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The IUCN/WWF Forest Conservation Newsletter

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Forests and Natural Disasters

Natural disasters appear to be on the increase. According to the 2004 World Disasters Report, natural disasters have risen by about 65% over the last decade. More than 478,000 people were killed by disasters such as earthquakes, floods and hurricanes from 1994 to 2003, according to a UN report last year. Since then, the Indian Ocean tsunami has put a new perspective and high profile on these figures, accounting as it has for more than 280,000 deaths. The disaster has made the forest conservation community, as everyone else, stop and think. Is it inevitable that natural catastrophic events become 'natural disasters'? What role can forests play in reducing peoples' vulnerability to natural catastrophic events and how can forest conservation programmes and policies strengthen this role?

A boy in Nagapattinam, India amid the rubble of his home, after the tsunami struck.

Evidence from the tsunami, as summarized in this issue, confirms that in some cases at least well-established mangrove forests and coastal tree plantations offered an effective physical barrier against the tidal waves, and helped save both lives and property. The tsunami has also shown the importance of forests in post-disaster recovery, by providing timber for the reconstruction of homes and the fishing boats on which the livelihoods of tens of thousands of families depend. These forest-disaster linkages have a number of policy implications: that poorly-planned mangrove clearance for uncontrolled shrimp farming and tourist development needs to be brought under control, that coastal zone development would benefit from sustainable forest restoration and management activities, and, wherever possible, post-disaster reconstruction should use timber from responsibly-managed forests.

However, there is also a danger in always assuming a straightforward causal linkage between more forests and better disaster prevention. This issue will explore some of these uncertainties, including whether upland forests really do help prevent floods and landslides in all circumstances. Those who argue the need for more forests on the back of natural disasters also ought to consider to what degree factors such as weak governance structures (that permit the expropriation of the poor's livelihood resources) and high levels of poverty (that force poor people to live in high-risk areas) help turn natural catastrophic events into natural disasters. Given that the tsunami alone is expected to throw nearly two million more people into poverty, according to a report by the Asian Development Bank, forest conservationists need to better appreciate that reducing poverty, ensuring local forest rights and promoting good governance are not only essential components of any disaster reduction strategy but also critical for long-term biodiversity conservation. Even though the linkages are often complex, the basic building blocks of disaster reduction and forest conservation strategies are the same.

Stewart Maginnis, IUCN and Chris Elliott, WWF



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Tsunami-Related Impacts on Forests

A Sri Lankan boy climbs a tree where a boat landed after it was swept inland by the tsunami.

Here we summarize some of the forest and biodiversity issues that are emerging from the preliminary assessment reports on tsunami impacts across the affected countries.

Coastal Forest Defences

Incoming assessment reports are highlighting the important role played by mangrove forests, coastal plantations and other natural ecosystems in weakening the impact of the tidal waves. These ecosystems not only helped reduce the magnitude and strength of the incoming tidal waves, but also collected the marine debris that can be even more damaging to populated areas than the gushing seawater. Throughout the region, coastal areas with dense mangrove forests, mature shelterbelt plantations and other substantial vegetative cover reported fewer human losses and less damage to infrastructure than those areas where coastal forest ecosystems had been degraded or converted to other land uses. In the Indian state

of Tamil Nadu, for example, villages in Pichavaram and Muthupet with dense mangroves seem to have been buffered from the worst effects of the tidal waves, compared to other nearby areas without mangroves. Shelterbelt plantations of *Casuarina equisetifolia* along a strip of Tamil Nadu's coast also proved effective natural barriers, where the trees were mature enough to withstand the tidal waves.

In Thailand, the head of the Department of Marine and Coastal Resources was quoted as saying that mangroves in Ranong and Phang Nga provinces had saved hundreds of lives. Eyewitness reports in Aceh also observed that coastal areas with dense mangrove coverage experienced a relatively smooth incoming tide rather than the full impact of the tidal wave, and suffered far fewer human deaths than other nearby areas where mangroves had been previously cleared. The relatively low death toll on the Indonesian island of Simeuleu, close to the epicentre, has been attributed in part to the surrounding mangrove forests. However, it is important to recognize that factors such as bathymetry, wave energy and coastal topography significantly determined the extent to which mangroves were able to play a positive role.

Sources: www.scidev.net, December 30, 2004; www.alertnet.org, January 14, 2005

Rapid Environmental Assessment in Sri Lanka

A team from IUCN's Sri Lanka office undertook a survey in mid-January of a section of the country's south-eastern coastline to assess the tsunami-related damage to the terrestrial and wetland habitats. While finding the damage to the area quite patchy, the team found a strong correlation between the extent of ecosystem modification before the tsunami and the level of tsunami-related damage. In general, sites shielded by broad beaches, tall mature sand dunes, thick coastal scrubland, casuarina plantations and/or broad intact mangrove patches showed little or no damage and proved effective barriers in protecting inland landscapes.

Six of the nine mangrove sites surveyed had been subjected to ecological damage that will require restorative action. Vegetation in home gardens was also severely damaged, by being uprooted or exposed to high levels of soil salinity. The team also found evidence that the tsunami has changed the distribution of several invasive alien species. Propagules of the invasive alien prickly pear cactus (*Opuntia dillenii*) that occurred in beachfront habitats have been transported inland by the tsunami waves and have already started to establish in these new areas. The invasive tree species Mesquite (*Prosopis juliflora*), already prevalent in the area, may increase rapidly now as it tends to dominate in conditions of high salinity.

