The UNEP Magazine for Youth

TUNZA

for young people · by young people · about young people

UNEP

Forests

Truly wild

Tell the difference

Money grows on trees

Forest heroes

Debt for forests

Plant for the Planet:
The Billion Tree Campaign

TUNZA
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Contents

Partners for Youth and the Environment

UNEP and Bayer, the German-based international enterprise involved in health care, crop science and materials science, are working together to strengthen young people's environmental awareness and engage children and youth in environmental issues worldwide.

A partnership agreement lays down a basis for UNEP and Bayer, who have collaborated on projects in the Asia and Pacific region for nearly 10 years, to step up current projects, transfer successful initiatives to other countries and develop new youth programmes. Projects include: TUNZA Magazine, the International Children's Painting Competition on the Environment, the Bayer Young Environmental Envoy in Partnership with UNEP, the UNEP Tunza International Youth Conference, youth environmental networks in Asia Pacific, the Asia-Pacific Eco-Minds Forum and a photo competition, 'Ecology in Focus', in Eastern Europe.

ONE **BILLION** TREES IN 2007!

That's UNEP's aim. Supported by star planters including Nobel laureate Wangari Maathai, UNEP's Plant for the Planet: The Billion Tree Campaign challenges nations, corporations, civil-society organizations, communities and ordinary people – *that's you and me*. Each tree will help save our soils, keep our freshwater fresh, absorb carbon dioxide from the atmosphere, and encourage other plant and animal life… making the world a better place.

Visit www.unep.org/billiontreecampaign to register your individual pledge – or a pledge from your school, college, youth or friendship group. It also provides practical advice on what to plant – indigenous species and the right kind of species for your local conditions – how to plant, when to plant, and how to care for your trees.

And, through the site, you'll be able to track the campaign's progress, post photos of you in action, and keep in touch with what others are achieving.

www.unep.org/billiontreecampaign

PLANT FOR THE PLANET

PLANTEZ POUR LA PLANETE

PLANTEMOS PARA EL PLANETA

Play your part...

join us and

get **planting.**

Editorial

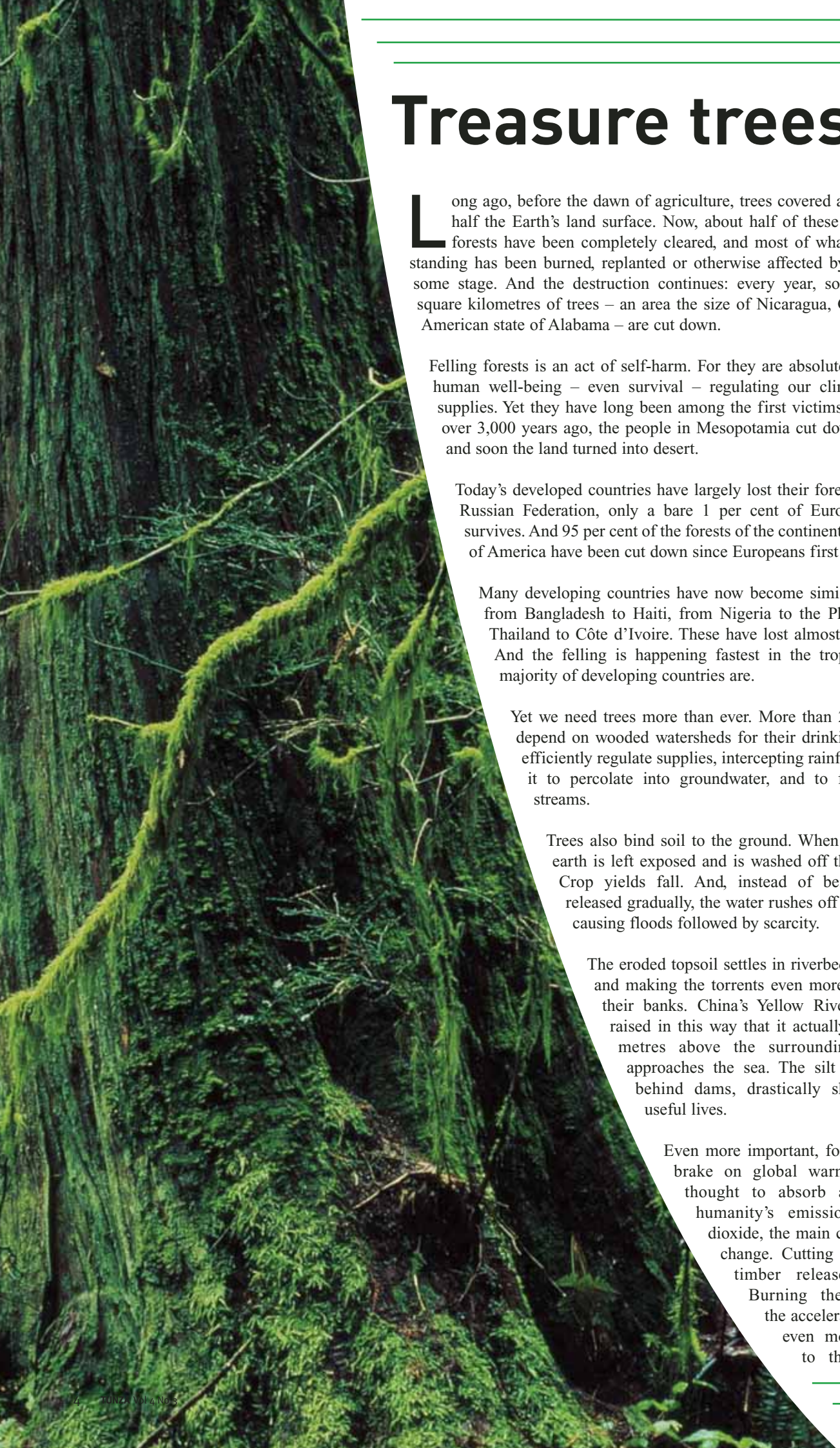
We are people of the trees – and not just because our distant ancestors lived in them. We could not survive without them. They protect us from nature's fury and our own follies. Up in the mountains, wooded watersheds regulate the water supplies of a third of the people on Earth. Down on the coasts, mangrove forests protect the land against storms and tsunamis as well as providing nurseries for fish. And all trees everywhere help soak up carbon dioxide that would otherwise speed up global warming.

Yet ever since humanity began to till the land, we have treated trees like enemies, not friends. They were in the way, taking up land that could be used for growing crops or building settlements. Worse, they seemed to harbour witches and wild beasts, and could give cover to crooks or warriors seeking to attack. So from the earliest times they were cut down: half of the wildwood that once covered 80 per cent of Britain was cleared by the time the Anglo-Saxons conquered England in the 5th century.

In recent decades this has begun to rebound on us. Cleared watersheds have caused water supplies to dry up, and allowed rain to run off the mountainsides, causing massive floods. Mangroves grubbed up to make way for fish farms or tourist playgrounds have exposed people to the violence of the sea. And burning forests release carbon dioxide, making the climate change faster and more severely.

Yet some people never took the destructive approach. Still in the forest, indigenous cultures have learned to make a living from their environment without damaging it; these people clearly have much to teach us about how to live in harmony with the environment. Our generation must abandon the confrontational attitude towards the forest and learn from the wisdom of indigenous cultures. Otherwise the outlook for our remaining forests – and for us – is bleak indeed.

We want to hear from you – your views, your news and your ideas. E-mail us at: tunza@ourplanet.com



Treasure trees

Long ago, before the dawn of agriculture, trees covered about half the Earth's land surface. Now, about half of these original forests have been completely cleared, and most of what remains standing has been burned, replanted or otherwise affected by people at some stage. And the destruction continues: every year, some 130,000 square kilometres of trees – an area the size of Nicaragua, Greece or the American state of Alabama – are cut down.

Felling forests is an act of self-harm. For they are absolutely essential for human well-being – even survival – regulating our climate and water supplies. Yet they have long been among the first victims of civilization: over 3,000 years ago, the people in Mesopotamia cut down their trees – and soon the land turned into desert.

Today's developed countries have largely lost their forests. Outside the Russian Federation, only a bare 1 per cent of Europe's tree cover survives. And 95 per cent of the forests of the continental United States of America have been cut down since Europeans first settled there.

Many developing countries have now become similarly denuded – from Bangladesh to Haiti, from Nigeria to the Philippines, from Thailand to Côte d'Ivoire. These have lost almost all their forest. And the felling is happening fastest in the tropics, where the majority of developing countries are.

Yet we need trees more than ever. More than 2 billion people depend on wooded watersheds for their drinking water. Trees efficiently regulate supplies, intercepting rainfall and enabling it to percolate into groundwater, and to feed rivers and streams.

