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GCSE
GEOGRAPHY

Resources for Paper 3 Geographical Applications

June 2019

Pre-release resources booklet

To be issued to students on Thursday 21 March 2019.

This booklet contains three resources as follows:

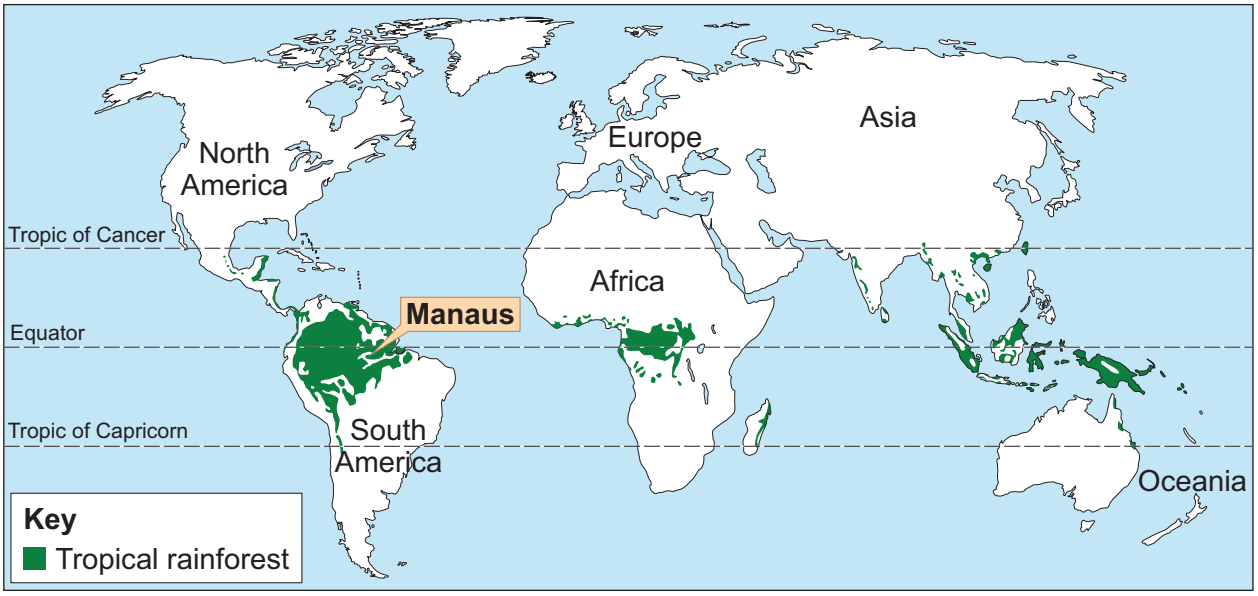
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Figure 1

Tropical rainforests

The distribution of tropical rainforests

Tropical rainforests cover approximately 6% of the earth's surface and are found near the Equator. Although tropical rainforests only cover a relatively small proportion of the earth's surface they support the largest concentration of plant and animal species on the earth.



The tropical rainforest climate

While each area of tropical rainforest is unique, they share common climatic characteristics. They are generally defined as 'hot and wet', with no real seasonal temperature differences and high annual rainfall. There are variations in the pattern of rainfall across the year but a common characteristic is the high level of humidity which provides ideal conditions for the growth of micro-organisms, an important part of the rainforest ecosystem.

Example of a rainforest climate – Manaus (Brazil) 3°S 60°W

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temperature (°C)	28	28	28	27	28	28	28	29	29	29	28	28
Rainfall (mm)	278	278	300	287	193	99	61	41	62	112	165	220

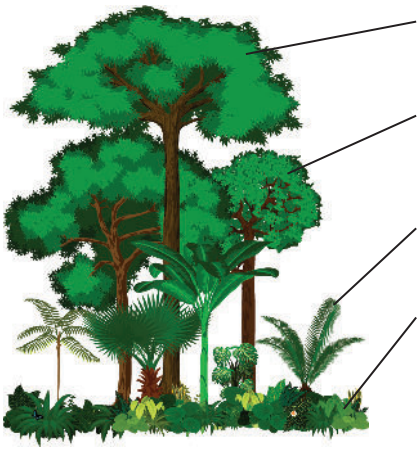
The tropical rainforest ecosystem

The hot, moist conditions create ideal growing conditions so plants can grow quickly and the high rates of decay return minerals to the soil. These minerals are rapidly absorbed by the plants or washed out by the rainfall, so soils are often poor. Most of the energy is stored in the plants and many have adapted to live successfully within the rainforest.