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"Coral reefs act as a natural breakwater, and mangroves are a natural shock absorber, and this applies to floods and cyclones as well as tsunamis." Simon Cripps, Director of WWF's Endangered Seas Programme.

“These latest findings...underline how the environment can be both a victim and a buffer against vulnerability to natural and man-made disasters”.

Klaus Toepfer, Executive Director of UNEP, on the results of the damage assessment report on Indonesia.

Mangrove Rehabilitation Requires Caution

Governments across the region have announced large-scale mangrove replanting programmes to replace those uprooted by the tsunami and develop better coastal resilience to future extreme weather events. Indonesia's Minister of Forestry was quoted as outlining government plans to replant 600,000 hectares of mangrove forests, with at least 30,000 hectares planned for the province of Aceh. The Indonesian government's post-tsunami recovery and reconstruction framework, prepared in collaboration with the World Bank and other international donors, estimates that the rehabilitation and expansion of mangroves in Aceh will cost around US\$4 million.

While conservation organizations welcomed these commitments to mangrove restoration, there were calls for caution in implementing the plans. Mangrove experts are warning that ill-planned mangrove plantations could damage coastal ecosystems and offer little protection from storms or flooding. FAO voiced concerns about the planned mangrove restoration efforts – warning against replacing other valuable ecosystems such as turtle nesting grounds and sea grass beds. “The real issue is overall coastal management, not just the presence or absence of trees”, said Patrick Durst, senior forestry officer in the FAO regional office for Asia and the Pacific. FAO mangrove expert, Mette Løyche Wilkie, noted that “the protective effects of mangroves against tsunamis mainly depend on the scale of the tsunami and the width of the forest and, to a lesser extent, the height, density and species composition”. Narrow, thinly-planted mangrove strips are more likely to be uprooted or snapped off at mid-trunk by heavy storms and swept inland, potentially causing extensive damage to property and loss of life. In one reported case in Thailand, they have also damaged shallow coral reefs.

Sources: www.laksamana.net, January 14, 2005; www.fao.org, January 19, 2005

Mangrove reforested area in the Philippines.



© WWF/Canon/Jürgen Freund

Forestry Staff Death Toll

There are reports that many forestry and national park staff have been killed in the tsunami. The Director General of Indonesia's Ministry of Forestry Research and Development Agency was quoted as saying that over one hundred Ministry of Forestry staff had lost their lives in the disaster.

Source: www.cifor.cgiar.org

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“Many mangroves have been cleared to grow shrimp ponds so that we, here in Europe, can have cheap shrimp”

Jeff McNeely, Chief Scientist, IUCN

Indonesia's Mangroves – Damage Assessed

The World Bank's preliminary damage assessment report for Indonesia estimates that of Aceh's 340,000 hectares of mangroves, all of the 25,000 hectares that were in poor condition prior to the tsunami have been lost, with the cost of this loss conservatively placed at US\$118 million. It will take some time before the final impacts on the affected region's mangroves are known, since the deposition of silt may clog the pores of the aerial roots of mangroves and suffocate them. Changes in topography, soil salinity and freshwater inflow from upstream may also adversely affect the mangroves and other coastal forests in the longer term.

Source: www.worldbank.org/tsunami

Mangroves in India – Strength in Diversity

A preliminary assessment by WWF India of the tsunami-related environmental impacts confirmed other reports that the ability of mangroves to withstand the tidal waves and protect inland areas depended in part on the level of species diversity within the mangrove stands. In the Krishna district of Andhra Pradesh, more than eight species were found in just two random samples of the stand and these species-rich stands were considerably taller and denser than stands elsewhere that were dominated by just a few species. Machilipatnam port, located inland of the Krishna mangroves, was completely unaffected by the tsunami, despite its vulnerable location near the mouth of a canal.

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Silver Lining for Mangroves

Observations from a mangrove research project in Tamil Nadu, India indicate that the tsunami has actually improved the health of nearly all the 1,500 hectares of mangroves in one area (Pichavaram). The tidal waves have reportedly opened up the mangrove forests to a fresh influx of seawater and flushed out the high level of hydrogen sulphide that had built up. “Last year, the forests faced the danger of withering away, with the salinity level rising to an alarming 60 grams per litre.” said Dr. V. Selvam, director of the M S Swaminathan Research Foundation's mangrove project. Now he estimates that, apart from the frontline trees that were damaged, 99 per cent of the trees are now in good health.

Source: www.mssrf.org



Timber Demand for Reconstruction

Rebuilding houses in Banda Aceh.

The tsunami has left five million people homeless, with their livelihoods destroyed. There is therefore a huge and pressing need to build shelter, rebuild homes and reconstruct lost livelihood means – including tens of thousands of fishing boats. A report by Greenomics Indonesia, a policy research institute, and WWF shows that as much as 260,000 hectares of timber – an area more than four times the size of Singapore – will be needed for the tsunami reconstruction effort in Aceh over the next five years. The two organizations say that to avoid the clearing of hundreds of thousands of hectares of Indonesian forest, alternative foreign sources of timber should be explored so as not to create further financial burdens on the Indonesian government (see the WWF focus page in this issue for more details).

In January, the Indian Supreme Court responded to the post-tsunami demand for timber in the reconstruction effort on the Andaman and Nicobar Islands by relaxing its logging ban for a six-month period. However, the ban will continue to apply to forests within 1,000 metres of the sea, national parks, sanctuaries, and coastal mangrove forests. The timber harvested will be used for the reconstruction and repair of houses, the establishment of relief camps and the repair of public infrastructure and buildings. While recognizing the need for timber for emergency reconstruction, conservation organizations are urging the governments of the tsunami-affected countries to ensure that timber for the longer-term reconstruction demands is sourced from responsibly-managed forests. They warn that a shortage of wood could encourage an increase in illegal logging, particularly in forests close to the damaged coastlines.

