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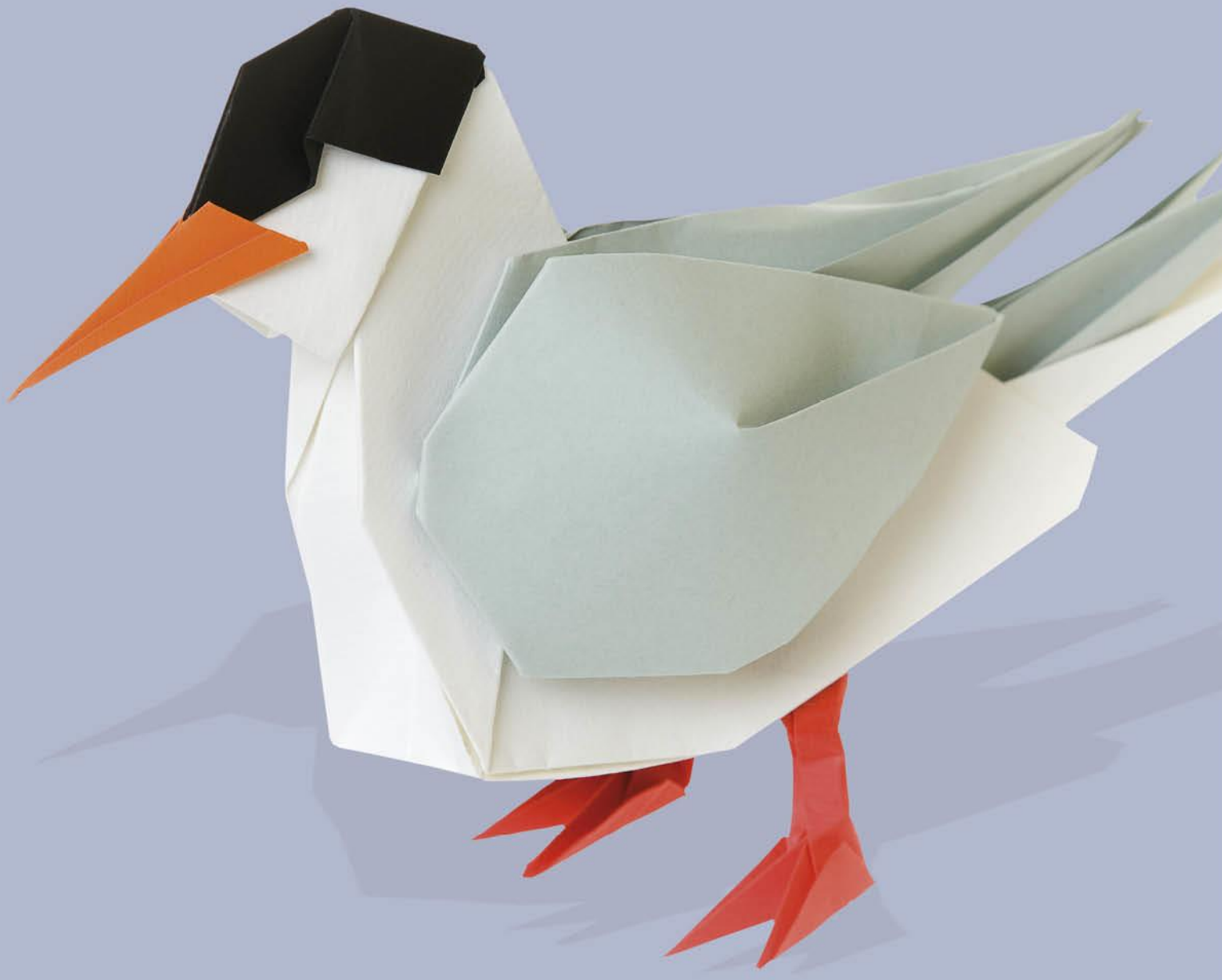
Examiner marked exemplars for Topic 5 Water cycle and water insecurity



A Level Geography

Pearson Edexcel Level 3 Advanced GCE in Geography (9GE0)

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Contents

Introduction

This guide has been created using student responses to A level Geography Specimen Paper 1 and focusses on Question 4 parts (d) and (e) which are assessing Topic 5 Water cycle and water insecurity. The examiner marked answers and commentaries in this guide can be used to show the standards in the 12 mark 'Assess' and 20 mark 'Evaluate' questions.

Paper 1 exam structure

Paper 1 assesses the physical geography topics in the A level Geography specification and is split into 3 sections:

Section A: Students answer all question parts

Question 1: Tectonic Processes and Hazards

Section B: Students answer **either** Question 2 **or** Question 3

Question 2: Glaciated Landscape and Change

Question 3: Coastal Landscape and Change

Section C: Students answer all question parts

Question 4: The Water Cycle and Water Insecurity and The Carbon Cycle and Energy Security

The exam duration is 2 hours and 15 minutes. The paper is marked out of 105 marks and is worth 30% of the qualification.

