evaporates before it enters natural or artificial stores.

155 Water supply and demand

- There is a growing mismatch between water supply and demand because the amount of accessible freshwater is changing in some places due to drier conditions, contamination and over-abstraction. At the same time water demand is increasing due to population growth (domestic use), increasing urbanisation (construction use), economic development (industrial use) and more intensive farming (e.g. irrigation).
- The map shows that the regions with greatest water stress are (a) those with semi-arid or Mediterranean climates, such as the MENA (Middle East and

North Africa) region, southern Europe, southern Africa, Chile, Australia, the USA and (b) countries with large populations, such as India, China and Indonesia. The first group have experienced drier conditions, largely due to climate change, and growing economies that are demanding more water. The second group have experienced rapid population growth with high population densities, especially in megacities and emerging economies, so the demand has become very high.

156 Causes of water insecurity

The pressures on finite freshwater resources are increasing. This is because the world's population continues to grow, especially in countries such as India (1.35 billion), although it has been slowing down, and every person needs clean freshwater in order to survive and people will take what they need. Water is important to food production and everyone needs to eat, so as populations have increased so has the demand for food, and more water is used for irrigation of crops. A lot of countries have been emerging economically, and all the construction and industries use water, but also people have become wealthier and want to improve their lives so they improve their homes with appliances and eat a greater variety of food (especially meat) all of which consume more water.

157 Water scarcity issues

Overall Egypt has a better WPI score than Ethiopia (61.7 compared to 34), especially in terms of access, capacity and use due to the level of development in the country that has water management and expensive dams, providing clean water for domestic, agricultural and industrial use. However, Ethiopia has a better score in terms of resources as it has the availability of water from a large part of the upper Nile River Basin, but it is still a low score (6.6/20). Both countries only score about 10/20 on Environment, showing that ecological sustainability needs improvement.

158 Water conflicts

International conflicts develop over water resources because it is so essential to human life and wellbeing, and being a liquid it moves from one place to another so it is difficult to get complete control of it. Where rivers flow through several countries, those downstream are anxious to protect their rights to a fair share of the waters that would normally flow to them. With growing pressures from population growth, economic development and climate change, countries have become even more worried about water security and the wish to generate cheap renewable energy through HEP, which requires dams which change flows downstream, upsetting those countries (e.g. the Grand Ethiopian Renaissance Dam).

159 Hard engineering and sustainable water schemes

Sustainable water supplies are important to the future, as it is a resource that needs to meet the needs of people now and in the years to come. The UN recommends using the natural hydrological cycle as much as possible to achieve this, such as restoring or enhancing the cycle in local areas. This can be achieved by looking after existing forests and natural vegetation or reforestation so that interception, absorption and evapotranspiration processes can help control runoff and encourage infiltration and percolation, which will help store water until it is needed. Reconnecting rivers with their floodplains by allowing them to flood helps maintain wetlands and encourages infiltration so that water is retained in a local area. Water harvesting can be used to collect rain falling on impermeable surfaces such as roofs in barrels or directing it into storage areas. Replacing impermeable surfaces with green areas can absorb rainfall rather than losing it to systems of drains. Farming uses 70% of all water, so action to conserve water by using drip irrigation or limiting the supply to plants can save water, or grey water can be directed to crops instead of using new supplies.

160 Drainage basin management

The effectiveness of water treaties and frameworks depends on the cooperation and agreement between many countries, such as 10 countries in the Nile River Basin Framework. This is not easy to achieve because getting effective monitoring and resolving conflicts is not easy, as shown by the 37 violent disputes over water since the 1960s. Also, situations are changing all the time due to human pressures, such as population and economic growth and climate change, which is changing supplies and demand for water. The Berlin Directives are now part of international law, which helps countries seek peaceful resolutions to treaty and framework disputes through international courts.

163 Exam practice 1

- 1 NGOs such as the charity WaterAid can help by improving access to clean freshwater supplies. For example, by training local people to make rainwater harvesting barrels/jars from cheap local materials that can store water during wet periods for later use. These barrels collect water from roofs, with the added benefit that women and children do not have to travel long distances to get water.
- 2 Urban areas change the hydrological cycle locally and downstream by introducing impermeable surfaces (roofs, drives, roads); this increases runoff by 45% and may quickly increase river discharges downstream of the urban area and make flooding more likely. With more runoff there is less infiltration into soils (15–20% reduction), so soil moisture levels are lower. With less vegetation evapotranspiration is reduced by 10% so the air is drier (lower humidity).
- 3 Conflicts over freshwater may arise because it is an essential for life, farming and economic activities. Within a country, disadvantaged groups may find that their access to clean water is restricted because it is diverted for other uses such as irrigating farmland or for HEP production, so poorer people may have their health and livelihoods affected, for example they may become more susceptible to disease. An example of this is the Omo River in Ethiopia, which affected over 200 000 people (e.g. the ethnic Mursi group) who relied on the river for subsistence farming; however, the building of the Gilgel Gibe III dam has threatened their survival. Tensions build and can result in open conflict, such as the displacement of people due to the construction of the GERD in Ethiopia. Many river basins are transboundary, covering several countries, and there are not many water agreements in place; those countries downstream will always be concerned about what countries upstream may do as dams can severely limit river discharges downstream. An example is the Nile River Basin where Egypt is in the lower course. A 1959 agreement guarantees Egypt a large share of the Nile's waters but this has been threatened by the GERD in Ethiopia.

164 Exam practice 2

- 1 The hydrological cycle is a closed system on Earth with changes being caused by evaporation rates and precipitation patterns by higher average temperatures. In addition, it is subject to short-term changes within world regions due to variations in weather systems caused by, for example, fluctuations in polar front jet streams – which may cause a blocking anticyclone (e.g. lowering rainfall in Western Europe), or cycles such as ENSO with La Niña and El Niño bringing floods or droughts to different regions of the world (e.g. El Niño creates a dry South East Asia (June to January) and a wet southern USA (November to April), while La Niña makes South East Asia wet (June to December) and the southern USA dry (January to April)). However, over a longer period of time global temperatures have been increasing; part of this is a natural change linked to Milankovitch cycles but a significant part is due to anthropogenic emissions of greenhouse gases since the industrial revolutions in Europe. Global average temperatures have increased by about 1°C since and are predicted to continue to increase (current rate 0.2°C per decade). Some changes associated with this increase are: intense and heavy precipitation globally (greater convection) creates higher river discharges and more flooding in some areas in winter (e.g. the UK); summers can be drier because higher air temperatures enable it to hold more moisture leading to lower precipitation and even short-term droughts, more significant in subtropical high pressure zones (e.g. Sahel); higher evapotranspiration rates decrease infiltration rates; higher evaporation from open water surfaces and soil increases condensation and cloud cover, and increased precipitation in low pressure regions (tropics – ITCZ – and mid-latitudes).
- 2 There are several human and physical geographical factors that may cause water insecurity because it can be caused by economic, social and environmental factors. Global population has grown rapidly from 3.7 bn in 1970 to 7.6 bn now. The UN predicts that it will reach 9.8 bn by 2050. Therefore more water is required and water scarcity results when annual supplies fall below 1000 m³ per person. Wealth and standard of living are also increasing so water is being used. Population growth rates are highest in developing countries, such as in sub-Saharan Africa, (Figure 2 shows that here there is water scarcity due

to economic factors). Even some developed countries are experiencing pressure due to population growth (e.g. south-west USA (part of the Sun Belt)). UN Water estimates that water use grew at twice the rate of population increase in the 20th century, and by 2025 66% of the world's population will experience water stress. Your answer should also consider the role of urbanisation, industrialisation, globalisation, energy production, food consumption and physical factors (climate variability, effective rainfall, salt water encroachment). You should also include examples of places with physical water scarcity and schemes to reduce water issues, before coming to a reasoned judgement as to whether human or physical geography factors are more important to the causes of water insecurity.

165 Carbon cycle

- 1 There are two sets of fluxes that are larger than all of the others. The interaction between the land surface and atmosphere has significant annual fluxes of respiration and wildfires, which emit CO₂ to the atmosphere with a comparable (but slightly larger) flux of photosynthesis, which takes CO₂ out of the atmosphere. The other set is the interaction between the oceans and atmosphere with diffusion taking place in both directions where they are in contact; the process is fairly equal (with slightly more being dissolved into the oceans than emitted). All other fluxes are very small.
- 2 By far the largest store of carbon is in sedimentary rocks, although the actual amount can only be estimated. The next largest store is the ocean (but only 0.05% the size of the sedimentary rock store), followed by an even smaller store in the atmosphere, where only 0.03% of natural air is CO₂. Biogeochemical processes over a very long geological timescale are responsible for the differences in size. During more active volcanic periods there was more carbon in the atmosphere, but for about 290 million years there has been less activity and 400 million years ago, land-based ecosystems started absorbing CO₂ from it through photosynthesis. Carbon has been trapped in sedimentary rocks over billions of years and so the quantity has built up; this happens as oceans absorb CO₂ from the atmosphere and land sources to form calcareous oozes on the seabed. At the same time the shells of dead sea creatures, formed by extracting calcium carbonate from seawater, settle on the seabed. Over time all these deposits are compacted and recrystallised to form limestone. So the carbon is constantly moving through the ocean to the rock store.

166 Carbon stores and processes

- 1 Sedimentary carbonate rocks are formed when marine organisms, especially in warm tropical waters, fall to the seabed creating calcareous ooze with shells and skeletons (over 30% calcium carbonate). When this layer is over 100 metres deep it is compacted by the weight above. At about 100 metres it is cemented together, and by 1000 metres deep with a temperature of 40°C recrystallisation takes place to form solid limestone rock.
- 2 The calcium carbonate of limestone rocks is dissolved by rainwater, which is a weak carbonic acid, having absorbed CO₂ when falling through the air. This chemical reaction releases some of the calcium carbonate to be carried by groundwater flow and runoff to the sea, where it sinks to the seabed; it also releases carbon dioxide into the atmosphere. These are part of the annual fluxes in the carbon cycle.

167 Biological and oceanic processes

- 1 Phytoplankton are plants and photosynthesise; therefore, they take CO₂ out of the atmosphere as they float on the sea surface to use with the Sun's energy to grow (create carbohydrate). They store the carbon in their mass until they are eaten by zooplankton; when they or the zooplankton die, they sink to the bottom of the ocean to become part of a calcareous ooze (which is eventually turned into limestone rock). Some plankton have shells or skeletons which are made from calcium carbonate.
- 2 The physical and marine carbonate pumps move carbonate deposits. Warm and cold ocean currents move carbon laterally but also vertically between shallow and deep waters. The thermohaline circulation carries dissolved carbon from equatorial areas and deposits it in cold water sinks in sub-polar areas such as the Weddell Sea. The carbon taken from the atmosphere then sinks (the remains of sea creatures) to form calcareous oozes (but only up to a depth of about 6000 metres) to be eventually fixed in limestone rocks.

168 Terrestrial and biological processes

- Land-based plants use the process of photosynthesis to grow and during this process they store carbon. Photosynthesis uses CO₂ from the atmosphere together with water and the Sun's energy to create a carbohydrate and oxygen. In this way carbon is stored within the biomass of plants and reduced in the atmosphere. Some carbon is moved via the litter and decomposers to the soil store, and perhaps if the conditions are suitable into the rock store (e.g. coal formation).
- Decomposers in soils digest dead biomass (litter) and break it down into basic minerals, one of which is carbon. They respire a little CO₂ into the atmosphere, but most of the carbon that they produce becomes part of the organic matter store (or humus) fixed within a soil layer. Eventually some of this carbon store may be moved by water deeper into the soil or rock, or into rivers by throughflow.

169 Natural greenhouse effect

Greenhouse gases—such as CO₂—are found in the atmosphere and these absorb most of the heat radiated from the Earth's surface; the heat is then recycled within the atmosphere and helps to keep the Earth's average temperature higher than it would otherwise be. Scientists have found evidence in ice cores that shows that, in the past, there was a positive correlation between CO₂ concentrations and the average temperature of the planet; these correspond to Ice Ages and interglacial periods. When CO₂ atmospheric concentrations are high, then the Earth's average temperature is also higher.

170 Natural carbon pathways

Organic matter (or humus) collects in soils through the process of decomposition of litter. Decomposers release nutrients from litter. Organic matter has the ability to absorb and hold moisture, which dissolves the nutrients released by decomposition; once dissolved the nutrients and water are absorbed by plants through their root systems to help them grow. This growth, or increase in biomass, is also known as productivity (measured in GPP: Gross Primary Production – the total amount of CO₂ fixed by plants in one year, or NPP: Net Primary Production – GPP minus losses due to respiration).

171 Energy consumption

- The average wealth of people is increasing worldwide and therefore people are using more energy directly in their homes and travel or indirectly by purchasing products. The use is greatest in developed countries due to higher wealth levels and more manufacturing industries and tertiary businesses. However, due to environmental concerns and legislation to decarbonise and review nuclear power safety (after Fukushima 2011), energy use per person has declined significantly (e.g. Japan –15% between 2000 and 2014). Those countries with large reserves of energy resources, especially oil, make a lot of money and so have a lot to spend on activities that use energy – such as construction and desalination plants. Developing countries are poorer and have fewer manufacturing industries and businesses, so energy use is much lower. The fastest increase in energy use per capita is in economically emerging countries such as China (+149% between 2000 and 2014), where western-style industrialisation and trade has increased average wealth and the demand for energy. China has also improved its efficiency at using energy to increase its GDP.
- In the EU between 2000 and 2016 the use of coal, oil and nuclear as primary fuels decreased. Natural gas increased slightly. HEP stayed the same. Renewables increased overall, especially biomass/waste. Wind, solar and geothermal all make up a small proportion of the total but had big increases between 2000 and 2016. Reasons for these patterns include:
 - EU stocks of fossil fuels running out and an increasing dependence on unstable areas (e.g. Middle East and Russia) for imports, creating the need to find alternatives
 - natural gas being the least polluting of the fossil fuels
 - decarbonisation policies and regulations, with targets to reduce fossil fuel emissions more stringent than those of international protocols and agreements
 - the number of HEP locations being limited by physical factors
 - renewables being recognised as the main way of replacing fossil fuels in electricity production and so governments have encouraged their development, and technologies have improved over a short time period.

172 Access and consumption

- Different cultural and political priorities create different approaches towards, and views of, energy. In some countries the natural environment is seen mainly as a provider of resources for people and therefore energy sources are exploited to their full potential, often to support economic motives (e.g. Russia, Nigeria). In other countries there is a growing concern about how the exploitation and production of energy is harming both the natural environment and people, such as the emission of pollutants from fossil fuels that are continuing to cause global warming and the radioactivity from nuclear power (e.g. Japan). For example, decarbonisation is happening in many European countries and some emerging countries.
- Oil TNCs are one of the major energy players – examples are ExxonMobil and BP or state-owned ones like Gazprom (Russia). Oil and gas is big business and these TNCs have made a lot of money from prospecting, extraction, transport and refinement of these energy resources. They prioritise making these energy resources available and so usually create availability. They wish to keep trade flowing through the established pathways and maintain a profit. Much of this profit is put into exploration for more oil reserves, often unconventional sources that are more expensive to extract (e.g. deeper water), and without their ability and willingness to invest these resources would go undeveloped. They construct pipelines and own tankers that transport oil and gas to refinery areas or demand areas.