The tropical rainforest has a vertical structure with plants responding to levels of moisture and light. It is thought that rainforests have the highest biomass of any ecosystem and contain over 60% of the world's biodiversity, being home to over 15 million different species of plants and animals, including over a half of the world's flowering plants. The vast range of plant life creates the ideal environment for animals to thrive. In the Amazon rainforest it is estimated that on average one hectare of land contains 1500 species of fish, 2000 bird species and over 30 000 species of insect. Animals live at different levels within the rainforest, with some living high up in the tree cover and never touching the ground. All of the plant and animal life forms a complex food web, depending on each other to survive.

Figure 1 continued

The structure of the rainforest



Emergents – A small number of trees break through the general level of the forest, reaching heights of over 30 metres.

Canopy – Continuous, dense tree cover protects the ground from heavy rainfall and reduces the amount of light to areas below.

Understorey – Woody plants and shrubs grow in the humid, calm conditions with limited sunlight.

Ground layer – Largely made up of decomposed material broken down by the hot, humid conditions. This level consists of scattered plants and fungi, used by insects as a source of food.

The importance of tropical rainforests

Tropical rainforests are not only a resource, they are also important in many other ways and are a vital part of the global carbon balance. Tropical rainforests are valuable because:

- Over 50 million years of plant and animal species evolution has created a huge diversity of species. It is estimated that over 10 species are being lost every day due to rainforest destruction.
- They act as a global carbon sink and a climate regulator, and also help to reduce local risks of erosion and flooding.
- They provide a wide range of local foods and industrial products, including fibres, resins, dyes and rubber.
- They are home to over a thousand indigenous tribes who depend on the rainforest for their survival. These people have learned to live sustainably within the rainforest over hundreds of years.

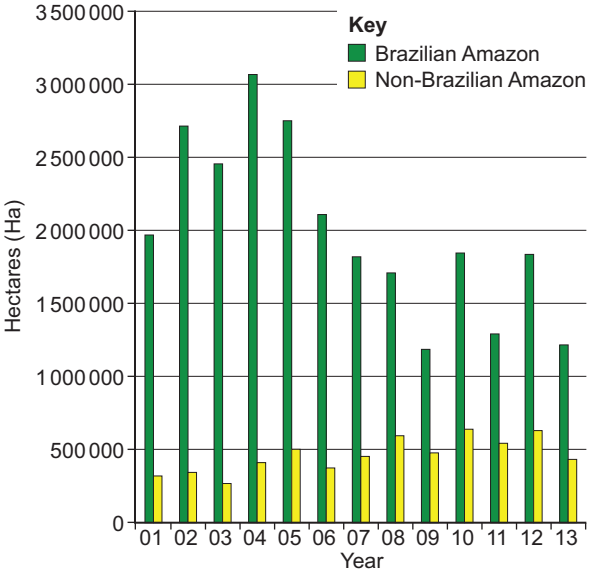
Tropical Rainforests – the World's Medicine Cabinet
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Figure 2

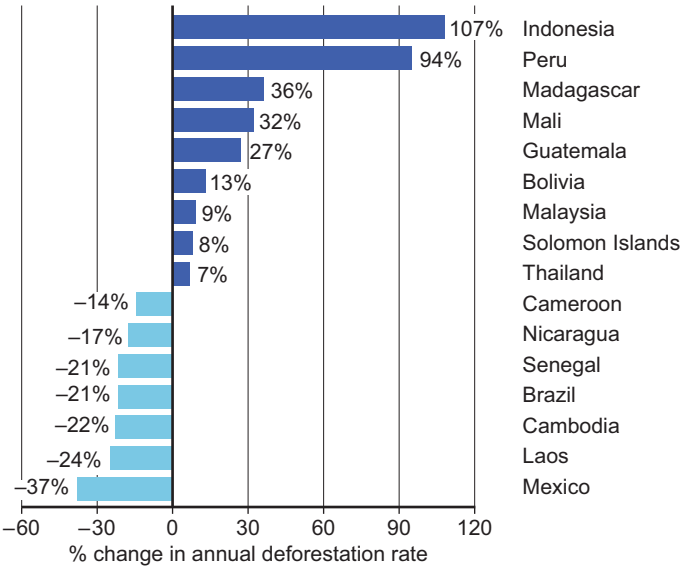
Deforestation of tropical rainforests

Tropical rainforests are both a local and global resource. They are coming under increasing pressure as countries see the exploitation of rainforest resources as a way of earning money in order to improve living conditions in some of the poorest parts of the world. Consequently, there is often a conflict with people who feel that the rainforest should be conserved for future generations.

