

# Conservation Education



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## Rainforests

Imagine that you're in a thick, dark forest. It's very hot and sticky and the sweat soaks your t-shirt. You can hear the sound of wild animals all around you. From the trees above, birds and monkeys are calling. You hear the constant buzzing drone of insects. What was that?! A rustling and a grunt in the undergrowth near you makes you jump. Then thunder explodes almost overhead and the sound of heavy rain on the leaves above you drowns out all the other noises. You are in a rainforest - one of the most fascinating and diverse habitats on the planet!

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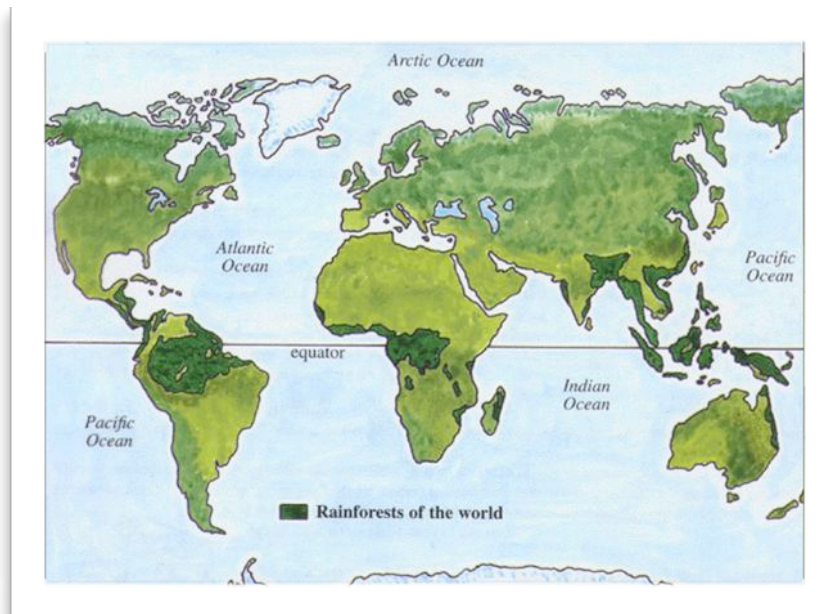
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### Where in the world are they?

Rainforests are found across the world between the Tropic of Cancer and the Tropic of Capricorn (23.5 degrees north and south of the Equator). They occur in Asia, Africa, South America, Northern Australia and on many tropical islands. Put together, they cover about 6% of the planet's land surface - about fifteen million square kilometres! But we've been destroying them fast. They used to cover about 15% of the earth's land surface! The largest of all rainforests, the Amazon in South America, spans eight different countries and still covers an area of almost 5.2 million square kilometres.

# What's the weather like?

Well, perhaps unsurprisingly given their name, it rains a lot in the rainforest! Rainforests experience annual rainfall of at least 2.5 metres, with some receiving up to ten metres of rain each year. That's as tall as the average house!

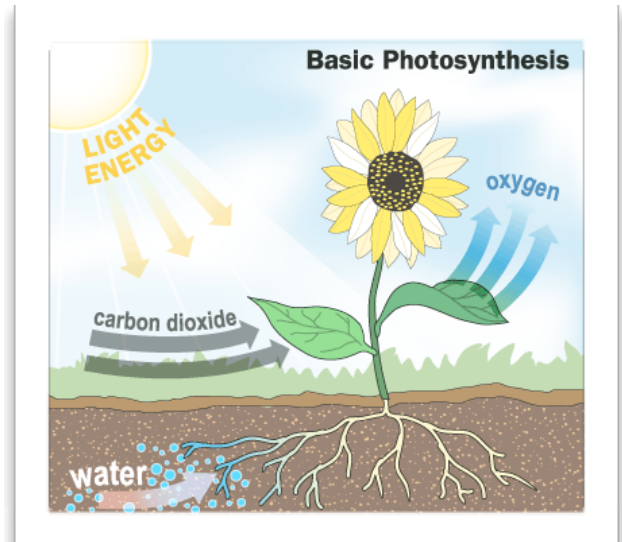
It's hot and sticky too. Temperatures rarely fall below 20° C and can exceed 30° C, giving annual average temperatures of around 25° C. Humidity in the rainforest can reach up to 100%. As the sun is almost directly overhead throughout the year, there are no distinct seasons.

## The lungs of the planet

Rainforests really do help the planet to breathe. During the day rainforests absorb carbon dioxide from the atmosphere. The trees and shrubs make their food using 'photosynthesis', in which leaves absorb carbon dioxide from the air, combine it with water sucked up by the plant's roots and with the aid of sunlight convert them into sugars. This provides the fuel the plants need to survive and as a by-product oxygen, which is released into the atmosphere.

Rainforests help to maintain the global balance of carbon dioxide and oxygen in the atmosphere.

Although they emit carbon dioxide (CO<sub>2</sub>) at night, they emit less than they absorb, meaning that they help to reduce carbon dioxide in the atmosphere. Even more importantly, they act as stores of carbon. The carbon contained within the trees is released as carbon dioxide when they are burned or even when they are left to rot. It is estimated that the remaining rainforests contain 1,000 billion tons of CO<sub>2</sub>.

