

GCE

Geography

Unit 3 Contemporary Geographical Issues (GEOG3)
Exemplar Script 3

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Option 1 Plate Tectonics and Associated Hazards**Total for this option: 25 marks****0 1**

Study **Figure 1**, a satellite image of the Mayon volcano in the Philippines and the area to the south and east.

Comment on the nature of the hazards that this volcano may present.

(7 marks)

Candidate's Answer

*The satellite image clearly shows how there is an urban area situated to the south east of the Mayon volcano. Therefore when an explosion occurs, and lava is erupted, the inhabitants of this area will be at risk from the extremely hot lava that will run down the slopes of the volcano. There could be pyroclastic flow in which there is a basal flow of turbulent solid material that could destroy the buildings within the urban area. This would be more likely to occur if it was basaltic lava as this could potentially reach the urban area quickly, with little warning, even though the town of Legazpi is several kilometres away. **[Some specific reference to the image here, together with statements of likely hazards - a level 2 comment]** To the east there is the Lagonoy Gulf which has a water flow/river entering it from the summit of the volcano. The ash and lava from the volcano could mix with this and consequently travel downstream and pollute the Gulf. **[..and the hazard is?]** This may affect wildlife within the water and also have damaging effects to any tourism in the area. Furthermore the surrounding area is largely covered by vegetation which could be lost if lahars (mudflows) flow over them. **[A series of general and vague statements here]** **[One Level 2 comment overall - 5 marks]***

02 Describe and explain the characteristic features of various types of volcano. (8 marks)

Candidate's Answer

Fissure eruptions are one type of volcano and are found at conservative plate margins ie. where two plates move apart from each other. They are seen as an elongated crack of the surface crust and an example is the Mid-Atlantic Ridge and underneath the Atlantic Ocean. As the plates move apart, basaltic (basic) lava is able to rise and erupts through the crack. [First type] Shield volcanoes are another type of volcano and these have gently sloping sides. This is because basic lava is also erupted from these which is less viscous and can therefore flow much further and faster before it cools and hardens. Shield volcanoes are found at destructive plate margins where oceanic crust is subducted under continental crust. An example of one is Mauna Loa in Hawaii which is the biggest volcano in the world and is found at a hotspot.

[Second type, plus good example. Level 2 now]

Composite stratovolcanoes are found at destructive plate margins and have much steeper sides than shield volcanoes. This is because the lava erupted from them is andesitic intermediate and so flows less easily as it is more viscous. Therefore it can not travel as far, resulting in the steep sides of the volcano. An example of this is Mount Fuji and also Mt Etna in Sicily. These therefore have more explosive eruptions as the thicker more viscous lava builds up until a large amount of pressure causes it to erupt. [Third type, plus example]

Calderas are another type and these again have steep sides due to more viscous lava. They are found at destructive margins and produce rhyolitic lava which is acidic with a very high silica content. The main differing feature of a caldera is that it has a large open crater at the summit and this is because the rhyolitic lava cause such explosive eruptions that in the process the summit can be blown off. An example of this is Chaiten in Chile. The crater may then fill with water as a result.

[Fourth type, plus example.]

[Overall, a full range of volcano types and examples. Top Level 2 - 8 marks]

03

With reference to **two** volcanic events that you have studied from contrasting areas of the world, compare the ways in which volcanoes and their impacts have been managed. (10 marks)

Candidate's Answer

*Nevado del Ruiz erupted on 13th November 1985 and is situated in Colombia, South America. It had a huge death toll of 23,000 from within the town of Armero, situated at its base which was 85% of its total population. Conversely, Mount Etna in Sicily has erupted every single year since 2001 and a larger eruption in 2002 saw a death toll of zero. Colombia is less economically developed than Sicily as it has a fairly corrupt government with huge drug issues leaving its economy unstable. **[Clear linkage between two events, though not sure of the relevance of 'drug issues']***

*The Nevado Del Ruiz eruption of 1985 had almost no management prepared and this is largely due to the failure of the government. They had been given warnings by geologists that the volcano was likely to erupt as they had been monitoring it and noticed increased levels of sulphur dioxide. Poor management can be seen from the initial point that the government failed to pass this information onto the general public, and in particular the residents of Armero. **[Some detail of management of N del R]***

