

**2004 Geography**

**Higher – Applications**

**Finalised Marking Instructions**

## 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 ( $\lambda$ ) 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.

## Rural Land Resources

### Question 1

- (a) For an answer to achieve full marks well annotated diagrams must be used. Although unlikely, if an answer does not have any diagrams then mark out of 8.  
Explanations of any one feature eg corrie, should score a maximum of 5 marks, but at least three features for full marks. (2 features = maximum 9)  
Award up to 1 mark for specific named examples of different features.

**Assess out of 10**

**10 marks**

- (b) Environmental factors which limit opportunities might include:
- Slopes too steep for cultivation and communications
  - Acidic, waterlogged soils
  - High levels of precipitation causing leaching
  - Bare rock surfaces and scree making cultivation and building difficult
  - Hard igneous and metamorphic rock making construction difficult
  - Low temperatures and high rainfall deterring tourists
  - Floods and snowdrifts blocking transport routes
  - High winds, low temperatures etc affecting plant growth.

**Assess out of 5.**

**5 marks**

- (c) (i) Environmental conflicts might include:
- Traffic congestion on narrow rural roads and in car parks particularly during holiday periods
  - Large volumes of visitor traffic increase air and noise pollution and can spoil the attraction of small local villages
  - Erosion of footpaths by hillwalkers and tourists
  - Visitors may cause problems to farmers and landowners by disturbing animals and damaging walls
  - Development of unsightly visitor/leisure complexes and accommodation
  - Water pollution may arise in lochs from diesel leaks
  - Bank erosion and noise pollution may arise from motor powered craft
  - Visual pollution and erosion may arise from specific activities like skiing eg erosion on ski runs, and cable cars and ski tows being eyesores
  - General anti-social activities may arise eg litter and vandalism.
- (ii) Candidates should indicate key features of National Parks which may help resolve conflicts:
- Government passed various Acts and set up statutory bodies
  - NPs were set up to conserve and enhance the natural beauty, wildlife and cultural heritage of areas
  - NPs promote opportunities for understanding and enjoyment
  - NPs will have a strong voice in issues like planning permission and setting up special areas eg SSSIs
  - NPs have committees as part of National Park Authorities which will consider environmental conflicts.

**Assess 7/3.**

**10 marks**

Maximum of 2 marks in part (ii) if no reference to National Park Authority Status.

**Total (25)**

## Rural Land Degradation

### Question 2

- (a) (i) Explanation might include:
- Periods of below average rainfall tend to come blocked together
  - Low rainfall will lead to lack of plant growth, plants may die
  - The soil therefore loses the protection of the vegetation cover from wind and water erosion and also the root system which helps to bind the soil together
  - Dry soil also lacks the binding effect which moisture provides
  - The result is that the dried out, unprotected soil can be much more easily eroded by wind or by sudden storms.
- Credit explanations linked to heavy rainfall.

**Assess out of 3**

**3 marks**

- (ii) Answers will depend upon the area(s) chosen but for the Dust Bowl candidates may refer to the following points:
- Use of farming techniques better suited to the moister east
  - Monoculture, especially of wheat or of demanding crops (like cotton), depleted the soil of moisture and nutrients
  - Deep ploughing of fragile soils (previously these light sandy soils had been held in place by natural grasslands)
  - Marginal land farmed during blocks of wet years leaving them in a fragile condition in dry years
  - Farm sizes small, forcing owners to overcrop, particularly when prices were low.

For the Tennessee Valley the following may be mentioned:

- Poor mining practices
- Deforestation of slopes
- Bad farming practices:
  - Ploughing up and down slopes
  - Monoculture
  - Lack of fertilisers
  - Leaving soil exposed for part of the year

**Assess out of 5.**

**5 marks**

- (b) (i) Impact on **people** may include:
- Crop failure and resulting malnutrition leading to famine eg Sudan, Ethiopia and much of the Sahel
  - Migration on a large scale – often into shanties on the edge of major cities
  - Collapse of nomadic way of life due to 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.

Impact on the **environment** may include:

- Soil structure breaks down due to overcropping and overgrazing
- The 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.