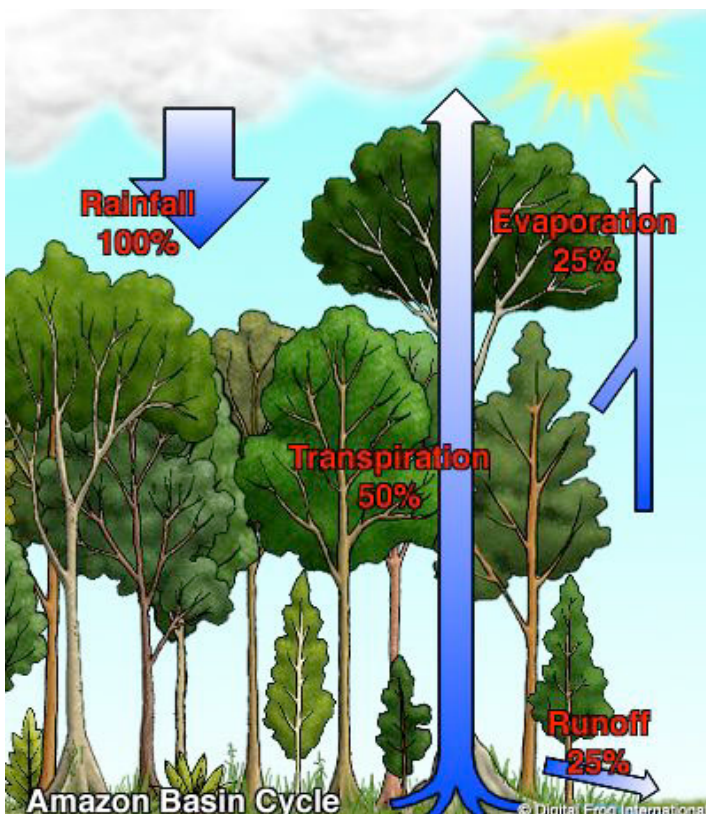


Carbon Dioxide is a 'greenhouse gas', which acts like a blanket around the planet, trapping heat within the Earth's atmosphere. If the amount of CO<sub>2</sub> in our atmosphere increases, it is likely that this will increase global temperatures, speeding up climate change. So protecting the rainforest is a way to lessen the impact of climate change on all of us.

Rainforests also help to cause regular rainfall in areas well beyond the forests themselves, preventing both floods and droughts. This is because the clouds formed over the rainforests often travel far beyond the forests, giving many countries the fresh water they need for drinking and for growing crops. Destroying the rainforest can disrupt that rainfall and cause drought and crop failure many miles from the forests.

## An unequal balance

It could (and has been) argued that by planting crops where once there was rainforest, the crops are still absorbing CO<sub>2</sub> and releasing oxygen, as the forest did. However, an area of crops will absorb around 100 times less CO<sub>2</sub> than the same area of rainforest – and the amounts of rainforest we are talking about are staggering! An estimated 50 million acres (an area of land equal to England, Scotland and Wales combined) is being destroyed each year.



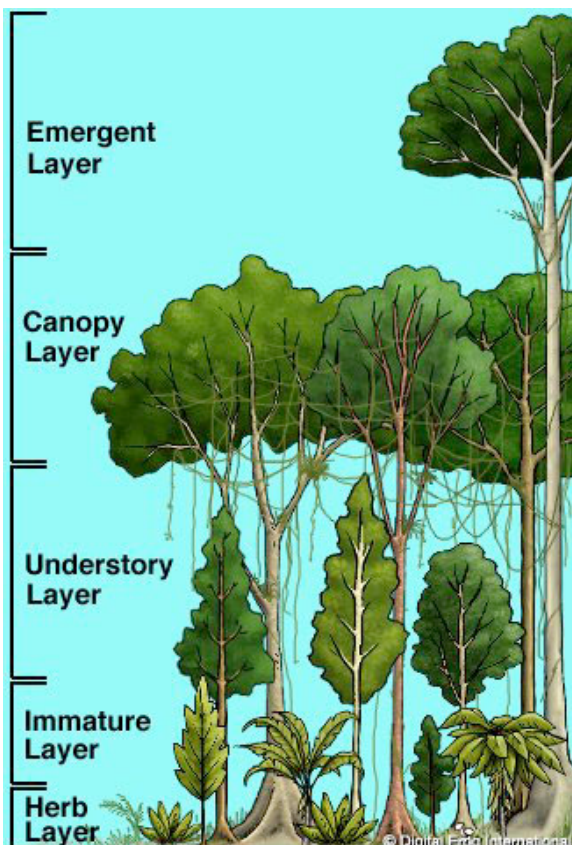


## What lives in the rainforest?

Rainforests are amazingly diverse stores of animal and plant life. A third of the world's plant life grows in the rainforest and each square metre can support up to 80kg of living material (biomass). Incredibly, more than half of the world's animal and plant species live in the rainforest, and a single hectare (an area of land measuring 100 metres by 100 metres) can contain 200 different tree species and over 40,000 species of insect. In ten hectares (0.1 square kilometres) of Malaysian rainforest, 780 different species of tree were discovered. That's more than the total number of tree species that are native to the whole of the USA and Canada!



The plants of the rainforest are well adapted to their environment. Trees often grow to 60m tall (the tallest ever recorded grew to 83m). Their leaves are concentrated high up in the canopy. Many have huge 'buttress' roots to help anchor them to the ground and soak up nutrients. Below them, there are other plants adapted to living in the shrub and floor layers of the forest.



Amazingly, given the vast number of species rainforests support, their soils are shallow and acidic. In fact, they are among the poorest in the world, and heavy rainfall quickly washes away any nutrients that are not taken up by the trees. Rainforests are able to thrive because they feed on themselves - dead plant and animal matter rots quickly on the forest floor and the shallow-rooted trees quickly absorb the nutrients.



# People of the forests

Living in the world's rainforests are tribes of native people, such as the Kayapo and Yanomami. People such as these have lived in harmony with the rainforest for thousands of years, with a way of life that went almost unchanged for centuries.

In the Amazon, tribes like the Yanomami, Kayapo and Yekuana have learned to conserve the resources of their forest home. They know never to take too much from the forest. They hunt for meat, grow crops and gather fruits and nuts. They use many of the plants and animals to provide medicines for their people and poisons for hunting.



© Fiona Watson/Survival

Yanomami woman, Brazil

Indeed, photos of a new and previously uncontacted tribe, the Panoan Indians, who live deep in the rainforest on the Brazil-Peru border were released in February 2011. Taken from a distance of over a kilometre away from a light aircraft fitted with a powerful zoom lens, the photos show a people at peace, relaxed and with plenty of food stocking their jungle gardens.

There they grow basic crops like manioc, papaya and bananas, gather and hunt what they can from the forest around them and do not take more than they need. When they move to a new area, (something they do every few years), the forest where they have been living quickly regrows and recovers.

