

Examiners' report

A LEVEL

GEOGRAPHY

OCR Level 3 Advanced GCE in Geography

H481

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Introduction

Our examiners' reports are produced to offer constructive feedback on candidates' performance in the examinations. They provide useful guidance for future candidates.

The reports will include a general commentary on candidates' performance, identify technical aspects examined in the questions and highlight good performance and where performance could be improved. A selection of candidate responses is also provided. The reports will also explain aspects which caused difficulty and why the difficulties arose, whether through a lack of knowledge, poor examination technique, or any other identifiable and explainable reason.

Where overall performance on a question/question part was considered good, with no particular areas to highlight, these questions have not been included in the report.

A full copy of the question paper and the mark scheme can be downloaded from [Teach Cambridge](#).

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Paper 3 series overview

Among the candidate scripts, the majority presented clear evidence of a worthwhile engagement with the course. Knowledge and understanding of geographical patterns and processes that are the focus of the Specification were both strengthened and extended during the teaching and learning experienced by candidates.

One disappointing trend observed quite strongly in this series was the tendency of some to rely on pre-learned case study material that was offered wholesale and without reflection as to its purpose in the context of the question. Candidates in general are reluctant to deploy diagrams to convey knowledge and understanding, many responses would be aided by the inclusion of a briefly annotated diagram.

The use of abbreviations is acceptable when these are conventionally accepted ones such as UK, USA, UN, GDP, GHGs, CO₂ for example. Some candidates invent their own which are not acceptable, such as LWR (long wave radiation), CD (communicable disease) or MSH (Mount St Helens).

Once again it has been the case that assessors have encountered too many scripts where legibility is an issue. The result is that individual words and phrases cannot be read and so both fluency of argument and detail can be missed.

Candidates who did well on this paper generally:	Candidates who did less well on this paper generally:
- applied their knowledge and understanding selectively to answer the question explicitly - offered appropriate real world exemplification, both historic as well as contemporary - used selectively, case study material directly targeted the question - offered supporting quantification such as indicators of economic status (Gross National Income per person).	- tended to write in ways that paid insufficient attention to the actual wording of the question - omitted real world exemplification - tended to use a question as a chance to 'write all I can remember' about a case study - did not back up statements with factual detail such as average temperature of a pyroclastic flow or population density - tended to rewrite the question so as to justify the inclusion of material they had memorised.

Assessment for learning



Across the five Options and mainly a feature of Section C but also relevant to Section B, was an absence of quantitative support for points made in candidates' discussions. Examples of data that would help secure a response by giving it authority would include population densities, economic status, e.g. Gross National Income (GNI) or CO₂ parts per million.

This is not a request for candidates to undertake rote learning of facts and figures but for them to consider the support their arguments could benefit from by the deployment of some well-chosen and up to date data.

Section A overview

Candidates are faced with two sub-parts in each Option in Section A. Sub-part (a) is an AO3, skills test asking for appreciation of the limitations of a resource. Sub-part (b) asks for an explanation of some element in the Option.

Most candidates are able to identify at least two if not three limitations. The most effective approach and one that aids a candidate, is the use of three bullet points so that there is no muddling of the respective limitations. In terms of approach the more secure route is to assess both the reliability and accuracy of the resource, something candidates should be familiar with from their own NEA.

In the second sub-parts, it is the clarity of explanation that determines the mark's level. A candidate that has secure knowledge and understanding of for example, the global mean energy balance or the scales used to measure earthquake magnitude is well placed to answer *concisely* and *precisely*. The correct use of technical terms such as flow resources or globalisation is a significant advantage when responding to sub-part (b) questions.

Question 1 (a)

Topic 3.1 – Climate Change

1

(a) Identify **three** limitations of **Fig. 1** as a source of information about responses to climate change. [3]

Most candidates managed two or three limitations of the word cloud. The ambiguity of phrases such as 'Kyoto units' or 'green reduction' was not lost on candidates, neither was the lack of clarity as to variations in size of words/phrases. Given that all candidates will have studied in Component 2 Human interactions, the limitations that informal representations have, it was surprising that more candidates did not mention that the word cloud was a qualitative source of information.

Question 1 (b)

(b) Explain how humans influence the global mean energy balance. [6]

A key indication of the quality of a response was the knowledge and understanding of the global mean energy balance. The more convincing responses conveyed their understanding that the Earth's atmosphere system is a closed system and that it is human activities that are causing the long term balance in that system to become unbalanced. Influences such as increasing concentrations of greenhouse gases from activities such as burning of fossil fuels were quoted by the majority. It was encouraging to read explanations that linked the increase in global temperatures to higher rates of evaporation of water thereby increasing the concentrations of water vapour which is one of the greenhouse gases. Particularly pleasing were the answers from candidates who identified this as an example of positive feedback and thus was leading to further dis-equilibrium. Credit worthy comments referring to land-use change such as deforestation and the impact on albedos were less frequently read.