Sources: www.panda.org, January 4, 2005 and January 27, 2005

other news in brief

Australian bush fires: January's bush fires in the Eyre peninsula, South Australia, burned 100,000 hectares of mostly grazing land and claimed nine lives. A combination of high temperatures and strong winds made this the country's worst bush fire incident since 1983. Scientists from Macquarie University's Natural Hazards Research Centre analyzed data from previous bush fires and estimated that 500,000 Australian homes are at high risk of being destroyed by fire because of their proximity to the bush.

Source: www.theaustralian.news.com.au, January 15, 2005

Indonesia ups logging quota: Indonesia's Minister of Forestry is pushing for an increase in the country's logging quota from 5.45 million m³ to between 20 and 30 million m³. "Reducing the logging quota is not a wise way to curb illegal logging. The low quota has prompted most forestry-based companies to seek illegal timber to meet their demand" he said. At present, the forestry-based industry has an installed capacity of about 42 million m³ per year, but the industry is flooded with illegal timber from already depleted natural forests. The great discrepancy between the demand and the available logging quota has been cited as a key contributor to widespread illegal logging across the country. The quota increase is expected to boost the industry's contribution to the country's foreign exchange revenue to about US\$9 billion, from an estimated \$7.8 billion last year. The plans to increase the quota have met with opposition from some Indonesian stakeholder groups and are still under debate.

Source: The Jakarta Post, January 7, 2005

Philippines logging ban – a landslide win for forests?

Following the flash floods and landslides in December that killed more than 1,000 people, the Philippine government announced a major crackdown on illegal logging, with the appointment of a new 'illegal logging Tsar' and the imposition of a total logging ban across the country. The logging ban, still to be passed by Congress, would apply to all forests except those on private plantations, which are estimated to cover some two million hectares. Opposition to the ban has come not only from logging companies, but also Indigenous Peoples' organizations and some forest conservation groups, on the grounds that many local peoples' livelihoods depend on forest resources and community forest management is a better solution to help halt the country's deforestation.

Sources: www.iht.com, December 2, 2004; www.panda.org, December 10, 2004

US passing the conservation buck? A strong conservation ethic in the United States has shifted environmental problems overseas, said Dale Bosworth, chief of the U.S. Forest Service, at the agency's centennial congress in January. Referring to President Roosevelt's turn of phrase that loggers were "skinning the country", Bosworth said "I'm afraid that we're still skinning the country – somebody's country, anyway, when we import lumber from places that have fewer environmental protections." Bosworth said that American consumers need to face the ethical issues arising from their high demand for wood products. "Americans want it all" he said, "recreational opportunities, access, clean water, wildlife, scenery ... and lots and lots of toilet paper."

Source: www.denverpost.com, January 5, 2005



Tsunami Impacts on Protected Areas

Uprooted trees in Yala National Park, Sri Lanka.

The tsunami's impact on the region's marine and coastal protected areas seems to have varied enormously across the affected countries and parks. A report by UNEP's Asian Tsunami Disaster Task Force, released on 22 February, highlights the protective function of intact coastal ecosystems. In Sri Lanka's Yala and Bundala National Parks, vegetated and stabilized coastal sand dunes took the force out of the tidal waves, which were only able to enter where the dune line was broken by river outlets or artificial channels. Damage in these parks is therefore highly localized, though severe, with park facilities, forests and grasslands damaged in several areas.

In Thailand, the UNEP report cites six marine national parks as most severely damaged – Laem Son, Sirinath, Mu Ko Surin, Mu Ko Similan, Tan Bok Koran and Hat Noppharat Thara. Significant impacts were also reported in four sea turtle conservation projects in the country, with loss of life among project staff and participating communities, destruction of project infrastructure and equipment, damage to nesting sites and loss of thousands of turtles likely to have long-term impacts on these conservation efforts.

In Indonesia, while detailed assessments have not yet been conducted on the protected areas, WWF has noted that the proximity of the Gunung Leuser National Park to the impacted area is of concern. Timber demands for reconstruction, together with the proposed Ladia Galaska road through the Leuser ecosystem could potentially increase illegal logging in the park.

Source: www.unep.org, February 22, 2005. Both IUCN and WWF are on the UNEP Asian Tsunami Disaster Task Force and have contributed to the UNEP report.

New PAs in Brazil: Brazilian President Luiz Inacio Lula da Silva announced in February the creation of two new major protected areas in the Amazon, totalling 3.7 million hectares. The decision was made in an effort to fight deforestation and land conflicts and came less than two weeks after the murder of a US-born nun known for her outspoken efforts to support peasant farmers and wildlife conservation in the region.

Source: www.panda.org, February 21, 2005

Icelandic PA – Europe's largest: The Icelandic government has announced plans to create Europe's largest national park, protecting some of the island-nation's key habitats and natural landscapes. Covering more than 10,000 km² – nearly one tenth of Iceland's land area – the proposed national park will include the Joekulsa, a Fjoellum watershed encompassing the largest free-flowing rivers in Iceland, and will protect the central highland glaciers to the country's northern coastline.

Source: www.panda.org, January 26, 2005

Peru's first sacred PA: The first Natural Sacred Site in Peru was launched in December as a Community Conservation Area. Kechua communities from Cusco established the site in the Vilcanota region with technical support from Peruvian and international conservation organizations. This model of protected area aims to recognize and promote Kechua values and principles in the conservation and sustainable use of biodiversity. The Vilcanota region includes the second most important glacier system in Peru and is recognized as a hot-spot of biodiversity.