Illegal logging across the Peruvian border is meaning that the industrialised world is encroaching more and more on the Panoan's rainforest home. Pressure is now building from organisations like Survival International to lobby the Peruvian government to provide proper enforcement of the law against the illegal loggers. If this doesn't happen soon, there is a real danger that the loggers and the Indians will come into conflict.

Let's hope that the Panoan Indians receive the protection that they need and that their way of life in the forest can continue uninterrupted. There is something very special about their being uncontacted by the modern world. If they wish to stay uncontacted, then we should do everything we can to let them remain so.



© Gleison Miranda/FUNAI/www.uncontactedtribes.org

Aerial view of Panoan Indians

It is estimated that the Amazon rainforest supported about six million tribal people before 1500AD. By 2000, there were less than 250,000 of them left. Over 90 tribes are thought to have disappeared from the Amazon alone during the 20th Century. Many were wiped out when western settlers brought diseases they had never encountered before - like measles - which wiped out thousands of tribespeople.

Now, some of the tribes, like the Yanomami, have protected homelands in government-approved reservations, and they are more able to maintain their traditions. The way of life of the forest peoples is as fragile as the forests they live in. They could teach us much, but most prefer to be left alone to continue living as they always have done, in harmony with their surroundings.

Learn more about tribal peoples from  
**Survival International**  
<http://www.survivalinternational.org>

Picture right - Davi Kopenawa, Yanomami leader and shaman surrounded by children, Demini, Brazil



© Fiona Watson/Survival

## Logging

Rainforests have been exploited for years for the high-value hardwoods like teak and mahogany to supply the timber markets in Europe, Japan and the USA. An estimated 5 million hectares (50,000 square kilometres) of rainforest is lost each year to logging. Many logging companies are now trying to reduce the impact of logging by taking only 'selected' trees and allowing the forest to regrow naturally.



### The growth of sustainable hardwoods

Modern 'sustainable' hardwood plantations are becoming more common. But most hardwood trees take at least 60 years to grow to a size at which they can be felled, so it's difficult to predict how sustainable these new plantations will be. In Scandinavia, sustainable forests are becoming the norm, with growing times of 100 years on the slow-growing pine forests meaning that no forester ever harvests the trees he or she plants, so there is hope, but it will take some time to know whether this works.

However, large, valuable trees do not tend to live close to each other, meaning that logging operations spread out over a wide area. When a large tree is felled, it brings down many of the smaller trees around it, along with all the vines, lianas and climbers on it.

Removing the felled tree causes further destruction, as the massive logging vehicles used in the process plough through areas of forest to get to the felled trees, destroying all the smaller trees in the way. It is estimated that in South-East Asia, up to 75% of the trees remaining after logging has taken place have been damaged or destroyed. The tracks left by the huge vehicles leave the soil exposed, so that it can be easily washed away by the rains, clogging rivers with silt and increasing the chances of flooding.

Each time trees are felled, habitat for the birds, mammals and other wildlife that lived there is lost. Once their habitat is destroyed, the creatures that lived there have to move on or die. They can't wait for the forest to grow back.

## Mining the forests



**In the rock underlying rainforests, there lies a wealth of natural resources in the form of minerals and precious metals such as gold, silver, diamonds, gemstones, bauxite (used to make aluminium), tin, copper, lead and even coal!**

To get at them, people have to create mines, which not only destroy the rainforest but also cause other big problems like erosion of the weak forest soils and sometimes the poisoning of water supplies with heavy metals like mercury, which is used in the process of extracting gold. The mercury poisons creatures in the rivers and the people and

animals that drink the water. Mercury can build up in the food chain so larger animals such as otters that may eat a lot of fish will have larger amounts of mercury in their bodies. Some 9,000 tonnes of mercury was washed into Brazil's rivers during the Pala State gold rush of the 1980s. Where soil is eroded by the rain, it is washed into the rivers, which gradually clogs them up, making flooding more likely.

Large areas of forest in Indonesia are protected by law against any prospecting or open cast mining, although new rules do allow underground mining in protected areas. Once roads are built to reach the mines, it becomes easier for illegal logging and poaching to take place.

## Roads to Disaster

Roads open up the rainforest. They allow people who otherwise would not be able to make their way through the impenetrable forest to get into remote and previously inaccessible areas very easily. The roads are built for various industries, including logging, mining, oil and gas extraction, but soon they are used by others too: people, who have perhaps been displaced by farms or war and who find the roads are an easy route to new land that they can use to set up smallholdings.



Trans Amazonian Highway

The Trans Amazonian Highway in northern Brazil was built in the 1970s. It stretches some 2,000 miles across the Amazon rainforest from east to west. The Brazilian government's plan was to create settlements in previously unused areas. They offered settlers 250 acre plots, 6 months salary and easy access to agricultural loans, but the project ended up costing \$65,000 per family settled. As the forest soils were so unstable and easily eroded, the road was often impassable, while harvests failed and the fragile topsoil was washed away.

In more recent times, plans have been drawn up to improve another road through the Brazilian Amazon, the BR-163, which stretches for 1,100 miles from Cuiaba, near the Bolivian border to Santarem on the banks of the Amazon. Around 600 miles of it is still dirt track, but the Brazilian government plans to pave all of it and this is a real cause for concern for environmentalists.



soya beans

The first 450 miles of the BR-163 are already properly surfaced. Either side of it, what was once untouched forest is now rolling fields. The main crop being grown is soya, half of which is exported to countries in the European Union. Much of that soya is used for cattle feed, which is worrying, as it means eating British or European meat may in some cases be indirectly damaging the rainforest. The soya crop is the main reason for paving the rest of the BR-163. Santarem has a deep water port, and a fully-paved BR163 would shorten the

journey of the soya crop by 600 miles over land and by a similar distance by sea, saving on transport costs and increasing profits for the producers.



soya plants

Many people follow roads into areas of rainforest already damaged by industries like logging, mining and searching for oil. The Brazilian government used the slogan 'Land without men for men without land' to encourage landless peasants to set up farmsteads in former rainforest that had been cleared as a result of

logging operations.



