

2006 Geography

Higher – Environmental Interactions

Finalised Marking Instructions

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Instructions to Markers: General Notes

Procedure before Markers' Meeting

You are asked to make yourself familiar with the question paper and the marking instructions. Marking of scripts at this stage should be only tentative and none should be finalised or returned. Please note any point of difficulty for discussion at the meeting.

Marking

- 1 The maximum mark for Paper 2 is 50. Markers are encouraged to use the whole range of marks and to give a high assessment for an answer of high quality.
- 2 The total marks assigned by you for each complete question should be entered in the outer right-hand margin of the answer book. When a question consists of more than one part, the marks assigned to each part **MUST BE SHOWN SEPARATELY** in the column provided on the inner right-hand side of the book.

It is of great importance that the utmost care should be exercised in adding up the marks. Where appropriate, all summations for totals and grand totals must be carefully checked. Where a candidate has scored zero marks for any question attempted '0' should be shown against the answer.

The **TOTAL** mark for any paper as recorded in the box at the top right-hand corner on the front cover of the script, and as entered on the Mark Sheet, must be given as a **WHOLE NUMBER**. Where a fractional mark has been given in a total mark, you must round up the total mark to the next whole number. Thus if the candidate gains, say, 29 $\frac{1}{2}$, the mark 30 should be entered in the box on the front of the script **AND ON THE MARK SHEET**.

- 3 It is helpful in later procedures if points receiving marks are clearly indicated. In general a $\frac{1}{2}$ mark should be awarded for a short correct statement with a full mark being awarded for a developed point.
- 4 All mistakes **MUST** be underlined in red pen. A wavy line (~~~~~~) should be used for something that is not quite right, a single line (-----) for mistakes which, though not very serious, are undoubtedly wrong, and a double line (=====) for gross blunders. These corrections are valuable when borderline cases and appeals are being considered. Where a page shows neither a correction nor a mark, a red tick **MUST** be placed at the bottom right-hand corner.
- 5 The marker should take the candidate's answers strictly as they are written; no attempt should be made to read into answers ideas which the candidate may have intended to convey but which have not been successfully conveyed. A caret (λ) should be used to indicate an important omission. A question mark (?) should be used to indicate that the marker cannot understand the meaning intended. The letter 'R' should be used to indicate that the candidate is repeating something already stated in the answer.
- 6 Care should be taken that no credit whatsoever is given to irrelevant parts of answers, however accurate the irrelevant passages may be. Irrelevant passages should be square-bracketed [].

It should be noted, however, that a fact or argument which is irrelevant in one candidate's answer may be made quite relevant by another candidate who has the ability to connect it to the question.

Question 1 – Rural Land Resources

- (a) For an answer to achieve full marks well annotated diagrams must be used. Although unlikely, if an answer does not have any diagram then mark out of 8. Explanations of any one feature eg corrie, should score a maximum of 5 marks but at least three features must be covered for full marks. Award up to 2 x ½ for specific place names of different features.

For a Corrie points could include:

- snow accumulates in a (north-facing) hollow on mountainside
- successive layers of snow compress first snowfalls into ice/neve
- ice moves downhill under gravity
- freeze-thaw weathering loosens rock above glacier
- plucking steepens back wall of the corrie
- maximum erosion takes place where weight of ice is greatest
- boulders and stones embedded in ice grind away at the bottom of corrie (abrasion) carving out hollow/armchair shaped depression (overdeepening)
- rate of erosion decreases at edge of corrie leaving a rock lip.

10 marks

- (b) Responses will vary according to the area chosen but opportunities might include:

- Social – tourism, recreation, nature conservation
- Economic – hill farming, forestry, HEP generation potential, water supply, quarrying.

Candidates must consider both parts to achieve full marks. Any answer that omits social or economic opportunities should be marked out of 4.

