UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Advanced Subsidiary Level and Advanced Level

**GEOGRAPHY** **9696/23**

Paper 2 Advanced Physical Options **October/November 2012**

INSERT

**1 hour 30 minutes**

**READ THESE INSTRUCTIONS FIRST**

This Insert contains all the Figures and the Table referred to in the questions.

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This document consists of **4** printed pages.

UNIVERSITY *of* CAMBRIDGE
International Examinations

**[Turn over**

## Table 1 for Question 1

### Some factors affecting the ecology of tropical rainforests

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|---|
| A large proportion of nutrients are found in the above-ground biomass. Many of these nutrients are in the leaves, twigs and small branches. |
| Rainforests intercept a very high proportion of rainfall and, in all areas, total rainfall is high and is often intense. |
| Deep rainforest soils may receive virtually no input of nutrients from weathering bedrock. Nutrient input is dependant upon decomposition of vegetation, atmospheric input via rainfall and deep nutrient capture by the long tap roots of dominant trees. |
| Most roots, suckers, decomposition and seed germination occur close to the soil surface. |

## Fig. 1 for Question 3

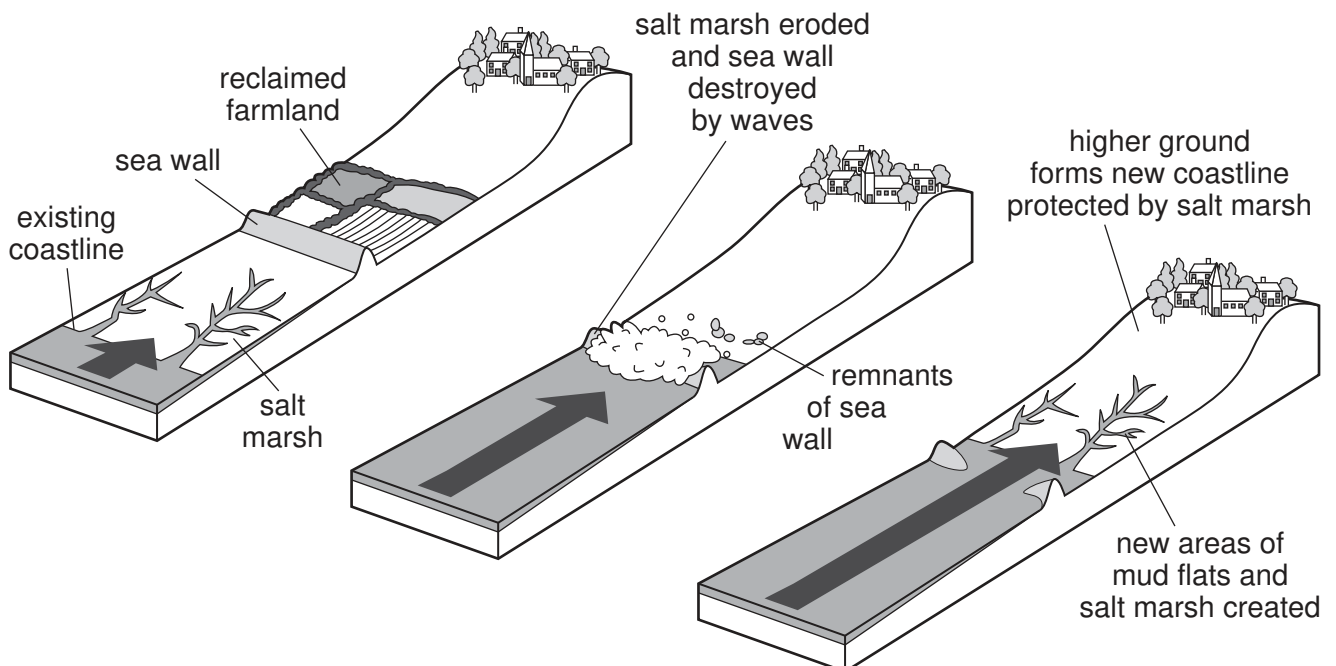### Managed natural retreat as a form of coastal management

**Fig. 2 for Question 5**

**Predicting volcanic eruptions**

# Satellites spot volcano ready to erupt

A volcanic eruption has been successfully predicted with the use of satellites. Researchers disclosed yesterday that they had detected the impending eruption of Pacaya, in Guatemala, a week before it happened.

The team, using satellites with infra-red detectors, picked up a heat signal on May 13 indicating that hot magma was bubbling towards the surface. The volcano erupted on May 20 sending an ash cloud over Guatemala City and the airport 13 miles away.

Andrew Harris, of the Open University, said: "We saw it coming from space.

To date this has not happened before."

