a-level exam questions & answers:

water & carbon cycles (section a) >

20 mark question #5 (farming & the carbon budget)

References:

Need help? Check out our ultimate guide to A-Level Geography!

Access The Mark Schemes Directly Here!

This document is available both as a pdf and editable word document – from the water & carbon cycles topic page which can be printed.

1) 'Assess the impact of farming practices on the carbon budget.'

Water & Carbon Cycles >> 3.1.1.3 >> The Carbon Cycle & Changes In The Carbon Cycle

I'm a past paper question! AQA

[20 marks]

writing tips & tricks:

This is considered a difficult question for students as it relies on a very good knowledge of a fairly small part of the specification, so don't worry if you looked at it and was like 'how do I write 20 marks about this?!' A good starting place may be to consider the concept of a carbon budget and the different factors and stores affecting it, particularly human ones of which farming is among the most influential. Then write a few paragraphs for / against the point – making sure you weave in case study knowledge or examples, for example the Amazon Rainforest in Brazil, of which 80% of deforested land is to make way ultimately for cattle ranching. Finally, keep time of the 25 (or 32 if extra time) minutes here to write a small conclusion giving your opinion – don't sit on the fence!! – as well as possibly some higher-level thought such as what may happen in the future – like a little hypothesis.

a-level exam questions & answers:
water & carbon cycles (section a) >
mark scheme | 20-mark question #5

version stage v1.1, last updated 24.01.22, © Luke Pearson & AQA | geographyportal.co.uk

Q.:	Sp. Ref.:	Information For Markers:	B'down:	Marks:
5)	3.1.1.3 AQA	**Assess the impact of farming practices on the carbon budget.** AO1 – An understanding of farming practices within the context of water and carbon. An awareness of the impact of human activity upon the carbon budget. AO2 – Application of knowledge and understanding to show how farming practices can alter/affect carbon stores and transfers at local, regional and global scales. Notes for answers AO1 • Global distribution, and size of major stores of carbon – lithosphere, hydrosphere, cryosphere, biosphere, atmosphere. Factors driving change in the magnitude of these stores over time and space, including flows and transfers at plant, sere and continental scales. • Photosynthesis, respiration, decomposition, combustion, carbon sequestration in oceans and sediments, weathering. • Changes in the carbon cycle over time, to include natural variation (including wild fires, volcanic activity) and human impact (including burning, farming practices, deforestation, land use changes). • The carbon budget and the impact of the carbon cycle upon land, ocean and atmosphere, including global climate. • The role of feedbacks within and between cycles and their link to climate change and implications for life on Earth. • Human interventions in the carbon cycle designed to influence carbon transfers and mitigate the impacts of climate change. AO2 • Responses are most likely to focus upon the damage caused by farming practices, particularly in tropical rainforests. • Some may refer to traditional slash-and-burn techniques and the small-scale nature of this approach to farming. Whilst small-scale rotation is more sustainable, there is still a localised increase in carbon emission associated with the burning.	AO1=10 AO2=10	20

		• Ranching may also feature in candidate responses. For example, cattle ranching is now the biggest cause of deforestation in the Amazon, and nearly 80 per cent of deforested areas in Brazil are now used for pasture. The cattle industry has grown rapidly since the 1970s, giving Brazil the largest commercial cattle herd in the world. Since 2003, the country has also topped the world's beef export charts and the government planned to double its share of the market by 2018. The impact this is having on the forest is huge – between 1996 and 2006, an area the size of Portugal was carved out for cattle ranching. Large-scale forest clearance removes a major carbon store and reduces the intake of carbon by photosynthesis. There is also the issue of methane release as a result of cattle farming. Some may link this to the carbon dioxide issue and concerns about increased greenhouse gases. This is an acceptable line of argument in the context of the question. • In the state of Acre in western Brazil, farms and pastures are surrounded by large, undisturbed areas of Amazon rainforest. Since January 2005, many areas in the state have been experiencing severe drought, and the forests have become tinder dry. Experts attribute the drought to at least in part be caused by the disruption to convection rainfall. The tinder-dry conditions have led to forest fires, releasing even more carbon into the atmosphere. • Soil erosion is another issue. As the areas are over-cultivated, nutrients and minerals become depleted, rendering the area useful for farming but also, at least in the short term, recolonisation by vegetation. In this sense the store for carbon is reduced and emissions carbon in the atmosphere is not reduced thus maintaining a high budget. • Some may refer to recent forest fires in places such as Amazonia. Provided this is linked to farming, ie deliberately set fires to clear woodland, this is a valid approach. • Some may consider more positive and sustainable farming practices which are having a more positive impact on the carbon budget. The Great Green Wall in the Sahel is an attempt to reverse the impact of desertification and the extension of arid lands in the region. The benefits of this initiative directly relate to opportunities for soil preservation, agricultural extension as well as forestry. It is the forestry which is increasing the store of carbon both above and below ground, with the newly accumulated biomass. • Expect to see some reference to feedback systems. Some may argue that current farming practices are leading to a positive feedback loop with an imbalance moving further and further away from equilibrium. Others may suggest that more sustainable practices can produce a negative feedback which returns the carbon budget to equilibrium. Either approach is valid but should be based upon preceding content.		

		• Credit any other valid approach.		

Examiner Marking Level Criteria:

Level/Mark Range	Criteria/Descriptor
TOP LEVEL 4 (16-20 marks – 80+% - typically an A* answer)	• Detailed evaluative conclusion that is rational and firmly based on knowledge and understanding which is applied to the context of the question. Interpretations are comprehensive, sound and coherent (AO2). • Detailed, coherent and relevant analysis and evaluation in the application of knowledge and understanding throughout (AO2). • Full evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Detailed, highly relevant and appropriate knowledge and understanding of place(s) and environments used throughout (AO1). • Full and accurate knowledge and understanding of key concepts, processes and interactions and change throughout (AO1).
HIGH LEVEL 3 (11-15 marks – 55-75% - B to A grade answer)	• Clear evaluative conclusion that is based on knowledge and understanding which is applied to the context of the question. Interpretations are generally clear and support the response in most aspects (AO2). • Generally clear, coherent and relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Generally clear evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Generally clear and relevant knowledge and understanding of place(s) and environments (AO1). • Generally clear and accurate knowledge and understanding of key concepts, processes and interactions and change (AO1)
LOWER LEVEL 2 (6-10 marks – 30-50% - D-C grade answer)	• Some sense of an evaluative conclusion partially based upon knowledge and understanding which is applied to the context of the question (AO2). Interpretations are partial but do support the response in places. • Some partially relevant analysis and evaluation in the application of knowledge and understanding (AO2). • Some evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Some relevant knowledge and understanding of place(s) and environments which is partially relevant (AO1). • Some knowledge and understanding of key concepts, processes and interactions and change. There may be a few inaccuracies (AO1).
LOW LEVEL 1 (1-5 marks) - <25% - E or below answer	• Very limited and/or unsupported evaluative conclusion that is loosely based upon knowledge and understanding which is applied to the context of the question (AO2). Interpretation is basic. • Very limited analysis and evaluation in the application of knowledge and understanding. This lacks clarity and coherence (AO2).

	• Very limited and rarely logical evidence of links between knowledge and understanding to the application of knowledge and understanding in different contexts (AO2). • Very limited relevant knowledge and understanding of place(s) and environments (AO1). • Isolated knowledge and understanding of key concepts, processes and interactions and change. There may be a number of inaccuracies (AO1)
LEVEL 0 (0 marks) – no answer provided	• Nothing worthy of credit (something has gone ridiculously wrong if you're here!)