5 marks

- (c) Conflicts might include:

People arguing for the railway

Jobs will be created during and after the construction

Less traffic on the roads – less pollution and congestion with the railway encouraging people to leave their cars in railway car parks outside the Park

The railway will boost visitor numbers to the National Park and bring money into the economy of the local area

People who do not own their own transport will be able to view the scenery from the railway carriage

People arguing against the railway

Labour force – probably not local people, strain on local services

Building transport/heavy machinery – more traffic congestion especially on narrow rural roads during railway construction

Railway itself will damage the fragile ‘wilderness’ sites and encourage more visitors to these areas – footpath erosion etc

Car parks and buildings associated with the railway will cause visual pollution

Assess out of 6, with a maximum of 4 marks for arguments ‘for’ or ‘against’. 6 marks

(d) Solutions might include:

- traffic restrictions in more favoured areas
- reduce congestion on busy roads using a one-way system
- encourage use of minibuses
- separate local and tourist traffic
- attempt to develop wider spread of 'honeypot' areas
- screen new buildings, car parks etc behind deciduous trees and use only local stone for buildings
- better visitor education.

Assess out of 4. Up to 2 x ½ may be awarded for place names appropriately linked to the above measures.

4 marks

Question 2 – Rural Land Degradation

(a) (i) Description could include the following points:

- the pattern shows constant fluctuations
- from 1950 until about 1970 rainfall is above average
- after 1970 rainfall is consistently below average.

3 marks

(ii) Answers might include:

- during drier periods – soil will dry out – plants die – hence no root systems to protect the soil. The soil can easily be blown away
- it is often the most fertile topsoil which is affected
- if a heavy (convectional) rain storm falls unprotected soil is easily washed away
- reference might also be made to human responses – eg during periods of above average rain, cropping and animal husbandry boundaries can be extended into previously dry areas – when a climatic reverse occurs the resulting overcropping/overcultivation can lead to considerable degradation.

Award up to 2 marks for detail regarding erosion processes by wind or rain.

Assess out of 4

4 marks

(b) Answers will vary according to the specific areas studied but for **North America** answers may include:

People:

- land and crops destroyed
- farmers abandoned land and moved to find work – eg from Oklahoma to California (Steinbeck's family in the 'Grapes of Wrath')
- those who remained lived in poverty.

Environment:

- lack of cover to protect the land – soil dried up and blew away
- dust storms
- desertification of the countryside
- soil exhausted.

(b) For **Africa north of the Equator** answers may include:
cont.

People:

- crop failures and the resulting malnutrition leading to famine eg Sudan, Ethiopia and much of the Sahel
- migration on a large scale – usually into shanties on the edge of the major cities
- the collapse of the nomadic way of life due to the lack of grazing and water
- many nomads forced to settle in villages – with a consequent increase in pressure on the surrounding land
- The breakdown of the settled farmer/nomad relationship in places like Yatenga province in Northern Burkina Faso.

Environment:

- soil structure breaks down due to overcropping and overgrazing
- advance of the Sahara – ‘desertification’
- wind erosion of dried out soil/severe erosion from rains when they do eventually arrive
- lowering of water tables
- drying of the climate due to lack of moisture re-cycling and the Albedo effect.

For the **Amazon** basin answers may include:

People:

- destruction of the way of life of the indigenous people – eg clashes between the Yanomami and incomers.
- destruction of the formerly sustainable development eg rubber tappers and Brazil Nut collectors
- clashes between various competing groups eg the violent death of Chico Mendez allegedly at the behest of ranchers
- reduction of fallow period leading to reduced yields with obvious consequences for the dependent population
- creation of reservations for indigenous people
- increase in ‘western’ diseases
- increase in alcoholism amongst indigenous population.

Environment:

- impact on the closed nutrient cycle
- leaching of minerals and laterisation
- increased run-off and flooding
- loss of wildlife habitat/biodiversity
- impact on global climate – Greenhouse Effect.

Assess out of 8, with a maximum of 5 for either of the areas described. Up to 2 x ½ may be awarded for place names appropriately linked to the above impacts.