*This contrasts with Mount Etna which is monitored and then information is relayed in real time by radio and mobile to the local town centres. Consequently, the local authorities are able to pass this information on to the residents that live in its surroundings and plan evacuation attempts if required. Therefore the authorities of Sicily can be seen to be much more proactive than those of the Colombian government. **[Some detail of management of Etna, with clear comparative statements]***

Management after the event also differs largely. For lahars left 80% of the town of Armero destroyed and covered in thick ash after the eruption of Nevado Del Ruiz. The government struggled to make high rescue efforts as people were trapped under the ash and mudflows due to poor communications and a lack of national aid. Without suitable infrastructure and technology the government largely struggled to rescue people as roads were blocked and therefore access limited. This contrasts with the eruption of Mount Etna in which the pre warnings of an eruption allowed the damage to be limited and no casualties. Also the government made local businesses have tax breaks so that they could recover after the eruption and restore their businesses.

[Focus on comparison of management is clear, though some detail of strategies is sketchy. The majority are specific to the two named events though, and comparison is explicit. Low Level 3 - 9 marks]

Option 5 Development and Globalisation**Total for this option: 25 marks****1 3**

Study **Figure 5** which shows a development by the oil company Royal Dutch Shell in a remote part of Canada. Comment on the possible socio-economic and environmental impacts of this development. (7 marks)

Candidate's Answer

Figure 3 shows a development of the TNC Shell. The figure shows a variety of impacts which will affect people on a local or national, even international scale. [Intro - doesn't say much]

An economic positive factor of this development is bringing foreign direct investment to the area. This will cause a multiplier effect and cumulative causation will occur. This development will affect local people on a socio-economic level as it will provide a source of employment of people in the surrounding area. This in turn will help people to improve their livelihood and bring more capital to their local economy which funds small and local businesses. [Generic statements - no link to photo]

A negative impact of this development is and degradation and land contamination. The environment is therefore damaged on a local scale. The large grey area in figure 5 will have poor soil quality and will not be able to be used for food production and may be contaminated with heavy metals eg lodmium. [Clear link to photo together with valid comment - Level 2] This area may, due to a lack of vegetation, undergo soil erosion, which is bad for vegetation growth. Another negative environmental impact is the release of greenhouse gases such as CO₂. [Evidence?] These lead to global warming and will affect the world's climate on a global scale – will cause loss of habitat and issues with desertification for example.

In conclusion, many positive socio-economic facts are produced by the development, but globally and locally, the environment will suffer. [Only one comment made - low Level 2 - 5 marks]

1 4

Outline the spatial organisation of transnational corporations (TNCs).

(8 marks)

Candidate's Answer

Transnational corporations are companies which have factories or other services in another country or countries other than its original country. They have host countries. The sectors of production can be broken down into primary, secondary, tertiary and research and development and TNC's use the global scale to their advantage, creating economics of scale. [A series of general statements so far]

TNC's such as shell and BP often extract their primary resources from LDC's if possible. They do this to exploit resources for a low cost. Sometimes, this is done in a neo colonial way – where MEDC's still exploit the resources of their former colonies. This is done due to political alliances which are already existent. [More general comment]

Secondary production is manufacturing. This is done in many NIC's – such as China. China has emerged as the 'work shop of the world' due to its cheap, ununionised labour and cheap land. Special Economic zones created to attract foreign direct investment which now is responsible for 80% of Chinas GDP from TNC's. The government provided tax breaks to entice TNC's into the coastal open cities. These provided advantageous geographical conditions for TNC's. Therefore TNC's are attracted towards the favourable conditions of China for cheap manufacturing. [A little more specificity here regarding types of activity in China, and the reasons for them, but no reference to any TNC yet]

Research and development however, has remained in MEDC's due to their high level of education and technology. MEDC's often have the headquarters of TNC's and control the work in NIC's such as China. Services in tertiary industry are often outsourced to India, for example IT services due to the 50 million English speaking workforce. This keeps costs lower. [Again some specificity regarding the countries involved, but no named TNC. The overall statements of spatial organisation are correct, and sophisticated]