(ii) Impact on **people** may include:

- Destruction of the way of life of the indigenous people – eg clashes between the Yanomami and incomers
- Loss of formerly sustainable activities such as Rubber Tapping and the collection of Brazil nuts
- 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 reserves for indigenous population
- The rapid degradation of pasture land means that more and more rainforest must be cleared to create suitable new pasture.

Impact on the **environment** may include:

- Impact on closed nutrient system leading to soil impoverishment
- Leaching of minerals and development of laterite
- Increased run-off and flooding
- Loss of wildlife and biodiversity.

**Mark people/environment 3/5, 4/4 or 5/3.**

**8 marks**

(c)

Soil conservation methods might include:

- Crop rotation/diversification
- Contour ploughing
- Keeping the land under grass
- Trash farming/stubble mulching
- Shelter belts – used in the moister east
- Strip cultivation – inter-cropping tall crops shelter smaller ones
- Increased irrigation
- Soil banks – farmers encouraged to keep soil under grass rather than plough it up
- Increase farm size – the previous farm size of 160 hectares was based on moister eastern conditions – to support farmers in the drier west farms had to be bigger – but used less intensively
- Farmers encouraged to have another job to avoid total dependence on their farms (and hence overcropping).

**Assess out of 9.**

**For full credit some attempt must be made to explain how these methods help reduce land degradation, and how successful they have been – otherwise, maximum 7.**

**9 marks**

**Total (25)**

## River Basin Management

### Question 3

- (a) (i) Candidates might make reference to:
- Rainfall imbalance between wet east (Durban) and drier west (Kimberley)
  - Semi desert conditions in west
  - Rainfall imbalance between wet “summer” and dry “winter”
  - Water (and HEP) demand from urban concentrations, many of which are found in drier areas.

**Assess out of 4.**

**4 marks**

- (ii) Candidates should note:
- Heavy rainfall in eastern coastal strip and moderate rainfall in mountains, brought by SE Trades
  - Hence adequate water supply and potential surplus in east
  - Watershed close to east coast, hence short rivers flowing east and long rivers flowing west through drier areas
  - Storage potential in mountains by damming rivers
  - Potential for water transfer from east to west, using tunnels.

**Assess out of 4.**

**4 marks**

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

**BENEFITS**

**ADVERSE  
CONSEQUENCES**

**Social:**

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>• Greater population can be sustained with increased food supply</li> <li>• Less disease and poor health due to better water supply and more food being available</li> <li>• Recreational opportunities</li> <li>• More widespread availability of electricity</li> </ul> | <ul style="list-style-type: none"> <li>• Forced removal of people from valley sites</li> <li>• Increased incidence of water borne diseases such as bilharzia in irrigation channels</li> </ul> |
|--|--|

**Economic:**

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>• Improved farming outputs – surplus for sale?</li> <li>• HEP – industrial development creating job opportunities</li> <li>• Water for industry</li> <li>• Navigation opportunities</li> </ul> | <ul style="list-style-type: none"> <li>• Huge cost of new schemes</li> <li>• Dependence on foreign aid/finance in the case of ELDC's – consequent debts</li> <li>• More money required for fertilisers</li> <li>• Possible dislocation of communication links</li> </ul> |
|---|--|

**Environmental:**

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• Increased fresh water supply improves sanitation and health</li> <li>• Scenic improvement?</li> </ul> | <ul style="list-style-type: none"> <li>• Water pollution and industrial pollution</li> <li>• Loss of alluvial supplies to flood plain</li> <li>• Silting up of reservoirs</li> <li>• Flooding of archaeological/historical sites</li> </ul> |
|--|---|

Answers should be authentic for the chosen river basin.

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

**12 marks**

(c) Political problems will depend on the river chosen, but may include:

- Water control/dependence on neighbours upstream
- Pollution levels across borders
- Reduction of water flows in some areas
- Excessive influence of more powerful partner eg RSA v Lesotho

Solutions are usually dependent on some form of agreement between the “participants” eg Colorado Compact, or the project may be overseen by an external body eg World Bank in Lesotho.