The exam paper will include open response, calculation and resource-linked questions and calculators will be required. The marks per question item increase throughout each question so that each question will culminate with an extended open response question. Question 1 will culminate in a 12 mark extended open response question. Questions 2, 3 and 4 will culminate in a 20 mark extended open response question.

Our command words are defined in our specification, please see page 95, and will remain the same for the lifetime of the specification. Questions will only ever use a single command word and command words are used consistently across question types and mark tariffs. Our AS and A level Geography Getting Started Guide contains more information about the command words and mark tariffs used for different types of questions.

Specimen Paper 1 Question 4(d) "Assess" 12 marks

Question

(d) Study Figure 4b.

Assess the likely impacts of changing precipitation on the hydrological processes in the drainage basins shown.

(12)

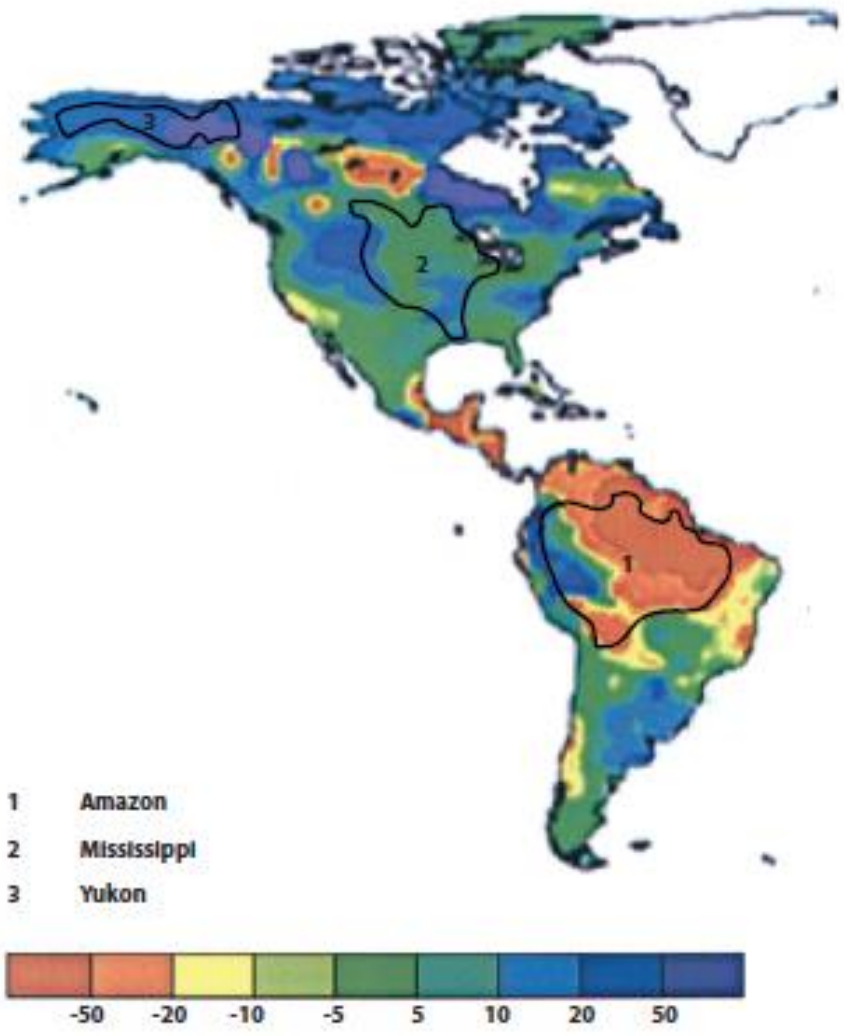

Figure 4b : Predicted change in annual precipitation levels by 2050 and selected drainage basins

Mark scheme

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–4**	• Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate. (AO1) • Applies knowledge and understanding to geographical information/ideas, making limited logical connections/relationships. (AO2) • Applies knowledge and understanding to geographical information/ideas to produce an interpretation that is not relevant and/or supported by evidence. (AO2) • Applies knowledge and understanding to geographical information/ideas to produce an unbalanced argument that lacks coherence and makes judgements that are generic and/or unsupported by evidence. (AO2)
Level 2	**5–8**	• Demonstrates geographical knowledge and understanding, which is mostly relevant and may include some inaccuracies. (AO1) • Applies knowledge and understanding to geographical information/ideas logically, making some relevant connections/relationships. (AO2) • Applies knowledge and understanding to geographical information/ideas to produce a partial but coherent interpretation that is mostly relevant and supported by evidence. (AO2) • Applies knowledge and understanding to geographical information/ideas to produce an unbalanced, partially-supported argument that is drawn together with some coherence in order to make judgements. (AO2)
Level 3	**9–12**	• Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1) • Applies knowledge and understanding to geographical information/ideas logically, making relevant connections/relationships. (AO2) • Applies knowledge and understanding to geographical information/ideas to produce a full and coherent interpretation that is relevant and supported by evidence. (AO2) • Applies knowledge and understanding to geographical information/ideas to produce a balanced, fully-supported argument that is drawn together coherently in order to make rational judgements. (AO2)

Exemplar A

The Amazon is seeing a high rate of precipitation fall which will change its water budget balance. The Amazon rainforest intercepts majority of the water through the dense forest leaves, water would go down through stemflow. With reduced precipitation there will be less water going through the stem and then to the soil. Also as there are a lot of trees the minimal water amount which does reach the soil will be taken up by roots of plants leaving even less water to travel down to the ground water. Overall there will be a less groundwater storage and so the hydrological processes will become smaller (not as much water).