In conclusion, the special organisation of TNCs are very global and on a large scale. They exploit cheap raw materials in LEDC's, manufacture and process in NIC's with good conditions such as China. However, research and development remains in the MEDC's which control functions of NIC's with some services such as IT moving to India to exploit a favourable country and conditions. [Largely a repeat of the previous material. Although no TNC has been named, there is some depth of understanding of the spatial organisation of TNCs in a general sense, and there are some sophisticated statements. Mid Level 2 awarded - 6 marks]

15

With reference to contrasting areas of the world, discuss the development issue: 'Economic sustainability versus environmental sustainability'. (10 marks)

Candidate's Answer

Sustainability is defined as 'meeting the needs of today without compromising the needs of future generations'. This can be seen as economic or environmental and the amount of sustainability depends on the location. For example, China for economic sustainability and Ecuador for environmental sustainability. [Setting the scene for the answer, with a definition and named examples to be considered] China is an NIC which has undergone rapid urbanisation and seen a huge economic growth of 8-10% per year. China is growing to be an economically sustainable country. Due to its economic growth it has rapidly improved its population's livelihood as now only 19% of the population live below \$1 per day. [Economic sustainability in a named area]

Due to the transfer of technology, it has a well education workforce which has developed skills. 80% of its GDP has come from FDI meaning the economy is now very strong and has began to produce its own TNC's. However, China has exploited the environment to develop economically. The WHO said China has 7 of the 10 most polluted cities in the world and China are the second largest consumer of oil in the world. [Environmental un-sustainability in the same area] In the future, this exploitation of the environment will hinder economic development due to a lack of finite resources and high levels of air pollution. The government in China, need to make decision upon how to improve this. [An element of discussion - Level 2 awarded]

Environmental sustainability has been achieved in Ecuador through ecotourism schemes and keeping a fairly low level of development.

Tours of Ecuador are run by tribes and local people but a strict guideline is set up to ensure local environmental sustainability is ensured and the culture is protected. For example, no exchanging of gifts and all refuse must be removed from the rainforest environment. This scheme in Ecuador is essential to preserve biodiversity and the environment, however, people have a very low standard of living and have low development in the area, meaning that economic development may have to occur to improve people's lives in a social and economic way – eg improve the GDP per capita. [Clear contrast to the previous example - environmental sustainability at the cost of economic. Plus some discussion. Top Level 2]

In conclusion, China has achieved economic sustainability and improved the population's livelihood, but with huge impact to the environment as opposed to Ecuador ecotourism schemes in the rainforest where ecology is hugely protected but at the limit of tribes and local peoples social and economic development. [Clear explicit comparison with evidence of depth of understanding. Low Level 3 - 9 marks]

Option 3 Ecosystems: Change and Challenge

- 2 1 Evaluate the relative roles of natural succession and human activities in the creation of ecosystems within the British Isles. (40 marks)

Candidate's Answer

Ecosystems can be altered by both natural succession and by human activity. Succession is often a much slower process. The impact of human activity is often to add or remove species from the ecosystem in order to maintain a favourable condition such as heather moorland for sheep grazing, producing a plagioclimax. [Clear introduction - some evidence of critical understanding (c/u)]

One example of natural succession in the UK is the psammosere succession seen in Formby. [First case study] This succession starts with a pioneer stage, this occurs around the high water mark and the pioneer species include sea couch. The seeds are blown in by wind or washing up by sea but only the most hardy of the species can survive in these salty, alkaline conditions. Plants have adaptations like deep roots and hard waxy leaves to increase their chances of survival. As the plants die they add humus to the sand which adds nutrients, this allows a second stage of plants such as marram grass to colonise as the conditions are less harsh. As more humus is added to the soil the colour of the sand turns grey and becomes more stable, this allows tall herbs to grow such as fennel and they out-compete the pioneer species. Eventually when the sand more resembles soil, trees and shrubs can grow. Trees such as aspen shade out smaller plants and are the natural climatic climax. [Knowledge of the processes of psammosere development]

A problem however is the conifers are often planted to act as wind breaks and these become the new climax as a plagioclimax. Humans can also interfere with this succession by building golf courses and houses on the beaches. Therefore although succession is important, it is often stopped by human activity. [Evidence of synopticity, and c/u. Example not developed well]