**Award up to 4 marks for problems or solutions.**

**5 marks**

**Total (25)**

## Urban Change and its Management

### Question 4

- (a) Specific characteristics will be dependent upon the city chosen by the candidate and will be enhanced by authentic references.  
A weighting of 5/3; 3/5 or 4/4 may be applied for either of the two functions chosen.  
**Both** description and explanation must be included for full marks.

Answers may include references to:

#### Shopping

- High rental values together with limited space for storage and display have squeezed some retailing out of central city areas – in addition these retailers have been attracted to out of town centres where parking is free and access via inter-urban motorway network is relatively easy

On the other hand

- Specialised retailers often move in to central city locations as older commercial properties are renovated/gentrified, their former occupants having been displaced to cheaper locations outwith the central city area
- Redevelopment of key sites within the CBD and attraction of flagship stores eg Buchanan Galleries, St Enoch Centre (Glasgow), and ongoing redevelopment of Jenners Department store on a key site in Princes Street
- Focus on designer label/high-end shopping taking advantage of CBD “status” eg Harvey Nichols (Edinburgh), Italian Centre (Glasgow), Princes Square (Glasgow)

#### Transport

- Focus of public transport termini remains within the CBD and has been subject to massive reinvestment in many cities of the Developed World. This includes the introduction of light railways, Metro and reopening of branch railway lines with connection/terminus in CBD. However the sheer number of people attracted continues to put a strain on these transport services (London, Glasgow Underground, suburban rail services etc)
- Difficulties with train operators and rail operators (formerly Rail Track) continue to plague transport facilities in CBD
- Growth of bus transport serving niche markets from outlying housing areas to CBD
- More stringent traffic regulations in and around CBDs including the total ban of private vehicles, charging schemes, scaled parking schemes
- Growth of Park and Ride schemes
- Development of Bus Lanes to ease movement to and through CBD
- Cycle Lanes

### **Entertainment/Leisure**

- The growing market for city break holidays based on quality retailing and/or cultural/historical significance of the central city area has attracted a growth in hotel chains and the leisure industry generally, in many central business districts
- Growing importance of the “conference circuit” too has added impetus to this (hotel) development
- A younger more affluent population continues to be attracted to the central city area by the long standing concentration of theatres/cinemas in the CBD. This has a multiplier effect on other leisure activities – pubs, clubs, restaurants
- The continued resurgence in cinema audiences has led to the redevelopment of major multiplexes within the CBD (eg Warner Village/Edinburgh; UGC/Glasgow)
- “status” of a central city location is crucial to the success of these leisure businesses

**8 marks**

- (b) (i) Again answers will be dependent upon the city chosen.  
Weighting of 5/3; 3/5 or 4/4 for parts (i) and (ii) may be applied.  
Maximum of 1 mark for examples.

Factors responsible for conflicts on the edge of the city may include:

- Loss of recreational land as pressure for new developments (particularly residential properties) puts additional pressure on these amenities (golf courses; country parks)
- High land values in the city centre, increasing personal mobility and traffic problems in the CBD all encourage the development of out of town shopping centres
- Need for by-passes and ring roads
- Loss of farmland on the urban fringe and vandalism to farmers' property often attributable to residents of peripheral housing schemes
- Increased pressure on rural land for land-fill and the consequent conflict between local residents and those requiring land fill sites
- Preferences for modern industries and office developments to be located on the edge of cities adjacent to main roads, adequate room for expansion etc.

- (ii) Strategies aimed at reducing the conflict may include:

- Attempt to dissuade Greenfield development in favour of Brownfield sites (with high levels of support for development on these sites)
- Rehabilitation of residential property in the inner city rather than wholesale demolition so as to reduce the need for new housing on the periphery
- Efforts to focus new development around specific nodes, often pre-existing villages/communities – coupled with strict planning restrictions
- Adherence to planning zones and protection of designated Green Belt areas
- Developments permitted on strict terms set down by local authority which often includes developers contributing to the “common good” (building sports facilities/developing specific transport projects)

If developing world city discussed, award half marks.