Misconception

Water vapour is the primary GHG in the Earth's atmosphere and its contribution to the natural greenhouse effect is some two to three times that of CO₂. It is true that additional water vapour from anthropogenic activities (crop irrigation; power and industrial plant cooling; fossil fuel combustion) is injected into the atmosphere. However, water vapour behaves differently from CO₂ in one fundamental way: it can condense and precipitate. The typical residence time of water vapour in the atmosphere is about ten days. The flux of water vapour into the atmosphere from anthropogenic sources is much less than from 'natural' evaporation and so does not contribute significantly to the long-term greenhouse effect.

It is the case that as atmospheric temperatures increase, the air's ability to hold water as vapour increases. This amplifies the greenhouse effect and so leads to more warming, an example of positive feedback. So, the increase in atmospheric concentrations of water vapour is the result of the increased emissions of other GHGs such as CO₂, methane CH₄ and nitrous oxide N₂O. Water vapour is not a significant forcing element in itself but relies on the emissions of other gases which can clearly be linked directly to human activities.

Question 2 (a)**Topic 3.2 – Disease Dilemmas****2**

(a) Identify **three** limitations of **Fig. 2** as a source of information about alcohol-related deaths. **[3]**

Limitations of the graph presenting data of alcohol-related deaths were mostly appropriate. Candidates picked up on points such as the relatively short period of time covered by the data, the masking of regional variations and the inclusion of a relatively small spatial coverage that is just England and Scotland. Presentational limitations were also identified such as the independent variable (year) being on the y axis and the imprecision in reading the number of deaths from the scale on the x axis. Many picked up the very valid point that the phrase 'alcohol-related' hid more than it revealed with regards to actual cause of death.

Question 2 (b)

(b) Explain how physical barriers affect dealing with disease.

[6]

Physical barriers were well known and understood by most candidates with most focused on the negative impacts when dealing with disease. Mountain ranges, deserts, seas and oceans and vast expanses of forest were seen as presenting great difficulties for medical aid to enter and cross in order to deal with both routine health care as well as emergencies such as an outbreak of a communicable disease.

A good number split their response adding comments about the positive impacts of physical barriers in preventing disease. Remoteness defined in a variety of ways was seen as protecting a population and in this context, it was good to read responses that referred to types of diffusion that would be restricted by remoteness such as contagious and expansion.

There were a significant number of candidates who interpreted 'barriers' as 'factors' and while some factors are also barriers, that is not always the case.

Question 3 (a)

Topic 3.3 – Exploring Oceans

3

(a) Identify **three** limitations of **Fig. 3** as a source of information about piracy.

[3]

The use of a photograph was recognised by a clear majority as a limitation of an informal representation. Who took the image, when, where and for what purpose were questions frequently asked. Perhaps the three individuals are actually part of an anti-piracy patrol was another suggestion made by several. It was an interesting development to read about the possible role of AI in generating the image.

Question 3 (b)

(b) Explain how wave and tidal energy can be used as flow resources.

[6]

A number of candidates were unsure about the meaning of flow resources. This term is explicitly highlighted in the Specification and textbook and so should be known and understood by candidates. Those who were secure in their responses wrote about tidal barrages using the movement of water via tides to turn turbines to generate power. Only the upper quartile managed to write effectively about wave energy referring to the rise and fall of water in a passing wave being used to compress air or a fluid to drive a generator.

Question 4 (a)

Topic 3.4 – Future of Food

4

(a) Identify **three** limitations of **Fig. 4** as a source of information about soil moisture.

[3]

Frequently mentioned limitations were the absence of a linear scale, the imprecision of terms such as very high and low in the context of surface water and the ambiguity of some of the colouring. A thoughtful point raised by a few was that the time of year the image was created is important in relation to wet and dry seasons.

Question 4 (b)

(b) Explain how the globalisation of the food industry creates opportunities.

[6]

Responses to this question tended to focus on the increase in consumer choice, both in terms of availability out of season (strawberries at Christmas in the UK) and a wider variety of food available (sweet potatoes and mangos). Writing about this trend would have benefitted in most cases by explicit reference to those who do gain, the ACs. Opportunities for growers in EDCs and LDCs in terms of exports to ACs was mentioned by many, with the more convincing answers offering real world exemplification such as banana producers in the Caribbean and coffee growers in a variety of locations. The term in the question 'food industry' allowed inclusion of more than just growers and a few candidates picked up on the opportunities for technology including biotechnology to enhance food production.

Question 5 (a)

Topic 3.5 – Hazardous Earth

5

(a) Identify **three** limitations of **Fig. 5** as a source of information about the relationship between disaster and response.

[3]

The widely used Park model was subject to examination as regards its limitations with most candidates able to offer at least two valid points. Comments about the generalised nature of the time periods (several years), the vague nature of the term 'quality of life' and the need to know what the three lines labelled, A, B and C refer to were frequently read by assessors. It was encouraging to read candidates' appreciation of the importance of knowing the type of hazard event (e.g. duration, severity) and the significance of what degree of preparation had been in place as this varied greatly from one place to another.

Question 5 (b)

(b) Explain the different scales used to measure earthquake magnitude.