Using a technique called 'slash and burn', these small farmers clear an area of forest by cutting down the big trees and setting fire to the rest. They grow crops on a small scale in the forest, but the soil does not remain fertile for long, so they are forced to move on. Shifting cultivation is thought to be responsible for up to 60% of tropical forest loss. In the Brazilian Amazon alone, around 500,000 small farmers are responsible for clearing an estimated one hectare each per year!

# Clearing the rainforest for cows

Ranching is now the biggest cause of deforestation in the Amazon and every year, more and more forest is destroyed to make way for huge cattle herds. In the last 20 years, Costa Rica has lost the majority of its forests to cattle ranching.



Brazil has the largest cattle herd in the world – a staggering 205 million animals! It has been the biggest exporter of beef on the planet since 2003, and almost 80% of the deforested land in the Brazilian Amazon is now used for cattle ranching.

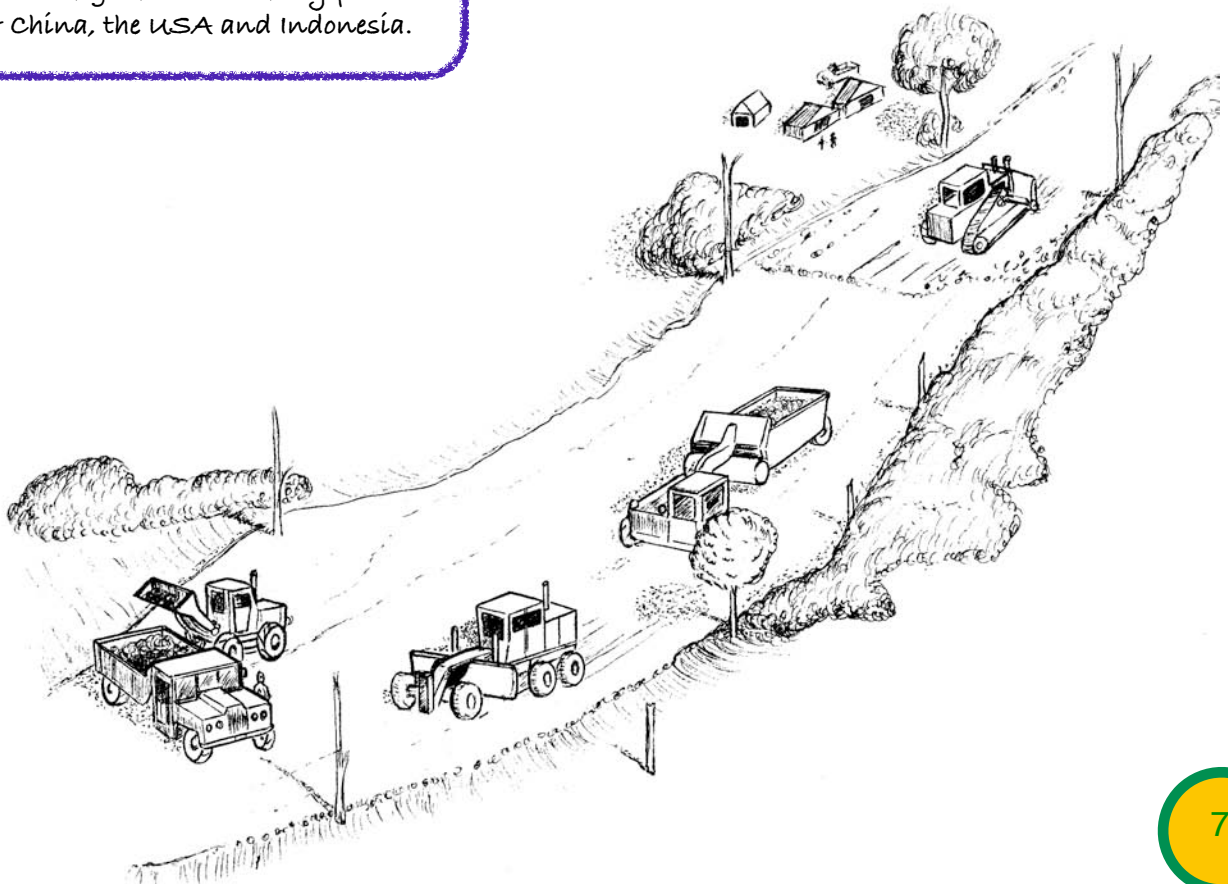
Alarmingly, the Brazilian government is aiming to double its share in the world beef market to 60% by 2018, whilst also aiming to reduce deforestation by 72% by 2017 as part of a national action plan to combat climate change. Achieving both goals at once would seem to be pretty much impossible. Incredibly, an area the size of Portugal (about 10 million hectares) of rainforest was cleared between 1996 and 2006 in the Mato Grosso region of Brazil to make way for the huge cattle herds.

## More cattle = more methane

Three quarters of Brazil's greenhouse gas emissions are the result of the burning of rainforest. 'Bovine methane emissions' (that's cow farts to you and me!) are responsible for most of the rest and methane is a much more potent greenhouse gas than carbon dioxide! The increasing size of Brazil's cattle herd is helping it to overtake other nations as a leading producer of greenhouse gases. It's already fourth after China, the USA and Indonesia.

## Diminishing returns

As we know, rainforest soils lose their fertility quickly once the forest is removed. Initially, you need about one hectare per cow per year, but after about eight years, you will need five hectares for each cow, as the soil gradually becomes poorer and less able to produce the pasture needed by the cattle. So the ranchers simply move on, destroying yet more of the forest in the process. As a rough guide, for every pound of beef produced for the world markets, 200 square feet of rainforest is destroyed.



# Burning the forests

Deforestation (cutting or burning down forests) accounts for up to 25% of man-made greenhouse gas emissions worldwide each year - a staggering two billion tons per year! To give an idea of just how huge that is, all the planet's transport and industry account for roughly 14% each.

Flying, which is often seen as one of the biggest evils in climate change only accounts for 3% of total greenhouse gas emissions. In fact, in the next four years, burning rainforests is likely to pump more CO<sub>2</sub> into the atmosphere than every flight that has ever taken place from the Wright brothers' first ever powered flight until 2025! Make no mistake about it: ignoring the destruction of the rainforest is a recipe for future



environmental disaster.