Trees also bind soil to the ground. When they are felled, earth is left exposed and is washed off the hills by rain. Crop yields fall. And, instead of being stored and released gradually, the water rushes off the bare slopes, causing floods followed by scarcity.

The eroded topsoil settles in riverbeds, raising them and making the torrents even more likely to burst their banks. China's Yellow River has been so raised in this way that it actually flows 3 to 10 metres above the surrounding land as it approaches the sea. The silt also builds up behind dams, drastically shortening their useful lives.

Even more important, forests are a vital brake on global warming: they are thought to absorb a third of all humanity's emissions of carbon dioxide, the main cause of climate change. Cutting them down for timber releases the brake. Burning them stamps on the accelerator by emitting even more of the gas to the atmosphere.

We can lessen these effects by planting trees – which is on the increase around the world. About 57,000 square kilometres are re-forested in this way every year, bringing the overall loss down to 73,000 square kilometres, the size of Sierra Leone or Panama.

But replanting usually fails to replace like with like. What is cut down is normally rich, ancient, 'old-growth' forest, which worldwide is home to more than half the species on Earth. A single 1,000-hectare patch of tropical rainforest, for example, may well contain as many as 1,500 species of flowering plants, 740 types of trees, 400 kinds of birds, 100 of reptiles, 60 of amphibians and 150 of butterflies – insects as a whole are far too numerous to count.

This breathtaking diversity is regularly replaced by vast, regimented tracts of just one or two tree species, and little accompanying wildlife. The effect is incalculable – on the world's web of life, on the disappearance of species that could have provided important new foods and medicines, and on local people, who depend on the richness of the forests for more than a fifth of their meagre incomes.

It is far better to leave old-growth forest in place. One country – the tiny Himalayan kingdom of Bhutan – has shown the way. Measuring its success by 'Gross National Happiness' rather than 'Gross National Product', it decided, more than 30 years ago, that 60 per cent of its land should always remain covered by forest. In fact, it now has 74 per cent tree cover, making it the last green patch in the increasingly barren mountain chain – an example to inspire, and shame, the rest of the world.

J. Burton/UNEP/Topham

Supporting the sky

The Maori recognize the importance of trees in one of their creation stories.

Rangi, the sky father, and Papa, the earth mother, embraced each other. They held each other so tightly that they blocked out the sun's light, leaving their children to live in darkness, squashed between the earth and the sky.

Eventually, the children had had enough of the darkness. They argued over how best to find the sun. Tuma, the fiercer child, wanted to kill his parents, but Tane, the guardian of the forests, objected.

'Let's separate them, and let the sky stand far above us and the earth lie beneath us. Let the sky be a stranger to us, but let the earth remain close to us as our nursing mother.'

In turn, each child tried to push Rangi and Papa apart, but their embrace was too strong.

Tane tried one last time. He lay on his back and put his shoulders against the earth. He wedged his feet against the sky. He pushed, and groaned and strained.

With one huge push, Tane broke the sinews that held his parents together. Quickly, he propped up his father, the sky, with tall trees from his forests so that the sky and earth could not come together again.

Q & A

TUNZA

answers

your questions

Do you have any **QUESTIONS** on environmental issues that you would like the experts at UNEP to answer?

Please send them to **uneppub@unep.org**, and we will try to answer them in future issues.

Q **Once a rainforest has been cut down, is there any way that people can replant to recreate the biodiversity that was there before?**

A It has taken millennia for rainforest biodiversity to evolve, and we are only now beginning properly to understand the interconnectedness of many of the species. There are still many forest species that have not yet been identified, let alone studied. So while we can replant, it is unlikely that we will ever be able totally to restore what is lost.

Q **We have not heard much about acid rain recently: is it still killing forests around the world?**

A Acid rain results from fossil fuel emissions, particularly nitrogen dioxide and sulphur. When these combine with water vapour, sunlight and oxygen in the atmosphere, they create diluted nitric and sulphuric acid – which are washed out of the atmosphere by rain and snowfall often far from where the pollution originated, and are particularly harmful to forests and lakes. The problem has been greatly reduced in Western Europe – thanks to United Nations action – and North America, but is ongoing in Eastern Europe and the Russian Federation, as well as in China, where a parliamentary report recently concluded that a third of the vast country is affected.

Q **Are there global laws to protect virgin forests from being cut down? Do they work?**

A There are no global laws to protect virgin forests from being cut down. However, Forest Principles were negotiated at the 1992 Rio Earth Summit. Today, the United Nations Forum on Forests (UNFF), made up of all member states of the United Nations and its specialized agencies, promotes '...the management, conservation and sustainable development of all types of forests', and is working on turning this into a reality.

Q **In some places people are creating forest plantations. Should we welcome this?**

A Wood and other products, including food, can be produced from sustainably managed forests and plantations, which should reduce pressure on natural, old-growth forests. UNFF strongly promotes sustainable forest management under which all types of forests, including plantations, are managed to meet economic, social and environmental goals.

Q **Should we try NOT to cut down any trees?**

A Wood is used in a huge variety of ways, including as building materials, as fuel, in paper, or as part of brushes and other tools, and its sustainable use benefits local communities and entire industries. So some forests can be harvested to meet human, economic and social needs. The problem is unsustainable cutting or logging, which result in the loss of both species and environmental goods and services such as climate regulation and watershed protection, doing irreparable damage to the health and well-being of people and the planet.

Q **We read about tree species being moved around the world – rubber from Latin America to Malaysia and Indonesia, or eucalyptus from Australia to Africa. Is this wise?**

A Most experts would recommend extreme caution when introducing non-native species extensively, as they may destroy local ecosystems and cause environmental and economic damage. Invasive alien species are a significant threat, and can harm indigenous species and the local environment.

Q **How can we, young people, help preserve forests? Should we plant trees ourselves?**

A It is a good idea for young people to plant trees as well as promote the sustainable management of forests. Many organizations promote tree planting using appropriate local, native species. Check with your local community to find out how you can help – or join UNEP's Billion Tree Campaign and make a pledge (www.unep.org/billiontreecampaign).

Tunza Fun!

If you happened to be in the Taman Wetland Putrajaya on 28 August, your confusion at being surrounded by tree-planting children would have been understandable. It's not every day that 250 children from 60 countries get together to plant a forest. Yet forest planting was only one of the many activities that occupied delegates attending the 2006 UNEP Tunza International Children's Conference.

Themed 'Save a Tree, Save our Lungs', the Conference was held in Putrajaya, Malaysia, from 26 to 30 August. Delegates aged 10 to 14 were selected, based upon their involvement in environmental clubs in their home communities. The event provided delegates with an opportunity to meet their peers from around the world and a forum for them to discuss and learn about their environmental rights and responsibilities. Delegates presented their own activities, voiced their concerns and shared ideas about the environment, conservation and sustainability.

HRH Raja Permaisuri Agong Tuanku Fauziah Binti Al-Marhum Tengku Abdul Rashid, Queen of Malaysia, presided over the opening ceremonies, encouraging participants to cement friendships and learn from each other in the coming days. All were then enthralled by performances by local children, especially a play, 'Tears of Trees'. The production's amazing costumes added depth to the storyline: that trees must be allowed to grow and reproduce to maintain the healthy ecosystem we call Mother Earth.

The four days were full of activity, fun and information. Workshops addressed such diverse topics as 'How to become an Eco-Journalist', 'Let's make Paper out of Waste', and 'Saving the Marine Turtle'. Each morning, a selection of delegates presented summaries of their own environmental projects. There were also field trips to the PETRONAS Towers, the Botanical Garden of Putrajaya, and the Forest Academy's innovative research centre. And, of course, there was the forest planting.

Delegates, chaperones and volunteers planted at least one tree each on behalf of their country. Covered in mud but hugely satisfied, the children continued planting after they had finished their own country's task – helping their neighbours in a truly global effort. The new forest was named Rimba Tunza Taman Wetland Putrajaya, which roughly translates as Tunza Forest.

After four eventful days the Conference came to a close. The final day was a whirlwind. Elections for the Junior Board took place in the morning, and by early afternoon the new representatives had been named (see box). These talented young people will work hard over the next two years to organize and shape the direction of the 2008 Tunza International Children's Conference in Norway. The closing ceremonies began with an eye-popping fashion show. Conference participants, chaperones and volunteers graced the catwalk wearing the latest look in wearable recycled waste. And, before leaving, all delegates agreed a Conference contract, committing both them and UNEP to concrete action to continue their efforts to protect the environment and raise awareness.

