

The Challenge of Tropical Rainforests – MARK SCHEME

Question 1

Using Figure 8 and your own understanding, explain how development in tropical rainforests creates economic advantages but at a cost to the environment.

- **Level 3 (5-6 Marks)** (detailed) responses will be developed. Some use of Figure 8 (direct or inferred) and specific own understanding.

Indicative content

- The command word “explain” is used, which means to provide a reasoned account of the economic advantages and environmental costs.
- Understanding of economic advantages.
Eg Development of land for mining, farming and energy leads to jobs such as construction and farming
Companies pay taxes; public services, such as education and water supply are improved.
Forest is cleared to make space for cattle grazing, so large companies can make profit.
Improved transport opens up new areas for industrial development and tourism. Products such as oil palm, soya and rubber provide raw materials for processing industries.
Hydro-electric power provides cheap energy, which can be used by all types of industry.
Commercial logging companies and paper making can make profits.
Minerals such as gold and cobalt are very valuable, and may support industry.
- Use of Figure 8 (1st photo) – indicating environmental damage. Image shows severe soil erosion which may be direct result of deforestation. There is still some forestry on the right but deep gullies have formed on the sloping land with water cutting into the surface, removing entire layers of soil, making the land unusable. Soils and other sediment have washed away into rivers. Likely cause is removal of forestry, possibly for grazing or cultivation-roots no longer able to hold soil in place, surface unprotected, exposed to heavy rain, leading to gully erosion.

- Credit understanding of environmental costs not shown in Figure 8.
Eg The long term effect of economic development can be destruction of valuable forest products and ecosystems
Plants (that could bring huge medical benefits and high profits) may become extinct.
Land may be left ruined and many pollutants wash into rivers.
Water quality is affected, shortages occur.
Local impact of climate change-disruption to water cycle, reduced evaporation; wider impact-increased CO₂ in atmosphere, temperature changes.
- Use of Figure 8 (2nd photo). The photograph indicates the large scale of mining operations (open cast, possibly coal), with forestry cover removed, exposed to wind and rain, some deeper terraced pits, roads built. Indicates huge investment of money, employment of workers, possibly large profits.
- Conclusion may emphasise that short term economic benefits may lead to long term environmental harm. However an overall conclusion is not essential to access maximum marks.
- Responses should refer to one or both photographs in Figure 8 (directly or inferred) to access Level 3.
- Max Level 2 for reference to economic advantages or environmental costs only.

Question 2a

Using Figure 8, which part of the rainforest matches the following description?

An almost continuous layer of branches and leaves between 15 and 30 metres high.

B. Upper canopy

No credit if two or more statements are shaded.

Question 2b

Using Figure 8, describe one characteristic of the base of the taller trees.

Buttressed roots (1)

The base is wider than the rest of the trunk (as roots extend into the ground) (1)

Wide base (1)

Question 3a

Using Figure 10, give one feature of the pattern of wildfires in Brazil.

Concentrated largely south of the Amazon river (1).

North of Brasilia (1).

There is a significant band running from west to east across the centre of Brazil (1).

There are relatively few in coastal areas (1).

Central Brazil (1). Northern Brazil (1)

Question 3b

Outline one reason why wildfires are a threat to global climate.

The Amazon rainforest acts as a huge carbon sink/absorbing and storing carbon dioxide (1). If the trees are destroyed, this carbon sink is lost (d) (1).

The forests help to cool global temperatures (1) so burning would lead to rising temperatures (d) (1).

The burning of trees releases CO₂ into the atmosphere (1) contributing to the greenhouse effect (d)(1).