Source: www.iied.org, December 7, 2004

Wall makes good neighbours in Virunga PA: Local community associations and international conservation organizations have collaborated to build a 20-km dry-stone wall around part of Virunga National Park, which runs along the borders of Rwanda, Uganda and the Democratic Republic of Congo. The wall is designed to limit wildlife-human conflict and stop further encroachment by farmers and pastoralists. An assessment last year revealed massive deforestation as 1,500 hectares of park land was cleared in less than a month for farming and grazing.

Source: www.panda.org, December 20, 2004

Tatras storms: A severe storm in November flattened forests in the Tatras National Park in Slovakia, clearing a strip 2-5 km wide and 40-50 km long and affecting all zones of the park. The storm also severely damaged several thousand hectares in other protected areas in the country, as well as some productive forests. A debate ensued about the appropriate rehabilitation and planning measures to be taken. WWF and other conservation organizations urged the government to leave fallen and damaged trees on site as deadwood, to provide important habitat and allow for natural regeneration.

Source: www.panda.org, November 25, 2004

Bonobos on the run: A new survey of pygmy chimps or bonobos in Lomako forest in the Democratic Republic of Congo indicates that their numbers may be higher than was feared a few months ago. The distribution of the bonobos however seems to have become much patchier than before, probably due to pressure from hunting. This may explain why a survey last year in the country's Salonga National Park (the only protected bonobo habitat) found so few bonobos. The patchiness is worrying scientists, as it suggests that hunting is changing the population structure and social ecology of the bonobos and forcing them out of their permanent settlements.

Source: www.newscientist.com, February 2, 2005

The World Conservation Congress - Forest News

The 3rd IUCN World Conservation Congress (WCC) was held in Bangkok in November last year. Held every four years, the Congress is the general assembly of IUCN members and combines the business of the Union with technical fora on a wide range of conservation issues. With its high levels of attendance and representation, the Congress also provides excellent opportunities for sharing information and experiences among IUCN's worldwide constituency of members, partner organizations and other stakeholders. Last year's Congress saw members voting on over 100 resolutions and recommendations on critical conservation issues, ranging from Genetically Modified Organisms to the conservation of our oceans. One resolution (Res. 55) adopted by the Congress called for IUCN to continue to play an active role in supporting international cooperation on forest management, including through the UNFF and the ITTO processes. The Congress also adopted a recommendation (Rec. 21) on 'advancing boreal forest conservation' which advocates sustainable

forest management and the application of the ecosystem approach in the context of the world's boreal forests. The recommendation puts particular emphasis on Canada and Russia (which together comprise the majority of the remaining intact boreal forests) and paves the way for more interaction between these two countries and other boreal forest nations in the development of a global effort to preserve this important ecosystem.

The World Conservation Forum, the three days of the WCC open to the public, was attended by over six thousand delegates from across the globe and boasted five hundred events. More than seventy workshops focused on forests and dealt with issues such as governance, poverty reduction and conservation, forest fires and markets for non-timber forest products.

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CITES Ramin Listing

What difference will the CITES listing of Ramin make to trade in this tropical hardwood?

Hin Keong Chen, TRAFFIC's Senior Forest Trade Advisor, looks at the potential benefits.

Ramin was placed on the Appendix II listing at the Thirteenth Conference of the Parties (CoP) to CITES, held in October last year. The fact that the listing was made by consensus, in contrast to the mahogany listing at the previous CoP that was achieved only by a simple majority, indicates growing acceptance of the role of CITES in managing commercial timber species. Ramin (*Gonystylus spp.*) is a tropical hardwood that ranges extensively from mainland Southeast Asia to the Pacific islands and is used in products such as cue sticks, picture and window frames.

CITES listing requires all trading countries to increase surveillance of the trade to detect and stop illegal activities

in contravention of CITES provisions. Whether the Appendix II listing will be an effective means of guaranteeing a legal Ramin supply will depend strongly on the availability of national laws and procedures to verify the source of Ramin as it moves through the supply chain to the point of export and import. The listing will also help ensure that export volumes of Ramin are maintained within sustainable harvesting levels, once the non-detriment findings (NDF) instrument of CITES is activated to determine off-take levels. Indonesia has already carried out the NDF for the one concession that is its only legal source of Ramin. The CITES listing will also assist and stimulate international co-operation to control the illegal trade of Ramin. Indonesia and Malaysia, as the two key range countries, and Singapore as the main re-exporter of Ramin, have already formed a Tri-National Ramin Trade Task Force, following a workshop convened earlier last year by TRAFFIC, the wildlife trade monitoring network of IUCN and WWF.

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Policing small boats carrying mixed cargoes of hardwood logs (often including Ramin) is a major challenge for CITES enforcement agencies.



From Berlin to Buenos Aires:

Ten Years of Climate Change

Melt down. Climate change is heating up the Arctic twice as fast as the rest of the world.

The UN Framework Convention on Climate Change celebrated its tenth anniversary last year.

Brett Orlando, IUCN's Climate Change Advisor, looks at the changing climate of negotiations and prospects for the Convention's future.

When the Climate Change Convention entered into force in 1994, the notion that human activities were increasing CO₂ emissions and helping to bring about a dangerous change in the global climate was still hotly disputed. Nowadays, the debate is about how the climate is changing and what level of change would be dangerous. The latest evidence shows that we may have already passed that point, at least in the Arctic. A study released at the climate

change negotiations in Buenos Aires in December last year concluded that temperatures in the US state of Alaska and in Siberia have risen 2 to 3°C over the last 50 years – twice the rate seen in the rest of the world.