The success of the Conference is best summed up by 14-year old Nikolaos Theofilidis from Greece: 'Until the Tunza Children's Conference, I knew only about environmental problems in Greece. But here I learned about other parts of the world. We all need to change our attitude to the environment. The Earth is our home and by harming it we harm ourselves.'

2008 Tunza Junior Board

Latin America and the Caribbean
Daniela Meléndez (Colombia)

West Asia
Ammar Hussain Ali (Bahrain)

Africa
Naylee Nagda (Kenya)
Guy Nindorera (Burundi)

Europe
Nathan Sutcliffe (United Kingdom)

North America
Clara Simpson (Canada)

Asia and the Pacific
Michael Bradley Lewis (Australia)

UNEP's Choice Junior Board Member
Juan Samuel Loyola (Philippines)

Representing Norway, the upcoming host country
Helga Anfinsen
Hanna Eikas
Hakon Haaland
Kristian Oion

Forest heroes

L. Hrinivasan/UNEP/Topham

Throughout history people have understood the vital importance of trees, and have been ready to die to defend them. Here are a few of the heroes of the forests.

1485

The **Bishnoi** sect is started by Guru Jambheshwar in Rajasthan, India. It forbids doing any harm to trees and animals.

1730

Bishnoi villager **Amrita Devi** hugs a tree to stop it being cut down by the local maharajah. She is killed, but 362 other villagers then sacrifice themselves in the same way, shaming the maharajah into forbidding felling in Bishnoi villages. Now they are oases of life in a desert.

Early 1800s

John Chapman, better known as **Johnny Appleseed**, roams the United States frontier planting cider apple trees which he sells for a few pennies to arriving settlers, helping to establish an economy and improve life in the wilderness.

1922

Richard St Barbe Baker founds Watu wa Miti (Men of the Trees) with Kenya's Kikuyu people to carry out reforestation there after seeing the soil erosion caused by felling in Canada and North Africa. The organization, a forerunner of modern conservation groups, eventually became the International Tree Foundation, with branches in over 100 countries. More than 26 billion trees are thought to have been planted worldwide by organizations Baker founded or assisted.

1973

Villagers near the Mandal Forest in Uttar Pradesh, India, march to protest the felling of ash trees by a sporting goods company. Inspired by the Bishnoi, they decide to hug the trees, stopping the loggers and starting a non-violent movement called **'Chipko'**, after the Hindi word for 'embrace'. They knew that cutting down the forest would erode soil and cause devastating floods. Similar protests erupted throughout the state to frustrate the loggers, mainly led by local women who depend most on the fuelwood and fodder the trees provide. After years of such resistance, the Government banned commercial logging in Uttar Pradesh. Chipko movements now focus on reforestation.

1976

Chico Mendes, a rubber tapper in the Amazon rainforest, first joins *empates*, non-violent marches into logging sites, where demonstrators ask workers to stop clearing forest for cattle ranches. He later becomes a pioneering advocate of creating forest reserves to be managed by traditional communities sustainably harvesting its riches – like Brazil nuts and rubber. In 1987, he successfully convinced the Inter-American Development Bank to halt and renegotiate a road project threatening the forest and its people's livelihoods, and became one of the first recipients of UNEP's Global 500 award. The next year he was assassinated at the behest of a rancher whom he was trying to prevent from logging a reserve.

1976

Sporting hero **Alexander Peal**, the former goalie of Liberia's national football team, starts fighting to protect West Africa's last remaining sizeable tract of rainforest, succeeding in establishing a national park seven years later. He had to flee for his life in 1989 when civil war broke out and gave rise to a brutal regime, but he continued to fight

Get involved!

Every year, thousands of community and student volunteers participate in **Australia's National Tree Day** by planting native trees and shrubs: more than 10 million trees in the last decade.

Since 2000, **Cultiva**, a non-profit group, has helped local students plant trees on the badly eroded Andean foothills around Santiago, Chile.

The **Government of Newfoundland and Labrador** has begun a pilot programme to offer secondary

for the forest in exile and returned to continue his work as soon as peace broke out.

1977

University professor **Wangari Maathai**, seeing the destruction caused by deforestation and desertification in her country, forms the **Green Belt Movement** after planting a nursery of trees in her back garden. She also begins campaigning to preserve African forests. Despite repeated persecution, she and the movement have so far enabled poor women in Kenya and all over East Africa to plant over 20 million trees, both combating soil erosion and creating a sustainable source of fuelwood, fruit and timber. The movement has spread internationally and, in 2004, Maathai was the first African woman to receive the Nobel Peace Prize.

1994

After fires destroy forests around their home village, **Monir Bu Ghanem** and four young friends from Ramlieh village in Lebanon dedicate themselves to preventing and fighting fires, planting trees and protecting forests. This group has grown into a national youth action organization, the **Association for Forest Development and Conservation**, which also promotes old-growth forest conservation, ecotourism and environmental education – and in 2006 provided shelter for refugees fleeing the conflict between Israel and Hizbollah.

1997

Julia Butterfly Hill climbs a 600-year-old, 55-metre-tall coast redwood tree, staying in it for two years in a vigil that would ultimately save the tree and a small area of old-growth forest around it from commercial logging, bringing the plight of the forest to national attention.

1997

In her first year of practice as a lawyer, **Anne Kajir** succeeds in forcing logging companies to pay damages to indigenous peoples in Papua New Guinea. She has continued to fight for the forests ever since – despite being physically attacked more than once – exposing widespread corruption which is allowing illegal logging to destroy the last remaining intact block of tropical rainforest in the Asia-Pacific region.

1998

Rodolfo Montiel Flores, a subsistence farmer in Mexico's Guerrero State, founds a peasants' movement to try to stop logging from devastating the area. In the following year, he and a colleague were arrested, imprisoned and extensively tortured. In 2000 he won a Goldman Award*, sparking an international campaign to have the two men released. They finally gained their freedom in 2001.

1999

Fatima Jibrell leads a march to stop acacia trees being felled and turned into charcoal for export from Somalia, then an anarchic country ruled by warlords. Despite repeated threats, she succeeded in persuading the Government of the Somali region of Puntland to ban the exports. Today, she and her colleagues promote solar cookers to eliminate the domestic use of charcoal.

2004

Tree sitters climb into platforms in *Eucalyptus regnans* trees 65 metres off the ground to protect Tasmania's old-growth Styx forest from being logged. Five months later, the Tasmanian Government promised to protect 18,700 hectares of trees.

* Wangari Maathai, Alexander Peal, Fatima Jibrell, and Anne Kajir have also won Goldman Awards.

Shane Recalde

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school graduates summer jobs planting some 900,000 trees.

The **All Pakistan Youth Federation**, coordinating 392 young peoples' organizations, sponsors tree-planting campaigns.

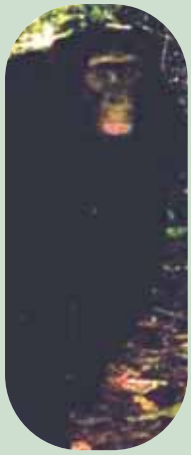
Tree For All, sponsored by the United Kingdom's Woodland Trust, has helped more than 350,000 young people plant 3 million trees.

So what are you waiting for...

www.unep.org/billiontreecampaign

Bili ape

Is it a chimp? Is it a gorilla? For a while noone knew. It's large and nests on the ground like a gorilla, but eats fruit like a chimpanzee. Recent DNA testing identifies the Bili ape of the isolated forests of the Democratic Republic of the Congo as a chimp subspecies – even though overgrown and with an unusual gorilla-like crest on its skull.



Karl Ammann/www.karlammann.com

Ebony cup

Plectasin – a powerful antimicrobial that fights pneunomia and meningitis – has recently been isolated from this fungus from northern European pine forests. Many other fungi-based medicines probably remain to be discovered, as do drugs and foods from all kinds of wildlife species.

Biopix.dk/www.biopix.dk

Vanilla orchid

That familiar taste comes from the pod of a rainforest orchid from Mexico, first used by the ancient Totonac people. The vanilla orchid is pollinated by the melipone, a tiny bee that cannot survive outside Mexico. So commercially cultivated *Vanilla planifolia* must be hand-pollinated, making it expensive.

BIOS Hazan Muriel/Still Pictures

Mud snake

A 'chameleon snake', recently discovered by WWF conservationists in Borneo's rainforests, the Kapuas mud snake appears reddish-brown in daylight, but goes white in the dark. Researchers think this may help control body temperature, as dark skin absorbs sunlight. Some 360 species have been discovered in Borneo in the last decade.