Another example of a natural succession is the colonisation of wasteland. This occurred at Hunslet and Victoria mills in Leeds, an abandoned mill. [Second case study] In the first stage of this, the pioneer species are mosses and algae, these are able to colonise the bare rock and as they die, produce enough humus for the next stage to occur. Grasses often grow in cracks, their roots help to break up the rocks which combine with the humus to form a poor soil. This is enough for tall herbs to grow which are then replaced by a mix of grassland. This shades out smaller species. The conditions at this stage are less extreme and so trees are able to grow and become dominant, this allows a range of insects to colonise the area which will then bring small mammals and birds. [Evidence of knowledge]

A problem with this however is that the derelict land and overgrown vegetation are often seen as an eyesore and so the land is likely to be cleared or developed on before it reaches a climax or community. Therefore although the succession could happen, it is unlikely because of human interference so humans are again the most important factor. [Evidence of synopticity, and c/u, and clear link to the question. Again example not developed well]

There are times when humans produce ecosystems themselves This occurs in ecological conservation sites. An example of these is Troopers Hill in Bristol. This was an old industrial area which was cleared to produce this ecosystem. [Third example]

There are several different ecosystems present in Troopers hill. This requires a lot of expertise and numerous management strategies however it is managed very well. The most important of these ecosystems is the heathland this is because it is the only heathland in Bristol. This shows humans are important in this because without interference succession would occur and it would become deciduous forest. **[Link to question]** They manage it by cutting down saplings and removing invasive species. Another important ecosystem is the flower meadow. This is maintained by removing invasive species and saplings which would out-compete it. **[Evidence of c/u]** The flower meadow and scrubland ecosystems are very important to biodiversity, they contain a number of endangered invertebrates, meaning that Troopers hill is home to 30 endangered species and of which are in the red data book. **[A bit more detail here regarding this example]** In the creation of this ecosystem human interference is far more important because if natural succession were allowed to occur then many of the ecosystems would not exist and the biodiversity of the area would suffer. The climax community of the entire area would be deciduous woodland. **[Clear sense of focus]**

Another example of where human activity prevents natural succession from occurring is in the maintenance of heather moorland. **[Fourth type of example, but no area named]** Heather is important as it is fed on by sheep and red grouse. The periodic burning of heather produces a variety of different ages of heather which encourages new shoots and removes less fire tolerant species. If succession were allowed to continue then the heather would be out competed by trees and would only exist in small amounts. **[Some evidence of knowledge]**

This also occurs in a hydrosere succession in Northumberland wildlife reserve. The reed bed present provides a home for an endangered bird however if succession were allowed to continue the area would be replaced by forest and the birds ecosystem lost. To prevent this, volunteers cut the reeds so they do not fill the pond when they die and reach the surface, thus preserving the plagioclimax through human activity. **[Fifth case study, with some detail]**

Human activity can also be a destruction of ecosystems. The spraying of pesticides and herbicides on crops creates a monoculture and the cutting down of forest for timber can destroy the ecosystem. Other human activities such as the creation of playing fields and gardens favour just grass. **[Evidence of synopticity]**

There are times however when the process of succession can be started by human activity. This occurs on routeways such as motorways when verges are made. Seed mixes are added to encourage growth but salt loving plants also colonise these areas because of the salt spread on roads in winter. **[Evidence of knowledge and synopticity]**

Overall I think the impact of human activity is much more important in the creation of ecosystems than natural succession. **[A view expressed]** One reason for this is because only 3% of Scotland is the natural climax community. Therefore the impact of humans through the maintenance of plagioclimax communities are more important than natural succession especially as succession often results in few different ecosystems whereas human activity will often produce a far greater mix of biodiversity. **[Evidence of c/u]**

[A strongly focused answer that clearly addresses the question in a variety of contexts, some of which are named. A weakness is that the examples are not well-developed though they are used to illustrate the conceptual points being made and support the argument. There is strong evidence of synopticity and critical understanding, and conceptual knowledge is generally sound.]

***[Knowledge - Level 3 (higher)
Critical understanding - Level 4
Case studies - Level 3
Synopticity - Level 4 (lower)
Quality of argument - Level 4***

Overall Level 4 (lower) - 33 marks.]