At the Convention's first meeting in Berlin, strengthening efforts to adapt to climate change was seen as a distraction from the agenda of reducing emissions. Today it's clear that no matter how successful we are at the latter, countries will have to spend money to adapt because of the amount of CO₂ we've already put in the atmosphere. A number of conservation organizations are tackling this challenge head on by re-thinking their strategies for protecting biodiversity in a warming world. Another difference now is that it's not only scientists who are doing the talking. More and more governments are testifying, as they did in Buenos Aires, to the rise of extreme weather events and other impacts they attribute to climate change.

The Russian Federation's ratification of the Kyoto Protocol in October last year cleared the way for the first legally-binding agreement to reduce CO₂ emissions to enter into force in February 2005. Despite its flaws, the Protocol has provided a crucial first step and a signal to business that government is willing to take action. Looking back, in 1994 hardly any businesses took climate change seriously. Today, as a result of the Protocol, a carbon market is poised to boom and hundreds of companies are now engaged. This will have implications for the forestry sector as well.

Although much has been achieved over the last ten years there are still doubts over the most fundamental questions facing the international community: are governments ready to commit to a long-term strategy to combat climate change, and are they willing to cooperate under an international framework? In Buenos Aires, it became crystal clear that some Parties are not ready to engage and are still waiting to see how the Protocol turns out. As the costs of climate change impacts start to grow, let's hope their precaution does not turn out to be a ruse for inaction.

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Research in brief

Making heat waves: Human influence has at least doubled the risk of extreme weather events, estimate the authors of a recent study on the 2003 heat wave in Europe. Scientists from the UK Hadley Centre for Climate Prediction and Research used computer modelling to compare the likelihood of the 2003 heat wave occurring with and without human-induced increases in greenhouse gas emissions. They determined that it was very likely that anthropogenic drivers of climate change in Europe have increased the risk of very hot summers in the region. The high temperatures of the 2003 heat wave, which led to 14,000 more deaths than the seasonal average in France alone, look set to return. Indeed, the scientists predict that the likelihood of such events will increase 100-fold over the next four decades, and conclude that "it is difficult to avoid the conclusion that potentially dangerous anthropogenic interference in the climate system is already underway".

Source: Nature **432**, 610-614, December 2, 2004



Forests, Natural Disasters and Human Security

© WWF/Canon/Nigel DICKINSON
Survivors of Hurricane Mitch rebuild their homes in Honduras.

What role do forests play in reducing human vulnerability to natural disasters? And what are the wider implications of forest degradation for human security? Anne Hammill, Oli Brown and Alec Crawford of the International Institute for Sustainable Development (IISD) look at these questions.

The uniquely tragic events of the morning of 26th December 2004 need little introduction. With a death toll now approaching 300,000 and untold human suffering, the impacts of the Indian Ocean tsunami will be felt for decades. Governments and communities found themselves unprepared and overwhelmed by the effects of the disaster. Questions over where responsibility lies for the extent of the devastation have reignited debates about the role of poverty and environmental degradation in amplifying the destructive power of natural events. Early reports have provided evidence linking the clearing of mangrove forests to the increased exposure of coastal communities to the disaster. Some have called for a greater investigation of the economic factors that drive such degradation, in particular the expansion of shrimp farming and the tourism industry.

Forests and disaster vulnerability: Evidence from around the world

Research and experience have shown that forest ecosystems play an important role in reducing the vulnerability of communities to disasters, both in terms of reducing their physical exposure to natural hazards and providing them with the livelihood resources to withstand and recover from crises. The degradation of these ecosystems is exacerbating vulnerabilities around the world, as the following examples illustrate.

Before the Indian Ocean tsunami, 2004 had already seen the deforestation-disaster vulnerability link given high profile following a series of natural disasters. In Haiti, severe floods

in May and Tropical Storm Jeanne in September together killed over 5,000 people. Scientists and the media were quick to highlight the link between these events and the country's high level of deforestation that has cleared 98% of its forests. In the Philippines, flash floods and landslides in November and December left more than 1,600 people dead or missing. President Gloria Arroyo publicly blamed the disaster on the indiscriminate logging that has left the country with less than 6% of its original forests.

Previously, the link between forest degradation and disaster vulnerability probably received the greatest attention in 1998 following Hurricane Mitch that killed over 18,000 people and caused an estimated US\$4 billion in damages. In less than one week, almost a year's worth of rain fell on the deforested hillsides of Central America, causing rivers to overflow and resulting in flash floods, mudslides and landslides. Decades of agricultural expansion and growth in human settlements had cleared the vegetation needed to absorb water and anchor soils during times of heavy precipitation. In the aftermath of Mitch, studies in Honduras, Nicaragua and Guatemala revealed that farms using agroecological practices – including agroforestry – withstood the storm's impacts better than those using conventional farming methods. The sustainably-managed plots retained more topsoil and soil moisture, experienced less erosion and fewer economic losses than neighbouring plots (see: <http://www.wn.org/Mitch.pdf>).