173 Fossil fuel reserves

- The map of global oil trade and flows shows that in 2017 there were major flows out (exports) from the Middle East (861.4 million tonnes (mt)), Russia (345.7 mt), Africa (e.g. Nigeria) (246.2 mt), and the USA (199.2 mt). The major flows in (imports) were to Europe (646.8 mt), the USA (451 mt), China (440.5 mt), India (204.9 mt) and Japan (154.9 mt). The main providing areas are those with reserves, especially the Middle East that has the largest oil reserves in the world; they are also countries with a surplus to their own needs. These flows are long distance and cover all continents and are especially more complex in the northern hemisphere, where most developed countries are found. The level of economic development is a key factor in deciding which countries are importing because they need energy to support their economies. Europe is the largest importer because it has many big economies, such as Germany, France and the UK. China and India are both emerging economies and are pushing their development, so their energy needs have increased. Japan has no fossil fuel energy resources of its own and so relies on imports, and the USA imports more than it exports because of its significant economic needs.
- Energy insecurity may occur in some places if they have a dependence on imports and their supplies are disrupted. A lot of oil and gas is transported long distance by tanker or pipeline, perhaps passing through several countries, and there is potential for disruption. For example, political disagreements between two countries may mean that sanctions are imposed so that countries stop buying gas supplies or the supplying country decides to cut supplies off. Piracy or armed conflicts at certain points, such as the Suez Canal, may prevent supplies getting through. Internal conflicts may disrupt production, such as in Venezuela, or wars such as in the Gulf may stop supplies. Also, increased demand and willingness to pay higher prices may cause a seller to divert their shipments to a new location (e.g. China).

174 Unconventional fossil fuels

Any two, such as:

- There are uncertainties about the impacts on the safety of people and the natural environment of new technologies used to extract and process the fuels.
- The fuels are still from a fossil source and are carbon based, so when they are used (combustion) greenhouse gases will still be emitted, adding to the rate of climate change.

175 Renewable and recyclable energy

Renewable and recyclable energies will lead to the development of new technologies and new employment opportunities. Dependence on expensive fossil fuels is reduced or eliminated, saving costs. Costs of electrical energy will eventually reduce below current levels, saving businesses money. These points will lead to a country generating greater wealth and more GDP. Even in a

developing country these technologies can be used at a small local scale and do not have expensive fossil fuels to buy, helping small farmers and local businesses.

176 Alternative energy

The IPCC may not be entirely correct about the future of biofuels, especially in developing countries. There are issues, such as the very large area of land required to grow the biofuel crops, which may take land away from the production of food crops in countries with growing populations. Some of this land area may come from extending the agricultural margins into natural areas, such as forests, adding to deforestation, which is still having widespread environmental impacts on the planet. Land ownership patterns may be forced to change, infringing the human rights of the people that own the land, taking the livelihoods of disadvantaged people away from them.

177 Environmental health

Global warming is affecting the ability of forests to sequester carbon because rainfall patterns are changing so that there are more severe droughts; this is affecting tree survival and there is large-scale dieback (e.g. Amazon). The drier conditions also increase the frequency of wildfires, with further tree deaths. With fewer trees, less carbon dioxide is absorbed from the atmosphere (via photosynthesis) and so levels in the atmosphere increase adding to atmospheric warming. The fires also release carbon from the biosphere store back into the atmosphere. If grasslands replace the forest then carbon sequestration is reduced by 70%.

178 Ocean acidification

- Ocean acidification is where the water becomes more acidic because it is absorbing more carbon dioxide from the atmosphere, forming a stronger carbonic acid. This increases the acidity to a point where wildlife is affected.
- Any four impacts, such as:
 - The dissolving of the hard calcium carbonate that makes up the base of coral reefs, the most biodiverse marine ecosystems. If these collapse, whole coral reefs could be lost.
 - Sea creatures that build shells will have greater difficulty doing so, as the acid will make it more difficult to make strong large shells, so they may be smaller. Shellfish may also be smaller and more vulnerable to predators.
 - The acidity will affect the young of all marine creatures, dissolving them before they are strong enough to withstand the conditions.
 - The speed of change may be so great that marine life does not have time to adapt, so some species may become extinct.

179 Threats to human wellbeing

The Kuznets curve shows that the trend for more developed countries is towards the sustainable level, while those emerging economically are increasing the loss of forests. As countries develop economically there is greater efficiency in using resources and reduced reliance on biosphere resources. Education levels and scientific knowledge increase, so there is an appreciation of the important role that forests play in Earth's systems, such as storing carbon. Economic foresight also shows that if resources are looked after, they last longer. However, in developing countries poverty may force people to overuse the resources that nature has provided, and emerging countries may use forest resources to support their economic development.

180 Impacts of climate change

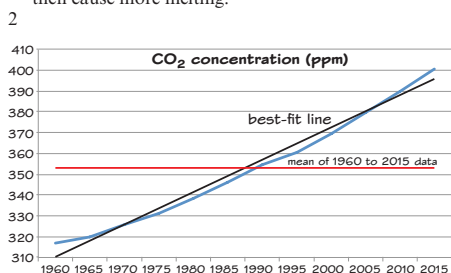
Freshwater stores may change:

- Smaller cryosphere store, due to melting ice and snow due to warmer temperatures.
- Surface water store changes depend on whether they are in drier or wetter areas – desert and subtropical dry areas may have less surface water in the future due to even less precipitation and greater evaporation, while higher latitudes will have more runoff due to saturated ground and more melting.
- Soil water store depends on the amount of evaporation from it, and this is likely to increase everywhere.
- Groundwater store depends on intensity of rainfall; if it is too intense, most will run off and not infiltrate and percolate, so it will reduce.

181 Uncertain future

- With Arctic areas warming the most, all types of permafrost are melting. There is decayed organic material frozen within the permafrost and once there is melting the gases stored within this organic material escape into the atmosphere. One of the

main gases is methane, a more efficient greenhouse gas than CO_2 . The release of this gas into the atmosphere increases the amount of heat energy trapped, and so raises the average temperature higher. This is a positive feedback loop, as this will then cause more melting.



182 Adaptation strategies

Water conservation and management can reduce the impacts of global warming but work best when everyone takes part; this can reduce the pressures on water supply if the climate has become drier or demands are exceeding supplies (e.g. when groundwater is not being replenished). To work on a large scale, such as in northern China, expensive schemes may be needed, which may be too costly for some countries to implement, or too costly for people if the costs are passed on to them through water rates or other charges. There are disputes over water in transboundary drainage basins such as the Nile and the Colorado.

183 Mitigation strategies

Carbon taxation can be an effective way of mitigating climate change because the extra costs for people and businesses make them think about avoiding this cost by moving to low-carbon alternatives. For example, people may change vehicles to electric or hybrid types, which reduce carbon emissions. But a problem is that these low-carbon technologies are often more expensive initially, and not everyone is able or willing to make this investment and simply accept the extra costs; and a business may also pass on these costs to the consumer.

186 Exam practice 1

- The main link is the two-way diffusion of carbon at the meeting point of the ocean surface and the atmosphere. The ocean absorbs 80 PgC/yr from the atmosphere while the atmosphere absorbs 78.4 PgC/yr from the ocean, so the ocean is storing carbon over a long period of time.
- (a) $123 - 118.7 = 4.3 \text{ PgC/yr}$
(b) Add all $\text{PgC/yr} = 207.1 \div 6 = 34.5$
- Oceans absorb more carbon from the atmosphere than diffuses to it; ocean currents then move this carbon over time. Cold deep water (under pressure) is able to store more carbon than warm shallower waters, so the Southern Ocean is an important carbon sink, such as the Weddell Sea and Ross Sea, with the Antarctic bottom current moving carbon northwards along the bottom of the Atlantic. In the Southern Ocean there are upwelling and downwelling currents which move dissolved carbon (physical carbon pump); at upwelling places carbon diffuses back into the atmosphere. The thermohaline conveyor moves carbon compounds over long distances between all of the oceans (except the Arctic). Much of the carbon eventually sinks to the bottom of the oceans, partly through the marine carbonate pump.
- The seasonally corrected values line shows a steady upward trend from about 391 ppm in 2012 to about 402 ppm in 2016; this is because of the cumulative effect of carbon emissions into the atmosphere from the combustion of fossil fuels dating back to the 19th century – natural processes are unable to transfer carbon to medium- (e.g. vegetation) or long-term stores (e.g. ocean) quickly enough. The monthly mean values trend shows a seasonal pattern which is linked to northern hemisphere ecosystems; during the growing season there is greater absorption of carbon from the atmosphere by plants, especially trees, and the CO_2 concentration level drops (by about 4 parts per million), whereas in the winter the CO_2 level increases again when the majority of plants are dormant and are not absorbing CO_2 from the atmosphere as part of their photosynthesis. There are some minor variations in the moving average, which will be linked to the climate providing more ideal growing conditions for plants in certain years, such as the spring/summer of 2013.

187 Exam practice 2

- Figure 2 shows that the largest oil pathway (1137.8 million tonnes (mt)) is from the Middle East to

other world regions and countries. The Middle East has the world's largest amount of conventional oil reserves. The largest share of Middle East exports are to the Asia Pacific region, especially Indonesia (276.4 mt), China (201.3 mt) and Japan (154.9 mt). This is because these areas have great demand due to economic growth and therefore industries and transport need the energy security. There was also a significant pathway from the Middle East to Europe (166.3 mt) and to India (153.8 mt), again for economic growth and transport reasons. The second largest exporter CIS (Russia) only had an outflow about one-third that of the Middle East in 2017 (416.6 mt), and it uses oil as a political tool. All other export flows were relatively small, for example from Canada to the USA or from West Africa (e.g. Nigeria) because production was smaller. The world regions with the largest inflows of oil are those with the greatest economic development, mainly Europe (646.8 mt), the USA (451 mt) and China (440.9 mt). These countries buy oil from at least five different sources in order to achieve energy security.

The oil pathways are important to maintaining energy security, especially where manufacturing (e.g. plastics) or road transport rely on it. The world has been in an oil age but, as conventional reserves become depleted, supplies become unreliable due to political and conflict factors, and restrictions are placed on CO_2 emissions; this is coming to an end. So oil pathways may become less important in the future. Energy security also depends on the ability to use the energy resources available, and this may depend on technologies (such as oil refining capacity, or renewable technology, or fracking and deep-water technology). A country with low energy demand will be less dependent on pathways.

The fossil fuel pathways may become less important as energy mixes change towards renewables, but currently most developed and economically emerging countries have energy mixes that have about an 80% reliance on fossil fuels and those without significant stocks of their own will depend on the oil (and gas) pathways.

2 Plan:

- Developing unconventional fossil fuels has the advantages of matching existing technologies, reducing costs to businesses as they do not have to change technologies, providing economic benefits to the countries that have these reserves, maintaining the benefits of trade between countries, and securing energy pathways for the future.
- But there are also disadvantages, such as the continuation of carbon emissions from fossil fuels; as the 2018 IPCC report stated, it is important to keep the global temperature increase to $+1.5^\circ\text{C}$ to avoid major problems. Spread of environmental damage due to extraction and transport technologies.
- Developing renewable energy resources has advantages such as reducing carbon emissions, which should allow natural processes to slowly rebalance the carbon cycle. Producing sustainable energy. Developing new economic opportunities through new technologies, a new range of businesses.
- However, there are disadvantages such as dependence on natural systems, such as clear skies for solar energy or wind for turning turbines. There are times when an energy mix relying on just renewables may not be capable of meeting demand. Renewables are less flexible energy sources and are mostly converted into electricity.
- Conclusion that evaluates based on these and other points.

188 Superpowers

The specification states that the characteristics of superpowers include economic, political, military, cultural, demographic and access to natural resources, so your three key characteristics should be selected from this list. Arguments can be made for all of them being 'key' in contrast to other characteristics. For example:

- Economic power is key, because without a powerful economy a country cannot afford a powerful military and will not have the political influence through trade deals to take on a dominant role in global politics.
- Access to resources is key because even if a country is an important trading nation, it might end up spending almost all of its GDP on resources if it doesn't have access to the resources it needs for energy and raw materials.
- A very large population is a key characteristic, because it means a very large workforce to build a strong economy and a large internal market to buy products made by the nation. Without a large population, a country might become reliant on

migration to grow its economy, which can lead to major social problems.

- A very large population can be an obstacle to a country becoming a superpower if those people are poor, or if many of the people have political ideas that are strongly opposed to the ruling government, leading, for example, to a civil war that weakens a country. That is why culture is a key characteristic: when a country has a unifying culture – like the 'American way of life' – everyone in the nation knows what they are working towards, whether they are recent immigrants to the country or have lived there all their lives.

You may well have come up with alternatives – just make sure you have explained why they are key characteristics for you.

189 Hard and soft power

- This answer will depend on the brand you chose to a certain extent, but it is likely that your answer will make some of the following points: an iconic brand such as Apple is an example of soft power because it is a desirable brand that is strongly associated with the USA, which develops positive associations. As a product it 'sells' aspects of US culture: for example, it is an individualistic product rather than one you share with friends, it is linked to purchases (e.g. through the App store and iTunes) and reinforces the aspiration to own and consume, which is a US value, and it is linked to style and image as set by US consumer culture.
- An example of soft power being effective could be the London Olympics and Paralympics in 2012. Through these Games, the UK had access to a worldwide audience of people watching the opening ceremony and the sporting events, and also the opportunity to influence visitors to the Games themselves. The opening ceremony portrayed some familiar themes about the UK to remind the global audience of its historical, political and cultural importance – for example, putting the queen and James Bond together. By promoting the UK in this way, the UK extended its soft power influence in, for example, encouraging people to visit the UK as tourists, encouraging foreign investment in the UK, etc.

An example of soft power being less effective could be Ukraine: the European Union used its soft power to try to bring Ukraine closer to the EU – for example, by allowing it to co-host the European Football Championship and by proposing a trading agreement with Ukraine. However, Ukraine has historic and recent ties with Russia, which felt threatened by the EU's attempts to gain influence with Ukraine. A revolution followed in Ukraine after the Ukrainian president blocked the agreement with the EU, led by Ukrainians who wanted closer ties with the EU, leading to further conflict in which Russia responded with hard power – effectively invading parts of Ukraine to maintain its hold over the country. The EU's soft power approach destabilised Ukraine and made relations with Russia and the EU much more difficult – not what the EU hoped to achieve in any way.

190 Geo-strategy

- The Heartland for Mackinder was the centre of the Eurasian landmass, which was controlled by Russia at the time he was writing in the early 20th century. Control over this enormous area, in Mackinder's time, meant control of 50% of all the world's resources, which would give any country controlling this area a significant advantage as they could use the resources to build a powerful military, develop wealth through industrialisation and support a large population. It would be very difficult for any other nation on its own to defeat a country that controlled the Heartland (making it a superpower in effect), so unless other countries worked together against the Heartland country, it would become globally dominant.