Mississippi has a moderate change in its precipitation levels as some places receive less precipitation however it is the replenished by some places receiving higher precipitation. This means that the hydrological processes will mostly stay the same. The areas which get more precipitation will have more ground water or surface runoff depending on the soil type and its porosity.

Lastly there is a very high rate of precipitation in Yukon. This would mean there are higher chances of surface run off and also more stemflow, throughflow. Rivers will see a rise as more water goes from soil into the river (throughflow). The ground water supplies will also see a significant rise as there will be a constant rate of infiltration until the soil is saturated.

Examiner commentary

This candidate's response was awarded a Level 3, 9 marks.

The candidate starts by interpreting the resource and correctly identifying that the Amazon basin is predicted to have a high rate of fall in precipitation. In this way the answer clearly has Level 3 characteristics as it demonstrates: *accurate and relevant geographical knowledge and understanding throughout (AO1).*

The candidate then links their knowledge and understanding of the Amazonian basin by explaining that with a reduced precipitation amount there would be less stemflow and less water in the soil. In this way the answer clearly has Level 3 characteristics as it applies: *knowledge and understanding of geographical information/ideas logically, making relevant connections/relationships (AO2).*

The candidate then further explains the likely impact on the hydrological processes in the Amazon by explaining how less water would reach ground water levels. In this way the answer clearly has Level 3 characteristics as it applies: *knowledge and understanding of geographical information/ideas to produce a full and coherent interpretation that is relevant and supported by evidence (AO2).*

The candidate then summarises the likely impact of the change on the hydrological processes by writing a mini conclusion. In this way the answer clearly has Level 3 characteristics as it applies: *knowledge and understanding of geographical information/ideas to make supported judgements about the significance of factors throughout the response, leading to a balanced and coherent argument (AO2).*

The candidate then examines the impact on the Mississippi ensuring that they can be considered for Level 3 marks as they are applying knowledge **throughout** the answer. The candidate makes reasonable suggestions on the likely impacts on the hydrological processes but could have gained more marks by suggesting how soil type/porosity might affect the surface runoff.

The candidate then cements a Level 3 response by examining the possible impact on the Yukon, correctly identifying that an increase in precipitation would lead to higher surface runoff and higher levels of ground water.

The candidate could have obtained a higher mark within this level by continuing the good practice in the first paragraph by writing an overall summary and thereby ensuring they meet the AO criteria of: *applies knowledge and understanding of geographical information/ideas to make supported judgements about the significance of factors throughout the response, leading to a balanced and coherent argument (AO2).*

In addition, they could have also explored the likelihood that the increased precipitation in the Yukon would be likely to be snowfall and so this would initially add to the cryosphere stores and might only be released to the river during summer snow melt. Overall the candidate was given Level 3, 9 marks but would need more detailed assessment throughout the answer to obtain higher marks. In addition the best answers might point out that a change in rainfall amounts is unlikely to be the only climate change and without knowledge of temperature changes much of the answer is therefore highly speculative.

Exemplar B

The majority of the Amazon will have a reduction in precipitation, by about 20mm. naturally this means less water is received at the ground. The vegetation will initially intercept it at the same rate as before, meaning less actually gets to the soil. This may then cause much of the water reliant vegetation to wither, reducing interception in the long-run. The discharge of the actual river will be lower, and there will be much less humidity due the volume of evaporation being reduced. As vegetation increases the porosity of the soil, there would also be less infiltration. This means there would also be less groundwater available.

The Yukon faces a rise in the amount of precipitation it receives, by about 20-50mm. This will increase the discharge flow and possibly increase flood risks too. An increased flow means more sediment is eroded and carried by the Yukon. The actual volume of the basin would

naturally increase due to lack of evaporation and lack of vegetation, as well as high surface run off. Surface run off would increase due to the frozen ground, or an oversaturated soil.

The Mississippi basin sees a very little change of roughly 15mm. This would do little to natural processes, however the south seems to face a rise in precipitation. This would increase flow, and provide more water downstream. Moreover, it may flood surrounding areas, increase erosion and damage itself. The damage may come as a result of the farming and increased surface run off, from saturated soil. This is because it would cause eutrophication to occur, leading to an algae bloom in places. Also vegetation would die, at the bottom of the river.

Examiner commentary

This candidate's response was given Level 2, 8 marks.