Palm oil plantations have expanded very rapidly in Indonesia - the area of land occupied by plantations has doubled in the last ten years, threatening endangered species like the orang-utan and Sumatran tiger with extinction. The burning of its rainforests to create palm oil plantations is the reason that Indonesia is now the world's third largest emitter of carbon dioxide.

## What do we do with palm oil?

Palm oil is a vegetable oil and it's a cheap and common ingredient found in a huge range of food products, from chocolate to crisps. It's found in about 1 in 10 food products in the supermarket and is also used in detergents and lipsticks.

## Is your car fuelled with palm oil?

Palm oil is added as 'biofuel' to the diesel sold to most motorists in the UK. In 2008, British motorists used 27 million litres of palm oil from Indonesia and 64 million litres from Malaysia. 'Unknown' countries supplied a further 32 million litres. The vast majority of this palm oil came from land previously occupied by rainforest.



Palm oil plantation in West Java, Indonesia

Palm oil plantations are the biggest cause of rainforest loss in Malaysia and Indonesia. The rainforest is cleared by burning, so that palm trees can be planted. This destroys all the rainforest plant species that lived there and forces any animals living there to either move deeper into the forest or die.

In theory, palm oil is less environmentally damaging than non-renewable fossil fuels like oil, because crops absorb carbon dioxide (the most important greenhouse gas) as they grow. However, to make way for the palm plantations, the rainforests are cleared - by burning them! This releases a huge amount of carbon dioxide into the atmosphere. In fact, it has been estimated that it would take a palm oil plantation up to 840 years to soak up the carbon released by burning the forest to make way for the plantation!

A European Union initiative, ironically trying to reduce greenhouse gas emissions, states that 3.25% of all fuel currently sold by oil companies has to be biofuel. By 2020, oil companies are expected to be selling 13% biofuel as a percentage of their total fuel sales. Most diesel now contains about 5% palm oil.



# The rainforests' endangered species

The world's rainforests are home to at least 50% of all animal and plant species on the planet and in many areas, destruction of the forests has already wiped out animal or plant species that lived there. The really sad thing is that sometimes we probably don't even know a species has been made extinct, as no-one had ever discovered it before it was gone.

## Orang-utans in danger

On the two islands of Borneo and Sumatra in Indonesia, the rapidly growing palm oil industry is threatening the survival of one of our closest relatives, the orang-utan. About ten million hectares of rainforest has already been cleared to make way for palm oil plantations. Palm oil plantations were responsible for at least half of the destruction of the orang-utan's habitat which took place between 1992 and 2003.

Right now, around 90% of the planet's original orang-utan habitat has been destroyed. Just a century ago, the combined orang-utan population of the two islands was around 230,000 individuals. In 2010, the total orang-utan population numbers no more than 62,500 and of these up to 5,000 are being lost each year, which means the orang-utan could have as little as 12 years left. A 2007 UNEP report has suggested that 98% of Indonesia's rainforest could be destroyed by 2022 if current rates of deforestation continue. Humans aren't even trying to wipe out the orang-utans directly, but they want their forest for palm oil plantations. Imagine how little chance a species would stand if we were trying to eradicate it!



macinate - CC BY 2.0

Orang-utan



nattek - CC ND 2.0

Sumatran Tiger

## More species in danger

There are probably only 400 Sumatran tigers left in the wild, again thanks to the destruction of its homelands for palm oil plantations. Meanwhile in the Brazilian Amazon, by 1993, there were just 272 golden lion tamarins (small monkeys) left in the wild. A highly successful captive breeding and reintroduction programme since then has led to a recovery in golden lion tamarin numbers. There are now over 1,000 golden lion tamarins in the wild, backed by a captive population of about 500 worldwide. Wherever humans destroy rainforest, animals and plants become endangered, but sometimes, as was the case for the golden lion tamarin, humans can help too.

## Are we losing vital medicines?

It's not only animals we're losing when the rainforest disappears. We cannot be sure of how many plants with possible medicinal uses are being destroyed before they can be properly investigated, but we can be almost certain that some have been. So far, more than 2,000 rainforest plants have been identified as having anti-cancer properties. Scientists have only tested one in ten plants and have studied only one in one hundred in detail. Around 25% of all medicines used by people in the United States are made using ingredients originating from the rainforest.



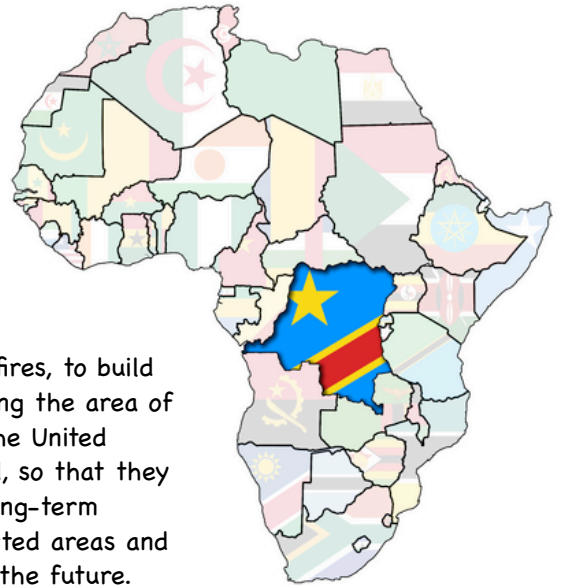
The Rosy Periwinkle  
on a Cuban stamp

Curare, which is extracted from a rainforest vine, is used in surgery as a muscle relaxant in carefully measured doses. Tribal peoples use curare in stronger doses as a poison on darts and arrows! Meanwhile, the rosy periwinkle from the rainforests of Madagascar is used to treat leukaemia. Who knows how many other cures remain undiscovered deep in the forests? Stored in the forests, as yet unidentified cures to diseases such as cancer, AIDS and Alzheimers Disease may well be awaiting discovery.

# Bushmeat

In the Democratic Republic of Congo in Central Africa, huge numbers of people living there have been forced to relocate because of a civil war. Some 375,000 of them are thought to have taken shelter within the rainforest of the country's Virunga National Park, home to more than half of the world's remaining population of mountain gorillas.