2 Reasons could include:

- In terms of resources, the Heartland region is no longer dominant: there are important oil and gas reserves in northern Russia, but the main oil-producing countries of the Middle East, for example, are not part of the Heartland, while China and Japan have become global powers without having the same resource advantages as Mackinder's Heartland.
- The Heartland was seen as being safe from invasion by other countries because it extended inwards so far from the sea, and sea power was the early 20th century's supreme military force. Now, however, air power means that this would not be an advantage and missile technology, including nuclear missiles, means nowhere on Earth is protected just by being a long way from the sea.

- The internet and other innovations in global communications technology mean that geographical factors are much less important now than they were in the early 20th century. Being able to profit from and control flows of trade through these communications is probably as important as where in the world a country is located.

191 Uni-polar power

Hard power was the main way in which the British achieved control of its colonies, for example by using its naval power (e.g. gunships) to take control of ports. The threat of its hard power was also important in maintaining power, since any rebellion or opposition to British control could mean that British ships in the trouble area could rapidly deploy troops and the opposition could be suppressed by force – hard power. Soft power was also important in maintaining power to some extent: people in British colonies could get jobs in the British administration of their countries and the chance to develop careers; some colonials got to benefit from British education. The British introduced sports like cricket to many colonies, and held competitions and sporting tournaments like the Empire Games. British media encouraged the idea that all the subjects of the Empire were part of something good and successful. British missionaries converted people to Christianity, and especially to the Church of England.

192 Bi-and multi-polar power

The most effective form of indirect control would be the one that would enable the superpower to have the most influence over another country. Arguments could be made for each of the four types, so your answer will need to justify your choice. For example:

- Political indirect control means that the superpower is able to influence the leadership, policy, political decision-making, etc. of the other country. This can be very effective because this can then influence economic, military and cultural aspects of the relationship between the two countries. However, it can lose effectiveness if the citizens of the indirectly controlled country resent the influence of the superpower over their leadership.
- Military indirect control is very effective in achieving strategic objectives and extending military 'reach' around the world, and has trade benefits too, as selling arms is very lucrative. However, there are potentially high costs for the superpower: it costs a lot to have military bases scattered all over the world and the superpower may get dragged into local conflicts, which can be unpopular and lose it influence.
- Economic indirect: the superpower gets influence and increased trade with other countries that it can arrange to benefit its own businesses, farmers, etc. Having other countries indebted to you means that you have the option to put pressure on them by calling in loans or raising interest rates if they decide to act in ways that do not suit your objectives. However, if economic indirect control is over-used, countries can become more of a burden. Corruption can make the countries unstable because the population get angry, which is bad for investment. Interest payments can get too high for the countries to afford the loans, and financial instability risks spreading back to the superpower. Poorer countries that are forced into dependence on richer countries through economic indirect control do not develop effectively, which means global trade is less than it could be, risking economic recession.
- Cultural indirect control has none of the risks of political or military indirect control: it is soft power. In the Cold War, young people in the USSR and Eastern Europe were often strongly influenced by western fashion, films and music that reached them through Radio Free Europe (despite censorship) or which were smuggled in. This increased resentment against the Soviet regime and its ideology. However, while cultural indirect control can change attitudes, on its own it is not strong enough to ensure that another country's politicians make the choices a superpower wants, that its businesses produce the materials the superpower needs at the price it demands, or that another country fights the enemies or allows access to the strategic locations that the superpower wants.

193 Emerging powers

The emerging powers are very important to global attempts to reduce the rate of climate warming and the impacts of climate change. First, the emerging powers are themselves responsible for a large proportion of global greenhouse emissions – for example, China is now the world's largest emitter of greenhouse gases. It is therefore crucial that the emerging powers can be

influenced to reduce emissions if the rate of climate change is to be reduced.

Second, the emerging powers are still growing and their demand for energy is still increasing. While the most developed countries now generally have slow rates of economic growth and are able to achieve some reductions in emissions relatively painlessly through, for example, switching public transport to electric vehicles, this would not be the case for emerging powers, which might experience lower growth if they reduce emissions. That means compromises have to be achieved in global climate change policy, for example to recognise that emerging powers should be allowed different, lower targets for cutting emissions than the most developed countries that have emitted the most greenhouse gases over time. Third, the rapid development of technological expertise in the emerging powers means that effective global responses to climate change are increasingly likely to be developed in India, Indonesia or China rather than in France, the UK or the USA. It is therefore very important that emerging powers have the opportunity to contribute to and to take leading roles in global efforts to tackle climate change.

194 Development Theory

There is no single correct answer, but any argument you give should be justified. Looking at changing patterns of power from uni-polar (British Empire) to bi-polar (Cold War) to multi-polar:

- Modernisation Theory works well in explaining why Britain, by industrialising first, was in a world-leading position that enabled it to directly control large areas of the world. It explains why other countries were able to challenge Britain's dominance as they also followed the same modernisation path: the USSR deliberately implemented massive rapid industrialisation programmes in the 1930s to achieve just the sort of 'take off' to a modern society that the model sets out. However, it does not explain why some countries have not been able to follow the same path to modernisation, and it does not account for the decline of countries such as Britain once their global dominance began to fade.
- Dependency Theory is the strongest theory for explaining unequal power since it sets out how the core of most developed countries operate to deliberately block the development of what Frank saw as underdeveloped countries. This model accounts for the development of neo-colonial relationships of power and may be part of an explanation for why emerging powers have not reached superpower status on a par with the USA. However, it does not explain how emerging powers have been able to emerge despite being from the periphery, or why it might be that once dominant core countries can begin to take on more peripheral characteristics (e.g. a low-wage economy).
- World Systems Theory is the strongest theory for including change into a theory of development, as it recognises how long-term cycles in the global economy create opportunities for some peripheral countries to develop rapidly, for some core countries to decline as recession strips out their competitive advantages or they make the wrong choices about investments or other economic priorities. However, World Systems Theory does not have a strong explanation for why these changes happen, why the patterns of power that emerge take the form they do, or why some countries seem able to deal with economic opportunities and challenges better than others, or better at some times compared to other times.

195 Global economy

On the face of it, IGOs appear to be above the interests of any one country and aim to serve all countries – for example, the World Bank aims to reduce poverty around the world, as does the IMF, rather than aiming to make the most powerful countries more powerful – so how could they help superpowers to influence the global economy? The current leader (at the time of writing) of the world's superpower, President Trump of the USA, is in favour of 'America First', which involves protecting US manufacturing and services from competition from other countries. However, there has been widespread criticism over many decades about the role of IGOs in promoting capitalism and free trade. Capitalism is the ideology of the USA and its western allies, as opposed to the socialist and communist ideologies of the USA's Cold War enemies. Free trade favours the core, in Dependency Theory terms, and disadvantages the periphery, since it opens up the markets of developing countries to global trade, meaning that local manufacturers are forced out of business by foreign competition, foreign TNCs move in and exploit

low-wage economies, and the core countries are able to get periphery countries to compete to sell their raw materials to core countries for the lowest prices.

196 TNCs: global influencers

- 1 Reasons could include: a historical legacy – that many of the patents still held by western patent holders were developed a long time ago when the majority of R&D took place in western countries; TNCs do around half of the world's R&D, and many TNCs have their headquarters in the USA and the EU; patents were developed by the western legal system and there could be a cultural acceptance of the advantages of the patent system that is not present to the same degree in other parts of the world; western education may have been better than education in other parts of the world until recently, meaning a greater proportion of R&D was done in the west.
- 2 IGOs such as the IMF and World Bank helped countries agree on international standards for finance, which made it easier for TNCs to operate across more than one country. IGOs like the World Bank lent money to developing countries to develop the infrastructure that TNCs needed to see (e.g. ports, roads and rail, energy supplies) in order to invest in production in developing countries. The WTO and other IGOs have encouraged all countries, including developing countries, to open up their markets to foreign investment and free trade and it is this, more than anything, that enabled TNCs to use their transnational status to maximise their profits.

197 Decision-making

- 1 Powerful countries often take a leading role in crisis response: for example, in providing funds and expertise for disaster relief, especially when a disaster occurs to a neighbouring country or ally. This can influence the way other countries respond. Powerful countries can also make decisions to intervene in conflicts, for example the USA led a coalition of countries in opposing the invasion of Kuwait by Iraq in 1990–91. The decisions that powerful countries make about environmental issues can strongly influence the response of other countries: for example, China has taken a leading role in climate change negotiations and in its investment in renewables and innovative adaptation measures. The United Nations Security Council recognises the leading role of powerful countries in its permanent membership: the five permanent members include the USA and China – the world's leading powers.
- 2 Global geopolitical stability means that the world's economy and the peace and security of countries around the world are not threatened by political crises and instability such as global financial crises or world wars. The UN is very important for attempts to keep global politics stable because it is the forum that countries can use to settle disputes: the International Court of Justice provides a court for settling legal disputes between countries, while the Security Council makes decisions about how the UN should deal with international conflicts and crises, which can include sending peacekeeping troops to trouble spots and helping resolve conflicts, preferably before they flare up and destabilise countries and regions.

198 Resource demands

- 1 The main human activities contributing to carbon dioxide emissions are generation of energy and heat, industry, transportation, farming and deforestation. Because of their large economies, the USA and China generate a lot of electricity, both for industrial/business and domestic use, and create a lot of carbon emissions from their large industrial sectors. Both have large populations and both have climate requirements for heating in the north in winter and air conditioning in the south in summer. Both have large farming sectors that are fully mechanised in the case of the USA, and increasingly mechanised in the case of China.
- 2 Advantages of the Earth Overshoot Day concept could include:
 - creates an easy-to-understand comparison that helps people to grasp a complex problem
 - allows comparison between countries (if the world all lived like...), which shows the disproportionate resource use of developed countries
 - allows comparison year on year so it is possible to see if the situation is improving or deteriorating over time.
 Disadvantages could include:
 - it implies that the Earth's resources are renewed, which is not the case (at least not in the timescale of human civilisations) for non-renewable resources
 - the target of not overshooting does not appear realistic because to achieve it, everyone in the

world would need to live in the way people do in Vietnam, which people in developed countries are unlikely to agree to and which people in Vietnam might want to move away from

- it does not identify who the most significant over-users of the world's resources are: for example, Qatar and Luxembourg are small countries and are unlikely to be using as many resources overall as China or the USA.

199 Willingness to act

There are arguments on both sides (and no single correct answer): certainly the future growth of middle-class consumption in emerging superpowers such as China and India is a significant environmental threat, since that consumption inevitably means increasing demand for increasingly less available resources, risking environmental degradation on a major scale – all of which could still happen even if the emerging superpowers were able to reduce their greenhouse gas emissions to their 2030 targets under the Paris Agreement. Although the USA as a whole has withdrawn from the Paris Agreement, some of the 50 states that make up the USA have decided to continue to work towards reducing their carbon emissions anyway, which is an important point to make about the USA's willingness to act.

However, the reluctance of the US government to commit to reducing carbon emissions – and the continuing scepticism in sections of American society about climate science – could be seen as more of a threat, since the USA is the second largest contributor to greenhouse gas emissions: the USA's reluctance to cut emissions therefore puts an extra burden on the rest of the world. The USA is also the world's leading superpower, a position that in the past has involved a leadership role in the global community. The USA's actions may convince other powers, for example Russia, that they also should not risk damaging their economic position by cutting emissions. Alternatively, the USA's position on climate change may risk it losing a lot of its global influence and may permit another emerging power, such as China, to take the lead in global governance, which would potentially mean a major shift in geopolitics that could sideline the USA and end up damaging not only its soft power influence but its economic growth.

200 Resources and rights

- 1 These countries are largely where TNCs located production in order to take advantage of lower wages and a less stringent regulatory environment, which meant higher profits – for example, environmental regulations or health and safety regulations were not really enforced there. However, this less strict regulatory set-up meant there was less protection for TNCs from police and the legal system against counterfeiting, while low-paid workers, working long hours in sometimes uncomfortable or even unsafe conditions, had little incentive to show loyalty to the TNC and refuse to make counterfeit products.
- 2 It is likely that China will take an increasingly serious attitude to international law protecting intellectual property rights, if only because China is now developing many more innovations itself, protected by the international patent system, which it will wish to protect from counterfeiting by others.

201 Spheres of influence

Building structures on disputed land is a flash point for conflict because it implies ownership. If an uninhabited island is disputed by several different powers and one builds something on it, this helps to make a case in international opinion that the land should be considered in that power's sphere of influence. China's construction of military bases, airstrips, artificial reefs and other types of building in the South China Sea sets out a very clear claim to the islands that, because the buildings are military, would be difficult for other powers to remove without provoking open conflict, and which give China a strategic advantage in the area. Russia's construction of a bridge between mainland Russia and the peninsula of the Crimea is an example of Russia constructing something that integrates or links the Crimea to Russia and looks to replace the Crimea's existing connection by land with the rest of Ukraine. It makes it harder for Russia's claim to the Crimea as part of its federation to be thrown out, even though the majority of countries see Russia's actions as an annexation of what should be part of Ukraine. Another example not on this page but which you may know about is the building of houses on contested land in the Israel/Palestine conflict. These houses back up Israel's claim to the land, even though no legal decision has awarded it to Israel.

202 Changing relationships

China might be interested in turning African nations into the next 'world's factory' because Chinese companies are looking for low-wage economies to shift their manufacturing to, in the same way that developed countries shifted their manufacturing to China in the 1990s. As China's economy turns more towards the service sector, and its industries towards higher tech, high-skilled work, the expanding Chinese middle class will still want to buy consumer products at a good price, but Chinese wages will be too high for China's industries to maximise their profits. African countries, where wages are still often very low, therefore represent a good place for China's industries to invest in new production facilities.

203 Changes in influence

- 1 The location of the world's economic centre is a reflection of where the most economic growth is occurring in the world. Since the 1950s, the economic centre has moved rapidly from a location off the east coast of the USA, reflecting the strongest growth being in the west of the northern hemisphere, towards the east, reflecting a much stronger 'pull' from the rapidly industrialising and urbanising Asian countries of Japan, China, India, Malaysia, Indonesia and others.
- 2 China's Belt and Road initiative is investing \$1 trillion in a huge array of infrastructure projects in 70 countries across Asia, Africa and Europe. The project aims to strengthen trade between China and these countries, to help develop countries (e.g. Pakistan) that can become markets for Chinese companies, and to boost global trade generally. By strengthening trade relations across these regions, China is buying influence with many other nations. This is worrying for powers that also have interests in these regions, for example India. India has a hostile relationship with Pakistan, which is potentially a major partner in the Belt and Road initiative. India relies on Pakistan being weaker than India economically, demographically and politically, so China's actions through the Belt and Road initiative could strengthen Pakistan and perhaps make war between India and Pakistan more likely.