The candidate correctly identifies that much of Area 1 will receive less precipitation in some cases by more than 20mm and through the use of the resource. In this way the answer has Level 2 characteristics as it demonstrates: *geographical knowledge and understanding, which is mostly relevant (AO1).*

The candidate then correctly explains that this reduced precipitation would reduce soil moisture leading to the vegetation to wither and die and so reduce interception in the long run. In this way the answer clearly has Level 3 characteristics as it applies: a*pplies knowledge and understanding of geographical information/ideas logically, making some relevant connections/relationships (AO2).*

The candidate then summarises the impacts by listing the possible impacts on the hydrological cycle. In this way the answer has Level 2 characteristics as it applies: *knowledge and understanding of geographical information/ideas to make **judgements** about the **significance** of some factors.* The candidate then correctly identifies that the Yukon will receive more precipitation and so increase river flow and possible flood risks. Unfortunately the candidate is sidetracked into explaining how this change in hydrological processes would also then result in a change in geomorphological processes and makes some incorrect assertions on the volume of the basin. In this way the answer has Level 2 characteristics as it applies: *knowledge and understanding of geographical information/ideas to produce a **partial** but coherent interpretation that is **mostly relevant** and supported by evidence (AO2).*

The candidate then states how in area 2 there would be only a small change in precipitation but an increase in precipitation in the south would result in increased flow. Again the candidate becomes sidetracked and explains the possible environmental consequences of this (increased erosion and eutrophication) and so loses focus on the questions. In this way the answer has Level 2 characteristics as it applies: *knowledge and understanding of geographical information/ideas logically, making **some** relevant connections/relationships AO2.*

To obtain Level 3 marks the candidate should ensure that they make judgmental comments on the likely impacts on the hydrological processes as this is a 12 mark assess question as opposed to an 8 mark explain question. They must also focus on the question and not become sidetracked into explaining general impacts on the basin rather than the hydrological impacts.

Exemplar C

Clustered in Area 2 shown in 4b there will be a higher concentration of increased precipitation, in some areas as much as 20mm. With increased precipitation there is likely to be an increase in interception but also an increase in infiltration thus dramatically increasing the saturation of the soil. This is likely to increase the level of flooding and surface runoff in these areas. This paired with the increase in saturation, in also likely to increase throughflow and underground water flows. Overall there will be a much greater flow of water into river estuaries which will increase the speed of water flow. In the long term this may slow down due to the rivers now higher rate of river bank and bed erosion which will likely deepen and widen the river, however at first the likely impact on river basins, due to a greater amount of water flowing into them, they are likely to not only be more prone to flooding, they are also more likely to contain sediment and nutrients from increased rate of erosion from the river and leaching through surface run off.

In the north of South America however, Area 1, the precipitation levels are falling dramatically between 50-20mm annually. This will both reduce the amount of interception as well as the amount of infiltration, groundwater and throughflow. This would likely reduce the amount of water flowing into and through rivers. Not only would this starve the river basin initially of water reducing its geographical land mass, it is more likely to force human intervention through water needs. There would likely be an increase in dams to allow humans to have access to water, thus affecting river flow and the size of the basin to an even greater extent than if left to its own devices.

Examiner commentary

This candidate's response achieved a Level 2, 7 marks.

The candidate correctly identifies that much of Area 2 will receive more precipitation in some cases more than 20mm. In this way the answer clearly has Level 2 characteristics as it demonstrates: *geographical knowledge and understanding, which is mostly relevant (AO1)*

The candidate then correctly explains that this increased precipitation would increase infiltration and so increases the saturation of the soil. In this way the answer has Level 2

characteristics as it applies: *knowledge and understanding of geographical information/ideas logically, making some relevant connections/relationships (AO2).*

The candidate then makes a summary of the impact by explaining that the overall effect would be to have a ***greater*** flow of water. In this way the answer has Level 2 characteristics as it applies: *knowledge and understanding of geographical information/ideas to make **judgements** about the **significance** of some factors (AO2).*

The candidate then unfortunately is sidetracked into explaining how this change in hydrological processes would also then result in a change in geomorphological processes but does try to relate back to hydrological cycle by linking the changes in precipitation to flooding and surface runoff. In this way the answer has Level 2 characteristics as it applies: *knowledge and understanding of geographical information/ideas to produce a **partial** but coherent interpretation that is **mostly relevant** and supported by evidence (AO2).*

The candidate then states how the reduction in precipitation in area 1 would reduce interception but does not explain why (likely to have been the result of forest death in Amazonia). This is then linked to a reduction in other hydrological processes (infiltration, groundwater and throughflow). As with the drop in interception this not explained and therefore has Level 2 characteristics as it applies: *knowledge and understanding of geographical information/ideas logically, making **some** relevant connections/relationships (AO2).*

The candidate is again slightly sidetracked by (correctly) identifying that such a drop in river flow might elicit a human reaction and correctly identifies the consequence of that human action. In this way the answer has Level 2 characteristics as it applies: *knowledge and understanding of geographical information/ideas to produce a **partial** but coherent interpretation that is **mostly relevant** and supported by evidence (AO2).*

To obtain Level 3 marks the candidate should have focused on all three basins (instead of becoming diverted by the impact on geomorphological and human processes) and ensured that they made some comment on the relative importance of the changing precipitation levels on the hydrological processes on each of the three basins as they had successfully commented on Basin 2.