All of these people need wood every day to burn on their cooking fires, to build their houses and to make tools. The trees they cut down are making the area of pristine forest in the Park smaller and smaller. Aid agencies and the United Nations purchase wood to supply these people with what they need, so that they do not have to cut down more of the forest, but this cannot be a long-term solution. Instead, people are being trained to look after the protected areas and being given a stake in looking after these very special habitats for the future.



Mountain Gorilla

## Education for Conservation (does that sound familiar?)

Conservation charities and aid agencies are now working with forest communities to show them how valuable their forests could be as tourist areas. They are also working to train more people to work on preserving protected areas. In many areas, bans on bushmeat trading are now in force.

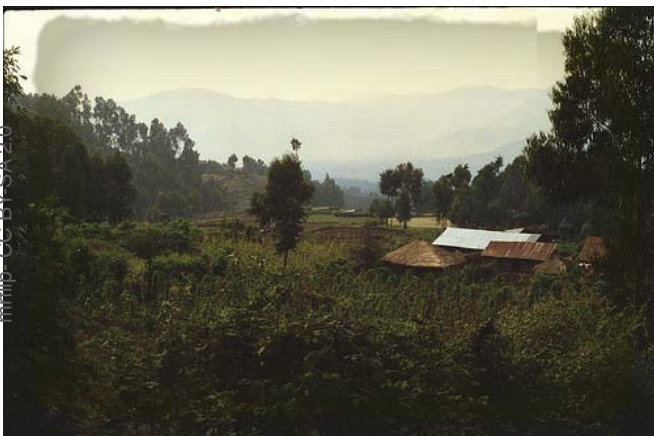
## Who's for dinner?!

With so many very poor people living in the DRC's rainforest, it's not surprising that some turn to poaching to feed themselves. But some of the most spectacular and most endangered large mammals on the planet, including gorillas and forest elephants are on the menu and could soon be wiped out. It's tragic to think that these amazing creatures are being eaten as 'bush meat', but it's also tragic to think that people are so poor and so hungry that they have to set out to kill such beautiful creatures to survive. In a very poor country, where sources of meat like cattle and chickens are not plentiful and are expensive, it actually makes sense for hunters to venture deep into the jungle to hunt and kill gorillas for their meat. A hand-sized piece of pre-cut and smoked gorilla meat costs about US\$6. You can even buy gorilla hands for about US\$6 each, too!



Above: Elephants

Left: Virunga National Park



## Hydroelectric power

With more and more people moving into rainforest regions there is an ever increasing demand for energy. The mighty rivers of the Amazon rainforest have huge potential for creating electricity by moving water at speed through turbines, which are like giant propellers. The technical term for creating electricity with water is hydroelectric power, or HEP. This is in theory a renewable and therefore 'green' energy, but in the context of rainforest areas, it often spells massive destruction.

The amount of irreversible environmental damage caused by HEP schemes is huge. Dams are built in rainforest valleys, often in places where native tribes have lived for hundreds, if not thousands of years. Once a dam is in place, the valley slowly floods, destroying the rainforest and the habitat of countless millions of animals forever, whilst forcing any people living in the path of the floodwaters to move too.

The Tocantins River Basin Hydro-Electric Project plans to convert the Tocantins river into a string of lakes and hydro-electric dams, stretching for 1,200 miles, with a total of 27 dams. The first, at Tucuruí, flooded 2,860 sq. km of rainforest and forced more than 40,000 people to move home.

A further scheme is planned for Belo Monte, which will be the world's third largest hydroelectric scheme and will involve the construction of a 3.75 mile long dam on the Xingu River, (a part of the Amazon River basin) in order to create 11,000 MW of electricity – enough to power 23 million homes. However, the project will also flood at least 500 square kilometres of rainforest and will mean that around 50,000 people including thousands of tribal people who live in the floodwaters' path will need to be relocated.

The Brazilian government says that it will pay them compensation and help them to move, but for tribes who have lived in the same areas for centuries, the



*Tucuruí hydro-electric dam*

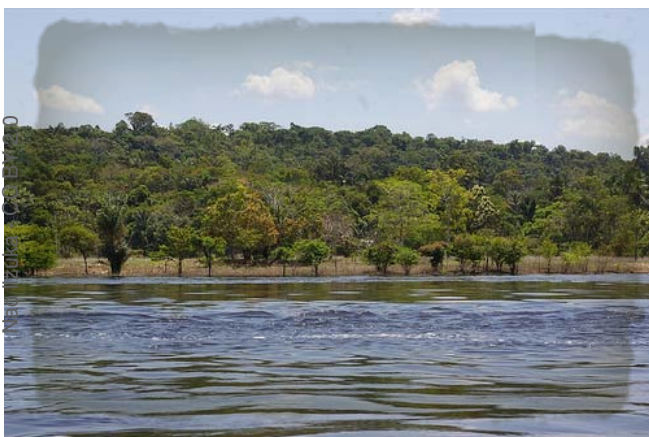
Belo Monte project presents a huge threat to their traditions and way of life. The Kaiapo Indians, who will see their lands flooded by the plans, held a huge protest against Belo Monte in Brasilia. Speaking at the protest, Raoni, one of the tribal leaders said, "We don't want Belo Monte because it will destroy our rivers, our jungle and our way of life."



*Traditional Amazon Indian house on the Xingu river*

The government listened and on 26 February 2011 a judge ruled that the Belo Monte project had not paid sufficient attention to environmental impacts and the scheme was blocked. As there was a drought in 2010 in the Amazon region, a hydroelectric scheme is maybe not such a good idea. During the summer months, when the rains usually subside, there are concerns as to whether the Xingu River will have sufficient flow to adequately power the Belo Monte project. Plans for a further dam at Altamira, which would store water for use in the summer months have for the moment been shelved, but if they were ever to be dusted off, more than 6,000 square kilometres of additional rainforest may have to be flooded, which is a horrifying thought.

In June 2011, the Brazilian environment agency gave its definitive approval for the Belo Monte scheme to go ahead, so it looks like the tribes' victory may have been short lived and work on the dam at Belo Monte has been resumed. However protests from the tribes and environmental groups will continue.



