The UNEP Magazine for Youth





for young people \cdot by young people \cdot about young people

Hazards and catastrophes

Keeping the peace

Pests and pestilence

Looking forward?

On the safe side

Food first

and

TUNZA

the UNEP magazine for youth. To view current and past issues of this publication online, please visit www.unep.org



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Front cover image By 14-year-old Tin Chi Ting Coco from Hong Kong, winner of the 19th Bayer/UNEP International Children's Painting Competition. In total, 594,032 entries were submitted by children

from 95 countries. For more information see www.unep.org/tunza/children/19th_Gallery.asp.

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CONTENTS

| Editorial | 3 |
|--------------------------------------|----|
| Hazards and catastrophes | 4 |
| A disaster documented | 5 |
| A grey world | 5 |
| Wrecking reefs | 6 |
| Keeping the peace | 7 |
| On the map | 8 |
| Don't blame nature | 10 |
| House of bricks | 11 |
| Natural hazards | 12 |
| Swimming at the top of the world | 14 |
| Remember the day you wanted to help? | 15 |
| Pests and pestilence | 16 |
| On the safe side | 18 |
| Looking forward? | 20 |
| Heroes of hazard | 22 |
| Food first | 24 |
| | |

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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.

The partnership agreement, renewed to run through 2010, lays down a basis for UNEP and Bayer to enlarge their longstanding collaboration to bring successful initiatives to countries around the world 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/Children's Conference, youth environmental networks in Africa, Asia Pacific, Europe, Latin America, North America and West Asia, the Asia-Pacific Eco-Minds forum, and a photo competition, 'Ecology in Focus', in Eastern Europe.

Numbers

8 cm The shift of the Earth's axis caused by the 2010 earthquake in the Pacific, 11 kilometres off the coast of Chile. The huge quake caused damage estimated at \$4-7 billion, but because of disaster preparedness including strict building regulations, the death toll was limited to 512 people.

10 The strength of seismic activity is measured on a logarithmic scale (the Richter scale) based on a factor of 10. So a force 2 earthquake is ten times stronger than a force 1 earthquake (not just twice as strong) and a force 4 is 10,000 times stronger.

13 times more people die in each reported disaster in developing countries than in developed countries.

1450 BC (approx) The year the Minoan civilization – along with the mythical 'lost continent of Atlantis' – was destroyed by a volcanic eruption in the Aegean Sea. The remains of the volcano now form the Greek islands of Thera (Santorini) and Therasia. The lagoon between the two islands is actually the caldera of a volcano some 400 metres deep.

3,000 The official death toll of the world's worst chemical disaster, when 40 tonnes of poisonous gas were accidently released from Union-Carbide's pesticide factory in Bhopal, India, on 3 December 1984; a further 600,000 people were affected. The company paid compensation of \$470 million in 1989, and in June 2010, eight people were convicted of causing 'death by negligence'.

18,156 The number of confirmed deaths worldwide from the 2009 swine 'flu pandemic. The effectiveness of worldwide action, led by the World Health Organization, is apparent when you compare this with the 750,000 people who died in the 1968 'flu outbreak and the 50-100 million casualties of the 1918-1920 pandemic.

230,000 The number of deaths across 14 countries caused by the Indian Ocean tsunami on 26 December 2004. Up to 30-metre-high waves, created by an ocean-floor earthquake 160 kilometres northwest of the Indonesian island of Sumatra and measuring 9.3 on the Richter scale, reached as far as Africa's east coast.

830,000 The number of deaths in the world's deadliest earthquake in Shaanxi province, northern China in January 1556, which reduced the local population by 60 per cent. Hills and valleys changed height and shape, destroying entire towns and villages.

100,000,000 or more. The number of deaths caused by the Black Death – bubonic plague – that spread from China, across Asia, Africa and Europe, killing more than a third of the population, and possibly two thirds, between 1346 and 1352.

EDITORIAL



wo of this year's disasters have underlined how dependent even the richest economies are on nature and the environment. The eruption of Iceland's Eyjafjallajökull volcano created an ash cloud that closed down most air travel in northern and western Europe for six days in April. And on the very day that flights began to get back to normal, the blow-out in the BP oil well deep in the Gulf of Mexico caused America's worst ever environmental disaster. Primarily an environmental crisis with oil gushing into the sea, endangering its life and washing up on Louisiana's vital wetlands, it soon mutated into an economic crisis devastating the area's fishing and oil industries, a corporate crisis jeopardizing one of the world's richest companies, and a political crisis engaging much of the time of the President of the United States.