8 marks

- (c) Clearly answers will vary according to the chosen conservation strategies but might include:

For **North America:**

Shelter belts:

- Trees planted at right angles to the prevailing winds – help to protect the soil from wind erosion and assist in the trapping/binding of soil that is being blown about. These can also help to trap snow in winter which melts into the soil in springtime increasing the sub-surface water supply.

Contour ploughing:

- Ploughing along, rather than up and down the lie of the land. This avoids the creation of ‘acceleration channels’ for any run-off and actually forms small dams (in the furrows) which help to trap water and hence increase the amount of rainwater that can infiltrate the soil.

For **Africa North of the Equator:**

Magic Stones (Diguettes):

- Lines of stones placed along contours to trap the run-off of rain water (and soil) following the seasonal rains of the Sahel. (The process of diguette creation may be outlined ie the use of plastic tubes with water – marking off of the contours and then the collection of stones.)

Animal fences:

- Fences to keep animals out (or in)! Animals, particularly goats, are a major source of degradation (through overgrazing). The construction of fences prevents animals getting on to fragile ground giving it a chance to recover. The fences can also keep animals away from cropland.

For the **Amazon Basin:**

Purchase by conservation groups:

- Land is bought by groups such as WWF. Their aim is to return the forest to its natural state by stopping all logging/extractive industry and replanting with native tree species. In this way the ecosystem can return to its ‘natural’ condition and degradation of rural land ceases. The process is usually carried out by involving the local people and may include an element of returning the land to a more traditional form of ‘light touch’ farming.

Agro-forestry schemes:

- These are schemes which provide an alternative way of making sustainable use of the forests whilst at the same time helping forest peoples – by encouraging small-scale farming in plots. Tree crops and arable farming take place eg in Tome-Acu (south of Belem in Brazil) – combines cocoa/coconut/rubber trees with passion fruit/pepper production. The advantages of this are – employment, sustainable yields and the protection of ways of life of the people.

**Assess out of 10 with a maximum of 4 marks for any one conservation strategy. For full marks four strategies must be included.
Max 9 for three strategies**

10 marks

Question 3 – River Basin Management

(a) Candidates may mention a range of reasons to explain the need for water management including:

- very high summer rainfall
- flood control
- regulating flow and storage of water
- power supply for expanding cities and industry
- water for industrial purposes
- water for agricultural irrigation as food demands increase
- drinking water for increasing population
- maintaining navigable river.

Assess out of 6, awarding a maximum of two marks for specific data taken from graphs.

6 marks

(b) Physical factors might include:

- solid foundations for dams
- consideration of earthquake zones
- narrow cross-section to reduce dam length
- large, deep valley to flood behind the dam
- lack of permeability in rock below reservoir
- sufficient water supply from catchment area
- low evaporation rates
- impact on hydrological cycle.

Human factors might include:

- cost of construction
- proximity to areas of demand for water, electricity etc
- cost of removing people
- cost of compensating farmers, home owners etc
- effect on communications.

Assess out of 7, with up to 5 for either Physical or Human factors.

7 marks

- (c) Answers will depend upon the basin chosen. However, some suggestions are outlined below.

Benefits	Adverse Consequences
<p>Social:</p> <ul style="list-style-type: none"> • greater population can be sustained with increased food supply • less disease and poor health due to better water supply and more food being available • recreational opportunities • more widespread availability of electricity. <p>Economic:</p> <ul style="list-style-type: none"> • improved farming outputs – surplus for sale? • HEP – industrial development creating job opportunities • water for industry • navigation opportunities. <p>Environmental:</p> <ul style="list-style-type: none"> • increased fresh water supply improves sanitation and health • scenic improvement? 	<p>Social:</p> <ul style="list-style-type: none"> • forced removal of people from valley sites • increased incidence of water borne diseases such as <ul style="list-style-type: none"> □ ilharzias in irrigation channels. <p>Economic:</p> <ul style="list-style-type: none"> • huge costs of new schemes • dependence on foreign aid/finance in the case of ELDCs – consequent debts • more money required for fertilisers • possible dislocation of communication links. <p>Environmental:</p> <ul style="list-style-type: none"> • water pollution and industrial pollution • loss of alluvial supplies to flood plain • silting up of reservoirs • flooding of archaeological /historical sites.