*Amazon river*

## Solutions/ How to help - Using REDD to keep the forests green

'Reducing emissions from deforestation and degradation' or REDD is a way in which rainforested countries could be compensated by the rest of the world for protecting their rainforests, rather than cutting them down. The argument is that if the forests remain standing, they do not release carbon dioxide, so reducing the impacts of climate change for the future. As this is something that affects us all, it seems right that the rest of the world should pay rainforested countries not to exploit their rainforests.

It is estimated that in 2007, up to 73 million tons of CO<sub>2</sub> were released through the destruction of forests in Papua New Guinea alone. If the world placed a nominal value of even \$5 on a ton of CO<sub>2</sub> saved, this would amount to \$365 million for the year, which far exceeds the official figure of \$189 million that was made by Papua New Guinea in that year from the exporting of logs and other timber exports.

The problem is going to be getting all of the world's nations to agree how to value a ton of CO<sub>2</sub> and to then ask them all to contribute a fair amount to make REDD work. Global environment conferences like those in Bali in 2007, Copenhagen in 2009 and Cancun in 2010 have so far failed to come up with a solution and meanwhile the forests continue to burn.

### Sustainable farms in the forest

**Sustainable crops may be the future for some rainforest areas. This means growing crops in greater harmony with the environment, reducing impacts on the soil and removing the need to keep moving on every few years as the soil becomes infertile. And there are benefits too, as farmers who choose to farm sustainably can gain certification which allows them to charge higher prices for their crops.**

Sustainable agriculture aims to cause less water pollution by reducing the use of pesticides and fertilisers. Soil erosion is reduced by planting on

natural contours in the ground and keeping a covering of trees over the ground. Important wildlife habitats are protected, with buffer zones on river banks and wetlands. Patches of forest are also preserved - rather like 'setaside' land on European farms.

By-products of agriculture like banana stems, coffee pulp and orange peels are used as natural fertiliser for the soil, rather than being thrown away. Waste like glass, plastic and metal are recycled where possible. Waste of water is minimised. Farmers plan their activities better and take care to ensure that their farms improve over time.

### Better pay, better conditions, better crops!

Workers on certified farms have much better working conditions, with fairer wages, better housing and access to clean drinking water. They and their families have access to schooling, transport, healthcare and training. Sustainable farms are more productive and produce better crops, while their workers are more efficient than their counterparts on less ecologically concerned farms.



Tea pickers, Cisarua Bogor, Indonesia

### Better farms mean better forests

Although it takes more effort to farm sustainably, the benefits are clear. Certification from an organisation like the Rainforest Alliance enables sustainable farmers to get better prices when their crops go to market and their higher incomes make it easier for them to access credit to invest in improving their farms further. Many sustainable farmers also co-operate with conservationists to try to ensure that species and habitats are protected. Sustainable agriculture has so many positives that it would seem to be an excellent model for the future.

Currently an international organisation, the International Agriculture Network, is active in 20 rainforested countries in South and Central America, Africa and South East Asia. It has almost 50,000 certified farms in its network, which between them cover almost 574,000 hectares. The main obstacle to having more sustainable farms in the forests seems to be in training and persuading the farmers to adopt sustainable practices - and the money it costs to make the training and persuasion possible.

## Respect the people to protect the rainforest

The people who live in the rainforest have to be involved in every step of every possible solution - from coming up with the ideas to working out ways of implementing them.

The small-scale agriculture that the forests' farmers tend to practice involves crop rotation (planting different crops each year to allow the soil time to recover). Their methods actually help the forest to grow and do no lasting damage. More schemes for sustainable farming, especially if backed by small starter grants would encourage small farmers' entrepreneurship and encourage them to manage their forest sustainably.

It is also important that the forest peoples have their land rights recognised. They depend on the forest not just for food, but for shelter, medicine and for their income. They can sometimes be thrown off their land by companies or governments who don't recognise that the people even exist, let alone have rights to the land. If their lands were recognised as theirs by law, it would give them even stronger reasons for making sure that those lands are protected.

### Want to find out more and make a difference?

#### General Information:

The Prince's Rainforest Project <http://www.rainforestsos.org>  
Mongabay <http://www.mongabay.com>  
Rainforest Action Network <http://www.ran.org>

#### Wildlife

World Wildlife Fund <http://www.wwf.org.uk>  
The Orangutan Foundation <http://www.orangutan.org.uk>  
The Sumatran Tiger Trust <http://www.tigertrust.info>

#### Indonesian Deforestation/Cattle Ranching/Boreal Forests:

Greenpeace <http://www.greenpeace.org.uk/forests>

#### Amazonian Soya Plantations:

Friends of the Earth <http://www.foe.co.uk>  
Greenpeace <http://www.greenpeace.org.uk/amazon>

#### Ancient & British Woodlands:

The Woodland Trust <http://www.woodlandtrust.org.uk>  
Nature Detectives <http://www.naturedetectives.org.uk>

#### Indigeneous Peoples

Survival International <http://www.survivalinternational.org>

#### Trade

Rainforest Alliance <http://www.rainforest-alliance.org>  
The Fairtrade Foundation <http://www.fairtrade.org.uk>

#### Check out the Young People's Trust's factsheets:

Rainforest Animals <http://www.ypte.org.uk/environmental/rainforest-animals/90>  
Rainforest Tribes <http://www.ypte.org.uk/environmental/rainforest-tribes/92>  
Rainforests <http://www.ypte.org.uk/environmental/rainforests/89>

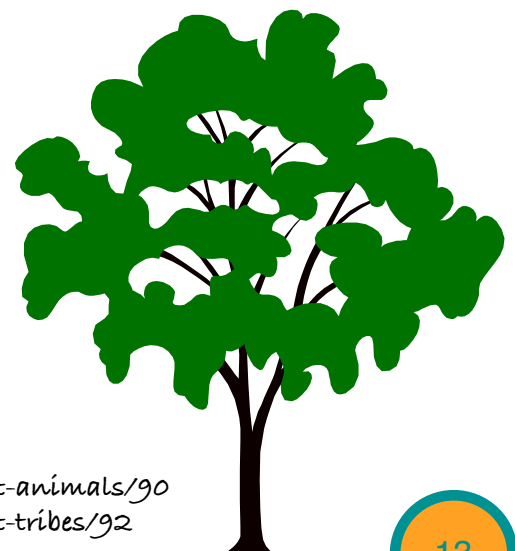
## Complex solutions to complex problems

It's OK providing a quick fix to a problem, but if we want solutions to work in the long term, we need to look at what's causing the destruction in the first place.