Virtually no one, it became clear, was properly prepared for either event. Neither the airlines nor the authorities had adequate measures in place to cope with the ash. And BP was unable either rapidly to stem the flow of oil, or to prevent the slick from damaging fisheries or reaching the shore, as the crisis intensified week after week. In both cases it appeared that nature had been taken for granted, and in both cases the world learned the hard way that, in the end, it calls the shots.

But the crises also present an opportunity, and one that goes well beyond the need for better preparation and regulation in future. The power of the volcano and the threat of more, and bigger Icelandic eruptions over coming years - may cause people to question the assumption of easy air travel, one of the more damaging of human activities to the climate. And the devastation in the Gulf of Mexico - far more visible and obvious than the early effects of climate change - could provide an impetus to the world to turn away from its addiction to climate-wrecking oil and fossil fuels and towards using energy less wastefully and expanding the huge potential of clean, renewable sources. We must work to make both crises hasten the advent of the green economy and low-carbon prosperity, working with the grain of nature and the environment rather than against it.

Hazards & catastrophes

We call them 'natural disasters', but it is usually human actions that turn hazards into catastrophes, either by causing the disasters in the first place, or by making them very much worse.

s the climate changes, weatherrelated disasters – like storms, hurricanes, floods and droughts – are happening more often, just as scientists have long predicted. In the 1980s, the Worldwatch Institute reports, 300 such events were recorded, on average, each year. By the 1990s this had risen to 480, and it soared to 620 over the last decade. And the Intergovernmental Panel on Climate Change forecasts they will get even more frequent and more severe, as global warming – caused, after all, by human activities – progresses.

Environmental destruction also makes such disasters worse. By the time Hurricane Mitch hit Central America in 1998, it had lost so much of its force that it had been downgraded to a tropical storm. But it caused the worst catastrophe to hit the western hemisphere to date because its torrential rains fell on hillsides stripped of trees, causing mudslides that killed some 10,000 people.

Similarly, a series of hurricanes and storms in the Caribbean in 2008 caused far worse flooding in Haiti, where only 2 per cent of the original forest cover remains, than in the neighbouring Dominican Republic, which has retained 30 per cent of its forests. And the impact of Hurricane Katrina on New Orleans was made worse by the increasing destruction of the wetlands that protected it from the sea. Every 6 kilometres of wetlands reduces storm surges by 30 centimetres, but over the past 40 years their disappearance has brought the sea more than 30 kilometres closer to the city.

The same principle held true in the devastating 2004 tsunami. The Indian Ocean's shores had long been protected from such waves – and from the angry seas stirred up by cyclones and typhoons – by a double barrier of coral reefs and mangrove swamps. Yet, as elsewhere around the world's warm oceans, both have, increasingly, been destroyed.

Places that still had these natural barriers generally fared far better than those that did not. Only a handful of people died on Surin Island, just off the Thai coast, even though it lies near resorts that suffered heavy casualties. The reason, said Thai authorities, was that it was surrounded by a ring of coral that both broke the force of the tsunami and acted as an early warning system: people saw the giant wave breaking on the reef and ran.

Mangroves proved, if anything, to be even more important, standing – as the great Indian scientist M.S. Swaminathan put it – 'like a wall to save coastal communities living behind them'. All round the ocean, areas that had preserved their mangroves escaped more lightly than those that had not. To give one vivid example: only two people died in one Sri Lankan village where their mangroves were intact, compared to 6,000 who died in an unprotected village nearby.

And the tsunami is not an isolated example. The area around Bhitarkania in the Indian state of Orissa, which has one of the world's largest remaining mangrove forests, was largely spared in 1999 when a cyclone brought a 6-metre wave crashing 20 kilometres inland, killing some 10,000 people elsewhere. And the planting of new mangroves along 100 kilometres of Viet Nam's coast protected the land behind them from the worst typhoon in a decade in 2000. By contrast, in 2008 Cyclone Nargis brought devastation to Myanmar's Irrawady Delta, where 83



per cent of the mangroves had been cut down since 1924.

Human activities, of course, bore no responsibility for the underwater earthquake that caused the tsunami, but were vitally important in determining the scale of the disaster. And it is the same on land. Eighty per cent of earthquake deaths are caused by collapsing buildings yet – even in the fiercest ones – well-built structures save lives. More than 200,000 people died in Haiti earlier this year, while an earthquake of the same magnitude in San Francisco in 1989 killed fewer than 70.

Of course relative wealth is even more important in determining the toll than the quality of buildings. An earthquake in Guatemala City, which killed 23,000 people in 1976 was even called the 'class quake' after the accuracy with which it hit the poor, who could only afford bad housing. Floods, storms, and droughts also disproportionately target the poor. Between 1980 and 2007 the number of natural disasters was more or less evenly split between developed and developing countries, but the wealthier ones suffered only 8 per cent of the casualties.