[6]

The Specification makes mention of three measures of assessing earthquake magnitude, Richter, moment magnitude (Mw) and modified Mercalli intensity scale. Among the top quartile, assessors were impressed to read authoritative explanations of these three that included secure technical knowledge and understanding. This include the appreciation that there is no theoretical upper limit to Richter, that it was devised in the spatial context of Southern California and that it is not used to express damage. The qualitative nature of the modified Mercalli scale was recognised and also its value in representing the impacts as expressed by people living through the seismic activity. The Mw scale was widely known with an encouraging appreciation of its upgrade on Richter via the inclusion of factors such as geological properties of the location, the area of the fault surface and the amount of movement on the fault.

Key point call out – technical terms

It is of great value to a candidate to be secure in their knowledge and understanding of technical terms. In the context of the Hazardous Earth option and seismic activity in particular, the three principal measures of earthquake energy and its impacts on people and places are explicitly mentioned in the specification and so should be part of the study of this topic.

Section B overview

Responses in this Section need to focus on the links between an aspect of one of the five Options in Geographical Debates and an element taken from one of the compulsory parts of the Specification in either Component 01 (Physical Systems) or Component 02 (Human Interactions). Because of the need to bring together these elements and as responses here take an extended prose form, candidates are well advised to plan their approach before starting their discussion.

Question 6

Topic 3.1 – Climate Change

- 6** Examine how the formation of landforms within **one** landscape system you have studied can be modified by climate change (coastal, glaciated or dryland). **[12]**

The explicit inclusion of the three categories of landscape system in the question helped focus candidates on appropriate material. Most candidates were, therefore, making clear links between climate change and their chosen landscape system. The greater the links made between climate change and processes occurring within a landscape system, the more convincing the response. For example, authoritative responses drew attention to current climate change bringing about global warming that in turn is leading to the thermal expansion of water and so eustatic change is occurring. Additionally, these candidates linked together, climate change, global warming, the accelerated melting of land-based ice and subsequent rise in sea level. With higher sea level, marine processes are able to reach higher sections of cliffs and beaches leading to enhanced erosion and transport of sediment. Candidates then linked these changes to modifications such as development of overhangs on cliffs, cliff collapse and retreat, formation of arches, stacks and stumps, and enhanced movements of sediment affecting beach profiles and landforms such as off-shore bars and spits.

Impacts on glaciated landscapes were also linked with global warming with the point made that higher temperatures lead to more meltwater. This can seep to a glacier's base and increase ice velocity through lubrication between ice and valley floor. Increased volumes of meltwater were also linked with sediment transport and the resulting modifications possible such as impacts on glacio-fluvial landforms such as outwash plains, eskers and kames. There were many candidates who wrote securely about modifications likely in periglacial environments. These responses frequently drew attention to the thawing of permafrost, the expansion of the active layer, the impacts on solifluction and modifications to pingos. Comments about freeze-thaw action were at their more effective when linked with a location. For example, freeze-thaw cycles are likely to become less frequent in mid-latitude regions such as the UK whereas in the higher latitudes they are likely to become more common.

Question 7

Topic 3.2 – Disease Dilemmas

- 7 Examine how the eradication of disease can be affected by issues of **either** human rights **or** territorial integrity. [12]

Assessors were pleased to read many accounts of the impacts of issues of either human rights or territorial integrity on disease eradication that were well informed of contemporary examples. It is a credit to candidates that they were authoritative and sensitive in their handling of material based on situations in locations such as Gaza, South Sudan, Afghanistan and Myanmar.

Candidates drew attention to the negative impacts on health care that a lack of human rights or territorial integrity can have on people. Issues such as the absence of medical facilities including supplies, interruptions to health care programmes such as vaccinations and disruption to availability of food and clean water were discussed. Gender and sexuality as factors leading to inequalities in access to medical care were frequently mentioned and many candidates then made the valid point that this usually also meant that infants and babies were adversely affected along with their mothers.

Assessment for learning



When considering the issue of human rights, it is important that candidates are cautious when allocating a certain perspective to an entire country. For example, too often statements were made stating that access to medical care by females in India was restricted, treating this vast country as homogenous in its attitudes towards female health. While it is the case that gender is a major determinant of health, access to health care for females in India is far from a uniform matter. Socio-economic status, urban or rural dwelling and contrasting situations among the states account for a heterogeneous pattern. Candidates studying this specialist Option should be encouraged to research topics such as inequalities in health care in detail.

Question 8

Topic 3.3 – Exploring Oceans

- 8 Examine how pollution in the ocean can be affected by **either** global trade **or** global migration. [12]

Pollution rightly received a wide interpretation with a wide variety of sources of pollutants being accepted. Candidates drew attention to emissions from the engines of vessels such as CO₂ which can then be absorbed by the oceans and lead to an increase in acidification of ocean water. Spillages of contaminants such as fuel oil and the loss of cargo were frequently mentioned including the amusing and informative loss of plastic ducks. In connection with the former type of pollution, some candidates took this question as the opportunity to offer extended accounts of one particular pollution episode such as the Deepwater Horizon disaster. These were not always successful as the candidate's writing did not have a sharp focus on the question. Comments about the mass of materials such as plastics, timber, textiles and fishing gear were appropriate with such debris originating from both global trade and migration. In the latter's case, the debris caused as a consequence of the flows of migrants such as asylum seekers in the Mediterranean and Channel was identified as a source of pollution.