**8 marks**

(c) (i) For full marks specific references must be made to the candidate's chosen city:

- Explanations for city growth should include both urban "pull" factors and rural "push" factors (do not credit simple "reverse" statements)
- Reasons can also be explained by the higher Birth Rates commonly found in cities and further credit should be awarded for any explanations offered for this higher Birth Rate found in cities
- Specific reference to the growth of squatter settlements may also be made relevant
- Growth may be partly due to spatial expansion of city boundaries (true of Mumbai).

(ii) Social, economic and environmental problems should be relevant to the candidate's chosen city and might include:

- Unemployment/underemployment
- Growth of the "grey" economy and black markets
- Poor wages for unskilled jobs due partially to the huge supply of labour available
- Drugs, crime, racketeering and prostitution are common in areas of cities in the ELDC, and often involve a greater % of the population than in a city of the More Developed World (cf "City of God", recent Brazilian movie based on a notorious favela in Rio de Janeiro)
- Lack of services, schools and hospitals
- Chronic traffic congestion and high levels of atmospheric pollution associated with this
- Chaotic urban infrastructure eg incomplete water and sewage supplies and connections
- "natural" disasters, such as landslides resulting from inappropriate building techniques and methods on fragile or unstable land.

**Maximum of 5 for either part (i) or part (ii).**

**9 marks**

**Total (25)**

## European Regional Inequalities

### Question 5

- (a) Wide regional variations between the member states ranging from Belgium and Germany with an average purchasing power of 112 to 110 respectively, to Portugal with an average purchasing power of 71. This is the poorest of the European Union states shown. Those countries on the periphery (Spain, Ireland and Portugal) are all below the standardised average (100). The UK (99) is just below the EU average with France (101) and Italy (103) just above the standardised average.

UK has a large inequality between its richest and poorest regions, with Inner London around 225 whilst Cornwall and Isles of Scilly have only around 70.

Germany has a similarly broad differential – Hamburg (195) to Dessau (52). In Belgium – Brussels (170) to Hainaut (80) – and France – Ile de France (160) to Languedoc – Roussillon (80) – the regional disparities are not as pronounced.

There is also a large variation within Italy (103), although just above the EU standardised average, its poorest region Calabria scores only around 55 GDP, one of the lowest scoring regions.

Differences between and within the EU must be considered with a maximum of 3 marks for one part.

**5 marks**

- (b) (i) Answers will be dependent upon the country chosen but must be authentic for the candidate to attain full marks.

**Physical factors could be related to:**

- difficult terrain/relief (mountain ranges: Northern Spain, Central Italy, Highlands of Scotland)
- Physical isolation (highlands of Scotland/Wales, areas in Central Spain, much of Southern Italy)
- Climatic problems such as drought (Southern Italy, Central, Southern and Eastern Spain)
- Prolonged winters (Northern Sweden, much of Finland)
- Natural disasters (earthquakes; Greece, Italy; volcanic eruptions; Southern Italy).

**Human factors could include:**

- Differences of employment opportunities
- Decline in the range and scope of opportunities in the rural based economy
- Decline in the range of relevant skills in a declining industrial area
- Perceptions of inward investors
- Problems of land ownership and tenure
- Political/terrorist factions (ETA/IRA)
- Overdependence on seasonal employment in (for example) the tourist industry (Southern and South-eastern Spain and Southern Italy)
- Variations in investment infrastructure.

**Maximum 5 for either physical or human factors.**

**7 marks**

- (ii) **Social problems could include:**

- High levels of unemployment and the consequent deterioration in the quality of life and increase in deprivation (however measured)
- Lack of appropriate skills training
- Out-migration.

**Economic problems could include:**

- Run down of traditional industries
- Lack of investment from both private and public sources.

**5 marks**

(c)

National strategies are often difficult to separate entirely from EU strategies as much is based on co-financing arrangements.

- ERDF: this fund supplies finance for a wide range of direct and indirect assistance to encourage firms to move to disadvantaged/declining areas
- ESF: funding for job training and relocation of labour
- EIB: loans for businesses setting up in disadvantaged areas
- Regional development status, Enterprise Zone status, capital allowances, training grants and assistance with labour costs eg Scottish Highlands was the fastest developing area in the UK in Dec '02
- Specific assistance to old coal mining areas (this often benefits from Objective 2 funding)
- Intervention by national government resulting in the location of major government employers in disadvantaged areas (eg MOD to Glasgow)
- Intervention by national government to “encourage” multi-nationals to locate (often with mixed results eg Spain and VAG/SEAT [relatively successful], Scotland and Chungwa)

Strategies to reduce both social and economic inequalities must be tackled for full marks. Some mention of the effectiveness of the national strategies is required for full marks.