204 Middle East tensions

Your three reasons could include:

- The Middle East is strategically very important to superpowers and emerging powers because of its vital energy resources. However, countries in the Middle East use their importance as energy suppliers to control oil prices by increasing or decreasing world supply. This can sometimes trigger global recessions, which damage superpowers and emerging powers.
- Superpowers and emerging powers would like to have energy security – not to be dependent on unstable nations in the Middle East for their energy supplies. Attempts by powers to source alternative or substitute energy supplies can lead to more tensions in other regions – for example, China's territorial claims in the South China Sea.
- The Middle East is economically very important to superpowers and emerging powers, but the region is politically unstable due to the many competing ethnic groups (e.g. Kurds vs Turks, Jews vs Arabs) and religious groups (such as between Shia Islam and Sunni Islam or between Christianity, Islam and Judaism in Israel and Palestine). Superpower or emerging power investment in the Middle East risks drawing powers into conflicts between these groups.
- Superpowers and emerging powers have historically competed with each other for influence in the Middle East, for example Egypt allied with the USSR against the USA in the Cold War. This can increase tensions between superpowers or emerging powers. For example, Russian intervention in the Syrian civil war has significantly aided the current leader to stay in power, against the wishes of the previous US leadership, while the USA is aiding its ally Saudi Arabia in a civil war in Yemen, where opposition forces are funded by Iran.

205 Economic challenges

- 1 A very large national debt is not a terminal situation for a superpower, because the USA is seen as a safe place to invest money. However, all debts involve interest payments, which the federal government of the USA has to pay. Money that it spends on interest payments is money that the government is not spending on infrastructure or social care, or funding for education and skills development or university research grants.

While interest rates are low, a very large national debt may not be a problem, but there is always the risk that interest rates increase, in which case a large national debt poses greater challenges. If it looks as though a country cannot repay the interest it owes, investment in that country will reduce and investors will demand higher interest rates, making the situation worse.

It is more difficult for the USA to continue to give tax cuts to the wealthiest Americans as the national debt increases. This is because if the government does not get the money it needs from taxes, it borrows more money to pay its bills, making the national debt bigger.

It is challenging to reduce national debt without raising taxes because the way this is done is by cutting back government spending. This has major impacts on the lives of Americans – as the UK has experienced with its austerity programme from 2008, crime may increase as police numbers are cut, education may suffer as funding for schools fails to keep pace with rising student numbers, health care can become more expensive as government support for health insurance schemes is reduced. These changes can have political implications, with more people, on the one hand, choosing to support political candidates who are pushing for increased state aid to help those in need (left wing) or, on the other hand, choosing to support political candidates who push for greater protection for those who have against those who have not: stricter police controls, reductions in immigration/a 'hostile environment' for illegal migrants (right wing).

2 Economic restructuring in the USA has mainly meant the shifting of manufacturing from the USA to cheaper locations, often in Asia. This has not caused long-term unemployment in the USA, as jobs have shifted from manufacturing into services, but it has created communities that took their identity from secondary sector industries (such as car manufacturing) that feel 'left behind'. Many Americans feel that 'their' jobs were given away to Asia, and this is why China has grown so fast. Comparing the USA of today with the USA of the 20th century, in which America dominated the world, has made many Americans feel that economic restructuring has caused the USA to lose its way – hence President Trump's rallying call to 'Make America Great Again'. The challenge facing the USA as a result of economic restructuring is how to negotiate the political fallout of economic restructuring's impacts on those communities that feel left behind, and how to recover the USA's dominant global influence, which caused such national pride in Americans of the 20th century.

206 Global military power

- 1 Arguments for the economic costs being worth it:
 - The USA's ability to project its military power anywhere in the world has enabled it to take a leading role in geopolitics because of its ability to back up its position with overwhelming hard power.
 - The USA's military power acts as a global police force, reducing the chance of tension turning into conflict all round the world, which benefits millions of people.
 - The USA's spending on its military creates jobs in the USA, which benefits its economy, and accelerates technological developments, which benefits the rest of society when civilian spin-offs are developed.
- 2 Arguments for the economic costs not being worth it:
 - The USA is spending huge amounts of its citizens' money on a role of global policeman that benefits other countries rather than the USA.
 - The cost of the USA's overseas military forces is money that could be spent on domestic US issues such as reducing inequality.
 - The threat from other countries today is more about cyberwarfare than traditional warfare, and terrorism rather than combatting enemy armies. The USA's global military power is not a deterrent to cyberattack or a terrorist dirty bomb, for example.
- 2 Arguments for are likely to reference the technological, scientific, engineering and medical, etc. advances that have come as a direct and indirect effect of solving the problems of sending machines and humans into space. Satellite technology, for example, has brought immense benefits to every nation through communications, entertainment, mapping and every technology that relies on GPS. Arguments against are likely to reference the staggering cost of space exploration and argue that technological advances linked to space exploration

that meet human demands would have been developed anyway, while other similar technological advances have been made without requiring space exploration: medical discoveries linked to the unlocking of the human genome, for example, owe little to space exploration. Space exploration to discover the chemical make-up of distant planets may one day pave the way for human life on other planets, but arguably the money could be better spent on protecting the planet we have from further damage by its human inhabitants.

207 Future power structures

Arguments for the USA's continued dominance are likely to refer to its dominance in cultural, political and military spheres as well as its economic strength – emerging powers have experienced rapid economic growth but arguably have serious challenges in moving out of a regional power status to achieve anything like parity (equality) with the USA's global power, even if it is declining, in the short or medium term.

Arguments for a bi-polar power structure in the future are likely to evidence China's rapidly growing influence in regions outside East Asia – for example, in Africa, South Asia, Central Asia and Europe. Unlike in the Cold War when the USA wanted to destroy the USSR because of US anti-capitalist ideology, the USA has no apparent objections to communist China, perhaps because China has no objections to integrating China fully into the capitalist system and is making no attempts to convince other countries to come under the leadership of the Chinese Communist Party. In fact, the two countries are closely linked together through trade and debt, which means to some extent that both need the other to maintain their superpower status.

Arguments for a multi-polar power structure in the future are likely to point to the USA's economic problems (high national debt), trends towards protectionism (protecting American businesses behind tariffs) instead of increasingly free global trade, and reluctance to act as the world's policeman in areas such as Syria or Yemen. At the same time, there are more emerging powers than China alone – India for one – which argues for an increasingly multi-polar world. Globalisation may make a multi-polar world more likely too, since international capital (investment money) is not tied to national interests but goes wherever reliable returns on investment are highest, which varies as global economic cycles create areas of opportunity and areas of declining profitability.

210 Exam practice

- Your reason is likely to be that some oil exporting countries in the Middle East have the capability to act together to affect world oil prices, with major consequences for economic growth in the rest of the world. Political tensions within the region make it challenging because conflicts can affect the supply of oil and gas to the rest of the world. Desire for energy security has led some superpowers to attempt to gain influence in the Middle East. That has meant some nations allying with the USA (e.g. Saudi Arabia) and some nations opposing the USA (e.g. Iran).
- Modernisation Theory sets out a path for countries to follow in modernising, and assumes that different countries will be at different points on it at different times. As new countries succeed in modernising, these emerging powers will change the pattern of power. Dependency Theory sees existing superpowers as exploiting their dominance to prevent developing countries from competing on a level playing field: the implication here would be that changing patterns of power would come as emerging powers find new routes to challenge superpower dominance, for example the BRICS' move to establish a rival funding body to US-dominated IGOs. World Systems Theory has changing patterns built into it, in its semi-periphery where change and tensions occur, and also recognises the importance of long-term economic cycles, such as Kondratiev cycles (alternate intervals of high and low growth rate), which give advantages to some countries over others.
- Westernisation is one example of the global cultural influence of superpowers. One reason for its importance is likely to be because of the success of the spread of 'western' (i.e. US) values since the end of the Second World War across the globe: consumerism, capitalism, wealth-creation, English language as the dominant language, 'western' brands (Apple, Microsoft, Nike).
- Your answer is likely to focus on the USA's decision under President Trump to withdraw from the Paris Agreement (2015), in which nearly 200 countries, including China, agreed to voluntary reductions

in carbon emissions with the aim of keeping global warming below the 2°C 'tipping point'. The USA was the only country to withdraw from the Agreement and the USA's reasons were in terms of maintaining the USA's superpower dominance (whatever the global cost).

5 Challenges:

- Interdependence risks becoming dependent on China.
- If China lends more money than an African country can afford to repay, that country risks becoming something similar to a colony.
- Chinese investment is made through top-down loans to national governments, which risks money not reaching local people and businesses, especially if governments in some African countries continue to have problems with corruption.
- Some Chinese projects have caused excessive environmental degradation, which is not under control because African governments have not set up suitable environmental regulation, or it is not properly enforced.
- There is the risk that without proper government control over working conditions, Chinese management of projects will not show due regard to employment rights and health and safety.

Opportunities:

- China is providing huge amounts of investment which African countries might otherwise struggle to get:
 - China wants to see African countries develop so they can be markets for Chinese products. Development through trade will bring higher GDP, opportunities for local businesses to make money, more government tax revenue to spend (potentially) on health care, education, security.
 - Infrastructure projects create jobs for local people, develop skills and transfer new technology from China to African nations.
 - Chinese investment in new ports and other infrastructure increases trade.
 - Chinese money does not have 'strings attached', unlike the IMF or World Bank that often require corruption controls, environmental safeguards and an opening up of national economies to free trade.
- BRICS are Brazil, Russia, India, China and South Africa.
 - They are increasingly important to global economic and political systems, to the environment, to migration and they also project power through military might.
 - Your answer might view the rest of the world in terms of a focus on a challenge to the USA as the only remaining superpower, or more broadly to include developed and developing countries.
 - Threats could be in terms of projection of power, but also prices of energy, food and other resources. Opportunities could be new markets, contribution to global wealth, innovations, contributions to global leadership.
 - Your answer could take a country approach or by theme, or threats/opportunities.

211 Measuring human development

Alternative measures of development have arisen because some people and governments believe that economic development is not the only path that countries could take. There are other ways in which people's lives could improve, such as having democracy and freedom of speech, but some aspects of this are difficult to collect objective data on. The natural environment also provides resources and services, so damage to it harms human wellbeing, such as climate change; the Happy Planet Index considers this but does not consider socio-political factors.

212 Contrasting views

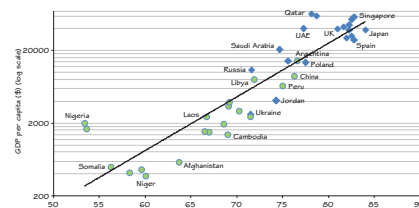
Economic growth may be the best way of improving socio-political conditions for people because as a country generates more wealth from its businesses and industries the government becomes wealthier through the ability to raise tax revenues. With these revenues the government can invest in health-care systems, and the health of the population improves and people live longer. The lives of people also improve because there will be investment in infrastructure such as water supply and education; with education people recognise the importance of freedom of speech and the rights of disadvantaged groups such as women.

213 Health and life expectancy

- Clean freshwater is essential to people's health; they need enough of it on a daily basis to live but also for personal hygiene and for cooking. In developing countries some water supplies are taken directly from

rivers, lakes or the ground and do not go through artificial treatment to take out harmful bacteria. If sewage, or farm or industrial pollutants, contaminate these water supplies, then human health will be affected with the consequent increases in mortality rates.

2 You should draw a best-fit line as follows:



The graph shows a positive correlation, so as GDP per capita increases, life expectancy at birth also increases. A log scale for GDP data has been used because there is a large difference between the poorest and richest countries.

214 Ethnicity and poverty variations

- Ethnic minority groups can find themselves at a disadvantage compared with the majority of a population when it comes to health matters. In Australia the Aboriginal people have problems because of lifestyle changes away from traditional ways of life, including changes in diet and smoking, which have introduced health problems such as higher obesity, including among children, and cancer rates. Many indigenous Australians still live in remote areas and do not have access to appropriate health care, and many are poor and cannot afford health care. Consequently life expectancy is 10 years shorter for both Aboriginal males and females than for the non-indigenous Australian population.
- Different lifestyles can lead to a disparity in health across a country. In the UK different regions have different health levels, as reflected in life expectancies. For example, the difference between Dorset and Glasgow is over 10 years for males, and about four years for males and females between Liverpool (poorer urban) and Kesgrave, Suffolk (richer semi-rural). These differences reflect combinations of factors, such as the type of work, air pollution, life stress levels, eating habits, alcohol consumption and smoking habits. Health is lower in areas such as Glasgow and Liverpool, where some people have manual jobs, live in polluted areas, experience employment-related stresses (low pay, unemployment), eat fatty or sugary foods (higher obesity levels), drink alcohol every day and smoke excessively. Opposite lifestyles tend to be found in rural areas such as Dorset and East Anglia.

215 Socio-economic development

There are significant differences in government spending between the UK (a welfare state) and Russia (an authoritarian state); the UK has larger spending on both education and health, only a small difference in education as schooling is compulsory at primary and secondary levels, but a much larger spending (approximately 9% higher) on health care than Russia. However, Russia spends more on welfare (by approximately over 17%) as it has to support a larger poorer population and those that were not assisted by the health-care system. Much more of Russia's spending is directed towards its military budget than the UK (around 2.5 times higher) and so this leaves less money available for spending on education and health care.

216 UN MDGs and SDGs

- Some world regions and the countries within them did not meet some MDG targets because they started from a very low base, with extreme poverty and very high mortality rates, as found in sub-Saharan Africa. Developing countries are poor and so between 2000 and 2015 did not have sufficient wealth to invest in social infrastructure, and instead devoted money to try to develop their countries economically, which would also have affected success in meeting environmental targets. Countries experiencing conflicts would have had difficulty improving living conditions, especially in the semi-arid areas of the Sahel and western Asia, where the climate and climate change would have increased the difficulties. Gender inequalities are entrenched in some cultures and it takes more than 15 years to bring about socio-cultural and political change. The Asia-Pacific region shows the difficulties in meeting all targets, especially for those countries that are more deprived.
- Progress towards the SDGs may depend on the availability and use of technologies, and needs to be appropriate to each country and its financial

resources (e.g. money to train teachers). The world recession (starting in 2008) has made funding SDG programmes more difficult, and reconciling economic targets and environmental sustainability is not easy. There are a number of conflicts in world regions, such as in the Middle East and Africa, and genocide (e.g. Rohingya), which increase mortality rates through interrupted food and water supplies and greater incidence of disease. High birth rates also introduce large numbers of youths into a population, and there may not be enough jobs for them when they need to work. Political changes, especially greater isolationism and nationalism in the last few years, may increase the incidence of human rights tensions and violations.

217 Human rights laws

- Several possibilities, such as:
 - Strengths: makes countries include human rights within their own laws and cultures; provides international protection for all groups of people wherever they are in the world.
 - Weaknesses: not all countries agree with every aspect of the UDHR and have been selective in the parts that they have adopted freely; some people and countries believe that the sovereignty of a country is reduced by international laws.
- The ECHR is sometimes controversial because it has brought together 47 countries with contrasting cultures, and some may disagree with the loss of sovereignty that occasionally seems to result from the decisions of the European Court. The EC also takes a long time to go through each case, and this can be frustrating to those awaiting a decision. However, others see it very positively as it promotes a uniformity to rights across the whole of the European continent; also, the number of cases brought to the EC reflects the areas where improvements need to be made.