Question 9

Topic 3.4 – Future of Food

9 Examine how food production can affect informal representations of place. **[12]**

Too often the focus of a discussion was on food retailing not food production with candidates writing about the arrival and impacts of fast food outlets and large supermarkets on places. The second area of concern for assessors was the absence of named informal representations of place. Although informal representations of place is explicitly mentioned in the Human interactions topic Changing Spaces; Making Places, candidates did not draw on their studies to help answer this question. Very few offered convincing accounts of contrasting media such as TV, film, music, art, literature, blogs representing food production in places such as the Lake District, the Prairies or rice production in South East Asia. There is no shortage of appropriate informal representations for candidates to consider in the contexts of the Human Interaction component and Future of Food topic.

Question 10

Topic 3.5 – Hazardous Earth

10 Examine how volcanic eruptions can affect stores in the carbon cycle. **[12]**

Assessors were pleased to read many secure and detailed examinations of how volcanic eruptions affect stores in the carbon cycle. One distinguishing element of the upper quartile was the confidence with which they included both the fast and slow carbon cycles in their responses. These candidates identified the subduction of carbon-rich sedimentary rocks into the upper mantle at tectonic plate boundaries where they are melted and vented to the atmosphere during volcanic eruptions. This effects a transfer of carbon from the slow to the fast cycle. For most candidates however, this linkage was not made as they simply saw volcanic eruptions as emitting CO₂ into the atmosphere and did not mention the transfer from one store to another. Many candidates did not mention CO₂ but focused on SO₂ emissions and the subsequent production of acid rain. There was some merit in mentioning this if they went on to link the acid rain to enhanced chemical weathering of carbonate rocks at the surface releasing carbon from the long term store and into the atmosphere and also dissolved in water into rivers and the oceans; very few managed this linkage.

Many candidates identified the release of carbon from biological storage when volcanic eruptions involved pyroclastic flows and or lava flows. The destruction of vegetation resulted in a short term shift in carbon stores until the weathering of the volcanic materials allowed plant regrowth and the storage of carbon in these organisms. A good number of candidates additionally mentioned that with a very large scale eruption (Mt Pinatubo) or a super-volcano (Taupo), vast volumes of ash were injected into the atmosphere that caused global cooling thereby reducing photosynthesis and stunting plant growth.

Exemplar 1

10	Volcanic explosive volcanic eruptions can affect the atmospheric store. When volcanoes erupt, they release a significant amount of CO₂ into the atmosphere, increasing the atmospheric store of carbon. For example, Mt. Pinatubo. Ash is released from eruptions, this can reflect solar radiation cooling the climate, for example Mt. Pinatubo cooled the climate by 0.5°C. This will slow the exchange of carbon between stores, increasing the amount of carbon held held within stores for a longer period of time. Ash cover will harm the growth of plants or even destroy them, for example 130km² of crop land was destroyed by ash at Merapi, this reduces the biospheric store and will increase the atmospheric store as plants burn. Lava flows will also influence the cryospheric store. For example, in Iceland the lava flows caused glaciers to melt. This will release carbon as glaciers hold a large amount of carbon, therefore increasing the atmospheric store of carbon.
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This response offers much that is encouraging, it directly discusses the release of CO₂ during volcanic eruptions, the production of ash and its link to the exchange of carbon between stores such as the atmosphere and plants and the destruction of vegetation directly from lava flows for example. A little more detail, such as reference to the slow and fast carbon cycles which are fundamental to this question, would raise the quality of the response even higher.

Section C overview

Assessors read many responses from across all five Options that were quite simply 'excellent'. Candidates wrote with fluency, authority and conviction to provide comprehensive application of their secure knowledge and understanding so that a detailed and substantiated evaluation of the matter under discussion was evident.

There were those whose essays were not of this very high standard but who nevertheless offered some thorough or reasonable knowledge and understanding and application to the question set. It is encouraging to read responses that indicate a moving on from GCSE and a developing appreciation of the geography of the topics covered.

It was good to see many scripts with a plan at the start of an essay response as exemplified below. However simple, such a device can really aid a candidate gather their thoughts, organise them into a logical structure and act as an aide memoire during the writing of a response so that nothing is omitted.

Question 11*

Topic 3.1 – Climate Change

11* 'Climate modelling is essential for an effective human response to climate change.'
Discuss.

[33]

This question draws on material encountered when candidates considered what is required for humans to respond to the impacts of climate change. It was encouraging to read discussions that included thoughtful comment about the nature of models. The awareness that models are, by their very nature, simplifications of the complexities existing in the real world is an important first step in appraising their value. Most candidates recognised that the essence of the long term dynamism of the Earth's climate is known and understood and that the forcings behind such fluctuations are natural. Candidates were able to acknowledge that the greenhouse effect is a natural process and is crucial to maintaining a suitable temperature for life was reassuring for assessors.