Answers should be authentic for the chosen river basin. Up to 2 x ½ may be awarded for appropriate place names illustrating the above.

**Candidates must refer to all 6 parts for full marks
(reduce maximum by 1 mark for each part missed)**

12 marks

Question 4

(a) Answers will clearly depend upon the chosen EMDC, but for Germany answers might suggest that cities are located:

- as sea ports eg Hamburg
- as major regional centres such as Hanover – largest cities in generally flat rural areas
- on rivers – Cologne, Frankfurt, Stuttgart – for communications/ trade/sources of raw materials – especially those on the River Rhine
- generally in the lower areas – only Munich is built on higher land – ease of building/communications could be reason for this.

**Assess out of 4 with maximum of 3 for description.
Max 2×½ for named cities, if appropriately located.**

4 Marks

(b) Again answers will depend upon the city chosen, but for Frankfurt the following might be suggested:

- flat land on bank of River Main provided site for religious centre
- 14th century – became supra-regional trade centre
- river provided excellent communications – especially the links with the River Rhine and Northern Europe
- developed at a junction of trades routes – north-south meeting east-west
- developed as a major financial centre in the late 20th Century – now headquarters of the European Central Bank
- major business centre – 35 million consumers live within a 200km. radius of the city – 41 autobahn connections – greatly enhance accessibility and contribute to recent growth.

**Assess out of 4, for full credit both site and situation must be included.
Max 1 for description of site.**

4 Marks

- (c) (i) Answers will once more depend on the city chosen, and will probably follow the ‘push-pull’ model. They may include points such as :

‘Push’:

- congestion/noise/pollution in inner city areas
- poor quality of housing in the inner city
- urban redevelopment schemes which reduce population densities in the inner city
- lack of affordable new and appropriate housing in the inner city
- high levels of council tax in the cities
- lack of ‘good schools’ in the cities.

‘Pull’:

- more attractive environment closer to the edge of the city or in commuter villages
- more spacious properties – both buildings and gardens
- accessibility by motorway has meant places some distance away can be reached quickly
- out of town shopping centres are more easily reached from the suburbs.

- (ii) Answers should be able to point out that the two major thrusts to counteract this have been:

- the establishment of greenbelts,
- and the attempts made to redevelop brownfield sites within the inner city.

Some attempt should be made to relate these policies to the chosen city.

Assess out of 7 – but award a maximum of 5 marks for either part. Up to 2 x ½ may be awarded for the use of relevant locations in and around the chosen city.

7 Marks

(d) The following might be included:

- the effects of urban ‘pull’ and rural ‘push’ factors (but do not credit simple ‘reverse’ statements)
- explanations linking population growth to the reasons for higher birth rates can also be credited
- the outward growth of the city can be explained by either the expansion of squatter settlements on the city edge or the movement outwards of industrial areas or in some cases better quality housing.

Assess out of 5, with maximum of 3 for either natural increase or immigration. 5 marks

(e) Answers might refer to the following:

Problems:

- unemployment/underemployment
- poorly paid work for ‘low-skilled’ jobs
- drugs, crime, racketeering and prostitution
- lack of services – schools, hospitals – use of public water taps and lack of sanitation
- pollution from nearby industries
- often built on hillsides which have been de-vegetated – consequently prone to mudslides
- illegal – can be removed, ‘bulldozed’ by the authorities.

Advantages:

- low-cost housing
- rent-free
- no paperwork/red-tape/planning regulations
- sometimes close to workplaces
- in places, a sense of community develops.