Forest loss in the Amazon region, 2001–2013



Change in annual deforestation rate, 2000–2005 v 2005–2010



We are destroying rainforests so quickly they may be gone in 100 years

Thirty years ago, a wide belt of rainforest circled the earth, covering much of Latin America, south-east Asia and Africa. Today, it is being rapidly replaced by great swathes of palm oil trees and rubber plantations, land cleared for cattle grazing, soya farming, expanding cities, dams and logging.

People have been deforesting the tropics for thousands of years for timber and farming, but now every year an area the size of England and Wales is felled. Half of the world's rainforests have been destroyed in the last 100 years. Satellites now show that in the last 15 years new deforestation hotspots have emerged. At current rates, rainforests will vanish within the next 100 years.

Tropical deforestation adds to the problem of climate change. As forests are removed local people become impoverished and move to cities in search of work.

So, what to do?

At the Paris Climate Summit in 2015 all countries agreed to reduce carbon emissions, and 50 countries who share the world's tropical rainforests promised to crack down on illegal forestry and restore and replant millions of acres of forest by 2030. These are some of the poorest countries in the world and rely on the exploitation of their forests in order to improve their living standards. Consequently, they will need financial and technical help from richer countries in order to carry out their promises. Germany, Norway and the UK have together promised $1 billion a year to help with this and the World Bank plans to contribute a similar amount. Part of this is intended to benefit indigenous forest communities which have always been the traditional protectors of the forest.

Figure 2 continued

Deforestation of tropical rainforests

The main threat to tropical rainforests is illegal activity

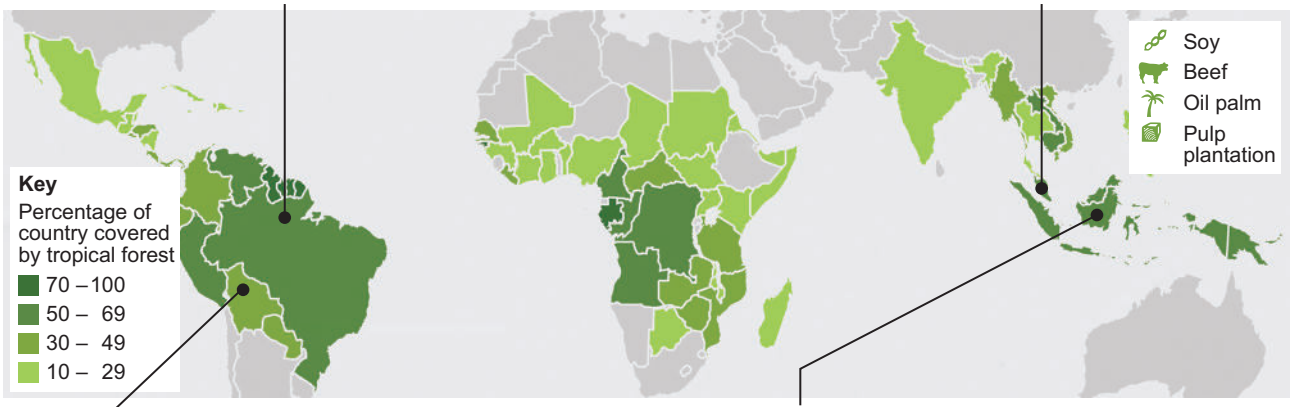
It is estimated that 50% of the deforestation of tropical rainforests is a result of illegal activities such as logging, mining and agriculture. These activities create few opportunities for local people and bring no benefit to the government, so they add very little to the wellbeing of the population. In addition, illegal deforestation causes huge amounts of environmental destruction because it is unregulated and ignores any environmental laws. As one environmentalist observed, "These people destroy large areas of forest just to get the most valuable trees and poison the land and rivers with their illegal mining activities. Government-backed schemes are usually more sensitive to the needs of the environment and local people and money earned is used to improve living conditions within the country. If illegal activities could be controlled the threat of deforestation would be reduced and tropical rainforests could be managed more effectively".