**Assess out of 8.**

**8 marks**

**Total (25)**

## Development and Health

### Question 6

(a) (i) Candidates ought to be able to refer to a number of countries and offer brief explanations (“positive” and/or “negative”) for their differing levels of development eg

- Newly Industrialised Countries such as those on the Pacific Rim (eg South Korea, Taiwan, China, Malaysia) have, through entrepreneurial skills, an educated, resourceful and relatively cheap work-force and foreign investment, been able to establish a wide industrial base (eg steel, shipbuilding, motor vehicles, electrical goods in the case of South Korea) and been able to earn valuable foreign currency through exports. Malaysia has benefited from the export of primary products such as tropical hardwoods, rubber, palm oil and tin and, like Thailand, has encouraged the growth of tourism
- Oil Exporting Countries such as Saudi Arabia, Kuwait, the UAE or Brunei have been able to generate great wealth which has, increasingly, been invested in improved infrastructure and services and has “trickled down” to a wider section of the population
- Similarly, countries such as Brazil have prospered due to the exploitation of their abundant natural resources (eg timber, iron-ore, bauxite) and the growth of manufacturing industry  
Others, such as Chad, Mali or Burkina are less fortunate and have limited potential for generating income/investment
- Frequent natural disasters have afflicted many countries and restricted their development eg Bangladesh (cyclones and floods), Mozambique (floods in 2001 and 2002), Chad, Somalia, Sudan, Ethiopia (recurring drought and associated famine)
- Many countries in the Developing World have unstable, despotic, corrupt regimes (eg Sierra Leone, Zimbabwe) and/or have suffered from border/civil wars (eg Rwanda, Angola, Somalia, Liberia, Sierra Leone) or war on a larger scale (eg Iraq, Afghanistan). Money which might have been invested in essential services such as education and health care may have been “siphoned off” into Swiss bank accounts or spent on armaments/rebuilding

Maximum of 2 marks for named countries correctly linked to explanations.

If comparison within a country, mark and then half the marks gained.

**Assess out of 6.**

**6 marks**

- (ii) Award one mark for a fully stated indicator and one mark for a suitable explanation as to its “usefulness” – ie 2 marks for each.

**Social** indicators could include:

- Crude Birth/Death rate
- Number of cars/TV sets/telephones etc per 1000 people
- Number of persons per doctor/per hospital bed.  
*(Developing Countries usually have thousands more people per doctor since such countries have not had the resources to educate and train sufficient personnel)*

**Economic** indicators could include:

- Average income per head
- Gross Domestic Product per capita
- Percentage of working population employed in, say, Primary sector.  
*(Far more people in Developing Countries are employed in Primary activities since many are still subsistence farmers and there is often a lack of opportunities in the Secondary and Tertiary sectors. Farming nowadays, in Developed Countries is more capital – rather than labour-intensive)*

**4 marks**

(b)

Examples of Primary Health Care strategies may include:

- The use of “barefoot” doctors who are cheaper to train. Therefore, easier to employ bigger numbers of them to serve wider areas/a greater percentage of the population. Often the “barefoot” doctors are supported by a network of local “trained helpers” who are more likely to be accepted/trusted by the community
- The use of ORT to tackle dehydration/diarrhoea as it is cheap, simple and easily administered
- The provision of vaccination programmes to offer protection against such health problems as polio, measles, whooping cough, cholera, TB
- Health education schemes often linked to local schools and volunteer mothers' groups. These focus on improving people's awareness of general health problems and on better diets and standards of nutrition
- Development of a network of local health centres/clinics staffed by generalist doctors (similar to GP's) who can conduct minor procedures
- Establishment of more reliable and cleaner water supplies and improved sewage/effluent disposal (eg OXFAM toilets) – usually involving community participation.....
- Use of locally manufactured (copy) pharmaceuticals which are substantially cheaper than those produced by the multi-national drug companies.