The more convincing arguments then turned to modelling itself. Fundamental to climate modelling is knowledge and understanding of the carbon cycle both slow and fast. For candidates appreciation of this starting point is supported by their engagement with Topic 1.2 Earth's Life Support Systems in the Physical Systems component of the Specification. Only a small minority of candidates wrote convincingly about these cycles and about the significance of positive and negative feedback mechanisms influencing carbon flows among stores. Most candidates however, made valid points about the need to know what was occurring to, for example sea level or rainfall patterns, in order to respond effectively. It was encouraging to read evaluations that considered the issues that LIDCs such as Bangladesh face. These responses recognised the importance of modelling to aid planning of adaptations such as flood defences, but acknowledged the scarcity of resources to invest in modelling research as well as to implement adaptations.

Some candidates lost a sharp focus on the question when they strayed into detailed descriptions of adaptation strategies making no reference to the basis on which these strategies were developed. They had planned for a different question to be set.

Question 12*

12* To what extent do different agendas shape the debates of climate change over time?

[33]

The top quartile of candidates analysing and evaluating this topic did so with an appreciation of the diversity of perspectives on the nature and causes of climate change and global warming in particular. They were well informed about different political and economic approaches to the topic and how these have evolved through time. It was encouraging that a good number of candidates were aware of the scientific advances made during the nineteenth century that led to the discovery of the greenhouse effect but that concerns about climate change outside of the natural fluctuations emerged many decades later. Candidates were comfortable when discussing different agendas of recent times, especially in the context of recent political events such as the re-election of Donald Trump to the Presidency of the USA and the rise of increasing opposition to strategies such as Net Zero in Europe. The role of the media and interest groups was well known by many and their respective views on the causes of global warming were set out in a considered manner by candidates. An area that very few responses included yet would reap considerable reward in adding to this topic is the role that interest groups such as NGOs have. Examples can be found across geographical scales, such as Christian Aid and Oxfam, the National Trust, regional wildlife trusts and local action groups.

Question 13*

Topic 3.2 – Disease Dilemmas

13* Evaluate the advantages and disadvantages of strategies used to respond to disease outbreaks. **[33]**

There were very few candidates who did not have some knowledge and understanding of at least a couple of strategies aimed at dealing with disease outbreaks. The distinguishing feature of the more convincing discussions was a sharp focus on the '...advantages and disadvantages...' of the strategies. This sharp focus was aided by sensible planning, an example of which was to organise the response according to scale of strategy. At the global scale the successful eradication of the acute contagious disease, smallpox, was well known by many. At this scale, the role of a global organisation, the World Health Organisation (WHO) could be identified as pivotal as well as the co-operation of national governments. Given that the last naturally occurring case of smallpox was in Somalia in 1977 and that WHO formally declared the disease 'eradicated' in 1980, analysis and evaluation of the programme of widespread surveillance and immunisation via inoculation needed to focus on the advantages.

Many candidates also used the recent Covid19 pandemic as an example of a global strategy to respond to a disease outbreak. There was considerable variation in the quality of responses using this pandemic. Rather too many needed greater depth and detail in their analysis relying on sweeping statements unsupported by material that is now readily available. The more thoughtful responses tended to deploy figures such as 'excess deaths' in their assessments as to the advantages or disadvantages of different strategies. Greater conviction in a response also came when it recognised that while there was a global strategy towards producing vaccines, individual countries determined the strategies adopted within their boundaries.

Many candidates made effective use of the example of combatting Guinea worm disease to promote the advantages of local, 'grass roots' strategies. However, few offered a comprehensive assessment of strategies aimed at eradicating this disease, as in locations where it is a serious issue, global partners such as the Carter centre, national governments as well as local groups are active in combatting the disease. It is the case that the disease is almost eliminated with just a handful of cases reported in 2024.

Question 14*

14* Assess the relative importance of economic factors in influencing the spread of disease. **[33]**

This question was equally popular as Question 13 in the Disease Dilemmas option and like its partner, drew the full range of quality of response.

Among the upper quartile much use was made of the epidemiological transition in focusing the discussion and in particular, Oman's model. In this context a simple sketch of the graphical form of the model conveyed much knowledge and understanding which could then be expanded upon in a candidate's text.

Candidates were generally secure in their understanding of the transition from times when communicable diseases, especially those that are infectious, were prevalent to ones when non-communicable disease become the primary causes of ill-health and mortality. The role of economic factors in this change was not always well analysed. The links between rising wealth, higher quality diets and housing and improved health were identified but evaluations were less secure in their acknowledgement of the roles played by public health policy, higher building standards and provision of clean water.

The role of education was mentioned by many which is appropriate, especially when linked with the ability of a country to facilitate scientific research and the training of medical staff for example.

Another factor candidates drew attention to in their evaluations were the role of geopolitics in influencing disease spread, with circumstances in locations such as Gaza, Ukraine, South Sudan and Myanmar being highlighted as detrimental to the health of local people.