Assess out of 5, with a maximum for 3 for either part

5 Marks

Question 5 – European Regional Inequalities

(a) Answers could refer to such points as:

- lies within more favoured area climatically – more moderate temperature range and precipitation levels
- fewer physical constraints upon urban development and transportation networks – includes extensive areas of lowland such as large parts of the North European Plain; East Anglia, Kent, Sussex; Plain of Lombardy
- well served by extensive transportation links – roads, motorways, railways (eg Channel Tunnel, Eurostar) – and contains major transport ‘hubs’ (eg Schipol Airport, Amsterdam; Parisian airports; Heathrow/Gatwick). Gateway for sea transport to global markets – major container ports such as Rotterdam/Europort, Antwerp, Felixstowe. Several major ferry ports/routes (eg Dover-Calais, Hull/Harwich – Rotterdam/Zeebrugge/Ostende). Also includes canal and river transport systems notably the Rhine
- considerable benefits to be gained by industry and commerce from agglomeration factors and economies of scale which have been able to operate effectively in the “Euro Core”
- region is the economic ‘heart’ of the longer-established and more prosperous EU member countries and is well placed to take advantage of future growth prospects with the recent eastwards expansion of the EU
- close to major political centres (eg Brussels, London, Paris, and Strasbourg).

Assess out of 6 allowing up to 4 marks for either physical or human reasons.

6 marks

(b) Essentially the data provided shows that the selection of newest member countries are less wealthy than the EU15 although candidates should note that Cyprus (particularly), the Czech Republic and Hungary have lower rates of unemployment. For full marks answers will require to illustrate the point with some well-chosen examples and statistics. For instance, Poland with 19.3% unemployment has more than twice the EU15 average and with only 9 PC’s per 100 people has the second lowest total of the countries shown – less than a third of the EU15 average. With the exception of the Czech Republic (84), all of the countries listed are well behind the EU15 average (85) for mobile phone subscriptions/ownership.

Assess out of 5

5 marks

(c) (i) Answers will, of course, depend on the EU country chosen but ought to be able to include mention (and, hopefully, 'illustration') of such social and economic problems as:

- long term unemployment resulting in 2nd and 3rd generation unemployed in the most deprived areas (eg parts of the extreme south of Italy, perhaps, or declining heavy industrial areas such as the Sambre-Meuse)
- growth of what is now classed as a 'dependency culture' reliant on outside help/aid/financial packages
- loss of younger, economically active population from depressed communities migrating to seek improved opportunities elsewhere
- ageing population left behind
- negative image of depressed run-down areas may deter future much needed investment
- considerable differences in living standards/personal wealth (eg house values/prices)

Assess out of 6 ensuring for full marks that both social and economic problems have been included.

6 marks

- (c) (ii) The EU has provided assistance for less prosperous regions in a variety of ways.

These include:

- European Regional Development Fund (ERDF) which supplies financial help to encourage firms to move to disadvantaged/declining areas eg loans, grants etc and assists with improvements to local infrastructure (roads, ferry ports etc)
- European Social Fund (ESF) which is used to improve job opportunities; provide re-training for agricultural workers or redundant miners/steelworkers etc. and assists with relocation
- European Investment Bank (EIB) which concentrates on providing loans for projects/businesses setting up in disadvantaged areas
- Problem/peripheral areas may be given Objective 1 or Objective 2 status which makes them eligible for funding packages/support for a set time.

The part played by national governments will, of course, depend on the country chosen but may include the likes of:

UK

- Government incentives: Regional Development status, capital allowances, training grants, assistance with labour costs, rent-free arrangements etc
- Government intervention: relocation of specific government offices (eg National Savings to Glasgow, DVLC to Swansea, Child Benefit Office to Newcastle) to provide new civil service jobs in areas of high unemployment.

Southern Italy

- Cassa per il Mezzogiorno
- Regional Development Plans
- direction of state-owned firms to invest in the South.

Southern Belgium

- capital investment grants in old coalfield areas
- exemption from corporate income tax for advanced technical research companies
- state subsidies to steel and coal industries.