Anders Wijkman, the Swedish Member of the European Parliament who served as President of the International Red Cross Disaster Relief Commission, once said: 'Most disasters in the Third World are unsolved development problems.' He could have gone further: they are environmental problems too. Indeed, tackling the three great challenges of our age – poverty, climate change and the destruction of vital ecosystems like forests and coral reefs - will also do much to lessen the impact of what we persist in calling natural disasters.

A disaster documented



Above: The *Discoverer Enterprise* and other ships at the site of the spill.

Below: The oil forms patterns and mosaics that are terrifyingly beautiful.

In mid-June 2010, photographer and author James Duncan Davidson joined a group of photographers and a videographer to document the Deepwater Horizon oil spill in the Gulf of Mexico. He sent TUNZA photos and thoughts from the first days of the expedition.

'Flying over the source of the oil spill, the smell of oil and gas is intense. It's like standing next to a bucket of gasoline sitting next to a leaky propane tank. Flying north from the source to Gulf Shores, we see oil all the way to the coast and as far as the eye can see in both directions. It's more than 160 kilometres from the spill site (known locally simply as 'the source') to the coast of Alabama. We talk to cleanup workers and local residents, examining beaches and taking photos by air.

'This is a disaster of the largest magnitude – nearly inexpressible. Whole communities and livelihoods are being destroyed, and the oil is eroding landscapes that will take a long time to recover, if at all. Various populations of wildlife are being stranded, alive and dead. But the worst is that the leak has not stopped. The effects since the explosion on 20 April 2010 are merely consequences of a continuous oil leak, while the long-term devastation is impossible to even imagine.'

To view the full expedition reports and photos, visit http://tedxoilspill.com/expedition.

A grey world

I come from Vík í Mýrdal, a village on Iceland's south coast, 37 kilometres from Eyjafjallajökull volcano. My family, some of whom are farmers, still live there. Currently, I live in Reykjavík where I study biochemistry, and where I was when Eyjafjallajökull erupted.

Vík í Mýrdal lies beneath Katla, another, much larger volcano that scientists fear may soon erupt too. Having grown up in its shadow, I thought I was prepared. But when the pictures started flowing in through the media, I was shocked. Floods crashed down; mud completely covered the land as if someone had dumped millions of tonnes of cement. Lone straws poked through the grey coating.

I felt like crying every day that first week, though I was geographically disconnected from the event. I saw a picture of my great-uncle leading his horses to slaughter, because the pastures are ruined – one of the saddest things I've ever seen.

When I went home, we were already chewing ash in the car as we approached, even with no windows open. A dozen people were working in the garden, shovelling ash from the land, ash falling on their heads. Sticky ash coated every blade of grass and every tree branch. After a couple of minutes outside the car it hurt to breathe. It was



Fríða's great-uncle leading his horses to slaughter.

dry, and the air had a metallic taste to it. I got a headache and felt nauseous – a combination of ash and emotion.

What has surprised me the most is the profound emotional impact it's had on my family. The ash is likely to stay for at least a year. People are collapsing from the burden, kids can't play outside or open the windows, and every day, they wake to a grey world. What a wake-up call about how our power, as a species, is dwarfed by that of nature.

Fríða Brá Pálsdóttir, 21

Wrecking reefs

Ayana Elizabeth Johnson

e call hurricanes, tsunamis and floods disasters because they harm humans - but what about the havoc they wreak in ocean ecosystems? In fact, they can all cause fish to scatter and corals to shatter partly from the impact of water moving with great force, but also from the tumble of scouring sand, land debris and dislodged corals. The wind-created waves of hurricanes tend to damage shallower reefs, while the earthquakecreated waves of tsunamis can cause deeper damage, and floods can assault reefs with freshwater along with the sediment, pollution and debris they bring from land.

These powerful forces can reduce a healthy, biodiverse and productive reef to mere rubble in a matter of minutes. Where tsunamis are concerned, some reefs can even rise out of the water as seismic activity pushes them up. Fortunately, such dramatic damage isn't uniformly spread. Depending on geography and the previous state of the reefs, some areas emerge relatively unscathed.

Though they get damaged, reefs can help buffer the impacts of hurricanes and tsunamis on coastal areas. By slowing down and reducing the force of waves as they approach the shore, reefs can diminish the distance that waves travel inland, preventing damage. The healthier – and therefore more structurally complex – a reef is, the better protection it provides. However, the critical role of mangroves and coastal vegetation should not be overlooked; they are much better than reefs at mitigating coastal damage.