Mark Auliya/WWF

Debt for forests

A. Mbabazi/UNEP/Topham

Cameroon's rich tropical forests are about to get some much-needed protection, thanks to a historic deal with France that reduces Cameroon's debt burden at the same time. Under the agreement, Cameroon will invest at least $25 million of its debt to France – instead of having to pay it back – to protect its part of the Congo basin, home to rare forest elephants and hundreds of bird species, as well as local inhabitants like the Ba'Aka people.

Such 'debt-for-nature' swaps were first thought up by Thomas Lovejoy, an American biologist and conservationist. He recognized that the world's richest wildlife areas are usually in developing nations, which both carry the greatest debt and have difficulty paying for environmental protection. The scheme redeems international debt, as long as the money is used to fund environmental protection in the indebted country. It is often a conservation organization that purchases the debt at a discount (yes, you can buy others' debts!) and redeems it in local currency, using the money for conservation on the spot. Sometimes an agreement is made directly between governments – as in the case of the France-Cameroon swap – but this is usually monitored by a conservation body, which can help identify what needs to be conserved and how. Either way, the developing nation saves valuable foreign currency, while managing its natural resources sustainably for both its own – and the planet's – benefit.

The scheme started in 1987, when Conservation International purchased $650,000 worth of Bolivian debt owed to a commercial creditor for just $100,000 – and used the funds to manage the Beni Biosphere Reserve and create more protected areas. By 1996, 16 countries had such swaps, including Costa Rica, Ecuador, Guatemala, the Philippines and Zambia.

In 1998, the United States of America passed a bill authorizing debt-for-nature swaps to protect tropical forests. This led to many more agreements. In 2002, for example, the United States redeemed $6.6 million of Peru's debt in this way with contributions from The Nature Conservancy, Conservation International and WWF. This swap helped protect 10 of the Peruvian Amazon's most biologically rich, critically endangered rainforests, over an area of 110,000 square kilometres.

Of course debt-for-nature can't erase all developing nations' debts. But it does help countries invest in managing the natural resources that they might otherwise destroy to raise money for repayments. And it's hard to argue with Lovejoy, the still-enthusiastic father of the idea, when he reports that debt-for-nature swaps are the world's biggest way of funding conservation.

Nothing new under the canopy

Home to plants and animals, of course, but how often do we think of forests as habitats for people? Yet millions around the world live in forests, with lifestyles interwoven with their environment. Indeed, it is thought that many forest communities in Latin America have yet to contact the wider world.

Most forest peoples are indigenous minorities living in small, tightly knit communities – and they have much to teach the rest of the world.

At the core is respect. The Bambuti people of the Congo refer to the forest as mother or father, and hold it sacred: a deity to ask for help and to thank. The Yanomami of Venezuela and Brazil believe that the natural and spiritual worlds are united: the fates of all people and the environment are inexorably linked. So when people destroy the environment, humanity slowly commits suicide.

Communities use the forest with restraint because it provides for their basic needs – food, shelter, water, medicine, fuel and clothing. In Borneo, the Penan harvest the sago palm, a fast-growing tree whose pithy trunk is loaded with starch used to make flour. Only the largest trunks are taken, the smaller shoots carefully preserved for future harvests. They call this *molong*, meaning never taking more than necessary.

When the Haida people of Canada fell a red cedar, the bark is made into a textile for clothing, ropes and sails, and the wood is used to make dugout canoes, ceremonial masks and boxes, and to build communal longhouses. Smaller branches are used for smoking salmon.

There is nothing new in this. Archaeological finds show that a Haida population was living on Haida Gwaii (the Queen Charlotte Islands) off Canada's west coast 5,000 years ago. Egyptian records refer to people in the forests of the Congo 4,500 years ago. And scientists now suggest that at least 10 per cent of what is often regarded as virgin Amazonian rainforest was in fact carefully planted. The people there focused on establishing a diverse assortment of trees: fruits, nuts and palms.

Passing on information is the key to a successful forest lifestyle. Both the Bambuti and the Bagyeli of Cameroon make storytelling, music, dance and mime central to transmitting cultural knowledge. All provide opportunities to teach the next generation the ways of the ancestors, showing children how they did things – and how they are done now.

Many forest peoples were never completely isolated, and many who once were now interact with the outside world. Most Penan have moved into houses along rivers, but regularly return to the forest to hunt. Bambuti live in the forest but trade with villages, providing bushmeat and honey, acquiring manioc and other produce. The relationship between the Haida community and the Canadian Government is entrenched in the Haida Accord, which authorizes the Council of the Haida Nation to represent its people when dealing with the provincial and federal governments about land and resources.

But, in the end, it is their separateness – spiritual, if not physical – that is of the greatest value to the world.

C.B. Hansen/UNEP/Topham

John Cancalosi/Still Pictures

Mexican dry forests (1)

A third of Mexico's endemic species can be found in this, the biggest stretch of tropical dry forest north of the equator. Plant life includes succulents, shrubs, thorn scrub and deciduous trees – and among them live rare red-kneed tarantulas, gila monsters, swallowtail butterflies, pumas and jaguars. Less than 2 per cent of the original dry forest remains in Central America, and it is only fragmentarily protected from cattle ranching and development.

M. Schneider/UNEP/Topham

Southwest Amazonian forests (3)

These isolated tropical forests, flooded savannas and swathes of bamboo forest provide vital refuge for the world's greatest diversity of birds, freshwater fish and butterflies, as well as for jaguars and several primates. Ninety-four per cent of this part of the Amazon rainforest – an area a bit smaller than Mexico – is intact, but still vulnerable to logging and to prospecting for fossil fuel exploitation, among other threats.

H. Them/UNEP/Topham

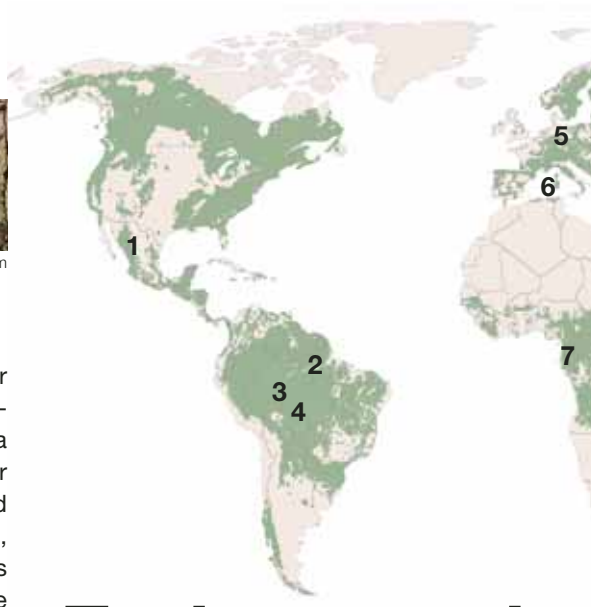
Amazon flooded forests (2)

Every year, rainfall makes the River Amazon overflow its banks, submerging an area about the size of Venezuela under 9 metres of water. The water fertilizes the surrounding plains and regenerates lakes. Aquatic creatures, from fish and reptiles to river dolphins and manatees, swim among the trees to breed and feed. It is a unique and stable ecosystem – but threatened by overfishing, sewage pollution and dam building.

Gunter Ziesler/Still Pictures

Chiquitano tropical dry forest (4)

South of the Amazon rainforest, the thorny scrub habitat of the biologically rich but little-known Chiquitano is under major threat. The grazing of animals and growing of soya, along with energy projects, threaten trees that are adapted to fire, flood and dry winters. It's the world's biggest healthy dry forest, but only 20 per cent of its original area remains. Its species – many not yet catalogued – include giant armadillos.



Endangered

Half the world's forests have already disappeared, and they are still shrinking on every continent at the rate of 130,000 square kilometres per year – that's equal to about 35

J.M. Ahrtal/UNEP

Baltic mixed forests (5)

Coastal rivers create wetlands within these temperate forests – making a perfect habitat for many birds, including raptors. Trees include beech, oak, European hornbeam, Scots pine and linden. European mink and two species of frog are among their endangered animals. They still cover great swathes of Germany, Denmark, Poland and Sweden, but have long been exploited and need ongoing protection from tourism, agriculture and hunting.