Brazil
Total forest loss 2000–2012: 30.6 Mha
Causes of deforestation:
17% exported Beef
75% exported Soy
90% deforestation due to commercial agriculture
79% illegal agriculture

Malaysia
Total forest loss 2000–2012: 4.7 Mha
Causes of deforestation:
90% exported Oil palm
87% deforestation due to commercial agriculture
43% illegal agriculture



Bolivia
Total forest loss 2000–2012: 2.8 Mha
Causes of deforestation:
75% exported Soy
75% deforestation due to commercial agriculture
90% illegal agriculture

Indonesia
Total forest loss 2000–2012: 15.5 Mha
Causes of deforestation:
75% exported Oil palm and pulp plantation
80% deforestation due to commercial agriculture
80% illegal agriculture

Mha = Hectares (million)

Figure 3

Road development in the Peruvian Amazon

Peru is a middle income country which ranks 77th out of 187 countries on the Human Development Index. According to government statistics about 30% of the population live below the national poverty line. In rural areas, where food insecurity is a constant problem, 50% of the population are considered poor. People born in Lima, the capital city, can expect to live almost 20 years longer than those in rural areas. In remote rural villages, many people live in huts which lack even the most basic facilities and have no modern technology.

Peru: development fact file

Gross national income	$11 295	(2016)
Infant mortality	19 per 1000 population	(2015)
Doctors	1.1 per 1000 population	(2013)
Access to clean water	91% urban, 69% rural	(2015)
Access to sanitation	82% urban, 53% rural	(2015)
Internet access	40%	(2014)

Road developments – an important part of the development process

The Peruvian government have given the go ahead for the construction of a number of new roads in the Amazon. The roads will connect major settlements and create opportunities for development in parts of rural Peru. The economic benefits of the road developments will be significant and the newly developed links with Brazil will create trade corridors. The Wall Street Journal reported that the new road developments will create exciting new travel opportunities and open up new areas to tourism. It is thought that tourism is a suitable way to develop the area because it will bring considerable economic benefits with limited environmental impacts. Supporters of the road programme claim that the economic gains will outweigh any negative impacts and, since the roads pass through protected reserves and National Parks, environmental damage will be kept to a minimum. Conservation groups are concerned about the effects on the environment and indigenous communities but agree that protected areas may be less at risk from deforestation.



Figure 3 continued

Road development in the Peruvian Amazon

Road building may destroy 275 000 hectares of the Peruvian Amazon

It is estimated that the development of new roads in the Peruvian Amazon will put over a quarter of a million hectares of rainforest at risk and cross two indigenous reserves and a National Park. A recent study carried out by the Amazon Conservation Association has shown that when a new highway is built through the rainforest it encourages a number of other activities. This results in a band of land up to 10 km wide being lost, causing significant destruction to wildlife habitats and local communities. In the Amazon rainforest it is estimated that most deforestation occurs near roads or navigable rivers. Whilst there is a need for economic development in Peru in order to improve living conditions, conservationists and local people believe that more environmentally friendly methods of development could be used to earn money, at the same time preserving the forest for future generations.



Road building, the engine of progress and enabler of destruction!

Peru is one of the most forested countries in the world; only Brazil has a larger share of the Amazon rainforest. This makes Peru one of the most biodiverse countries in the world, with nearly half a million people directly depending on the forest for their survival. The development of new roads will create opportunities for trade and open up areas for industrial development and tourism, but will also add to the growing rate of deforestation as land is cleared for cattle ranching, soya plantations and mining, destroying habitats that have existed for thousands of years. Only time will tell what effects road developments will have on the rainforest and whether the negative effects can be reduced.

Roads will help to drive rural areas of Peru out of poverty

Road developments will encourage the growth of the mining industry which is seen as a major way to move people in Peru out of poverty, fulfilling a government pledge to cut poverty by 50% by 2021. Despite a decline in poverty since 2000, it was reported that in 2016 over 40% of all rural dwellers were living in extreme poverty and were unable to satisfy their basic needs. Road developments will connect rural areas and create opportunities in agriculture and mining, bringing employment to thousands of people while also increasing export earnings and giving the government the opportunity to invest in social improvements.

Federation of Native Amazon Peoples quote cannot be reproduced here due to third-party copyright restrictions.

We must break with the view that the Amazon is an inexhaustible larder for other countries without taking into account its inhabitants.

Pope Francis

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