Specimen Paper 1 Question 4(e) "Evaluate" 20 marks

Question

(e) Evaluate the view that some approaches to managing water insecurity are more sustainable than others.

(20)

Mark scheme

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	**1–5**	• Demonstrates isolated elements of geographical knowledge and understanding, some of which may be inaccurate or irrelevant. (AO1) • Applies knowledge and understanding of geographical ideas, making limited and rarely logical connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce an interpretation with limited coherence and support from evidence. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce an unsupported or generic conclusion, drawn from an argument that is unbalanced or lacks coherence. (AO2)
Level 2	**6–10**	• Demonstrates geographical knowledge and understanding, which is occasionally relevant and may include some inaccuracies. (AO1) • Applies knowledge and understanding of geographical information/ideas with limited but logical connections/relationships. (AO2) • Applies knowledge and understanding of geographical ideas in order to produce a partial interpretation that is supported by some evidence but has limited coherence. (AO2) • Applies knowledge and understanding of geographical information/ideas to come to a conclusion, partially supported by an unbalanced argument with limited coherence. (AO2)

Level 3	**11–15**	• Demonstrates geographical knowledge and understanding, which is mostly relevant and accurate. (AO1) • Applies knowledge and understanding of geographical information/ideas to find some logical and relevant connections/relationships. (AO2) • Applies knowledge and understanding of geographical ideas in order to produce a partial but coherent interpretation that is supported by some evidence. (AO2) • Applies knowledge and understanding of geographical information/ideas to come to a conclusion, largely supported by an argument that may be unbalanced or partially coherent. (AO2)
Level 4	**16–20**	• Demonstrates accurate and relevant geographical knowledge and understanding throughout. (AO1) • Applies knowledge and understanding of geographical information/ideas to find fully logical and relevant connections/relationships. (AO2) • Applies knowledge and understanding of geographical information/ideas to produce a full and coherent interpretation that is supported by evidence. (AO2) • Applies knowledge and understanding of geographical information/ideas to come to a rational, substantiated conclusion, fully supported by a balanced argument that is drawn together coherently. (AO2)

Exemplar A

A successful management of water insecurity was Singapore. Singapore experiences a high rate of evaporation. They have implemented many strategies to retain water, which are through local and government efforts. Locally, Singaporeans are able to store water from rainfall which is a small but sustainable initiative. The government has also started desalination, which is a more expensive process, however it provides a better, high quality water. This may only be sustainable for the richer population. However Singapore has also made sure to import its water from Malaysia, this may be unsustainable. It is unsustainable as there is a dependence on Malaysia, which means that if their water supply is cut then there will be a colossal problem for the citizens, they import about 40% of their water from Malaysia which is high.

Sustainable water management occurs when water is gained from internal means. But there is also another element of successfully managing water insecurity. Secondly water management should not be too expensive otherwise it may become unsustainable. This is true for Lesotho where there has been many dams made to help increase water supply somewhere else where it is more industrialised. Such a top down effect means that the economy gained, as water insecurity elsewhere was reduced but it was unsustainable. Those Lesotho earned 80m in royalties and has enough hydroelectric power to sell, many of its

locals are seeing rising costs for water. This means that Lesotho is now facing water insecurity as the money needed to buy water to continue the project is increasing and that is unsustainable as the economy is not strong enough. Lesotho failed to manage their water insecurity.

A cheaper and more local idea to manage water insecurity is more sustainable. This is shown through Lima using fog nets. By placing fog nets in areas where humidity and fogs are dense. The water particles are trapped in the nets and then drop into buckets. This is sustainable as for Lima, its small population did not need to have such a big project (costly) in order to reduce water insecurity. Local initiatives are better as they would know how to improve water insecurity, as they can judge the living standards and act accordingly. In comparison to Lesotho, Lima's fog nets are more sustainable because they are economically cheaper and they are appropriate for its economy. They may also prove that top down projects fail to work.

Similarly in Australia where water insecurity is also a problem the approach to manage water has also failed as it's instead increased tensions between cotton farmers and fishermen. It can also be seen as a failure of a top down approach. The Murray-Darling river basin is used by fishermen and cotton producers who use a large amount of water for cotton production. Though the government put restrictions on the amount that can be taken up, it was not successful. Cotton producers on the other hand have taken up more water, but also find it more profitable to sell water because of the water insecurity. This is unsustainable as water that is taken upstream will be significantly reduced when it goes downstream and fishermen will also lose out economically. Therefore top down approaches may also be unsustainable for managing water insecurity.