Assess out of 8 awarding up to 6 marks for either EU or national government strategies. Award up to 2 x ½ for relevant locations illustrating the measures discussed.

8 marks

Question 6

(a) Answers might include:

- countries such as Saudi Arabia with natural resources such as oil or Malaysia which exports primary products such as tropical hardwood, rubber, palm oil and tin tend to be better off than countries such as Burkina Faso which lack resources
- some countries earn a great deal from being Newly Industrialising countries (NICs) eg South Korea, Taiwan
- some countries such as Brazil have both resources and growing manufacturing industries
- freedom from the natural disasters which can restrict development eg drought in sub Saharan Africa, floods in Bangladesh, hurricanes in the Caribbean.
- Political stability – avoiding disruptive civil wars such as these in Sudan/Rwanda/Somalia/Liberia/Sierra Leone.

(Assess out of 5. Answers which fail to mention appropriate countries should receive a maximum of 4 marks.)

5 marks

(b) (i) Answers should be able to use the information from the resources to draw valid conclusions about the likely state of health in Mali. For example:

- low quantities of arable land mean crop production will be less than required to feed the people – insufficient food can lead to ill health
- high birth rate will mean that each year there is a growing number of mouths to feed – stretching food resources further
- low literacy levels will have implications in attempting to educate about hygiene/birth control/disease control
- low GDP means that the country will struggle to provide services such as hospitals/clean water/sanitation – and this will increase ill-health.

Assess out of 5

5 marks

(ii) Examples of Primary Health Care strategies include:

- use of barefoot doctors – trusted local people who can carry out treatment for more common illnesses – sometimes using cheaper traditional remedies
- use of ORT to tackle de-hydration – particularly amongst babies
- provisions of vaccination programmes against disease such as polio, measles, cholera
- the development of health education schemes in schools, with groups of expectant mothers, with women in relation to diet
- sometimes these initiatives are backed up by the building of small local health centres staffed by doctors (like GPs)
- PHC can also involve the building of small scale clean water supplies/latrines or other simple sewerage systems – often with community participation.

Candidates may also refer to PHC as based on generally preventative medicine rather than (more expensive) curative medicine.

Assess out of 6

6 marks

(c) Measures taken to combat Malaria can include:

Trying to eradicate the mosquitoes:

- insecticides – eg DDT – however this is environmentally harmful – impacts on the food chain. In addition the mosquitoes build up a resistance to chemical insecticides
- newer insecticides such as Malathion – more expensive – also stains walls and has an unpleasant smell – so not popular!
- mustard seeds – become wet and sticky and drag mosquito larvae under the water – this drowns them
- egg-white sprayed on water – suffocates larvae by clogging up their breathing tubes. (As with mustard seeds – wasteful, costly and impractical – cannot be easily carried out on all breeding sites)
- Bti bacteria grown in coconuts. Fermented coconuts are, after a few days, broken open and thrown into mosquito infected ponds. The larvae eat the bacteria and have their stomach lining destroyed!! Cheap, environmentally friendly and 2/3 coconuts will control a typical pond for up to 45 days
- larvae eating fish – effective and a useful additional source of protein
- drainage of swamps – requires much effort – not always practicable in the tropics.

Treating those suffering from malaria:

- Drugs
 - Chloroquin – easy to use/cheap but mosquitoes are developing a resistance to it
 - Larium – powerful, greater protection – but can have harmful side-effects
 - Malarone – fairly new drug – said to be 98% effective – few side effects
- Vaccines – none yet available – still at experimental stage
- Education programmes
 - Insect repellent – eg Autan
 - Cover skin at dusk when mosquitoes most active
 - Sleep under a treated mosquito net
- Quinghaosu – extracted from a plant, traditional cure in China – easy to take and a major step forward.

Assess out of 9. Candidates who fail to provide some sort of evaluative comment on at least some of their methods should score a maximum of 7.

9 marks

[END OF MARKING INSTRUCTIONS]