Generally, such approaches have proven to be effective and more cost-efficient/able to reach a wider population than, say, investment in specialist hospitals or high-tech equipment. This is certainly the case when they continue to be supported by national policies (eg India).

Answers which simply provide a list of PHC strategies without offering any comment on their suitability to Developing Countries should score no more than **4 marks**.

**Assess out of 6.**

**6 marks**

(c)

Answers will, obviously, depend upon the disease chosen but for **Malaria** (probably the most popular choice) could include:

Attack and attempt to eradicate the vector (ie the female anopheles mosquito) by –

- Insecticides such as DDT sprayed on breeding grounds and in and around houses. *Cheap and effective but environmentally harmful (can enter food chain posing a threat to health) and due to be banned globally by 2007. Mosquitoes also build up a resistance to chemical insecticides*
- Newer insecticides such as Malathion. *(Less risky than DDT but more expensive since it is petroleum-based and needs to be used more often. It also stains walls etc a nasty yellow colour and has an unpleasant smell so is less popular!)*
- Mustard seeds which become wet and sticky in water and drag mosquito larvae below the surface and drown them
- Egg-white sprayed on stagnant water surfaces suffocates larvae by clogging up their breathing tubes. *Like mustard seed “bombing” this seems wasteful, costly (what happens to all those egg yolks?), impractical, even far-fetched but, allegedly, both are true!*
- Bti bacteria grown in coconuts. Fermented coconuts are, after a few days, broken open and thrown into mosquito-infested ponds etc. Larvae eat the bacteria and have their stomach linings destroyed! *Cheap to produce; environmentally friendly bacteria harmless to livestock and humans; coconuts are plentiful and often grow beside ponds infested with mosquito larvae; 2/3 coconuts will “control” a typical pond for up to 45 days*
- Larvae-eating fish – *useful source of protein in people’s diet*
- Drainage of swamps etc – *requires considerable effort, not always practical in tropical environments.*

Treat those suffering from Malaria/attempt to stop people catching the disease by using drugs or avoiding being bitten by mosquitoes in the first place through –

- Drugs
  - Chloroquine (often taken with Paludrine) – *easy to use, relatively cheap but becoming ineffective in some areas as mosquitoes develop resistance to it*
  - Larium – *more powerful and gives a greater degree of protection but can have harmful side-effects*

- Malarone – *fairly new drug which looks like being a success also recently made available in tablet form for children (Malarone Paediatric) – said to be 98% effective and few, if any, side-effects*
- Vaccines – *(still experimental. Dr. Manuel Pattarroyo (Colombia) has developed one but it is still not in widespread use/generally accepted as being safe. A British vaccine has been trialled in Gambia and could be the breakthrough that everyone is waiting for. A vaccine would probably be easier to administer than a course of drugs and would give more lasting protection)*
- Education
  - “Prevention is easier than Cure”?
  - Use an insect repellent (eg Autan or Repel Plus)
  - Cover exposed skin at dusk (when mosquitoes are most active and ravenous!)
  - Sleep in screened room under a mosquito net (even better if it has been sprayed with insecticide)

*All of these are fairly cheap and ought not to be too difficult to implement – Primary Health Care. It is thought that 30% of child deaths could be avoided, for example, if children slept under treated nets*
- Quinghaosu – *extracted from a plant – used as a traditional cure in China for 2000 years. Put into pill form it is easy to take and may be a possible major step forward especially given China’s improved relations with the West.*

No *one* solution has been found. A combination of strategies/control methods, combined with increasing public awareness/education campaigns (eg WHO’s “Roll Back Malaria” – a global campaign aimed at halving the number of malaria cases by 2010, which involves local people and cheap methods of control) will be needed to even keep malaria in check.

Candidates who fail to provide an “evaluation” (ie comment on the effectiveness) of at least some of their control methods should score a maximum of 7 marks.

**Assess out of 9.**

**9 marks**

**Total (25)**

[END OF MARKING INSTRUCTIONS]