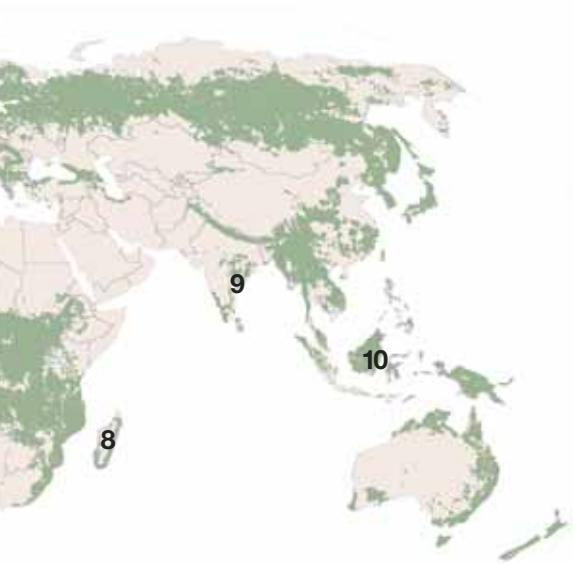
Cloud forests

THEIR EVOCATIVE NAME describes them well: as moist air rises from the world's warm tropical and subtropical lowlands into the colder mountains, condensation engulfs the evergreen montane forests. Resplendent with orchids, ferns and mosses, they provide habitats for such species as the endangered spectacled bear and mountain gorilla. About 80 per cent of their diverse wildlife has not yet been catalogued, and species are still being discovered, including wild relatives of potatoes and tomatoes. Millions of people depend on their ability to provide a clean, reliable source of water; by gleaning it from the clouds, forests provide all the drinking water and hydroelectricity for Dar es Salaam (Tanzania) in the dry season, for example. Only 3 per cent of the world's original cloud forest is left, and this could soon be lost to such threats as agriculture, grazing and global warming: a rise in temperature of 2ºC could dry up the clouds.

B.L. Christiansen/UNEP/Topham

Boreal forests

THE EXTENT OF the world's boreal forests – 12 million square kilometres – rivals the tropical rainforests and is just as important to the global ecosystem, even if it hasn't so far attracted the same public concern. Forming a ring around the far Northern Hemisphere just below the Arctic circle, their cold winters and short, but warm, summers produce forests dominated by evergreen conifers. Their year-round dark green foliage helps them to start



UNEP-WCMC

forests

football fields per minute. Much has been lost, but there is still much to be saved. Here is a snapshot of just a few of the world's most important forests and forest types.

Jean-Léo Dugast/Still Pictures

Western Madagascar dry forests (8)

These forests support hundreds of endemic species, including the extremely endangered angonoka tortoise and six of the world's eight baobab species. Many of their trees have adapted to the dry season by shedding leaves to conserve moisture, while baobab trunks can store up to 120,000 litres of water. Most of the forests have already been cleared for firewood, agriculture and pasture, which continue to endanger what remains.

John Cancalosi/Still Pictures

Mediterranean forests (6)

The many types of forest – from pine to wild olive and carob to various oaks – of the Mediterranean basin contain Europe's richest biodiversity and greatest concentrations of species found nowhere else, among them the highly endangered Iberian lynx and the Spanish ibex. Around 85 per cent of the original forest has fallen to centuries of exploitation; conservationists are now trying to protect 'hot spots' of high biological value.

A.V. Singh/UNEP/Topham

Eastern Deccan Plateau (9)

Many of India's tigers live in these monsoon-swept forests, where they are joined by such other large mammals as guars, the world's largest wild cattle. Dominated by sal, a hardwood tree valued for its timber, fragrant resin and fat-yielding fruits, only a quarter of the original forests remain, and only 4 per cent are protected. Fragmentation as a result of quarrying, mining and hydroelectric power threaten forests and tigers alike.

Martin Harvey/Still Pictures

Congo basin moist forests (7)

Dense jungle, mosquitoes and flooded forests keep most people out of one of Africa's last expanses of wilderness. But the Congo basin's impenetrability means that researchers haven't been able to catalogue its biodiversity. Known inhabitants include lowland gorillas, Congo sunbirds, bonobos and forest elephants. As most of the region can only be reached by boat, logging is not yet a problem, but poaching threatens its endangered species.

UNEP/Topham

Borneo lowland rainforests (10)

These abound with as much life as the Amazon, but are even more vulnerable. Half of them are already destroyed: the rest could be lost within 10 years to logging, palm oil and rubber cultivation, fires, and dams – threatening the region's 10,000 plant, 13 primate and 380 bird species, not to mention those still to be identified. The most gravely endangered include the Borneo orangutan, the Asian elephant, and the Sumatran rhino.

S. Kiyohiro/UNEP/Topham

photosynthesizing as soon as the sun emerges, while their conical shape helps them shed snow, keeping branches from breaking. The forest floor is rich in lichens and moss, while their many rivers, bogs and shallow lakes are important bird habitats. The boreal wilderness is still relatively intact, providing important habitat for large mammals such as caribou, bears and wolves. But it is under pressure from acid rain, air pollution and such energy developments as oil exploration and hydroelectric dams.

Mangrove forests

VITAL BUFFERS between land and sea, mangrove forests cover 150,000 square kilometres of tropical and subtropical coastal zones around the world. Their evergreen trees and shrubs are specially adapted to the swampy, oxygen-poor soil and salt water of the intertidal zone – with salt-resistant roots, leaves that excrete salt, and aerial roots that absorb oxygen directly from the air. Their dense vegetation protects marine life, prevents shore erosion, and shields the land from wind and waves, including tsunamis. Their shallow wetlands, rich in nutrients, provide essential nurseries for fish and shellfish, which in turn are food for birds. Manatees, crab-eating monkeys and amphibious fish also rely on them. But 20 per cent of the world's mangroves have disappeared since 1980, partly because they used to be seen as wastelands. They are vulnerable to oil spills and coastal development, with shrimp farming accounting for 38 per cent of their loss.

UNEP/Topham

FORESTS: *What do you know?*

1 How much of the Earth's original forest remains pristine and undisturbed?
a. 1/2
b. 3/4
c. 1/5
d. 1/8

2 Where can you find the largest single expanse of temperate rainforest?
a. Alaska
b. Pakistan
c. Uruguay
d. Russia

3 A square metre of rainforest can support how many kilograms of living material (biomass)?
a. 60-100 kg
b. 45-80 kg
c. 120-170 kg
d. 20-30 kg

4 African rainforests contain more than half that continent's animal and plant species. How much of the total area of the continent do they cover?
a. 20-25%
b. 70%
c. 60-65%
d. 5-7%

5 Which tree species is the most harvested of those in the Budongo Forest in Uganda?
a. Teak
b. Mahogany
c. Chestnut
d. Palm

6 How many species of fungus grow in boreal forests worldwide?
a. 5,000
b. 650
c. 1,000,000
d. 700,500

7 'Orangutan' means 'person of the forest' in which language?
a. Arabic
b. Mandarin
c. Malay
d. Urdu

8 Bamboo is actually a member of the grass family and can grow very quickly. How much per day?
a. 38 cm
b. 2 metres
c. 10 cm
d. 84 cm

9 Quinine, a medicine used to treat malaria, is extracted from the bark of trees from which kind of forest?
a. Bamboo forest
b. Amazon rainforest
c. Cloud forest
d. Temperate deciduous forest

ANSWERS: 1c, 2a, 3b, 4d, 5b, 6a, 7c, 8a, 9c

Give as well as take

Waranya Mei Roekpoorita, Tunza Youth Advisor for Asia-Pacific, describes fighting for the forests with the Thailand Youth Environment Network

Forests mean life. They provide food, shelter and even medicine. All living things, not just humans, benefit. In Thailand, we face substantial deforestation. Seventy per cent of the country used to be covered with forests: by the 1960s, this was down to 50 per cent, and by the 1990s they had declined to just 15 per cent, severely depleting their biodiversity and biomass, and gravely damaging the working of their ecosystems.

The Thailand Youth Environment Network (ThaiYEN) believes that working with village farmers is the most effective way for young people to combat deforestation. Farming practices in Thailand are often not very sustainable. As farmers grow the same crops every year, the soil is drained of its nutrients and loses its fertility – and they then clear forests to try to get new productive land.

One of ThaiYEN's projects works with villagers to develop appropriate and environmentally sustainable farming. We promote the idea that getting things from the forest is not enough: we also have to give back to the forest. So we should give back the nutrition we have taken from the soil by growing different crops planted in seasonal rotation, keeping existing fields productive for many years and avoiding the need to sacrifice forests. ThaiYEN also promotes sustainable consumption – as articulated by our king, HRH Bhumibol Adulyadej – diversifying land use by devoting some to grazing animals, some to crops and some to family gardens.

My experience in ThaiYEN has taught me the value of being connected to networks of young people. I have met many young environmentalists from South Asia and around the world through organizations like Tunza and events like the Global Youth Retreat. As a Tunza Youth Advisor I am involved in peer-to-peer education programmes and believe that they are invaluable because young people are stubborn: they do not like to be told how to think, but are convinced by getting involved in practical action.