The breakthrough may lead to the establishment of a worldwide automatic forecasting system for the 600 active volcanoes and many others considered potentially active.

The team also detected the eruption of a volcano in the remote Galapagos islands three hours before it began on September 15. The early warning gave experts on the ground time to move wildlife. The signals were picked up from the satellites by Chris Okubo, of the University of Hawaii.
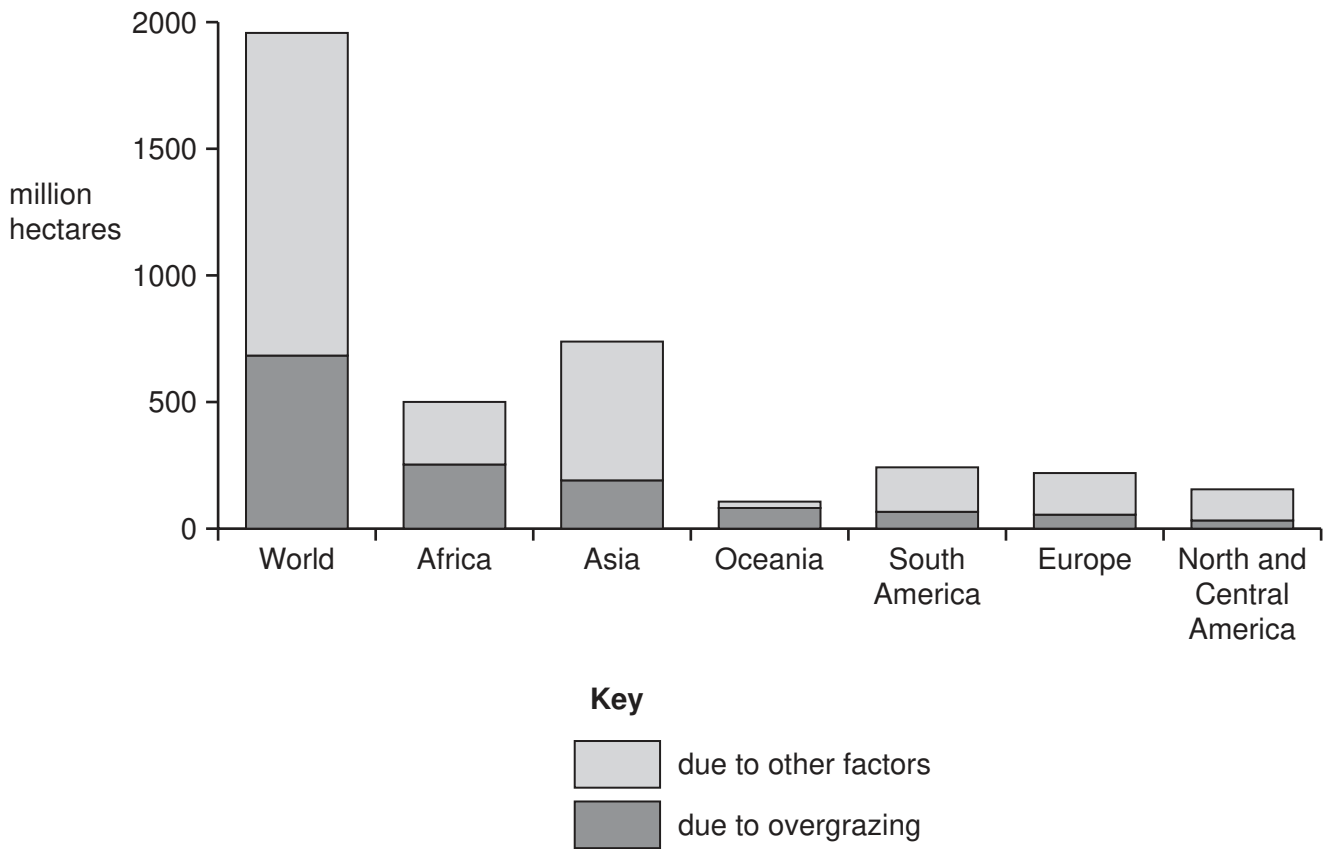
The team also spotted the eruption of Popocatepetl,

near Mexico City, from space. The satellites detected a moderate eruption on the morning of November 24, 1998. Local ground-based teams recorded the same event and sounded the alarm one minute earlier. But many parts of the world where volcanoes could burst into life are too treacherous to have trained staff in place. Dr Harris said: "Some places are just too poor and have too many volcanoes."

The satellite system, even if it spots an eruption only as it occurs, may give emergency services vital hours or days to get people cleared from an impending lava flow.

**Fig. 3 for Question 7**

**The contribution of overgrazing to global desertification by region**



**Key**

☐ due to other factors

■ due to overgrazing