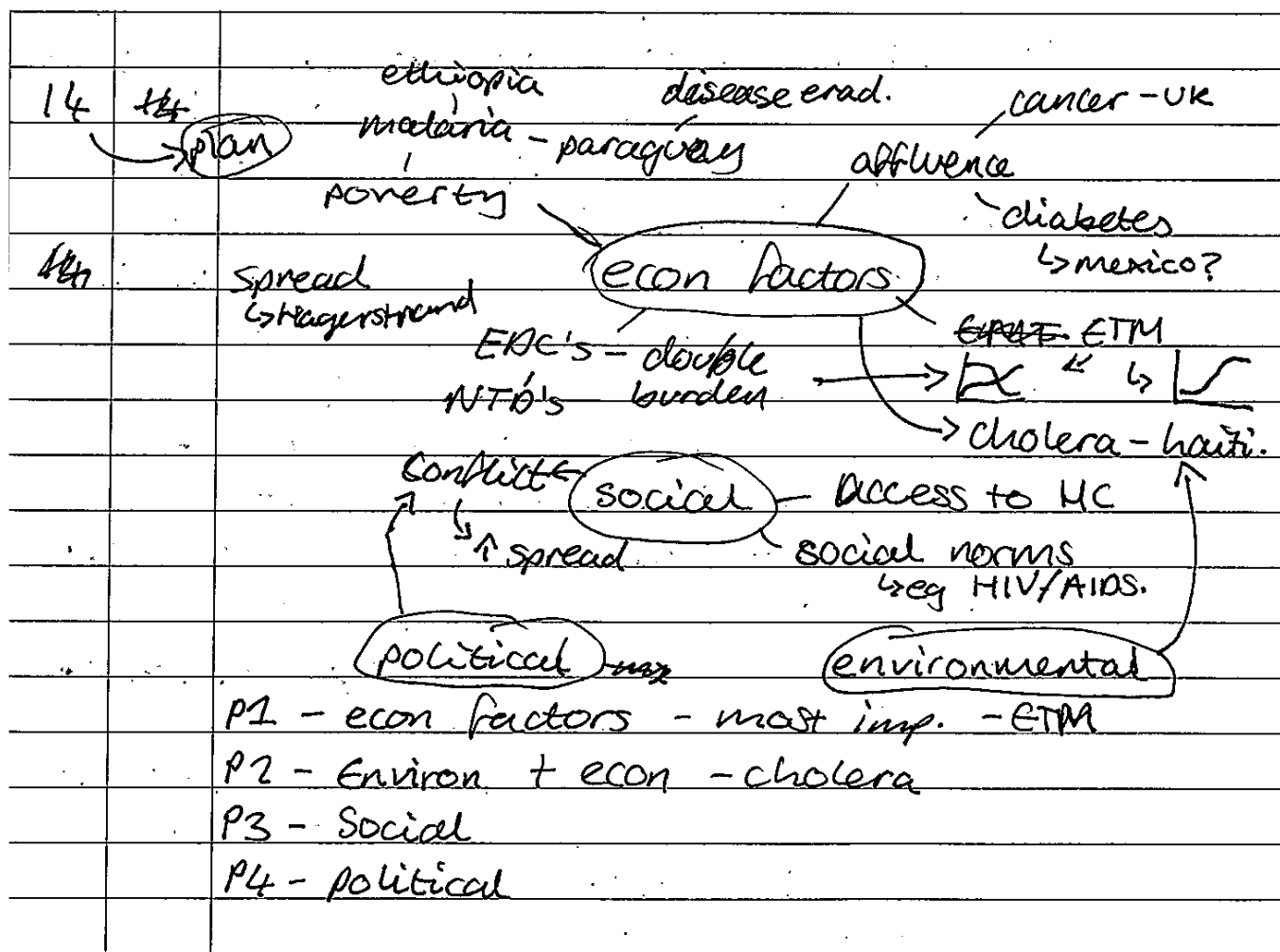
There were many responses that included discussion of the role environmental factors play in disease spread and in particular the concerns over global warming. In this context, the extension of the geographical range of diseases such as malaria and West Nile virus were discussed. Thoughtful analysis came when the economic resources of the areas into which diseases were spreading was considered. For example, the northward's migration of both malaria in southern Europe and West Nile virus into the southern USA was considered threatening to health but the strong economic resourcing of Europe and the USA was seen as countering the worst effects.

Misconception



Assessors were concerned to read too often of statements that held that in many LIDCs the people '...don't understand the risks...'. This was most commonly read in the context of malaria. Candidates are encouraged to be more cautious in their assessments as it tends to be a lack of resources to take actions that would ameliorate the situation. Strategies such as sleeping under insect nets, not having to sleep outside in fields during the harvest or infrastructure enabling surface water to be drained away reducing the availability of stagnant pools of water to mosquitoes are known but unaffordable in locations.

Exemplar 2



The exemplar highlights a candidate's approach to an essay response that is logically structured, focused sharply on the actual question and includes prompts as to real world exemplification. The candidate has identified 'economic factors' directly from the question wording and gives some examples of how economic will be addressed, 'poverty' and 'affluence' for example. The plan also clearly shows the candidate's intent to 'Assess the relative importance of economic factors...' by the inclusion of social, political and environmental factors. The candidate has identified some of the links between factors as shown by the use of arrows in the plan, this is further evidence of analysis and evaluation, the two key elements of successful responses in Section C.