218 Differing priorities

Countries approach human rights differently depending on their priorities, and this often links to the state of their economic and political development. Established democracies and developed countries are more likely to support and promote human rights, both within their countries and internationally, especially through the United Nations. New democracies or developing and economically emerging countries may place economic motives first, and this may cause conflicts with human rights, for example with indigenous peoples when their areas contain resources that the country wishes to use to help develop the economy. Some countries have greater access to international forums than others, for example Canada has close ties with two permanent members of the UN Security Council (the USA and the UK) (although Indonesia will be an elected member for two years from 2019). The strength and independence of the legal system may also play a role, by successfully prosecuting breaches of human rights or by being corrupt and favouring ruling elites.

219 Freedom and corruption

Corruption threatens human rights because it removes money from the system, redirecting it to benefit a minority rather than being used to improve the wellbeing of the population or disadvantaged groups. It also restricts political freedoms because elections are 'rigged' through bribery or misuse of police and security forces, to support the continuance of the ruling elite. Protests are often dealt with by force and deaths may not be uncommon. To save costs the business elite may apply pressures on authorities to overlook or not enforce health and safety regulations, or to ban trade unions, in this way damaging people's health and freedom to protest.

220 Differences in rights

- There are fewer rights for women in some countries because there is a lack of democracy and laws creating equal rights. In some countries there are also historical cultural and religious beliefs (e.g. Arab countries such as Yemen) that create a divide between the rights of men and women; these differences may also be enshrined in laws. Developing countries, especially those in sub-Saharan Africa, are the worst for gender inequality, and women have few opportunities in these countries. The 2015 to 2030 SDGs may offer some hope of change.
- Indigenous peoples in North America have poorer health and education levels because they often live in remote areas with harsher physical conditions (e.g. northern areas of Canada, or semi-arid areas in USA), which create difficult living conditions. They are also poorer and may live in inferior housing. Both of these combine to create poorer health overall than the non-indigenous population, with

higher rates of disease such as TB and more injuries. In addition it is difficult to provide the best health care and education because the tribal areas are often remote and isolated, which creates difficulties getting fully qualified staff. Also, the curriculum and type of health care may not be the most appropriate for this population, such as not covering traditional culture, knowledge and skills – which is also not helped when indigenous people move to other areas of the country because it is not economic or practicable to provide what is needed for a small scattered indigenous population, so educational achievement is 10% below where it should be. However, fresh injections of money may help to improve the situation in future, by providing schools and health centres with more relevant resources (e.g. equipment) and better pay and training of staff.

221 Equality

The conflict situation in Afghanistan greatly affects women's ability to improve their position. The opportunities for work and education are greatly reduced, as there is an emphasis on survival and the wars destroyed many businesses. Despite the role of international organisations, especially those of the UN and women's groups within the country, improvements have only been slow, as shown by the country's GII, which only gives the country a low rank position overall. The number of girls attending secondary school has actually fallen in recent years, which does not help the next generation of women to improve their rights and position. However, Afghan women's groups offer some support, although it is unlikely that they can help everyone. Also, the government is not really supportive, despite passing several laws that should improve women's rights. So only very slow progress is being made.

222 Geopolitical interventions

- Development aid has a wide variety of purposes, but mostly it is based on human welfare such as health and education, and so helps with this aspect of development. A large proportion is also devoted to 'Government and Civil Society' to help promote democracy and human rights within a country, such as 17% of EU aid worldwide. The amount of aid given to help economic development is smaller and is usually indirect, such as improving transport infrastructure in Pakistan (DFID – Economic Corridors Programme). Humanitarian aid (Disaster Relief) has the highest amount from both the EU and the UK, and this will help people in the short and medium term to recover from natural hazards, but is not aimed at long-term development. So development aid helps with social development and human rights, and to some extent with economic development.
- Interventions can be controversial because of the purpose behind them, especially as attempts may be made to hide the true purpose. Some people think that development aid creates dependency or forces 'westernised' standards on developing countries, and that not enough aid is being given to make a significant difference. Military action can increase the number of civilians at risk (e.g. Russian activity in Syria) and threaten the independent sovereignty of a country or create civil divisions within a country (e.g. Libya). There are covert operations, such as Russian involvement in DR Congo, perhaps to obtain the diamond wealth. Sanctions may harm the ordinary people of a country by decreasing the supply of goods, which increases prices and creates shortages (although countries are careful to target economic goods and not food and medicines). Military aid may be misused if given directly, such as to suppress a minority group in a country.

223 Interventions and sovereignty

- NGOs, such as Amnesty International, have an important role to play, as they are often independent and mostly concerned with the wellbeing of ordinary people, therefore not heavily influenced by a political viewpoint (although they may still operate from a 'westernised' set of values). They are also important sources of information, as they usually have operatives 'on the ground' in problematic countries and provide first-hand observations of what is happening. This can alert international communities and organisations to the need for interventions to protect people and prevent situations getting worse.
- Any external influences can bring threats to the national sovereignty of a country, but interventions can directly threaten autonomy and decision-making. Interventions may be justified on the grounds of protecting innocent people or ethnic groups from human rights abuses, but whatever form they take – whether aid or military actions – they

may change the way in which a country is governed, and sometimes in a way that was not predicted (e.g. Libya). Social and economic aid may be tied to conditions that the external provider imposes, forcing the country to make changes or not receive the aid. Direct military action can bring a change in government, but legitimacy is not always clear (e.g. Yemen).

224 Development aid

- Three differences include the following:
 - The amount of money given; IGOs have more to give than NGOs.
 - NGO aid does not usually have conditions attached to it, while IGO aid may be linked to conditions such as trade.
 - NGOs usually work directly with local people that need help (bottom-up approach), while IGOs work with governments (top-down approach).
- Australia's development aid was largely to developing countries relatively close, especially countries in South East Asia such as Indonesia and Vietnam. This is so that Australia can build positive relationships with these countries, benefiting from better trade and control of immigrants. Australia's development aid also supports some countries, often slightly further away, that have internal conflicts affecting people's wellbeing (humanitarian issues), such as Afghanistan. The level of aid is usually higher the closer the country is to Australia, so Indonesia and Papua New Guinea have the highest by far (the latter three times higher than the 3rd-ranked country).

225 Impacts of development aid

There is controversy over development aid because while there have been major successes, such as helping South Korea and Taiwan to develop economically and improve the lives of their population, there are negatives such as large sums of money going to authoritarian countries (e.g. North Korea from Russia). Aid given to countries with corruption reduces its effectiveness, and large sums may be diverted to support ruling elites rather than going to ordinary people suffering from human rights issues. Humanitarian aid is regarded as a success, as it provides essential help to those caught up in emergency situations, such as natural disasters, and to refugees; in addition, humanitarian projects improve living conditions and health (e.g. by providing clean water). Criticisms include the small scale and lack of funding for these projects, however some small-scale bottom-up schemes exactly match the needs of local people.

226 Economic development impacts

- Economic development may have serious impacts on minority groups because there is a lot of money to be made from extracting resources, selling them or making products from them to sell. Developing countries wish to trade in order to make money to develop the country, and TNCs are keen to help. So if the resources or infrastructure or industries need to be located in the land areas of minority groups, such as the Ogoni in Nigeria, then they have little say and protests are often dealt with through imprisonment or killing. Their area could be contaminated or the resources they depend on to live removed (e.g. deforestation). The people of the minority group also come into contact with modern ways of living, which may change the traditional lifestyle, especially among the young.
- Oil spills from drilling and pipelines in the Niger Delta area of Nigeria have entered river systems and soils, contaminating the area, which will kill the natural vegetation and aquatic life. The local Ogoni people will lose the quality of their living environment and may suffer health problems, the area with their fishing boats is contaminated so fish are likely to be killed or contaminated, reducing food supplies or passing the contamination on to people when they eat the fish. Their way of life is being threatened. The clearance of forests in Malaysia for a commercial crop, palm oil, destroys the forest structure and reduces biodiversity. This removes local resources from the indigenous people, such as foods from the forest, and disturbs their way of life. It is unlikely that they will have been consulted even though they have lived in the area for thousands of years, and their rights to ownership of the forest have not been considered.

227 Military interventions and aid

Human rights appear to be a low reason for military intervention or aid, and they are sometimes used as a convenient excuse to justify these types of intervention.

The main reasons appear to be strategic: for the superpowers and their allies to gain some influence in countries in key positions and to ensure security in world regions to protect resources or stop problems such as terrorism spreading to home territories. Sometimes, as a secondary benefit, human rights do improve in the countries where intervention and aid have been given, such as reducing the persecution in Iraq and improving the health of Iraqis. In other places, such as Jordan, military aid appears at the moment to have made little difference to human rights within the country due to the strong control of the king.

228 Military intervention

Any military action is likely to affect non-combatants as well as killing terrorists. Civilians are often caught up in the fighting, and in any war situation some are killed by 'friendly fire'. The fighting will also destroy people's homes and cut off water, food and electricity supplies – necessitating humanitarian aid. Terrorism is often in the form of covert operations and is difficult to detect, therefore intelligence gathering is an essential part of the fight. During the military action terrorists (or suspected terrorists) may be captured; some of these have been detained without charge, for example in Guantanamo Bay by the USA, and some have been tortured to reveal information. However, this breaches the Geneva Convention.

229 Measuring success

Changes in life expectancy can help reveal the success of interventions, because if safety and living conditions have improved, or ethnic minority groups have been protected, it would be expected that life expectancy (years from birth) would increase. This is because if conflicts have been stopped then there will be fewer deaths from fighting, aid may have helped improve water, food and shelter, and development aid may have improved the health-care system. The table of indicators of intervention success shows that half of the countries featured significantly improved their life expectancy (but that does mean half did not). However, this may take a generation to become evident, as the health of adults may have already been affected by poor health care or conflict. Obtaining accurate data is also difficult, as records of births and deaths may not be kept in a developing country, and estimates may be inaccurate.

230 Economic growth as success

Some countries prioritise economic development, such as China; in China's case this is partly to improve its position as a world superpower. Other reasons include a historical legacy of authoritarian control based on a system that the ruling elite believe has worked, such as the communist system in China. By prioritising economic development the wealth that a country makes could then lead to improvements in quality of life and human rights. In particular, trading with the rest of the world can earn foreign currency, which makes the country wealthier, and this allows greater spending to improve infrastructure and services (a multiplier effect). However, if the government system is too authoritarian then human rights may be suppressed during the stage of economic development and for some considerable time afterwards.

231 Success and failure of aid

There are two-way links between aid, development, health and human rights, but these links vary in their strength between different real-world situations. Development may be a key factor, as it enables countries to become aid donors rather than recipients, releasing funds for use elsewhere. Democracy also creates a wealthier society and some have predicted that once GDP per capita (PPP) is above \$10,000 then democracy also occurs, and with this human rights improve. Greater wealth can also be used to improve education, which gives people understanding of human rights, and also increases the amount of spending on health care. There are 'knock-on' effects and feedback such as a healthier workforce contributing more to economic development. Aid can also play an important role in maintaining human rights and health levels through interventions, even though there can be problems, as shown in Haiti. Aid can be used to provide funding for large-scale top-down schemes, such as HEP or transport infrastructure, to help countries reach the next development stage (Rostow's model), or fund small-scale bottom-up schemes that meet the needs of local communities.

232 Aid and superpowers

Some development aid does not reduce economic inequality because it may be targeted at social schemes rather than economic ones, and countries that have received aid still have inequalities in income within them and widespread poverty (e.g. Afghanistan). Some development aid is used for geopolitical purposes to gain a strategic advantage in terms of access to

resources or to gain political affiliations in organisations such as the UN (e.g. China); often this aid is for large-scale infrastructure schemes and does not help poorer people in the short term. The income share of poor people in Vietnam decreased despite a very large increase in ODA.

233 Military interventions: mixed success

The costs of military intervention can be severe, with deaths of civilians who get caught up in the fighting or their displacement to safer areas or other countries (refugees), their lives are disrupted and there may be no jobs, pay, food, power and clean water. However, before the intervention, minority groups may have experienced human rights abuses and in the long term there may be benefits for the society. Foreign armed forces may also impose a change of regime, which may cause a loss of sovereignty for the country or may help enforce the results of democratic elections (as in Côte d'Ivoire in 2011). The costs of other forms of aid are largely tied to the fact that not enough aid is made available, probably due to lack of funding, and therefore while improvements are made in living conditions this may only affect a small number of people and last a short time if aid is then withdrawn, especially if dependency has been created. However, if directed carefully to include involvement of local people in planning and implementation, development schemes can have long-lasting positive impacts. There are definite benefits of short-term disaster relief, which saves lives and helps people to start rebuilding after a human-made or natural disaster, including an outbreak of disease such as Ebola.

234 No action: impacts

To intervene or not is likely always to be a controversial debate, as shown by the Srebrenica massacre and Rohingya genocide in Myanmar, where no effective action was taken, and Côte d'Ivoire, Iraq, Libya and Syria, which had action. When people's human rights are affected, the UN clearly lists military action as one of the options, and it does not have to be the last option if the situation is deemed serious enough. However, there are other countries and NGOs that believe foreign countries should not interfere with internal matters, as this affects the sovereign rights of that country. Whether international action takes place often depends on the strategic position of the country and the geopolitical alliances that have been established. Consequences of no action mean that human rights abuses may continue and many people suffer; there may be political consequences, with authoritarian rule lasting for much longer than it may have otherwise done, or damage to the natural environment taking place through neglect or overuse.

237 Exam practice 1

- (a) Shading of the four countries must match the data range shown in the map key.
 - (b) Reasons are to be suggested so knowledge of the exact countries is not expected. Reasons are likely to include the level of:
 - democracy within a country
 - public sector corruption
 - conflict within a country or world region
 - GDP growth
 - social inclusion
 - crime.
- Indigenous populations often have poorer health and lower educational levels because of discrimination and marginalisation, lack of access to jobs and decision-making processes, poverty and the presence of abuse and atrocities. Only officially recognised tribes may have access to services, and perhaps only in tribal areas. The indigenous population may be spread over a very large area, often in isolated areas. Lack of funding and inferior services. Higher incidence of certain diseases (e.g. TB) and dietary issues such as diabetes.

238 Exam practice 2

- One possible answer is: In the UK generally people in southern regions have a longer life expectancy than northern ones, e.g. Dorset 83 years for males compared with Glasgow's 73 years. Cities have shorter life expectancies than rural areas, e.g. Liverpool 76 years for males compared with Kesgrave's (East Anglia) 81 years. The gap between males and females is greatest in the cities and in northern regions (4–6 years) compared with southern and rural regions (3–4 years). The reasons for these differences include lifestyles and living conditions, such as cleaner air and less pollution in rural areas than urban, smoking or non-smoking, drinking alcohol excessively or not, obesity due to poor diet choices, office jobs compared to manual

labour exposed to dust and danger, population density to spread infections and disease (e.g. London has highest rates in the UK). Higher education levels can help people access health care or avoid problems through understanding, and income can help wealthier people access private health care. Life expectancy continues to increase in the UK, faster for males than females, perhaps because of less physically demanding jobs for males in a modern consumer society, and continued improvements in health care and lifestyles (e.g. decrease in smoking).