During the 500 million years that coral reefs have existed, they have been exposed to a broad range of environmental conditions, so they have evolved the capacity to resist and recover from periodic natural disasters. Just as a young, fit person recovers more quickly from the 'flu than an older and weaker one, a healthy, intact reef ecosystem can more rapidly restore itself after being pummelled by natural disaster.

The problem is that coral reefs are becoming less and less healthy, and for that, we are to blame. Man-made pressures like pollution, sedimentation, overfishing and climate change stress reefs, weakening their immune systems. Pollution from fertilizers, chemicals, sewage and oil spills poisons reef organisms; sediment runoff from agriculture and coastal development smothers corals; and overfishing removes important components of the food web. Climate change warms water (often leading to coral bleaching and death), and may increase the frequency and severity of storms, while increased CO₂ acidifies the ocean, weakening the skeletons of corals and other creatures. All these are a greater threat to reefs than natural disasters. Corals grow slowly – many species only 1 centimetre a year – so a constant barrage of manmade threats prevents reefs from recovering before they are faced with the next damaging natural event.

Coral reefs are at a tipping point. They can only take so much abuse. And their reduced health is worrying not only because it would be sad to lose their natural beauty, but because hundreds of millions of people around the world depend on these havens of biodiversity for their nutrition and livelihoods. It's important to do everything we can to reduce the negative effects of our activities, so that reefs can bounce back from the natural disasters that are inevitable.

Ayana is a 29-year-old marine biology PhD student from Brooklyn, New York, who studies the management of fishing on coral reefs at the Center for Marine Biodiversity and Conservation at Scripps Institution of Oceanography, University of California at San Diego.





SOPHIE RAVIER, 33, works as an environmental officer of the UN Department of Field Support, which is in charge of logistical support for UN peacekeeping missions. TUNZA asked her about the relationship between peacekeeping, conflict and the environment.

To what extent is conflict driven by natural resources?

Environmental factors are rarely, if ever, the sole cause of violent conflict. But UNEP was involved in recent research suggesting that in the last 60 years, at least 40 per cent of all intrastate conflicts have a link to natural resources. Since 1990, at least 18 violent conflicts have been fuelled by the exploitation of natural resources, whether 'high-value' resources like timber, diamonds, gold, minerals and oil, or scarce ones like fertile land and water. Climate change is also seen as a 'threat multiplier', exacerbating threats caused by persistent poverty or weak resource management institutions.

What is UN peacekeeping?

It's a way to help countries torn by conflict create conditions for lasting peace. In 1948, for the first time, the Security Council deployed UN military observers to the Middle East to monitor the Armistice Agreement between Israel and its Arab neighbours. Since then, there have been 63 UN peacekeeping operations globally.

Field operations have evolved from 'traditional' missions involving strictly military tasks to complex 'multidimensional' enterprises designed to ensure the implementation of comprehensive peace agreements and help lay foundations for sustainable peace. Peacekeepers, comprising civilian, police and military personnel, do everything from helping to build sustainable institutions of governance, to human rights monitoring, to security sector reform, to disarmament, demobilization and reintegration of former combatants.

How does peacekeeping impact the environment?

Often, the countries to which thousands of peacekeeping personnel are deployed have very little infrastructure. All these extra people produce waste, which can impact the local environment if not managed properly. Moreover, temporary peacekeeping missions deployed in remote areas often generate their own power using a lot of fuel – emitting greenhouse gases and sometimes causing soil pollution.

In water-scarce areas like Darfur or Chad, the local community may see the UN mission as competing for resources. So we must carefully manage all resources properly to avoid possible tension.

What steps are you taking to make peacekeeping more sustainable?

We've identified the need to improve peacekeepers' environmental footprint, so in 2009 we developed an internal environmental policy. Key areas include waste, energy, water, hazardous substances, wild animals and plants, and cultural and historical resources management. An environmental officer is to be appointed to each mission.

The mission in Sudan (UNMIS) now uses wastewater treatment plants, reducing the consumption of water. And the Timor-Leste mission (UNMIT), among others, organized events around World Environment Day. In 2009, 13 missions participated in the UNEP Billion Tree Campaign, pledging and planting 117,848 trees.

Can the greening of peacekeeping missions affect the mission's host country after the mission is over?

It's really too early to tell, but certainly by practicing good environmental management and setting a good example in its own operations, the UN should have a positive influence on local communities, which should help support their transition from post-conflict recovery to sustainable development after peacekeepers leave.

To find out more about UN peacekeeping visit www.un.org/ en/peacekeeping; for more on Sophie's department visit www.un.org/en/peacekeeping/dfs.shtml; and for more on what the UN is doing about their CO2 emissions visit www. greeningtheblue.org/what-the-un-is-doing/departmentpeacekeeping-operations-dpko.



UN Photo/Albert Gonzalez Farrar



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