Question 15*

Topic 3.3 – Exploring Oceans

15* Assess the extent to which socio-economic factors influence the use of oceans.

[33]

Candidates answering this question were confident in their handling of the role of oceans in the process of globalisation. They identified the longer and increasingly extensive links across oceans with more people and goods crossing regularly and frequently. It was however, only a small minority who could offer details of the direction and types of trade that criss-cross the oceans and seas. While it is the case that socio-economic factors are fundamental in influencing where, why and how oceans are used, the role of physical geography was hardly mentioned in the evaluations of responses. The presence of the Suez and Panama canals, the restrictions they have on size of vessel, the influence on port location of factors such as water depth, tidal range and degree of shelter were infrequently read by assessors.

The role of technology tended to be relegated to the periphery of a discussion if it was present at all. Containerisation is fundamental to the process of globalisation as is the increase in ability to handle bulk cargoes such as ores and grains, with speed. Increasing vessel size, navigation aids and advances in weather forecasting allow journeys to be made across oceans that were previously either treacherous or simply not feasible.

Where most candidates did evaluate effectively was in discussing the political factors affecting the use of oceans. Candidates were familiar with the contested space that parts of the South China Sea have become and the Arctic that is increasingly becoming a space where countries are rivalling each other in terms of shipping routes and claims to ocean territory.

Question 16*

16* Evaluate the extent to which the use of biological ocean resources will ever be sustainable. **[33]**

Most candidates selecting the Exploring Oceans option chose to tackle this question. So few candidate responses included material on the 'value' of biological ocean resources as provisioning services within the ocean ecosystem. Ideas such as natural capital and natural income can assist in building a framework on which a focused and detailed response can be built. Candidates were perhaps too keen to write down all they could remember about the biological resource that had been studied, which; for the majority was the harvesting of krill in the Southern Ocean. Some of these accounts were impressive in their detail, for example of the participants in the trade and the organisations and measures that seek to regulate krill fishing. What they tended to lack was consideration of how resilient krill populations might be and what impacts climate change could have on krill numbers.

Many responses focused solely on krill harvesting, while it had considerable merit, was somewhat limiting in terms of full analysis and evaluation of the topic. The use of other biological resources offer valuable comparisons, such as whaling and the role of the International Whaling Commission (IWC) and various fish species such as tuna and cod.

An interesting contrasting perspective on the topic of sustainable use of biological marine resources could come from a small scale study of local fishing grounds such as are found around the UK or the now widespread use of fish farms in coastal waters. The development and policing of marine protection areas and no catch locations would offer material helpful to this topic.

Question 17*

Topic 3.4 – Future of Food

17* Assess the extent to which contrasting levels of economic development determine the success of strategies to improve food security. **[33]**

It is encouraging that almost all candidates are confident when addressing the concept of food security as seen in responses to both this and its partner question in the Future of Food Option. The three pillars of food security that are usually recognised, availability, access and utilisation, are almost equally well known with a fourth, stability, frequently included.

Variations in food security at a variety of scales are relevant in the context of this question with most candidates choosing to compare and contrast countries that are at different places along the development continuum. Most read by assessors were the contrasting approaches to ensuring food security of Cuba and the UK.

While level of economic development was addressed too little attention was given to other factors some of which are intimately linked with economic. More intensive analysis and evaluation could have included consideration of factors such as the physical environment, social and political factors. Of relevance are matters such as land ownership systems, the role of agribusinesses in all aspects of food production, transport and retailing and the degree of government involvement either directly or in-directly.

While most responses used the national scale to exemplify their argument, some made the welcome excursion into looking at variations within a country. Here there were some effective discussions of the location and need for food banks in the UK and the USA. Attention was drawn to inner urban areas but also acknowledging that people with limited economic means can be found almost anywhere including in the middle of major food producing places.

Question 18*

18* To what extent is food security of global significance?

[33]

The first paragraph referring to Q17 also applies here.

The geopolitics of food as well as the intimate relationship between food security and environmental change were features of candidates' responses. While these elements are relevant, only rarely did assessors read discursive responses in which candidates gave a sharp focus to analysis and evaluation. Answers were competent at describing issues such as where food security is adversely affected by conflict (Gaza, Syria, South Sudan and Myanmar for example) but the wider regional and global implications of food insecurity were not often forthcoming. The key issue of food distribution rather than scarcity of food was not given the prominence it should.

In similar manner, candidates were well aware of likely consequences of environmental pressures on food security such as from global warming, but tended not to extend the discussion so as to assess 'global significance'. Issues such as salinisation, desertification, pollution of water supplies, deforestation and soil erosion were not linked with factors such as instability of governments, tensions within and among societies and the rising tide of migrants both within and across borders.

Assessment for learning



A wide variety of data exist to measure factors such as food security and level of economic development. There are statistics on global hunger, the Global Hunger Index and the Global Food Security Index for example. Level of economic development can employ Gross Domestic/National Product for example with these stated as per person (capita). A valuable alternative is Gross National Income (GNI) again per person. This index is often available GNI per person ppp, which means purchasing power parity. This indicates the average economic prosperity of a country's inhabitants by factoring in the local cost of goods and services, hence the purchasing power of different currencies (available via the [World Bank](#)). By quoting just a handful of relevant indices for the countries being compared, candidates elevate the quality of their responses by adding the authority that up to date statistics can give.