Worawit Netrachad/UNEP/Topham

John D. Canning

GORILLA WARS

In May 2006, Hollywood actor and devoted environmentalist Daryl Hannah – most famous for playing a mermaid in the film *Splash* – took up residence in a walnut tree. The tree was growing on a lush farm in South Central Los Angeles, one of the city's grittiest areas, and she was there to prevent it being bulldozed by developers.

Hannah had climbed the tree to support the community of immigrant farmers from Mexico and Central America who had created and tended this 5.6-hectare oasis – the largest urban farm in the country – since 1992, after getting a permit to cultivate what had been an abandoned lot. They grew 150 species of vegetables and fruits, including avocados, mangoes and maize and heirloom varieties from their homeland – all fresh organic produce that fed 350 poor families. The farmers ran it by the Mexican *ejido* system, as communal land, with markets and cultural events open to the public. The farm also absorbed some of the vast amounts of carbon dioxide emitted by the city.

In 2003, the city sold the land to a developer who later served an eviction notice. To draw attention to the situation, Hannah sat in the tree for three weeks with activists Julia Butterfly Hill and John Quigley. 'I'm very confident that it is the morally right thing to take a principled stand in solidarity with the farmers,' said Hannah.

The fight for the farm is just one part of Hannah's personal crusade to protect the environment. A veteran of the film industry, she has over 60 credits to her name and is still busy acting. But she invests the rest of her time in promoting a green lifestyle. She recently began producing weekly 5-minute videoblogs (found online at dhlovelife.com) – 'guerrilla-style', as she puts it, without benefit of corporate sponsorship or a film crew. These inspirational mini-documentaries show people making choices that help the Earth in everyday life, covering green cosmetics companies, sustainable architecture, biodiesel, Rwanda's endangered gorillas and, of course, the South Central farmers.

Hannah lives her philosophy, too: her house is run on solar power in Colorado's Rocky Mountains; she grows much of her own food; and she drives a biodiesel car. 'It's not a matter of a political belief or an environmental stance. It's really just common sense,' said Hannah.

Sadly, there's only so much that common sense and star power can do. The South Central sit-in hit headlines, and other celebrities – including actors Martin Sheen and Leonardo di Caprio – supported it. But the eviction went ahead in June, the activists were forcibly removed and arrested, and the farm was bulldozed.

But the farmers are not giving up. They still hold vigils at the site and are looking for a way to restore the farm, legally and financially, while starting to cultivate another urban garden on a 3-hectare plot provided by the city. And Hannah still stands by them. 'The subsistence farmers are from one of the poorest communities,' she said. 'This farm should be a model for sustainable urban agriculture. It needs to be replicated, not eradicated.'

Hawaiian I'iwi

Although rare or absent from some of the islands, where it has suffered from habitat loss and avian malaria, this nectar-loving bird still has a foothold in much of Hawaii. Traditionally prized for its fabulous plumage, which matures to a brilliant red, the I'iwi's feathers were once collected to make cloaks and headdresses for Hawaiian royalty.

Doug Cheeseman/Still Pictures

Ayahuasca

Its name, in the Quechua language, means 'vine of the soul'. Traditionally prepared as a brew taken by the forest people as a vision-inducing sacrament, ayahuasca also makes a good medicine, causing intense vomiting and diarrhoea that helps purge the body of tropical parasites.

Dr Morley Read/Science Photo Library

Borneo elephant

They're not much taller than people, at 2.5 metres, but they're chubbier than Asian elephants – of which, according to new research by WWF and Columbia University, they are a subspecies – and have bigger ears and longer tails. Only about 1,600 of them remain in their home, the northeast tip of Borneo, and they are threatened by poachers and the spread of commercial plantations.

A. Christy Williams/WWF-Canon

Birdwing butterfly

The world's largest butterfly, with a 28-centimetre wingspan, lives only in New Guinea's lowland coastal rainforest. But Queen Alexandra's birdwing is rare, and becoming rarer, thanks to insect collectors and to clearing forests for palm oil plantations. It is particularly vulnerable as its larvae depends entirely on one plant – the pipevine, from which it gets a poison that wards off predators.

Francois Gilson/Still Pictures

Money DOES grow on trees

The way to make money from a forest is to cut it down and sell the timber. Right?

Wrong! Studies show that the trees, and all that goes with them, yield much more cash if left standing. Harvesting the living forest for its products, and growing crops in harmony with it, can earn up to nine times as much as felling it – and will go on producing an income indefinitely. And that is not counting the growing potential of ecotourism, or the incalculably valuable services of forests in providing freshwater and regulating the climate. Here are just a few of the riches that forests provide.

Neem

Fast-growing and resistant to drought, this native South Asian hardwood has so many uses that it has been called a wonder tree. It provides an antiseptic and antifungal ingredient in skin ointments and soaps. Its seeds are an important source of azadirachtin, an effective pesticide that does not harm beneficial insects or mammals. It is being cultivated for carving in Kenya, providing an income without depleting already overharvested hardwoods like ebony, and helping to preserve the habitat of such species as the Sokoke scops owl.

Enrico Bartolucci/Still Pictures

Matsutake mushrooms

These rare and expensive wild mushrooms, from Japan's red pine forests, are such a precious traditional delicacy that perfect specimens are given as gifts. Such is the demand for them that related varieties are also imported from places like the pine forests of Santa Marta Latuvi, Mexico, where communities of subsistence farmers harvest and sell them for export for up to $30 per kilogram.

Marisela Zamora

TRADITIONALLY, forest peoples have farmed in harmony with the trees – and many still do so, from Central America to Tanzania to Thailand. Two of the most popular of all forest products can be grown on a large scale in similar ways:

Cacao

More than half of the chocolate produced by Brazil, the world's fifth largest cacao-growing country, has been produced by the so-called 'cabruca' system, where the rainforest is thinned, but not felled, to accommodate cacao plants. The crop tolerates the shade and does well. Cabruca has recently been declining, but conservationists hope it can be revived, with international investment, to protect the country's Atlantic forest – one of the most species-rich but endangered habitats in the world.

Coffee

Coffee also originated in the shady forest. Indeed, shade-grown coffee – produced by smaller farms on land forested with fruit and hardwood trees that also provide farmers with income – is becoming increasingly popular. It is a bit more expensive, but it prevents deforestation, sustains wildlife, preserves moisture in the soil and decreases erosion. Shade coffee plants can produce beans for 50 years, compared with just 10 to 15 years for those grown conventionally in the full sun after forests have been felled.

Sean Sprague/Still Pictures

Cork oak

Evergreen cork oak forests provide a natural biodegradable material for a host of uses, ranging from floors to bulletin boards, insulation to stoppers for wine bottles. They thrive across 27,000 square kilometres in the Mediterranean basin and are home to endangered species like the Iberian lynx. The cork can be harvested from the live tree about once a decade, and then grows back, providing a sustainable income for more than 100,000 people.

Markus Dlouhy/Still Pictures

Rubber

People have used the sap of the South American rubber tree since before Christopher Columbus crossed the Atlantic. It sparked an extraordinary boom in the Amazon in the late 19th century, which collapsed when Europeans smuggled out the trees and set up plantations in Southeast Asia. Synthetic rubber followed and the Amazon now meets only a small fraction of world demand. But it is still an important source of income.

Luiz C. Marigo/Still Pictures

Brazil nuts

One of the most famous of all rainforest products, the Brazil nut utterly depends on its intricate ecosystem. Its tree is pollinated by bees, which themselves depend on orchids that grow in the forest, and it needs a rodent – the agouti – to disperse its seeds. As a result the nuts, which are highly valued for their oil and nutrients, cannot be commercially cultivated in plantations.

TopFoto/ImageWorks

Pine nuts

Once a staple of Native Americans – who ground them into flour – and now the main ingredient in Italian pesto, pine nuts come from a variety of trees growing wild in Europe, Asia and North America. Rich in protein, fibre and other nutrients, they also sustain many wild creatures, from birds to grizzly bears.

Walter H. Hodge/Still Pictures

WIN-WIN

When WWF, the global conservation organization, was looking for a symbol at its beginnings in 1961, it opted for the giant panda because it was highly endangered and instantly recognizable. Now the panda is finally making something of a comeback, thanks to reforestation.

The panda depends on bamboo forests: each eats 12 to 38 kilograms of bamboo each day and a breeding pair needs at least 30 square kilometres of forest to sustain it. Any forest loss – through logging, road construction or urban expansion – can spell catastrophe.

Since 1998, the Chinese Government has worked closely with WWF and other organizations to preserve forests – and in 2004 a survey found 1,600 pandas, a 40 per cent increase since the 1980s.