The powerful cyclone that hit India's Orissa coast in October 1999 provided another powerful example of deforestation and disaster vulnerability. Much of the damage caused by the cyclone occurred in the extensively-deforested new settlement areas along Orissa's coast as the storm surge ripped through a 100-km long denuded stretch, the Ersama block, killing thousands of people within minutes. According to local reports, illegal Bangladeshi immigrants had been allegedly encouraged to settle in the affected area

by vote-seeking politicians. During the construction of their homes, they destroyed the sand dunes as well as mangrove and *casuarina* forests, essentially stripping away the traditional barriers to storm surges and high winds (see: http://www.futureharvest.org/pdf/Weathering_Nat_Disas1.pdf).

Conversely, cyclone-prone coastal communities in Vietnam have been experiencing the risk reduction benefits of mangrove forests firsthand. Since 1994 the Vietnam National Chapter of the Red Cross has been working with local communities to plant and protect mangrove forests in northern parts of the country. They have planted nearly 12,000 hectares and the benefits have been clear. An initial investment of US\$1.1 million saved an estimated \$7.3 million a year in sea dyke maintenance. During the devastating typhoon Wukong in 2000, project areas remained unharmed while neighbouring provinces suffered huge losses of lives, property and livelihoods (see: <http://www.ifrc.org/publicat/wdr2001/>).

Much of the destruction associated with these disasters was inevitable. At one stage Mitch was a category V hurricane (one of four such hurricanes in the 20th century), while the Indian Ocean tsunami resulted from an earthquake with a magnitude of 9.0 on the Richter scale – the second largest earthquake ever recorded instrumentally. Even if all of the coasts and hillsides were densely forested, communities and ecosystems would have suffered significant losses. But the fact remains that healthy forests could have helped to minimize the impacts, at least in some places.

Forests and human security: The bigger picture

Environmental degradation that makes communities more vulnerable to natural disasters is central to the concept of human security – yet somehow these areas are often treated in isolation. Increasingly, the concept of human security is being co-opted into an understanding of security in terms of terrorism or violent crime. But human security is about more than freedom from violence or the threat of violence. It refers to, among other things, peoples' health, economic opportunities, political rights, community identity, and resilience to shocks such as natural hazards.

Woman carrying forest produce to market, Madagascar.



Forest resources and services play an important role in the achievement of human security. Whether it is through the provision of livelihood resources (e.g. food, medicine, cooking fuel, construction materials, etc.) or ecosystem services such as water purification, climate regulation and erosion control, forests are undeniably linked to the well-being and prosperity of people. When the availability of these resources and services is undermined, the resulting insecurity can range from hunger and susceptibility to disease, to loss of income and livelihoods, to social tensions and open conflict, and as seen in the examples above – to acute vulnerability to natural hazards. Exacerbating this increased exposure to hazards is a reduced forest resource base from which to draw on during times of crisis. Oftentimes, these resources are central to the local safety nets that sustain rural communities as they recover from disasters.

The relationship between forest ecosystems and human security is reciprocal. While forest degradation contributes to human insecurity, the reverse is also true. Insecurity in the form of chronic poverty, civil war, or the mass movements of internally-displaced people can destroy ecosystems and as resource-rich, multi-functional systems, forests in particular often bear the brunt of insecurity. Decades of experience has shown that when impoverished communities are left without livelihood options and support services, they turn to the environment for immediate solutions. During times of conflict, armed groups have turned to legal or illegal sales of timber to finance their operations, and often use forests as bases or targets during military operations, degrading the resource base in the process. Ironically, post-conflict situations can be even more damaging for forests. Governments struggling to maintain peace and regain an economic footing often promote timber extraction and the conversion of forested land to farmland as a way of compensating former combatants, resettling refugees and generating much-needed foreign exchange. Over the long term, forest conservation will only succeed in conditions of security for the communities living in and around them. Forests need human security as much as human security needs forests.

Including the environmental dimensions of vulnerability in our understanding of human security would help to focus public attention, policy-makers and funds on the long-term value of forest conservation and sustainable forest management. All too often forests are valued only over the short-term and primarily as sources of timber. This undervaluation means that the real costs of deforestation and mangrove destruction are not taken into account in policy decisions that authorize upland logging, shrimp farm expansion or coastal tourism development in disaster-prone areas. It is these long-term and hard-to-value costs that become apparent after natural disasters and it is the local affected people that are left to bear them.

The calamity of the Indian Ocean tsunami offers an opportunity to reassess the role of forests in natural disaster prevention and mitigation. It also presents a policy space to make significant progress in the global commitment to forest conservation. Rather than waiting for the next disaster to remind the world of the true value of forests, forest conservation must become a central part of disaster resilience and human security strategies.

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Logging and Floods A Watertight Argument?

David Kaimowitz, Director-General of CIFOR, has taken a critical look at the case against logging in the great flood debate. Is logging really to blame for floods, or is that, as Kaimowitz says, a “useful myth”? Here we highlight some of his challenges to the conventional wisdom on forests and floods.

Can we blame loggers for floods?



The response to last year's floods in Haiti and the Philippines was predictable – everyone blamed logging for leaving the land vulnerable to the ravages wrought by the water and mudslides. Governments, aid agencies, NGOs, academics and the media talked about the scandal of deforestation and logging and the need for reforestation and watershed management. Small farmers and logging companies were held responsible for the damage done and the lives lost.

The same response occurred in 1998 after Hurricane Mitch in Central America and after the floods along China's Yangtze river. Two arguments brought against deforestation and logging are that they reduce the soil's capacity to retain water during heavy rainfall and leave the denuded land more vulnerable to landslides. The impact of this established notion that loggers and farmers help cause floods can be enormous. Following the Yangtze floods, the Chinese Government imposed a logging ban that put over a million people out of work and the Philippines Government is now enthusiastic about a similar logging ban that would deprive many people of their livelihoods.