However some approaches are inevitable and cannot be changed meaning it will be unsustainable as the party has no power. This is true in the case of Palestine as they have water insecurity as Israel has a water pump from Golan Heights. Due to political and religious tensions they have had to face water insecurity. Therefore it is hard to even have an approach to manage water insecurity. However with Palestine creating a city called Rawabi, the major problem again is water. As they are located on the West Bank, they only have water through rivers or Israel. Therefore they need Israel to allow them to have water. This is unsustainable as Israel has all the power however it is inevitable as the population has nowhere else to go.

Local initiatives to reduce water insecurity are sustainable and government actions have a higher rate of failure. However, Singapore shows that government action does not always fail and local actions can work together. Therefore if the local and government get together there will be better management of resources. Yet in some cases the government may have no power, like Palestine, and so whatever approach they do it is better than none though it is unsustainable.

Examiner commentary

The candidate starts the essay with case study detail on Singapore. In a question such as this an introduction is essential. This should define the key words in the essay – in this case water insecurity and sustainable management as without a definition of what the candidate thinks sustainable management is, an evidenced conclusion is almost impossible. It would be also useful if the candidate outlined the debate implicit in the essay title as well as suggesting which side of the argument the candidate will support.

The case study detail on Singapore management of water is relevant if narrow and poorly developed (small scale, desalinisation and importation of water) and there are attempts to link to sustainability. In this way the answer has Level 3 characteristics as it demonstrates: *geographical knowledge and understanding, which is mostly relevant and accurate (AO1).*

As well as applying: *knowledge and understanding of geographical information/ideas to find some logical and relevant connections/relationships.*

The candidate also makes a mini conclusion by stating that sustainable water management occurs when water is obtained from internal means. In this way the answer has Level 3 characteristics as it applies: *knowledge and understanding of geographical ideas in order to produce a partial but coherent interpretation that is supported by some evidence (AO2).*

The candidate then explains that another aspect of sustainable supplies is the cost and uses an example of a top down management in Lesotho to demonstrate how this management has led to rising water costs which has made it unsustainable for some.

Again the candidate is demonstrating Level 3 characteristics similar to the previous paragraph but loses the opportunity to show that although the top down scheme has increased the costs for some and so increased water insecurity it has also increased water security for others. This type of evaluative skill is a key skill to develop for these 20 mark questions.

The candidate then details fog nets in Lima and explains that as it is a local initiative it is more sustainable than top down approaches. There are some inaccuracies (Lima's small population is in fact 9.75 million or bigger than London) but crucially there is little evaluation of the management scheme – is the scheme the only way that Lima sources its water? How much do the fog nets contribute to Lima's water supply compared to the three rivers that supply water? The candidate could have focused on the fact that these are improving water security for the very poorest of Lima who are not connected to the water supply system run by Sedapal.

The candidate then details water insecurity issues in Australia, specifically conflicts in the Murray- Darling River. Although the cause of water insecurity is explained it is really a water conflict issue and the management that has led to this has not been detailed and so much of the answer is not relevant. Similarly, the candidate then explores the water insecurity in the

Middle East but as with the Australia case study it is more about water conflicts than water insecurity and lacks a link to management.

The candidate then concludes by stating that local initiatives are more sustainable than national approaches but evaluates this by suggesting that some national government approaches can be sustainable. The candidate then explains that having some management is better than none by using the Palestine example. In this way the answer has Level 3 characteristics as it applies: *knowledge and understanding of geographical information/ideas to come to a conclusion, largely supported by an argument that may be unbalanced or partially coherent (AO2).*

Overall the candidate has much case study material much of which is relevant. However, the candidate fails to have a convincing 'story' or narrative throughout the essay and until the conclusion it is a very much whatever comes next approach. The candidate could have easily improved the essay by planning the essay and ordering the case studies from small scale (Lima) through meso scale (Singapore) to macro (Lesotho) and then perhaps using the Palestinian example to show that some management is better than none. Within each case study it would also have been better to evaluate how sustainable the schemes were in improving water security as opposed to just how sustainable the scheme was.

With an introduction and a tighter focus on the question this answer could have been awarded higher marks but was instead awarded Level 3 14 marks.

Exemplar B

Some approaches like water recycling are very sustainable. For example, Singapore is trying to create a water recycling scheme where it will recycle 90% of its grey/sewage water and collect rainwater for its supplies. This is certainly cost effective and reduces the need to use limited fresh water supplies all the time. Moreover, India's Wells for Life organisation is trying restore India's stepwells and use them again in areas like Cherrapunji and Rajasthan, which will meet rural water demands as well and conserve traditions prior to British Colonialism. However, many believe in using hard engineering methods such as creating reservoirs and buying and selling water. This is particularly evidenced in Lesotho where the government is providing water to its neighbouring countries, but this has a negative impact on the Lesotho population who are poor and cannot afford water supplies. Thus, not meeting demands of its future generations reducing sustainability. In addition to this, the Middle East being quite arid is focus on extracting water through desalinisation which is not only an expensive process and challenging for the economy, but requires a lot of energy causing the release of anthropogenic gases and contamination of water supplies as the excess salt is dumped back into the sea and the higher concentration as bad effects on marine life. Similarly, water abstraction from aquifers like the Ogallala aquifer may be a short term solution but it is a finite source and hard to replenish due to impermeable layers above it like caliche which limit percolation.