- 2 Suggested possible plan, fully develop each point: What ODA is and its aims. Problems with using aid (reference to the statement). Benefits of aid. Should ODA be avoided or not? Comparisons of ODA with alternative ways of helping countries; do these alternatives avoid the problems of dependency and corruption? A conclusion that answers the question: should official development assistance be used? Do interventions **always** lead to problems such as dependency and corruption? What about the players involved, what about the attitudes and actions, what about the future? Answer could also include points such as – is there enough evidence to link ODA to the problems? Do other types of intervention have the same problems and issues?
 - 3 Suggested possible plan, fully develop each point: The UDHR was set up after Second World War to help unify countries in terms of agreeing basic human rights to create a 'better' peaceful world for the future. People's rights to freedom, justice and to not be persecuted were established within international laws, protecting people all around the world by the incorporation of the International Bill of Rights into national laws. Minority groups in particular gained from this and it also encouraged countries to be more democratic. But some countries feel that the UDHR infringes on national sovereignty and suggests different decisions to ones that their socio-cultural background would make. For example, Islamic countries have created their own version to more closely represent their religious beliefs (Cairo Declaration). There are also inconsistencies in interpretation in international courts as situations are not always clear and depend on the point of view. There may be instances of misuse of the UDHR to justify aid or interventions. So there are strengths and weaknesses with the UDHR, but it provides a sound base for promoting human rights globally and with further improvements in the future should lead to a better life for all global citizens.

239 Globalisation

The right of free movement is restricted to citizens of EU member states and allows them to move to another EU member state and get a job there and/or live there, subject to any restrictions on this right that the country in question might have added (though the EU is not keen on there being any restrictions on this basic EU right). It explains why the UK, as a member of the EU, received a large increase in Polish migrants after the expansion of the EU to include Poland (in 2004). The Schengen Agreement is different – it is an agreement among 26 EU countries to remove internal border checks for people travelling between EU countries – in effect to create a passport-free zone. It made migration between countries quicker and easier, but it did not enable free movement for EU citizens – they already had that – and it did not remove borders between the EU and non-EU countries.

240 Different migration policies

- The main reason why highly industrialised countries such as Singapore and Japan need international migrants is because their populations are not growing rapidly enough to sustain the countries economically or socially. An ageing, long-living population does not contribute taxes to the government once people have retired, but the support elderly people require from the state is paid for from taxation. Because immigrants tend to be younger, and because immigrants tend to have more children, immigration provides the population growth these societies need, including the younger workers to provide the care older people need, and to pay the taxes the government has to have to provide the care in the first place.
- Both Singapore and Japan want to control who stays in their country long term, becoming a permanent resident or even a citizen. They do not want low-skilled workers to stay because low-skilled workers do not contribute the qualities these countries want permanently – they just want to be able to use low-skilled workers when they are needed. They do want to increase the number of highly skilled immigrants, because these people have valuable skills that will benefit people in the country, and they are

usually high earners who pay higher levels of tax to the government. Finally, countries want to control who stays in the long term, so they can try to select people who seem likely to integrate into their society rather than those who will become alienated and may cause problems in society.

241 Changing migration patterns

Impacts of climate change are likely to include increased sea level rises, which would change international migration by increasing the migration of people from low-lying islands (such as Kiribati, a Pacific Island group) and low-lying coastal areas, for example in countries such as Vietnam, Bangladesh, the UK and the Netherlands.

Some areas are likely to become drier as climate change increases: this could increase migration away from areas that are increasingly drought-stricken, for example Australia and the Sahel in Africa. Areas that rely on glacier meltwater in their river regimes, such as Pakistan, could see greatly reduced river flows, which might increase out-migration. There could be changes in food supplies – for example, for areas that rely on fishing, if climate change leads to changes in fish stocks. Furthermore, the tensions resulting from climate change impacts may cause conflicts over resources more intense, especially over water, which could produce political changes that increase migration as people try to escape violence and war.

242 Causes of migration

- Three possible causes of migration could include:
 - economic motives – people moving to earn more money or better career opportunities
 - family members moving to be with someone who has migrated for economic reasons
 - people who are forced to move because of fear for their own safety or the safety of their family.
- A refugee is someone who has been forced to leave their country to escape war, persecution or natural disaster. An asylum seeker is someone in a foreign country who is seeking to persuade officials in that country that they qualify to stay in that country as a refugee. Some people who claim asylum are not genuine refugees. If they are not recognised as such, they become illegal immigrants and might then be deported.

243 Migration and economic theory

- Wages for low-skilled work should increase, because there will be fewer people willing to do the work, so businesses will have to pay more to attract people to fill their vacancies.
- This will not be good for businesses that rely on low-skilled workers, as higher wages will cut into their profits.

244 Consequences of international migration

Singlish would help migrants get over one of the major obstacles for assimilation: language proficiency. Since Singaporeans speak a language that is made up of English plus immigrant languages, it is not privileged (special to) any one ethnic group, and everyone would find parts of it that they find easy to learn.

Singlish also represents an attitude in Singapore that recognises the contribution of migrant cultures to Singapore culture, rather than expecting migrants to assimilate into a 'host' culture. For example, it is difficult to pin down what is specifically 'British' about British culture in a way that different British people would agree with.

245 Migration and tensions

One reason why people have different perceptions of the impacts of migration could be that they are considering different impacts; for example, some might be talking about economic impacts and others about cultural or social impacts. People in different countries or different regions of the same country could have different perceptions of the impacts of migration because of different experiences of migration, or because of different migrants – for example, migrants with very different cultural or ethnic characteristics from the host culture compared with migrants of the same ethnic group or with a similar culture. Another reason could be that the different media they follow or read shapes their perceptions.

246 Variations in opportunities

- The advantages of points-based immigration systems to host countries are that the host country can control immigration so that only people with skills that the country needs are allowed to migrate to the country. Reducing low-skilled migrants may protect residents of the host country from competition with new migrants who are willing to work for less or work longer hours. A disadvantage may be that there are not enough residents of the host country who

want to do low-skilled jobs, or who are willing to do them well, which can cause problems for employers who depend on migrant labour, for example fruit and vegetable pickers in the UK.

- The advantages of points-based immigration systems in origin countries are that they make it easier for potential migrants with the right skills to immigrate, helping skilled workers see what different countries might be able to offer them.

The disadvantages could be that points-based immigration systems offer nothing to low-skilled people in origin countries, who may therefore be forced to turn to illegal migration and people traffickers, who demand a lot of money for their services and whose routes into host countries are often very dangerous.

247 Nation states and their origins

Your three reasons could include:

- if migration has created cultural/ethnic diversity in the country that has not been reduced by assimilation
- if a nation has been created out of different ethnic groups, which may have a past history of tension or conflict
- if a nation has developed regional identities over history, such as between the north of England and the south of England.

248 19th-century nationalism

Nationalism increased in countries that had empires, such as Britain or France, because people in those countries felt part of a common purpose and were proud of their country's achievements. Because their country had managed to take control over other territories they often felt that their nation had a special purpose, for example to 'civilise' other countries. Nationalism also increased in colonies of empires because the shared experience of being colonised brought people together and made them conscious of their shared history and the future that they could create together as an independent nation.

249 New nation states since 1945

The map shows that a significant number of countries speak English as their first language or as one of their official languages. The link with colonisation is likely to be that these were countries that were colonised by Britain and therefore where English became the language of administration and education. In the case of the USA, the nation became independent several centuries ago (in 1776), so the continuation of English after independence might also be due to the migration of large numbers of English people or English speakers. The same is true for Australia, which saw the forced migration of English people. The continuation of English in other nations where the majority of people spoke other languages as their first language, such as in India, could be because English was used as a common language in new nations with several different languages, or because the administrators of the country had been educated in English and trained in English government systems and therefore continued to use those after independence.

250 New state forms

- they have benefits for TNCs and business generally (they generate a lot of economic growth and make companies more productive)
- they are a consequence of deregulation of rules on foreign investment that are central to globalisation, which most governments and IGOs see as a good thing for global growth
- they bring benefits to the countries that offer low tax regimes.

For example, a low corporation tax of 12.5% helped Ireland to recover from the 2008 recession due to the massive FDI received by Ireland from companies wishing to take advantage of its low rates (the USA's corporation tax was at 35% until very recently), while Luxembourg – a tiny European country – has generated thousands of jobs for its population by encouraging businesses to take advantage of its very unusual tax breaks.

251 Growing global inequalities

Growing inequality creates a sense of social injustice (a perception of unfairness) among those who are losing out and seeing others getting rich at their expense. This sense of social injustice has increased political polarisation within countries, as people who feel they are losing out or being left behind back populist politicians who offer common-sense solutions. These solutions are generally anti-globalisation: for example, President Trump's campaigns to 'put America first' are about bringing back production to the USA of products that are currently imported from other regions at a cheaper price to the American consumer, while his wish to build a wall between the USA and Mexico is to protect

American citizens from illegal migrants who will work in low-skilled jobs for low wages. They threaten the global economic system because they do not facilitate the free movement of money, goods (products) and people, which is at the heart of a globalised economy: instead, they seek to protect individual nations from the negative impacts of the global economy, potentially at a high cost for global economic growth.

252 The United Nations

- Global governance is about countries working together to help resolve international challenges. The United Nations was set up in 1945 after the Second World War had ended with the aim of providing a forum for working out peaceful solutions to international problems and tensions, so that future generations would not have to suffer a world war again. The UN's General Assembly is where countries can take disputes and problems for discussion, and the UN can then make decisions about the best way to tackle these disputes. In cases where UN resolutions are not sufficient to prevent conflict or tension from escalating, the UN can agree economic sanctions against a problem country, using its members' powers over trade to block a problem country from exporting or importing specific products or services, until the problem country agrees to negotiate a peaceful solution. The UN even has powers to intervene militarily to try to stop conflict, using combined military and police forces of its member countries.

As well as conflict resolution, the UN also provides global goals for countries to work towards, for example goals for sustainable development and targets for reducing carbon emissions. This is global governance because it is about influencing and managing the global issues affecting all countries. The UN's agencies then provide assistance and funding for meeting those goals, for example the WHO (World Health Organization) has helped member countries to almost completely eradicate diseases such as polio.

- Individual countries, especially superpowers, have geopolitical aims and interests in other countries that are not always shared by other countries, especially other superpowers. This is a situation that causes problems in the UN Security Council, whose five permanent members are the USA, the UK, France, Russia and China. For example, the USA and France disagreed about intervening in Iraq in 2003 and France used its veto to block the UN from authorising military intervention. As a result, the USA side-stepped the UN and led an invasion of Iraq without UN approval. Therefore, one answer to the question is that countries still intervene in other countries when they are powerful enough to do so, even when other UN Security Council members do not accept their decision.

253 IGOs and world trade

Advantages include:

- tariff-free access to other countries' markets (e.g. the EU provides its members with free access to a market of 500 million people)
- free movement of products and people within the bloc
- standardisation of trade rules and regulations, which facilitates easy trade between member countries
- protection for certain economic activities within the bloc (e.g. the EU's tariffs protect EU farmers from competition from very cheap food from other parts of the world)
- pooled expertise in trade negotiations with other countries
- financing and funding from a development budget that all member countries pay into (e.g. the EU's 2017 budget was €157.86 billion), which can be used to, for example, improve trading infrastructure and reduce inequalities within the bloc
- the size of the trading bloc helps it to negotiate the most favourable deals with other nations outside the bloc, because of the large market that it offers.

Disadvantages include:

- limits on member nations from trading independently outside of the bloc, which could mean member nations get fewer benefits than might otherwise be possible
- richer nations (as with the WB and IMF) have to contribute more to the bloc budget than they may get back in bloc development spending
- decision-making on important issues such as immigration may no longer be under the sovereign control of individual nations if the trading bloc has decision-making powers
- some member nations may be perceived to be getting a better deal from the trading bloc than others – for example, Mexico was perceived by

the USA as taking jobs away from the USA under the old NAFTA agreement, while the USA felt Canada's dairy industry was unfairly protected from competition with US dairy producers.

254 IGOs: the environment

Some reasons for your answer could include the following:

- If some countries do not ratify an agreement, especially if they are powerful and important countries, it weakens the chance of managing the problem successfully, because: (a) those countries may continue to do whatever it is that is causing the environmental problem; and (b) other countries may be encouraged not to ratify the agreement either – perhaps because they do not want to be disadvantaged economically.
- Not all countries will agree on the right course of action. For example, some countries may want a radical approach (especially those that are most impacted by the problem) while others may take a more conservative line.
- If resolving the problem has economic costs then countries will be reluctant to commit to it, as it might lead to, for example, job losses, increased prices, slower economic growth – all of which could make citizens of the country unhappy.
- Some countries may be expected to contribute more/sacrifice more than others, perhaps because of their increased contribution to the problem. This makes those countries less likely to agree.
- There may be doubt about the best way to tackle the problem, especially if the results of research into the problem are disputed.
- Major international players such as TNCs may be opposed to the agreement and may use their political influence to stop the agreement from happening.

255 The Antarctic Treaty

Reasons could include:

- It has preserved Antarctica as a continent of international scientific cooperation rather than allowing different nations to divide it up and exploit it in different ways.
- The Treaty has acted to manage the amount of human activity in Antarctica: Treaty signatories meet annually to discuss projects, all expeditions and research visits have to be notified in advance, protocols conserve key species (such as Antarctic seals) and environments, and tourist numbers are managed to minimise human impacts.
- More nations have signed up to the Treaty: the original 12 nations have now increased to 53.
- The Antarctic Treaty has succeeded in keeping the Antarctic peaceful: no military bases have been set up, no weapons have been tested there including nuclear weapons, no military weapon waste has been dumped or stored there.

256 National identity

1 Ways could include:

- through education: students are taught about national values and encouraged to consider ways in which they should be proud of their nation
- through sport: the population may be brought together by pride in a nation's sporting achievements, hope of success, past sporting triumphs
- through politics: politicians making reference to nationalist symbols, policies that seek to boost or conserve national values, campaigns to recover or reassert national strengths, etc.
- through threats (perceived or real) to the nation; for example, rhetoric about the dangers of immigrants changing national culture or rejecting the national identity of a host nation, or terrorist threats motivated by 'hatred of British values'.

2 Reasons for this might be because being British is perceived to be a less ethnically specific national identity than English, Scottish, Welsh or Northern Irish, which are frequently associated with White ethnicity for cultural and historical reasons. British is frequently combined with other identities, such as British Asian for example, so one reason might be that people in ethnically diverse areas are identifying as British as part of a combination of identities. There might be some element of rejection of an English identity because of the association of White ethnicity and English identity that has sometimes taken on racist aspects: that might be why people more often identify as British Asian, for example, rather than English Asian. There could possibly be some connection between British identity and the legacy of the British Empire, for example Caribbean migrants in the 1950s were invited to Britain as British citizens.