But where is the evidence for this case? Kaimowitz contends

that, while deforestation and logging have been proven to contribute to smaller, localized floods, no such link has been established with major flood events and forest cover offers very little protection against such once-in-a-lifetime floods. Hurricane Mitch, for example, struck at a time when the soils were already saturated, and this timing plus the sheer quantity and duration of the rainfall (when between 300 and 1900mm of rain fell non-stop for nearly a week) meant that severe flooding would have been inevitable, even if the forest cover had been intact. According to Kaimowitz, the presence or absence of trees also had little influence on many of the more severe landslides provoked by Hurricane Mitch. As he puts it “Land use and agricultural practices were practically irrelevant to soil movements of such great magnitude. Geology, topography, and climate basically determined where these movements occurred, not how people managed the watershed.”

While Kaimowitz allows for the possibility that logging could make major floods marginally worse, by increasing the silt build-up in rivers for example, he says that any such effect would probably be limited. “If you want to limit the damage from large floods” he says “flood control measures such as drainage channels and keeping people out of risky areas are more effective methods than trying to stop people cutting down trees.”

But, the fact remains that floods have made deforestation and land degradation priority issues for the governments of the countries concerned, and that can only be a good thing, right? Up to a point, says Kaimowitz. The myth about forest cover reducing major flooding is a useful one, he says, in so far as it has generated environmental awareness and provided a rationale for much-needed development and conservation investments in rural areas. However, he argues, the myth has done little to help prepare for future floods, or to encourage the kinds of reforestation, soil conservation and watershed projects that might make a real difference at the landscape level. Worse, says Kaimowitz, is the fact that many governments have used the myth to force poor farmers off their lands and away from forests and several south-east Asian governments have used floods as an excuse to prohibit the traditional farming practices of ethnic minorities.

So what is the solution for watersheds in flood-prone areas? Kaimowitz urges that “we clearly need to move away from responding to immediate crises and exaggerated press reports and to take a longer-term proactive approach based on careful analysis and monitoring.” Kaimowitz also proposes that we need more emphasis on low-cost approaches to watershed management, based on natural regeneration, forest conservation, commercially viable tree crops, and fire control.

Contact: David Kaimowitz, d.kaimowitz@cgiar.org. This article is based on Kaimowitz, D, 2004. *Useful Myths and Intractable Truths: The Politics of the Link between Forests and Water in Central America* in M. Bonell and L.A. Bruijnzeel (eds.). *Forests, Water and People in the Humid Tropics: Past, Present, and Future Hydrological Research for Integrated Land and Water Management*. Cambridge University Press, Cambridge (see book review on back cover).

Will Rural-Urban Migration Reduce Floods?

Recently abandoned grazing lands in the mountains of the Dominican Republic.

The worldwide trend of rural-urban migration continues to have many socio-economic and environmental consequences. Focusing on Latin America, Mitchell Aide of the University of Puerto Rico and Ricardo Grau of the National University of Tucuman, Argentina, discuss some implications for forest cover and floods.

In September 2004, Hurricane Jeanne passed over Puerto Rico and Hispaniola (the Dominican Republic and Haiti). Although both islands received similar levels of precipitation the results could not have been more different. The two storms resulted in 7 flood-related deaths in Puerto Rico, 24 in the Dominican Republic, and more than 3,000 in Haiti. What is so different about Haiti? Although there are many socioeconomic and environmental differences among these countries, we believe that the key difference is rural-urban migration and the consequent change in forest cover, particularly in mountains.

An increase in forest cover, especially on mountain slopes, can reduce the risk of landslides and flooding associated with extreme rainfall events. For example, in Honduras, Perotto-Baldvieso et al. (*Agriculture Ecosystems & Environment* 103:165-176, 2004) showed that the effects of Hurricane Mitch depended on the land cover type. Although forested areas had the lowest landslide risk, areas recently abandoned and covered with shrubs were much less affected in comparison with grass fallow, croplands, or bare soil. These differences were even more dramatic in areas of steep slopes.

In Haiti, years of corruption and a faltering economy have contributed to widespread poverty where large segments of the population depend on wood and even roots for cooking. Deforestation and wood harvesting have consequently reduced the forest cover in Haiti to less than 3%, increasing the vulnerability of local communities to the impacts of storms like Hurricane Jeanne. Seventy years ago, forest cover in Puerto Rico was not very different from Haiti, amounting to only 10% of the island's land and limited largely to the Luquillo Mountains. Severe erosion and floods were common, and the associated sediment load degraded coral reefs around the island. Today, forests cover almost 40% of Puerto Rico, and a similar process of forest recovery is underway in the Dominican Republic.

Why have large areas of forest recovered in the mountains of Puerto Rico and the Dominican Republic? The short answer is that people are attracted to urban centres – in-country and abroad – because of better access to jobs,



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education, health services and other social benefits. But, another important factor is the globalization and intensification of agriculture. Agriculture and grazing activities on marginal lands are often not competitive with lowland production or international markets. Over the last twenty years, these drivers of rural–urban migration have contributed to a decrease of 20 million people who depend on agriculture for their livelihoods, across the Latin American and Caribbean region.

Unfortunately, in Haiti, the solution will not be as simple as ‘abandoning the land’. The degraded soils and the continued need for firewood will greatly limit the forests’ ability to recover. Also, many socioeconomic issues will need to be resolved before any revegetation activities can have an impact. Although international agencies have funded many reforestation projects, the success of these projects has been limited because the underlying causes of poverty have not yet been addressed. In addition, reducing the human impact of any future floods will require careful human settlement planning, to avoid the worst flood-prone areas.