Hence, some approaches to managing water supplies like water conservation are more sustainable and effective in managing water insecurity rather than hard engineering short term methods that damage the environment and create more water insecurity in the future.

Examiner commentary

This candidate's response was given Level 3, 11 marks.

As with the other examples there is no introduction and the candidate starts the essay with case study detail on Singapore. There is only brief case study detail on Singapore (the use of grey water) and there are attempts to link to sustainability. In this way the answer has Level 3 characteristics as it demonstrates: *geographical knowledge and understanding, which is mostly relevant and accurate (AO1),* as well as applying *knowledge and understanding of geographical information/ideas to find some logical and relevant connections/relationships (AO2).*

The candidate then details some aspects of well development in India but only partially relates this to the concept of sustainability. It is important to note that although the candidate has stated that both are considered sustainable, there is little evaluation of why or how each technique is sustainable – which is the key part of the essay title.

The candidate then addresses the issue of using hard engineering to meet water demands. It would be good practice to use paragraphs to reiterate that this is a separate section of the essay and addressing a different point as without paragraphs the argument of the candidate is very hard to follow. The candidate then uses an example of a top down management in Lesotho to demonstrate how this management has led to rising water costs which has made it unsustainable for some. Similar to the previous paragraph the answer demonstrates the characteristics of a Level 3 response, but needs more case study detail on Lesotho as well as some form of ongoing evaluation to be a level four response.

The candidate then explains how desalinisation in the Middle East is unsustainable due to the use of energy and the disposal of waste water – again the case study lacks detail and crucially lacks evaluation as in some cases desalinisation may be the only alternative to meeting rising water demands. The candidate then details the unsustainable use of the Ogallala Aquifer in the USA. Again it lacks case study details and on-going evaluation.

The candidate then concludes by stating that some approaches such as water conservation are more sustainable than others such as hard engineering but this is not substantiated with reference to the case study material presented in the essay. In this way the answer has Level 3 characteristics as it applies: *knowledge and understanding of geographical information/ideas to come to a conclusion, largely supported by an argument that may be unbalanced or partially coherent (AO2).*

The candidate has an argument in as much as they have compared the advantages of what they consider sustainable approaches to what they consider unsustainable approaches, but there is little case study material to substantiate this argument. In addition it is crucial in these 20 mark essays to evaluate how sustainable these approaches are by having on-going evaluation. As a result it was thought that this was worth Level 3, 11 marks.

Exemplar C

Some approaches of water management are more sustainable than others. The rain shadow in Colorado has led to over-abstraction of water from the Ogalalla Aquifer in the USA, which has led to subsidence. The view that as long as water is available it can be used is inherently unsustainable. Privately led water management doesn't necessarily focus on universal need to sustainably manage water, but on short term gains. In Singapore the state led management approaches, such as bricks in cisterns, show how small changes can make water sustainable. However they still import 40% of their water from Malaysia despite having 2300 mm of rainfall annually.

However whatever sustainable management approaches are implemented, it will always be undermined by the physical availability of water. Projects can be sustainable yet don't work in conjunction to water in the area itself. Contrasting public and private approaches in Bolivia show that management can fail if water isn't available to begin with.

Yet sustainability in water management is influenced by public attitudes. Some approaches work with public attitudes, such as Singapore and water conservation being part of national pride. In the USA however, the traditionally more protectionist attitudes of most people isn't necessarily helpful when determining sustainability and an integrated approach to water management.

Examiner commentary

This candidate's response was given Level 2, 8 marks.

As with the previous response, it is good practice to have an introduction that defines the key words, outlines the debate of the essay and states which side of the debate the following essay will examine. The candidate starts by making a valid point that if there is private extraction of a common good (in this case the Ogalalla Aquifer in the USA) then this extraction is inherently unsustainable as short term gains outweigh considerations of long term use of the resource. In this way the answer has Level 2 characteristics as it demonstrates: g*eographical knowledge and understanding which is occasionally relevant and may include some inaccuracies (AO1),* as well as applies *knowledge and understanding of geographical information/ideas with limited but logical connections/relationships (AO2)*. It is important to note that so far there is little evidence to support the candidate's assertions

and the candidate is 'making the examiner' do the work in seeking out the management in the example.

The candidate then compares the (presumably) lack of management in the USA to the state led management approach in Singapore. There is utility in this case study and here is an attempt to evaluate how sustainable the approach. In this way the answer has Level 2 characteristics as it applies: *knowledge and understanding of geographical ideas in order to produce a partial interpretation that is supported by some evidence but has limited coherence (AO2).* This case study has the potential to fully answer the question (by detailing how a sustainable strategy in some cases cannot on its own fully manage water insecurity) but as with the first case study the answer is implicit and not explicit.