257 Challenges to national identity

Your answer may include the following points:

It is a challenge to national identity:

- The sale of iconic 'British' brands to foreign companies is a signal of British failure to compete or to safeguard these symbols of national identity.
- There is a perception that foreign owners will not have the same sense of responsibility to British workers as British companies.
- Foreign ownership of large parts of the London property market is important symbolically because of the importance of London to British national identity.
- Foreign ownership is particularly challenging when it is foreign governments taking ownership because foreign governments have the interests of their own nation in mind – parts of London are perceived as no longer being British. This is shown in the jokey name of 'Londongrad', in reference to Russian ownership of London high-end property.

It is not a challenge to national identity:

- There would not be a British car industry on any significant scale if it was not for foreign investment: while the British were once the second largest exporter of cars after the USA, competition from Germany and Japan in the 1970s and 1980s was too strong for British manufacturers. It is therefore deindustrialisation that is the challenge to national identity.
- London has maintained its cultural identity – it is one of the world's most visited tourist destinations because of its museums, art galleries and landmarks. If the rest of the world identifies London as British, British national identity should not feel itself under threat.
- Foreign investment in British companies and property is under tight control by British law and the British government, which means the extent to which foreign investment can change or damage British interests is limited. For example, the government worked hard to prevent TNC car companies from changing location of production away from Britain after Brexit.
- Foreign investment is something British governments are keen to attract and do so by promoting British values (innovation, trustworthiness, education, long history of manufacturing) along with tax incentives. Foreign investment is a source of national pride, therefore, not a challenge to national identity.

258 Disunity within nations

Factors that increase disunity might include:

- Demands for independence from regions within nation states, because these threaten national unity. An example is Catalonia's movement for independence from Spain. If Catalonia did achieve independence, Spain would lose an important part of its economy (20%); a city seen as integral to Spanish identity, Barcelona, would no longer be part of Spain. In order to address independence demands, Spain has devolved state powers to Catalonia, which in itself weakens national identity as it weakens the authority of the state.
- Disunity because of inequality, for example an unequal sharing of the benefits and costs of globalisation. If one region or one social group is perceived to have benefitted much more than others from globalisation's wealth-increasing and job-creating effects, or if some regions perceive their jobs or cultural identity as unfairly impacted by deindustrialisation or increased immigration, disunity can increase. An example is Brazil, where many resented the way the increased national wealth earned through globalisation was spent, such as on hosting the World Cup, and the high levels of corruption that Brazilians faced in their everyday lives. Disaffection with Brazil's left-wing governments led to the election of a far-right president in 2018, whose promises included an end to corruption, a crackdown on crime, an end to environmental protection of the rainforest and a rejection of western cultural influences in regards to LGBT rights.
- The collapse of government control can create failed states – the ultimate example of disunity. In failed states there is no working government for the whole nation, but instead a patchwork of competing power groups (often backed by regional powers or superpowers fighting a proxy war) that leaves the population without support and at serious risk from conflict, malnutrition and disease.

261 Exam practice

- (a) Your answer is likely to suggest that the EU countries/EEA organisation had stricter regulation on the production of ozone-depleting substances after 1986 because the EEA curve on the graph is consistently below that of the world as a whole. Alternatively, the world as a whole could have included a few remaining countries with high consumption of ozone-depleting substances which skewed the global results above those of the EEA.
 - (b) The Montreal Protocol (1989) has succeeded in its goal for several reasons, including the following:
 - A clear problem to fix: scientists had shown that CFC gases destroyed ozone and the discovery of a 'hole' in the ozone layer over the Antarctic was easily verified. There was little complexity and uncertainty about causes and effects (compared to global warming, for example).
 - There was strong public demand for action against the thinning of the ozone layer because people could easily understand the direct threat to them and their families from increased UV radiation.
 - The USA had already developed alternatives for CFCs in refrigeration, so a solution to the problem was easy to find.
 - UNEP gave strong leadership and coordinated campaigns to convince the largest emitters of CFCs (USA was top of the list) and the largest manufacturers using CFCs to follow the plans UNEP had put together to phase out CFC production and consumption.
 - One major reason why SAPs were criticised is that the investment (more loans) to help the struggling countries came with conditions – most of which involved removing barriers to free trade, which benefitted developed countries. The IGOs thought that the trade barriers, for example tariffs to protect the developing country's farmers, were slowing down the country's development, but it turned out that removing these protections did not make the economy stronger in the short or medium term. Another major reason was that SAPs often required austerity-style cuts to public services. For example, the SAPs agreed with Jamaica in the 1980s involved wage cuts for all government employees, cuts to spending on health care and education, and the devaluation of the currency. All these had very negative short-term effects on people, which were strongly criticised: people could not buy enough to eat and there were riots against the government.
 - Points in support of the statement might include:
 - Migration changes the cultural and ethnic composition of nation states; that must affect national identity.
 - People experience migration as a threat to national identity and this perception of migrants as a threat to national identity is often expressed in increased nationalism.
 - National identity is built on distinctive legal systems, certain religious traditions, national 'character': migration can threaten all these if, for example, migrants identify with different legal systems (e.g. Shariah law or the European Court of Justice) or different religious traditions, etc.
- Points to counter the statement might include:
- Migration includes internal migration, which is people from the same nation moving from one place in the nation to another. Since they are from the same nation, they should share the same national identity.
 - National identity is not the same as nationalism: many states are multinational as a result of migration, and still have a strong national identity that migrants share. The USA is a good example of this: the vast majority of its residents are migrants or the descendants of migrants, and the USA's national identity is stronger because of this.
 - The most severe threats to national identity do not involve migration but are when unbridgeable gaps grow between the population and elite groups that run the country in their own interests – failed states.
- Points in support of the statement might include:
 - The Security Council of the United Nations is outdated because its five permanent members reflect the countries that were important post-Second World War, while France and the UK have since lost some of their global importance.
 - The veto powers of the five permanent members mean that they can block UN resolutions if they go against their strategic interests. Russia and China have used this veto to block UN sanctions

in Syria, for example, following chemical weapon attacks there.

- Countries have chosen to sidestep the UN in some situations, seeing it as an obstacle to their goals. This was the case with the USA in the Second Gulf War, for example, and the UN was powerless to prevent these kinds of unilateral actions.
- The UN has failed to find a way, to date, of convincing countries to reduce carbon emissions to the levels that are required to avoid significant climate-related problems both currently and in the future.

Points to counter the statement might include:

- The UN has had a significant impact on increasing environmental protection, for example the 1989 Montreal Protocol, 1992 Rio Summit and the 2016 Paris Agreement were all brokered through UN institutions.
- The UN's World Health Organization (WHO) has spearheaded many important global health initiatives, including its worldwide vaccination campaign against smallpox which resulted in that deadly disease being eradicated by 1980.
- The United Nation's role in protecting children (UNICEF) has saved the lives of 90 million children since 1990.
- The United Nation's work on Sustainable Development Goals and its earlier Millennium Development Goals provides an accessible blueprint for all those involved in development to follow.

262 Statistical tests

	Rank	d	d ²
Krakatoa	2.5	0.5	0.25
Unzen	2.5	15.5	240.25

- 2 Calculation using Spearman's rank formula:
 $1 - ((6 \times 976.5) \div (18^3 - 18))$
 $1 - (5859 \div 5814)$
 $1 - 1.008$
 $= -0.008$ (close to 0 = random, no correlation)

263 Mass balance and GIS

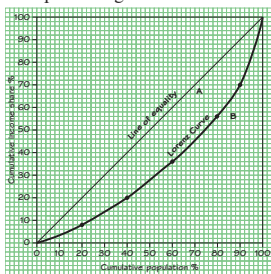
- 1 (a) Martial Este: $1.163 + -1.108 = +0.055$
 Sarennes: $1.720 + -3.230 = -1.520$
 (b) The glacier closest to equilibrium in 2016 was Martial Este in Argentina, being closest to 0 mass balance with +0.055.
- 2 The Quelccaya ice cap and its glaciers have shrunk between 1988 and 2010. Melting is shown by the number of meltwater lakes that have appeared (8) and the movement of glacier snouts back towards the centre of the ice cap. Barren land has been revealed where the ice has retreated. The amount of snow on the ice cap has reduced, as shown by the decrease in the bright white area and the increase in the darker blue colour.

264 Map analysis: connectivity

- 1 There are long inlets (fjords) on the coast, which cause roads to follow the coastline rather than going straight between settlements; this adds considerable distances to any travelling. There are mountains and high land, which will block modern communication signals. There are large areas of wilderness (e.g. bare rock), which shows that people are isolated and cut off from modern living. Lakes, rivers and ice provide barriers to land transport, causing detours.
- 2 Two likely human obstacles:
- Settlements are small and there is a sparse population, therefore the transmission of ideas, information, finance and other economic activities is limited.
 - Roads are often unpaved, which slows journey times, and there appears to be only one main road, with others reaching 'dead ends' at the edge of the 'moors and heathland'.

265 Lorenz Curve and datasets

- 1 Completed Figure 1:



- 2 Calculation notes: $A + B = 1250$ small squares on graph paper.
 $B = 820.75$ small squares. $A = 429.25$ small squares.
 Formula: $A \div (A + B) = 0.3434$ (Your answer should be close to this.)
 (Note: The World Bank estimate of India Gini coefficient in 2011 was 0.351. For comparison, the World Bank estimate for the UK in the same year was 0.333.)

266 Synoptic chart interpretation

- 1 In Figure 1 the storm centre (depression) is well to the north now (over Scandinavia) and a trailing warm front brought continuous heavy frontal rainfall to northern England, with its intensity increased by orographic uplift (mountains and hills forcing the air upwards, so increasing condensation). There was a lot of runoff and the rivers flooded. Winds were also very strong, as shown by the closeness of the isobars. (Cumbria had a month's rainfall in one day – December 2015.)
- 2 In Figure 2 very warm dry air (tropical continental air mass) has moved from the Mediterranean area to East Anglia, with the high pressure system (1024 mb) (clockwise movement of air around the high pressure system). As well as high temperatures the clear skies brought very sunny conditions and higher evaporation rates; without clouds there was no rainfall. The high pressure over northern central Europe (Germany) blocked depressions from the west, forcing them to move northwards from west to east, and so there was no frontal rainfall in East Anglia. (Central London maximum temperature reached 29.1 °C on 19 April 2018.)

267 Satellite image interpretation

In 2000 the area was still dominated by tropical rainforest but with straight lines representing roads along which there is clearance of forest for smallholdings at right angles. By 2012 all of these clearances had greatly extended, especially around Buritis, where there were hardly any patches of forest remaining. In the direction of Nova Mamoré the deforestation pattern has followed the road from Buritis, but not quite joined (protected area or unsuitable land/soils?). There had been considerable new deforestation to the north-west of this area, along what may be a new road and a new settlement. In 2012 the area was dominated by cleared land. As the patches of cleared forest appear to be relatively small individually, the land-use change is probably due to smallholdings where poorer people in Brazil have cleared patches of forest (slash and burn) to farm to feed themselves (subsistence) and make a living from selling surplus crops.

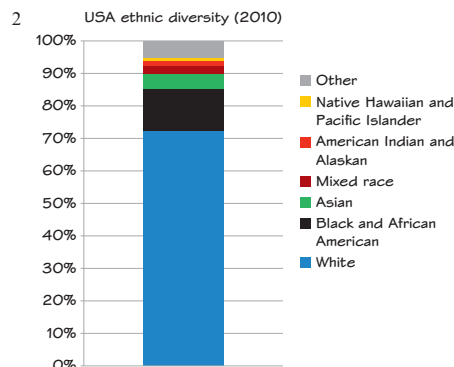
268 Analysing climate model maps

- 1 Figure C shows that most continents and world regions may face water shortages in the future; only northern latitudes of North America and Eurasia, India, East Africa and around Uruguay and Indonesia are significantly wetter. The driest areas are projected to be in the Mediterranean Sea region, from Spain to Turkey (-10), western and central Europe (-5), USA (-4 to -10), Central America (-5 to -7), West Africa (-4 to -6), Amazon Basin and southern Africa (-3 to -6). These areas of water shortages will include developed, emerging and developing countries.
- 2 Figure D shows that there is a projected flood frequency increase in most of Central and South America (except for the northern and southern parts of this region), West and Central Africa, South East Asia including India and China, eastern parts of Asia and a small part of North West Europe (including England and Ireland). North America has a very mixed pattern of decrease and increase in flood frequency, while most of Europe and western Asia is projected to have a decrease in flood frequency.

269 Divided bar graphs

- 1 The UK is dominated by the 'white' ethnic group (over 87%) with small proportions of other ethnic groups, mainly black (3%) who immigrated mostly from the Caribbean, and Indian (2.3%) from South Asia who migrated for better jobs and lifestyle. Thailand has a much larger original population (Thai = 96%) and so has experienced less immigration, the main ethnic minority group is from neighbouring Myanmar (2%) which may be a refugee movement. Kuwait contrasts with the UK and Thailand, the original Kuwaiti population (36%) is outnumbered by immigrant groups, especially the non-Arab Asian ethnic group (38%), with people also from other neighbouring Arab countries (20%). Kuwait also has immigrants from developed countries, such as Europe and Australia.

This mixture of ethnicity in Kuwait is due to the wealth and job opportunities created by oil wealth.



270 Use of proportional circles

- 1 Services (70%) dominated the economic output of the UK in 2016, being nearly 4 times larger than the manufacturing output (19%), and well over 100 times larger than the agricultural output (0.5%).
- 2 Diameter of circle should be 1.9 cm. £9.5 billion divided by 0.5 = 19 mm (or 1.9 cm).

271 Preparing for Paper 3

- 1 No one correct answer. A possible answer could be:
- completing practice questions using resources to get used to the style of questions and making use of several resources in one answer. In addition the benefit of this is the feedback from teachers once marked, to show where improvements in writing style are needed.
- 2 The list could include the following:
- Critically investigate the issue – What is the issue? How serious is it?
 - Coherent interpretation of the evidence – What do the facts tell us? Are the data reliable? How do the data link together? Do the data show agreement?
 - Make meaningful connections to relevant ideas – Are there links between different areas of physical geography? Are there links between different areas of human geography? Are there links between physical and human geography areas?
 - Reach a final judgement and write a conclusion.

272 A: The Nile River Basin 1

- 1 The upper course of both tributaries (White and Blue) are in wetter highland areas, while the middle course is mostly semi-arid (Sahel) and lower course is mostly desert (Sahara). The upper courses have a wet (monsoon) season and a dry season. Water availability is generally higher in the upper courses and decreases downstream, with increasing dependence on the Nile River, especially in Egypt.
- 2 Aswan High Dam in Egypt, and GERD (Grand Ethiopian Renaissance Dam) in Ethiopia. (There are also ones near Khartoum in Sudan, Kampala in Uganda, and Lake Tana in Ethiopia.)
- 3 This is a transboundary river system with parts of the river basin in 11 countries. Most countries only have a small area of upper catchment or headwaters within their boundaries, but what happens upstream is very important to those countries that are downstream, especially Egypt and most of Sudan. So, tensions and conflicts are possible. Locations of urban centres in relation to the Nile and its tributaries and agricultural areas that require irrigation water are important to water supply but also the possibility of pollution. Rates of urbanisation are high in many countries. Dams have been built across the river for HEP, flood control and irrigation water.