Question 19*

Topic 3.5 – Hazardous Earth

19* 'Explosive volcanic eruptions generate the most dangerous hazards.'
To what extent is this true?

[33]

This first question of the pair of questions in the Hazardous earth Option was the more popular of the two but not overwhelmingly so.

Assessors were pleased to read, often as part of an introduction, that candidates recognised that the products of eruptions become hazardous when they interact with human communities and activities. The more thoughtful of these comments went further to recognise that even a spatially remote eruption in an uninhabited region can present a hazard. The emission of substantial volumes of ash, for example, can circulate around the globe, impacting agricultural and transport (aircraft) activities.

Candidates were confident and secure in their knowledge and understanding of the nature of explosive and effusive volcanic eruptions and the hazards such events tend to lead to. The upper quartile of responses indicated their authority with details such as the typical speeds and temperatures of pyroclastic flows for example. A minority of candidates were able to use the Volcanic Explosivity Index (VEI) to good effect in terms of clearly understanding how the index is arrived at and thereby of value in assessing the level of danger a particular eruption might pose.

Most of the responses based themselves around appropriately chosen exemplars, among which assessors were pleased to read historic events. The eruptions of Vesuvius (79AD), Tambora (1815), Krakatoa (1883) were well deployed to make valid comments about the highly destructive impacts of explosive eruptions. There was also effective use made of the eruption of Mt St Helens (1980) and in particular the point that even with intensive levels of observation and management, the unexpected can have dramatic impacts, in the case of Mt St Helens, the massive landslide and lateral blast.

There was some convincing analysis and evaluation from those candidates who drew attention to the impacts of effusive eruptions at the local scale. Locally, eruptions of basaltic lava on Hawaii have meant destruction of property and infrastructure. More dangerous still have been the basaltic eruptions of Mount Nyiragongo in the Democratic Republic of Congo in 2021.

While most candidates compared and contrasted explosive with effusive eruptions, some responses brought in material concerned with the impacts of seismic activity which was valid given the question wording.

Exemplar 3

		One hazard of explosive eruptions is large amounts of gas and ash and tephra projected into the air with a quick speed of onset. The hazard event profile for a explosive vs effusive eruption is shown below:			
			○ Effusive	★ explosive	
	Magnitude	enormous	★	○	Small
	Speed of onset	rapid	★	○	Slow
	Duration	long	○	★	short
	Area extent	Widespread	★	○	Small
	Spatial predictability	random	○	★	Predictable
	Frequency	often frequent	○	★	rare

The following exemplar highlights the great value of a diagram in conveying much knowledge and understanding effectively and efficiently in terms of exam technique, something to be encouraged.

Assessment for learning



The Volcanic Explosivity Index (VEI) combines magnitude and intensity into a single number on a scale of 0 (least explosive) to 8 (most explosive). It is a logarithmic scale so each increase in number represents a tenfold increase in explosivity. It takes into account factors such as volume of erupted material, height the erupted material reaches and length of eruption in hours. It is of greater value in assessing an explosive rather than effusive eruption.

Phreatic eruptions – steam-driven explosions that occur when groundwater or on the surface is heated by magma or lava. The intense heat of such material – as high as 1200°C for basaltic material can cause water to boil and flash to steam thereby generating an explosion of steam, boiling water, ash and larger items of tephra. Examples include: Whakaari/White Island, New Zealand 2019 and Mount Ontake, Japan 2014.

Question 20*

20* Evaluate the extent to which earthquakes generate distinctive hazards.

[33]

Candidates tackling this question were confident in their descriptions of the hazards generated by seismic activities. Ground shaking, landslides and avalanches, liquefaction and tsunamis were all referenced to a greater or lesser degree of detail and understanding. Often the types of hazards were placed in the context of real world exemplification such as the Great East Japan Earthquake: Tōhoku (2011), Nepal (2015) and Haiti (2010). There was a tendency among many candidates to rely on a detailed unpacking of a case study to deliver, implicitly, the analysis and evaluation demanded by the question. It was too rarely read, that a discussion dealt with the term 'distinctive'. There were some thoughtful comments about liquefaction in terms of being unique to seismic activity from a minority of candidates with these tending to support their argument with case study material. Comparison of the earthquake affecting Kobe (1995), the Great Hanshin earthquake, with the eruption of Mount Ontake (2014) was evidence of the distinctiveness of liquefaction.

It was disappointing that a significant number of candidates saw landslides and avalanches as distinctive to earthquakes with the impacts of the seismic event striking Nepal in 2015 being quoted. Clearly the snow and ice avalanches around Mount Everest had caught candidates' imaginations.

Assessors did read some interesting discussions on the generation of tsunamis as linked with underwater earthquakes. Valid points were made about the requirement for vast releases of energy to uplift the sea bed so as to displace massive volumes of water to generate tsunami waves. The Boxing Day event affecting the Indian Ocean in 2004 and the Tōhoku event of 2011 were frequently quoted to good effect.

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