The candidate then asserts that sustainable approaches are also subject to climatic constraints, which again is a valid point to make, but is unfortunately substantiated with reference to Bolivia, which would be better used in an examination of how privatisation has improved water security for some but not for all.

The candidate then asserts that the success of the management policy depends upon public participation and contrasts those in Singapore and in the USA. This is also a valid point but needs to be focused far more on the question to gain Level 3 or 4.

There is no overall conclusion to the answer which is a vital component of the mark scheme and the response is deemed to only have what could be termed on going evaluation. In this way the answer has Level 1 characteristics as it applies: *knowledge and understanding of geographical information/ideas to produce an unsupported or generic conclusion, drawn from an argument that is unbalanced or lacks coherence (AO2).*

The candidate has a number of sophisticated ideas which revolve around privatisation and the issues about water as a public good – these are, unfortunately, tangentially but rather loosely tied to sustainability. Furthermore there was a lack of AO1 knowledge and understanding. The absence of accurate evidence makes the pretty thoughtful evaluation 'not substantiated'.

The response was therefore given Level 2, 8 marks.

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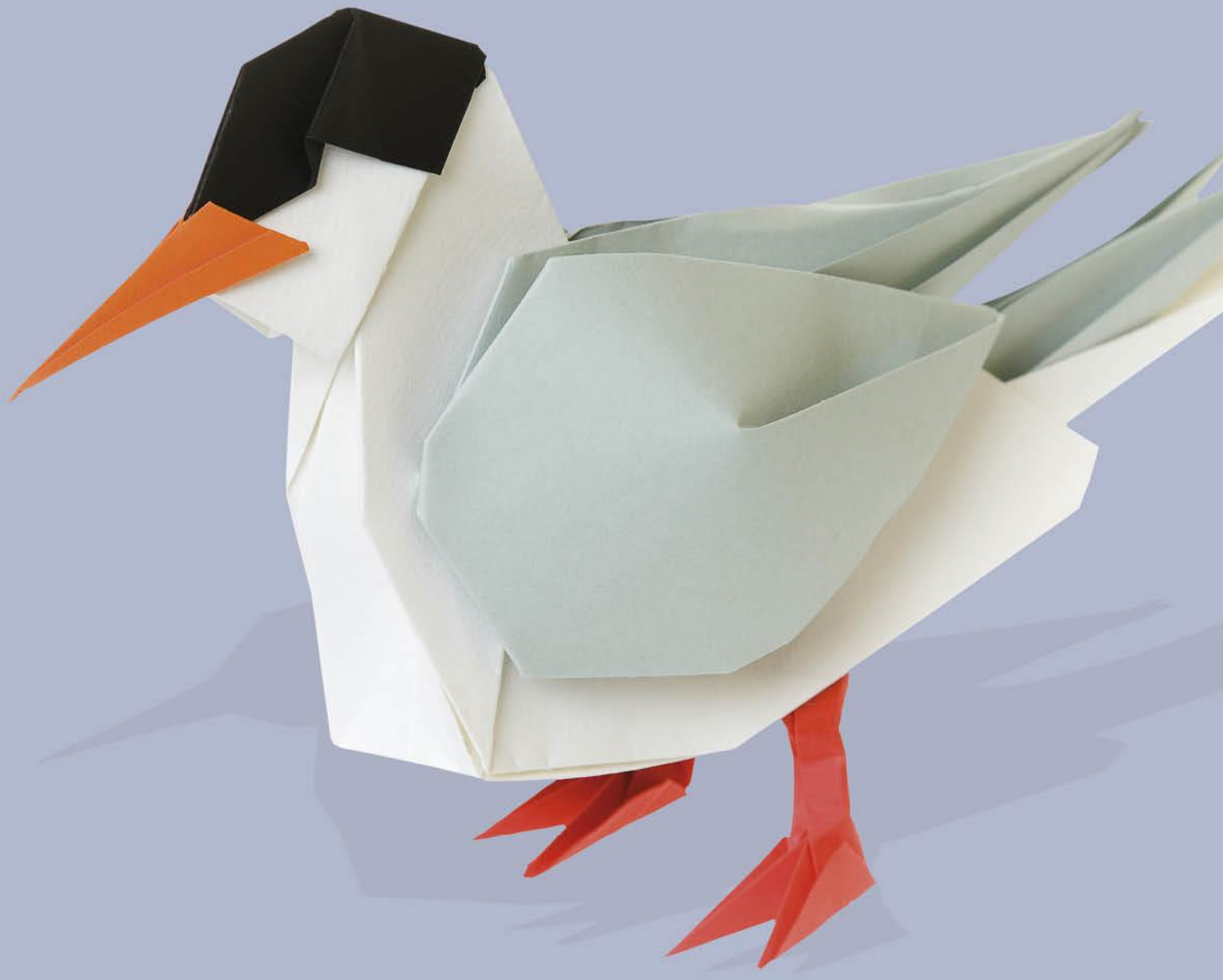

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