273 A: The Nile River Basin 2

The countries with the highest urban population increase, which are also above the means for the world and world regions, are Tanzania, Uganda, Burundi, Ethiopia and DR Congo. These also have the largest overall population growth rates. The smallest urban population growth rates are found in Egypt and Rwanda and overall in Egypt and Eritrea (but both above the MENA and world growth rate).

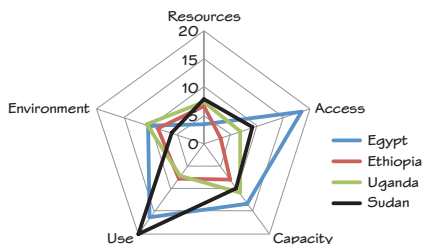
274 A: The Nile River Basin 3

- 1 Reasons may include the following:
- HDI combines economic and social indicators.
 - Egypt has the highest score because it is the most economically developed and most globalised of the Nile River Basin countries and close to the MENA average.
 - Kenya is similar, being more economically advanced and 'free' than other sub-Saharan countries and with a relatively high globalisation index.

- In contrast Burundi and South Sudan are low on the HDI scale because of lower economic development and also lower literacy and higher mortality rates due to poorer living conditions, well below the sub-Saharan average; they both score poorly on the freedom index.
- 2 All HDI scores are below the world and MENA averages and only four countries (e.g. Egypt) have a globalisation score of over 50.
Two explanations from:
- Some countries have a low Human Development Index score (e.g. Burundi about 0.41), which shows that economic and social development needs improvement; only Egypt has a higher score.
 - Eight of the 11 countries are rated 'not free' on the Freedom Index, showing that greater democracy and freedom of speech is needed in the region.
 - Some countries are not connected well to global systems (such as Eritrea and South Sudan) and they need this if they are to improve their economic positions and have money to spend on improving living conditions.
 - Only one country, DR Congo, has freshwater resources above the world average; others are well below (and below the sub-Saharan average) so people's quality of life will suffer from a lack of this essential resource.

275 A: The Nile River Basin 4

- 1 Overall Egypt, in the lower course of the River Nile, is the country that is 'better off' for water, although it has fewer water resources because it is mostly desert and relies on the Nile for its water supply. Access is high because Egypt built the Aswan High Dam to regulate the river's discharge. Ethiopia and Uganda are in the upper course of the river and both score lowly on the five indicators, partly because there is a dry season and a lot of poverty, which means that people and governments have trouble managing water supplies. (Sudan is mostly in the middle course and is desert or semi-arid, and so is also reliant on Nile water resources. It is a poorer country and so has problems with access and managing the riparian environment. Use is high due to irrigated farmland, similar to Egypt.)
- 2 The data for Sudan should appear as follows:



- 3 Figure 8 shows 71% of the world population has access to safely managed water that is clean and available when needed. A further 17% have access to water that is an improved supply but is not guaranteed to be safe to drink. Some 12% of the world population have problems with access, either because people have to make long journeys to go and collect it or it is unclear or taken straight from rivers without treatment.

276 B: Change in the Nile River Basin 1

Evaporation is likely to increase from open water surfaces and the soil due to higher temperatures. Precipitation patterns are uncertain, but dry areas could get drier and wet areas wetter. Runoff may increase during the wet season due to more intense rainfall, which quickly saturates the ground or due to the hard-baked surface of semi-arid areas (25% higher on Blue Nile). Evapotranspiration from vegetation will increase due to higher temperatures.

277 B: Change in the Nile River Basin 2

- 1 As the population size of an area increases, more resources are needed to support it, and an essential resource is freshwater. Demands for clean drinking water, water for washing and for services such as a sanitation system all increase as each person needs a certain amount. So a larger population size may lead to water insecurity because there may not be enough supplies of water for everyone and some will go without clean water or have enough for other purposes.
- 2 The Nile delta has a dense population and fertile farmland and the land is only just above sea level, so, as sea levels rise, the risk of coastal flooding

greatly increases and large areas of land could be lost without the construction of defences. With higher sea levels salt water will penetrate further up the distributaries in the delta and into groundwater, contaminating freshwater and groundwater used by people and farmers.

278 C: Global connections 1

- 1 Students complete the table as follows:

South Sudan	-13.8	11	1.01	7	4	16
Eritrea	8.7	2	0.04	11	9	81

- 2 In Spearman's rank correlation analysis the answer is a number and may show a positive or negative correlation (or no correlation). Geographers usually use the 95% confidence level (95% certain that it is not a chance result) as the world is a very complex place and there are always anomalies that introduce chance into the calculation. The significance of an answer is judged in relation to the null hypothesis (H_0 = there is no correlation), can it be rejected and the alternative hypothesis (H_1) accepted? Tables of significance based on sample size (number of items) show the level at which the null hypothesis can be rejected.
- 3 $r_s = 1 - \frac{6 \times 156}{11^3 - 11}$
 $= 1 - \frac{936}{1320}$
 $= 1 - 0.709$
 $= +0.291$ (not significant)

279 C: Global connections 2

- 1 The Nile River Basin countries are mostly (eight) in the top-left quadrant, which means that they have high vulnerability and low readiness to combat climate change. Rwanda has high vulnerability to climate change but is mostly ready. Egypt has lower vulnerability (just) but needs to do more to be ready for climate change.
- 2 (a) Sudan (b) Rwanda

280 C: Global connections 3

- 1 There was a greater amount of US ODA to Egypt (2.3%), Ethiopia and Kenya, and least amount to Burundi, Eritrea and Sudan. This is partly linked to geopolitical motives, with support for Egypt to keep an ally in the Middle East (and help keep the Suez Canal open to international shipping), and support for Ethiopia to combat China's influence. Burundi and Eritrea (0.2%) are smaller inland countries and are rated as 'not free' on the 2018 Freedom Index (however, Egypt and South Sudan are also in this category). South Sudan is a new country and so needs help developing, and has internal conflict and humanitarian issues, but so does DR Congo. There is no clear single reason for the pattern of US ODA.
- 2 China's aid through projects is mostly to developing countries, especially to sub-Saharan Africa, Pakistan and Argentina in South America, and some to economically emerging countries such as India, Russia and Brazil. These projects are designed to expand China's geopolitical influence around the world, especially through lots of smaller projects in Africa – the largest being about \$5 billion. China is also trying to build alliances with neighbouring countries such as Russia (largest financial size of \$15 billion and over \$20 billion), SE Asia, Pakistan, and along the new 'silk road' route from western China across Asia. Other ideas such as helping countries to develop economically and socially (health and education) could also be suggested rather than just the geopolitical reasons (although these are perhaps the strongest).

281 C: Global connections 4

No one correct answer; one possibility is:

- benefit = provision of freshwater in an area with uncertain precipitation and growing population, because without this more people would die
- problem = these dams are hugely expensive and as developing countries they are difficult to afford, putting the countries at risk of international debt or dependence on richer countries for support.

282 D: Future challenges 1

- 1 Of the 11 Nile River Basin countries, seven are in the very high risk for both droughts and floods, for example Sudan is rated 7/10 for drought and 7.6/10 for floods. Some are much higher in one category than the other, for example DR Congo rates 7.4 for floods but only 2 for drought. The other four countries are in the high-risk category, clustered close together, so have a similar rating for both floods and drought (e.g. Uganda).

- 2 Risks are higher in the future for all countries as conflicts are predicted to increase. This is because there are tensions over water supplies within and between countries, pressures from climate change are reducing natural resources and crop yields, and there are continuing ethnic tensions within countries such as South Sudan and DR Congo.
Other factors include lack of democracy within countries and terrorism.

283 D: Future challenges 2

There are more water resources in the upper basin than lower due to higher precipitation (highlands and wet season) and large lakes compared to the lower basin, which is dependent on the River Nile (flowing through an arid and semi-arid area). However, the demand for water is increasing everywhere due to industrialisation and urbanisation, as well as population increase. Figure 21 clearly shows that the water stress caused by these pressures, availability and use is higher on the Blue Nile than the White. (This has created some geopolitical instability between Egypt and upstream countries such as Ethiopia.) Tanzania and Kenya are exceptions on the White Nile, but most of the area of these countries is not in the Nile River Basin and so water stress may be due to factors outside the basin.

289 Exam practice 1

- 1 **Either:** (human geography reason): Egypt will be concerned about its water security because it is in the lower course of the River Nile with 10 countries upstream, such as Ethiopia and Uganda, that could control the flow of water to Egypt. This concern may increase as the countries upstream experience economic development and/or population increase, as then their demand will increase. Countries upstream already have some dams on the tributaries, which could hold back water if those countries experience shortages and if more dams are built the situation gets worse for Egypt.
Or: (physical geography reason): Egypt is totally within the Sahara desert so the only freshwater supply for the country is the River Nile. Egypt has already created a reservoir behind the Aswan High Dam to help provide a constant supply downstream to big cities such as Cairo, the capital. Rainfall is low because the country is under the descending part of the northern hemisphere Hadley Cell and moisture from the air has fallen near the equator (at the ITCZ), and then the air has warmed as it descends near the Tropic of Cancer, so holding any moisture still in it, leading to no precipitation. Egypt will therefore always be concerned about its water security, as the only input to the country is the runoff of the River Nile.
- 2 Figure 2 shows that there is a very high population density around Lake Victoria in Uganda, Kenya and Rwanda and Lake Tana in Ethiopia, where there is a plentiful supply of freshwater and a more equitable climate. There is a denser patch around Khartoum at the confluence of the White and Blue Niles, perhaps because of trade routes converging as well as water supply in a semi-arid area. Population is also dense along the River Nile in Egypt because the rest of the country is desert and so is not hospitable (e.g. no agriculture and food, no water). It is very dense near the mouth of the Nile, where the delta provides fertile soils and there is access to the Mediterranean Sea for trading. The Sahel zone, which experiences frequent droughts, also has fewer people (fewer than 10 persons per km²).
- 3 Calculation using Spearman's rank formula:
 $1 - ((6 \times 156) \div (11^3 - 11))$
 $1 - (936 \div 1320)$
 $1 - 0.709 = +0.291$
 Weak positive correlation, not significant so null hypothesis cannot be rejected, i.e. there is no correlation. This is a starting point for a closer geographical analysis of the data. The biggest anomaly is Eritrea, which has a faster GDP annual growth rate than expected when matched to a low amount of ODA; perhaps because it started from a very low base so that even a small improvement is a large percentage. Also, its relations with Ethiopia have improved recently after a war over disputed territory. Ethiopia and Tanzania have a strong positive correlation between GDP growth and amount of ODA received.
- 4 One possible outline is:
 Climate change is affecting physical and human processes in the Nile River Basin. Water cycle processes are being changed, with wetter conditions during the wet season in the highlands of Ethiopia

but drier conditions in the Sahel zone of Sudan. River discharges may therefore alter, though the exact pattern is unknown, but if lower then there will be water stress in the lower course of the river, reducing water supplies for Sudan and Egypt (which could lead to increased tension and actual conflict with countries upstream, such as Ethiopia that is building dams like GERD). People may find that food supplies are reduced as drier conditions increase desertification in the semi-arid areas of the Sahel, and that the amount of irrigation water is reduced along with reduced soil moisture due to higher evaporation rates with higher air temperatures. Environmental refugee movements may be created away from areas that can no longer support people, adding pressure to host areas, which may necessitate increased ODA to the region.

290 Exam practice 2

1 One possible answer structure is:

The pattern of aid given by the USA and China is complex; some countries receive support from them both while other countries have very little ODA from one. An example of a country supported by both is Ethiopia, which has multiple projects supported by China, some over \$5 billion, and 2.1% of the USA's ODA budget in 2016. Kenya, Uganda and Tanzania are also well supported by both. Egypt has little support from China but the largest amount from the USA (2.3%) of the Nile River Basin countries; similarly, South Sudan has three small projects supported by China but gets 1.4% of the USA's ODA budget. China supports many infrastructure projects but these are not the only type of assistance that countries need; for example, South Sudan faces humanitarian issues linked to civil war. Egypt has a key position as it controls the Suez Canal, an important international waterway and pathway for resources and cargo, and the USA and its allies wish to maintain good geopolitical relations with Egypt.

Part of the support for the same country may be due to competing geopolitical influences so that one superpower does not gain too strong an influence.

2 One possible outline is:

- Introduction: Human factors such as population growth, economic development and increasing wealth have changed views of the water resource in the Nile River Basin. There is an increased demand for it and for HEP to create electricity to support economic advances and improve quality of life. Water stress and geopolitical tension are two major issues. Climate change is also changing the pattern of water availability and so is also becoming a strong influence on water issues.
- Paragraphs: While Egypt has dominated water agreements in the past, due to its geopolitical power and backing by superpowers, economic development in other countries and ODA from China is changing the balance of power; Nile waters are transboundary – crossing international political borders; population increase and linked urbanisation have increased water demand; economic development has increased water and energy demands; increased wealth of people is increasing water demand – one way is through demands for food, which is increasing use of water for irrigation; however, physical processes are changing due to enhanced global warming so human activities are also changing the physical processes of the water cycle.

3 One possible outline is:

- Introduction: Water security is a very serious threat to the stability of Nile River Basin countries because it causes instability within countries, and internationally through transboundary water tensions and competing superpower interests.
- Paragraphs: Water stress is increasing, especially in the Sahel zone, due to climate change and human factors such as population growth, so the balance of water supply is changing; demands in

upstream countries are causing tensions within countries such as Ethiopia, where the government is pushing ahead with large dams to create electricity for economic growth but displacing people and damaging the natural environment; Ethiopia started building GERD without fully consulting downstream countries and created fresh tensions with Egypt (the Nile River Basin's most powerful country); urban areas downstream such as Khartoum and Cairo may have reduced water supply causing social problems within them, with poor people having restricted access to clean water; geopolitical tensions between Egypt, which benefited from the 1959 water agreement, and upstream countries because of changes in agreement wanted by upstream countries (e.g. 1999); population growth, industrialisation, urbanisation, increasing standards of living and climate change are increasing water insecurity, which cause tension and conflict when water supplies are insufficient to meet needs, and this may cause a Malthusian scenario of population reductions due to lack of water or fighting; therefore future conflict risk for all countries is very high.

- Conclusion: Water security is the most serious threat to the social and political stability of the Nile River Basin countries because of growing populations within countries, climate change threats and the transboundary nature of water supplies, and because there are few other issues within or between countries. However, some human rights are also serious issues, as several of the countries are not free (e.g. Sudan, Eritrea), and civil war exists in South Sudan. The threat to economic security is not clear, as further economic development has yet to take place, so the demand for HEP, which may affect water security in the lower course, is not yet known – although Ethiopia has newly constructed GERD.