This is largely thanks to 50 new nature reserves, and 'green corridors' which act as bridges between the panda habitats that had been turned into green islands by roads, farms and cities. Thus two large panda populations were recently linked by a 200-hectare green corridor created by putting a national highway in a tunnel.

The Chinese Government has pledged to restore another 1,275 square kilometres of forest, helping pandas and also securing wetlands, forests, arid areas and the habitat of the snow leopard.

Michel Gunther/WWF-Canon

Jason Kian Hwa/UNEP/Topham

TREES in the

FREDERICK OLMSTED, creator of New York's Central Park, called it 'the lungs of the city'. He was right. Green spaces aren't just pleasant retreats in the concrete jungle, but living organs vital to urban health.

A city's 'green infrastructure' filters pollutants from water before it gets into rivers, reduces the amount of

Beijing, China

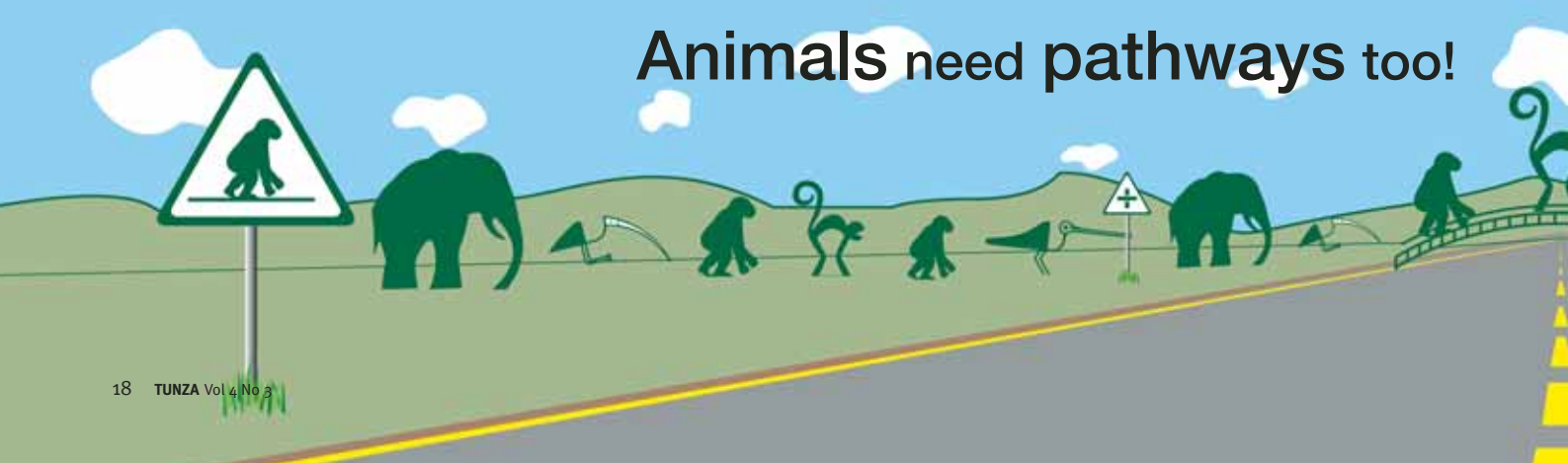
As it prepares to host the 2008 Olympics, Beijing has planted over 800,000 trees in its 680-hectare Olympic Forest Park, in the north of the city. Designed to evoke traditional Chinese 'mountain-water' art, it will include an enormous artificial mountain and a 122-hectare Olympic lake, as well as carefully chosen native plants and animals. After serving as a venue for tennis and other sports, the Park will provide a quiet refuge and clean air for the congested city.

Barcelona, Spain

The best view of Barcelona is from the Parc de Collserola, an 8,000-hectare oasis of pine, oak and bubbling springs in the mountains bordering the city. The city established it in 1987, since when Barcelona's parks and gardens have doubled, while its streets now also boast 150,000 flourishing trees.

Rio de Janeiro, Brazil

The 3,300-hectare Floresta da Tijuca is the world's largest urban forest, providing habitat for many rare and endemic



concrete jungle

water washed out by storms, oxygenates the air, cuts energy use by shading buildings, and absorbs carbon dioxide and other gases. Urban forests lower the temperature of the city, which is normally higher than in the surrounding countryside. And, of course, they provide recreational space and wildlife habitat.

species. But by 1844 it had been so degraded by coffee and sugarcane cultivation that the city's water supplies were threatened. Within 12 years, Manuel Gomes Archer, the forest administrator, had replanted 72,000 native Atlantic rainforest trees, restoring it almost single-handedly.

Nairobi, Kenya

Only 2 per cent of Kenya is still forested, so the 600-hectare Ngong Road Forest Sanctuary in Nairobi is a particularly precious resource. While providing a carbon sink and stabilizing the water table, it hosts 190 species of birds and more than 300 species of plants. Its many insects and arachnids are still being catalogued.

Louisville, Kentucky

The Jefferson Memorial Forest, 25 kilometres from the city centre, is – at 2,400 hectares – the largest city forest in the United States of America, and was originally established in 1946 as a tribute to Kentuckians killed in the Second World War. Hikers, campers and picnickers enjoy its oaks, ferns and wildflowers, as well as its many birds, including great blue herons and horned owls.

Championing the EARTH

Just downstream from Manaus, in the heart of the Amazonian rainforest, the giant Amazon and Negro rivers meet – creating one of the most extraordinary sights on Earth. The black waters of the Negro meet the muddy brown ones of the Amazon, but do not mix, running beside each other for 8 kilometres downriver until they finally mingle.

This July, their meeting point witnessed an equally remarkable event. The Ecumenical Patriarch of the Orthodox Church, Bartholomew I, two Roman Catholic cardinals and other religious leaders joined an indigenous shaman to bless the waters. Brazil watched on live television as the shaman – wearing a headdress of parrot and heron feathers, and carrying a spear and a sacred rattle, performed an ancient purification ritual – followed by blessings from the Christian leaders.

It was an extraordinary act of reconciliation and joint commitment, for the indigenous people of the Amazon were persecuted, and largely exterminated, after the arrival of Christianity.

Now top Christians were coming to learn from them, as part of the sixth of a series of floating environmental symposia convened by the Patriarch, dubbed the 'Green Patriarch'.

One of the Patriarch's most senior colleagues, Metropolitan John of Pergamon, summed it up: 'We are here to ask ourselves why it is that the indigenous people have managed to protect the environment better than we have been able to do. Let us listen with respect to cultures which have managed to survive the zeal of our ancestors who conquered them almost to the point of extinction.'

Nikos Manginas

Choosak Khemtai/UNEP/Topham

Tell the difference!

Shopping malls are some of the best places in which to save the world's forests. It's often hard to protect them on the ground, especially in developing countries where money is scarce. But if people insist on buying wood – from pencils to furniture, from building materials to barbecue charcoal – from forests that are sustainably managed instead of being ruthlessly cut down, the increasing demand for timber can be turned into a force to conserve forests rather than destroy them.

But how to tell the difference? After all, the wood looks the same. That's where the Forest Stewardship Council (FSC) comes in. It sets standards for environmentally friendly wood, and slaps labels on it to let consumers know.

Arising from a meeting in Toronto in 1993 of 130 professional foresters, indigenous forest dwellers, environmental organizations like Greenpeace and WWF, and big retailers like Sweden's IKEA and the United Kingdom's home improvement chain B&Q, the FSC set out to benefit people as well as trees. So its principles and criteria are designed to 'promote environmentally appropriate, socially beneficial and economically viable management of the world's forests'.

The FSC protects natural, diverse 'old-growth' forests and only approves wood that has been legally logged. And, as it realized that protecting forests involves looking after the local people, its standards also respect the rights of ownership, workers and indigenous people.

The FSC does not actually certify approved wood itself, but encourages other organizations to do this by carrying out inspections and conferring approval. That keeps it at arm's length from producers – who can be decertified if standards slip. The wood is then followed all the way to the finished product, so that any item with the FSC logo can be tracked back to any point in its production.

By the end of the FSC's first 10 years, almost half a million square kilometres of forest (an area the size of Spain) had been certified across 62 countries. More and more retailers – including Asda (a division of Wal-mart in the United Kingdom), Castorama in Italy, Migros in Switzerland and Home Depot in the United States of America – sell FSC-certified wood and wood products. Such retailers form buyers' groups committed to stocking only independently certified timber and timber products, putting pressure on suppliers to achieve certification. Consumer demand is growing too, as people learn about it. The production of FSC-standard paper in Europe, for example, quadrupled in 2003.