Paying a cattle farmer not to cut down an area of forest one day will not stop him from going somewhere else and cutting down another patch of forest the next day.

We need to find ways of allowing the people who live in the forests to make use of their land without having the need to clear vast areas and produce crops or cattle on a large scale. The message should be about quality, not quantity and we should be prepared to pay a premium for goods which have been sourced from farms in the forest where sustainability is seen as the priority.

Throwing money at the problem is not the answer, or at least, it hasn't been so far. Much of the funding given to rainforested countries in the past has ended up in the pockets of political elites, but if we can find a way to ensure that the money reaches the people who actually live in the forest - who have the power and the ability to protect them for the future - then schemes like REDD could be a way forward.



## 2011 - Year Of Forests

This year is the United Nations' Year of Forests, which celebrates all of the world's forests. Across the planet, some 1.6 billion people depend on forests for their homes and livelihoods. Tropical rainforests, that have been covered in this issue of Conservation Education are just one kind of forest. There are also temperate rainforests in places like the Pacific coast of the northwestern USA and western Canada; there are the boreal forests or taiga that spread in a continuous band of an estimated 1.7 billion trees stretching across Eurasia and North America, which together form the largest single biome or habitat type on the planet's land surface; there are also temperate forests, which spread across Western Europe, Eastern North America and Northeastern Asia.



The Year of Forests 2011 celebrates the way in which people around the world are trying to manage forests in a sustainable way, allowing time for regrowth and not taking too much, trying to be more in harmony with nature. It aims to encourage more and more people to adopt sustainable management of their forests, so that they will be there for future generations. Our forests are simply too important for us to carry on losing them. They have to be protected.

## What can you do to help?

It might seem as if there is little you can do to help. All of the planet's rainforests are a long way away, and even if you did go there (which would involve taking a carbon-emitting flight across the world!) and protected a little patch of rainforest, there are so many things you can do right where you are!

You and your family buy things all the time and by taking a bit of care when you shop, you can help to prevent further damage to the rainforest. People will only sell what others want to buy, so if enough people decide they won't buy a particular item, maybe because of an ingredient it contains, then the manufacturer will either change that ingredient, or stop making the product.



Siona Watson - CC BY 2.0

## Shop to support the rainforests

Look for a certification mark. These products, like coffee, tea, cocoa and bananas tend to cost a little bit more, but it's worth it to know that the little extra you are spending is helping to maintain a sustainable farm somewhere in the forest. A 'Fair Trade' logo or a 'Rainforest Alliance' logo on the packaging show that the farmers who grew the crop received a fair payment for it



and that their workers enjoyed good working and living conditions. They also mean that the crop was grown in an area where the protection of the rainforest is taken seriously. The Fairtrade Foundation pays a guaranteed minimum price for all of the produce its farmers grow, which is considerably higher than the going rate for ordinarily produced crops from the rainforest. Although the Rainforest Alliance does not guarantee a price for its farmers, the majority still earn considerably more than non-certified growers, as they have grown their crops using sustainable methods that don't harm the rainforest.

## Check the ingredients

This is a tricky one, as a lot of manufacturers don't list palm oil in their ingredients or they put "vegetable oil" instead. However, some do, so if an item contains palm oil, try to avoid it! Rainforest will have been destroyed to make way for the palms. As it's in one in ten supermarket products including soap, chocolate and even toothpaste, avoiding palm oil is not easy!



Toasty Ken - CC BY 2.0



## Ethical wood

When buying products made from tropical wood, like furniture and paper, look out for the FSC (Forest Stewardship Council) mark, which shows that the wood has come from forests that are well managed and where tribal people's rights have been respected.

## Adopt your own rainforest

Some organisations let you to adopt an area of rainforest in return for a donation. Your money should be used to buy new land, to plant trees and to pay staff to look after the forest and prevent poaching. Or you can adopt an animal such as an orang-utan or jaguar! You don't actually get to keep the animal or forest you adopt, but your money goes towards looking after it where it is! Do your research first though and ensure that your donation really is going to be put to good use.



## Experience the rainforest for yourself and help to make a difference!

When you're 18 or over, you might be able to go to the rainforest as a volunteer to join a project run by a charity that works there. It can be an amazing opportunity to experience life in the rainforest, working alongside local people and helping to build their communities. The types of work you could end up doing include monitoring important and endangered species, building new facilities for the people living in the forests, or promoting more sustainable farming and forestry. This isn't for everyone, but if you're wanting an adventure after leaving school, it could be the thing for you!

## Rainforests in the future

Our rainforests are truly amazing places. They are home to vast numbers of plant and animal species and they're mighty and they're spectacular. But the rainforests that have stood for millions of years, helping to regulate the Earth's climate and locking away vast amounts of carbon from the atmosphere are now in danger and it's we humans who are threatening the forests' future. Take away the trees and what remains doesn't last very long. The soil is too weak, too easily worn away and too lacking in nutrients for crops to grow successfully for long.

We simply cannot afford to stand by and watch as the forests disappear. We have to make a stand, we have to find a way of saying 'stop!' that others will listen to. In fact, the world needs to unite to protect the rainforests, not just for us and for now, but for future generations. And maybe the world needs to come together to decide how much it's worth to keep the rainforests as they are and how much we're prepared to pay to ensure they are protected, while allowing people in rainforested countries to develop and to improve their lives and those of their children.



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## Buy British

To know your beef wasn't reared on deforested land look for the red tractor and buy British meat.



## Check what you're eating at!

Buying organic or free range British meat is a good way of ensuring that what you're eating hasn't been fed on soybean meal that has come from the rainforest.



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