Most of the certification, however, has been of products from temperate forests in Europe and North America, rather than the often far more vulnerable tropical regions. Only a fraction of the 7 million square kilometres of the Amazon, for example, has been certified to FSC standards. And there are only two approved forests in tropical Africa, one – in the Congo – very recently. But the FSC is increasingly turning its attention in this direction.


Equilibrium Fund

Nutty solution

Two thousand years ago the great Maya civilization of Central America largely ran on highly nutritious nuts from a rainforest tree. The Maya nut formed much of the people's staple diet, and they planted millions of the trees that bore it in forest gardens, along with other food-producing trees like avocados and cacao.

Maya nut trees remain the tallest in the forest, often towering over the ruins of the ancient civilization. But at some stage after the society collapsed, people largely forgot about the nuts which fell each year to carpet the forest floor, at best resorting to them only at times of famine. Instead they chopped down the trees to make room for corn fields, which produced far less food in the same space.

But now the nuts are finally making a comeback among the Mayan's modern descendents, giving them both food and relative prosperity, while the forest is conserved.

It began when an American biologist, Erika Vohman, was working with a local man to gather the nuts for parrots and monkeys at an animal rescue organization in Guatemala. He told her his ancestors had eaten them and made her a 'delicious' nut soup. When she got home she learned that they contain more protein and other nutrients than corn, wheat or rice, and 'became convinced that I should go back and tell the people who live in the forest about what they were missing'.

She started five years ago in a village called La Benedición, full of refugees who had no food or crops. Once she had taught them about the nuts, they lived on them for months. All the families there still eat them, and they have planted new trees and have trained people from other villages – mainly women – in how to make use of the resource.

Most of the unlogged trees are in the most remote areas where people are hungriest. The trees produce nuts so abundantly that, in two weeks, a family can easily gather enough to survive on for a year. 'The women are thunderstruck to discover that they can eat stuff that they have always just walked over,' says Vohman. 'They collect the nuts for using as they are, or dry and grind them into flour. In some areas they now make and sell Maya nut products like cookies.'

She reckons that people from more than 400 villages in Guatemala, El Salvador, Honduras, Nicaragua and Mexico have been reintroduced to the nut – but finds it 'hard to keep track' as villagers are now spreading their knowledge spontaneously to others. Many have been able to set up small businesses, earning cash to relieve their poverty.

The tree needs no pesticides or fertilizers, and provides food for livestock like goats and cattle. And as people learn of its value, they do not cut it down, thus preventing de-forestation and protecting soil and water.

'Hopefully,' says Vohman – who won the 2006 St Andrew's Prize to expand her work – 'we have rediscovered the Maya nut tree just in time.'

Acrobatic ants

Tiny wingless ants – first found in 2004 in the Amazonian flooded forests near Iquitos – can save themselves from a fall from the rainforest canopy by executing a 180-degree mid-air turn, landing on the trunk, safely above the forest floor. It is thought the ants – which can grow up to a centimetre long – use visual cues and leg movements to perform their death-defying spins.


Steve Yanoviak

Ginkgo

It's a living fossil, this deciduous Chinese tree with unique fan-shaped leaves; its ancestors thrived in temperate areas 270 million years ago. It is now cultivated widely in Asia for its seeds, valued for food and medicine. Its beauty and hardy constitution – four survived the Hiroshima bomb – makes it popular in cities too.


BIOS M.G. de Saint Venant/Still Pictures

Tree kangaroo

Over 50 species of tree-dwelling kangaroo live in the rainforests of New Guinea and Queensland, Australia. Like their grounded cousins, they have strong hind legs. But these are attached to short, rounded bodies, longer claws, rubbery soles, and independently moving back feet – which help them climb, leap from tree to tree, and jump to the ground without getting hurt.


Martin Harvey/Still Pictures

River dolphin

One of the great sights of Amazonia, it swims among the trees of the flooded forests during the wet season, feeding on small fish and crabs. Some legends hold that the pink to greyish *boto*, as it is also called, embodies the spirits of the drowned, giving it some protection from hunters. Still, it is vulnerable to threats like mercury poisoning from gold mining.


Norbert Wu/Still Pictures

Michael Chan/www.flickr.com/photos/ahsup

7 forest *wonders*

Manú National Park, *Peru*

Hartmut Jungius/WWF-Canon

Founded in 1961 with the help of WWF, Manú is probably the richest protected area on Earth: just 1 hectare of its pristine rainforest has been found to contain more than 200 tree species. And its unique altitude range – from 365 to 4,000 metres above sea level – accommodates at least 14 types of forest, including cloud forest, montane rainforest and lowland tropical rainforest. Most of its species have yet to be discovered, but so far 800 species of birds and 200 of mammals have been identified, including the rare giant otter and giant armadillo. The Incas once lived here, and now four known indigenous peoples make it their home.

Styx Forest, *Tasmania*

Martin Wyness/Still Pictures

In ancient mythology the Styx river wound nine times around the underworld. Environmentalists fear that its namesake in Tasmania – one of 13 rivers around the world called after the Greek word for hate – may one day run through similarly lifeless territory because the pristine forest that surrounds it is being chewed up for wood-chips and paper. Yet it is home to the world's tallest hardwood tree, *Eucalyptus regnans* ('king of the gums'), which can live more than 400 years and grow to over 90 metres high; only California's giant redwood (a softwood) is bigger. Less than 13 per cent of the stands of the giant gum remain, and up to 600 hectares of the Styx forest are being logged every year.

Bialowieza Forest, *Belarus/Poland*

Adrian Arbib/Still Pictures

Once the hunting preserve of Polish kings, the ancient Bialowieza forest – straddling the Belarus/Poland border – is the last stretch of primeval temperate forest in Europe's lowlands. About half of its 10,500 hectares are a nature reserve, with one of the richest arrays of wildlife on the continent. Its most famous residents are several hundred wisent, or European bison, which became extinct in Poland in 1919 but were reintroduced to the wild 10 years later after being bred in captivity. In all, it has 11,500 animal species – including 250 birds and 54 mammals, more than 3,000 species of fungi, and 5,000 plant species, including 200 mosses and 277 lichens, many of which grow only in primeval forests.

Bwindi Impenetrable Forest, *Uganda*

J. E. Cozari/UNEP/Topham

Not for nothing is the large primeval forest in southwestern Uganda called 'impenetrable'. Its dense undergrowth of vines, shrubs and herbs makes it nearly impossible to get through – unless you are a mountain gorilla, that is, for it is here that half the world's population of the endangered species lives. Ranging from 1,200 to 2,600 metres up on the western edge of the Rift Valley, the forest includes both lowland and mountain plants, making it one of Earth's most biologically diverse areas. It is home to at least 120 mammal species, 350 species of birds, 200 butterflies, and over 100 ferns, while its 200 tree species include 12 found nowhere else in the world.

Virgin Komi Forest, *Russian Federation*

Doris Wiese/UNEP/Topham

Cold and forbidding, the conifer forest stretches along 500 kilometres of tundra on the European side of the Ural mountain range, which separates the continent from Asia. The Virgin Komi is huge, the largest area of primeval forest in Europe, covering around 33,000 square kilometres – a tract larger than Belgium. It became Russia's first World Heritage Site in 1995, saving it from massive felling for timber. Part of the forest is also protected as a federal biosphere reserve, but it is still under threat from gold mining and illegal logging, while its large mammals – which include brown bear and elk – remain tempting prey for poachers.

Jiuzhaigou Valley, *China*

Michael Chan/www.flickr.com/photos/ahsup

Blue-green lakes and spectacular waterfalls punctuate the high mountains and narrow valleys of this nature reserve. They are set amid 72,000 hectares of cloud forest, montane mixed forest, and subalpine vegetation. Two of China's most famous endangered species live here: the golden snub-nosed monkey and the giant panda. But it is becoming a victim of its own beauty. Some 7,000 tourists per day are ready to undergo a gruelling 10-hour bus ride to visit it. The numbers are expected to soar as transport improves and more hotels are built, increasing threats from pollution, erosion and poor development, while the forest is also felled for agriculture and firewood.

Coast Redwood Forest, *California*

Christian Slanel/UNEP/Topham

Dinosaurs once lumbered among giant coast redwoods (*Sequoia semperviren*), living fossils from 160 million years ago, and still the world's tallest trees. From a seed no bigger than one in a tomato, they can grow 122 metres tall (about as high as a 35-storey skyscraper) with trunks up to 7 metres in diameter. They may live for over 2,000 years in the cool, damp climate of northern California and southern Oregon, partly because they can clone themselves from stumps or roots. They resist fire, insects and disease, which makes their wood particularly valuable for building material, but this has contributed to their downfall: up to 95 per cent of the original forest has been logged.

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