The lessons learned from these two Caribbean islands have relevance beyond the region. Rural-urban migration is one of the most important current demographic processes, particularly in countries undergoing socioeconomic changes associated with globalization. In most regions, the lands being abandoned are in steep mountainous areas – which play a major role in determining watershed regimes including floods and the seasonality of water flow. The increase in vegetation cover will help reduce erosion and floods, and at the same time provide valuable habitats for wildlife. Given that demographic and socioeconomic changes appear to be as important as conservation efforts, these processes need to be incorporated into forest management and conservation policy.

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People-led Protection

Are governments alone responsible for disaster prevention? Terry Jeggle, Senior Officer with the UN International Strategy for Disaster Reduction, reflects on how societies can become involved in risk assessment and reduction.

The tragic consequences of the recent tsunami disaster in Asia again demonstrated dramatically the failure of governments to take serious account of natural hazards and preventive measures to minimize the risks associated with where their citizens live. But is it primarily governments who are responsible for the protection of peoples' lives, properties and livelihoods? We don't hear many commentators reflecting on the roles and responsibilities of resident populations themselves in raising government and community awareness of natural hazards and associated risks. Still less do we hear about how communities could become involved themselves in measures to manage those risks and reduce exposure to risks.

There is a strong tendency for the public to think of disasters as singular events, which *have already* happened. Much less concern or investment is dedicated to raising awareness about living with risks and anticipating potential crises. Public awareness of natural hazards, an appreciation of the protective values of natural resources, local education that spans generations, and neighbourhood risk assessments of immediate surroundings are all simple measures that can and should draw on locally-available resources.

While the massive earthquake and tsunami would have caused great material damage in any event, it is clear that many lives could have been saved by greater human understanding of hazard characteristics, timely and effective warning procedures, and more considered economic and policy choices of beachfront development.

Natural forces can not be prevented, but the extent of people's exposure to risk can be identified, assessed and greatly minimized. It is perplexing that while both individuals and government officials remain convinced about the social importance of epidemiology or preventive immunization in terms of public health, it remains so difficult to translate similar outlooks to the field of hazard reduction.

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“Natural disasters occur only where natural extremes of the environment meet a community that is vulnerable.”

Lewis, J., 1999, *Development in Disaster-Prone Places: Studies in Vulnerability*, Intermediate Technology.

Haiti: A High Risk Case

Why did Tropical Storm Jeanne kill and displace thousands of people in Haiti last year, whereas it caused no deaths in nearby Cuba? Disaster experts looked beyond Haiti's lack of an early warning system and its extensive deforestation, to focus on the underlying causes of the country's vulnerability to natural disasters. These causes, they said, include grinding poverty, an extremely volatile political situation and powerful external forces. "The reason they (the root causes of vulnerability) cannot be overlooked is that without political stability and good governance, an early warning system and other preventive and preparative measures are unlikely" said Ben Wisner, a disaster hazards specialist. "The broad sweeps of history and political/economic change always have specific consequences on the ground."

Source: www.alertnet.org, September 30, 2004



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Research in brief

Culprits up the creek? The longstanding theory that downstream problems of erosion, sedimentation and flooding are primarily the result of irresponsible resource use by upstream farmers was rejected as over simplistic in the mid-1980s by many within the international academic and policy community. A series of studies in the Hindu Kush-Himalaya region found that the anthropogenic causes of these problems were in fact dwarfed by natural causes, including a high natural rate of erosion. But does the theory still persist in national forest and environmental policies? Piers Blaikie and Joshua Muldavin consider this question in a study on Indian and Chinese environmental politics. They argue that the largely discredited 'upstream degradation' theory has continued to play a very important role in how these two countries manage and control valuable natural resources. Both countries have used the theory as the rationale for policy decisions that have significantly impacted local peoples' forest-dependent livelihoods. The authors call for new scientific information to be shared more openly and evaluated together by national policy-makers and a wide range of civil society members.

Source: *Annals of the Association of American Geographers* 94 (3), 520-548, September 2004

School children in Cameroon see how tree cover can reduce erosion. Environmental education is key to disaster prevention.

Drought – Natural Phenomenon or Natural Disaster in Pastoralists' Landscapes?

What makes a drought a disaster? Edmund Barrow of the IUCN office for Eastern Africa examines some of the threats to pastoralists' risk management and coping strategies.

Dry times and droughts have always occurred across the drylands of Africa and pastoralists – the dominant land users of such landscapes – have developed detailed drought and risk management strategies to enable them to survive and indeed thrive. Now however, droughts are increasingly turning into natural or 'man-made' disasters as famine strikes at local, national or regional levels. Political and development strategies are at the root of the problem as the past three or four decades have seen conversion of the best ('wetter' or richer) drylands for agriculture, irrigation, human settlement, parks and reserves. By expropriating the pastoralists' critical dry and drought reserve areas, such development compromises their drought management strategies and exacerbates the effects of the dry times, often at huge human cost.

Traditionally, pastoralists used sustainable land-use and natural resource management systems to cope with drought, by moving their livestock herds and making optimal spatial and temporal use of the land. They found ways to spread risk and build resilience into their land-use by:

- maintaining wet- and dry-season grazing areas, as well as dry-season forage reserves;
- keeping multiple species of livestock, including grazers and browsers;
- establishing well-defined access rights to land, trees and water;
- practicing low-input often opportunistic crop production;
- using and storing wild fruits and foods, especially tree products;
- selling stock and buying grain (and *vice versa*); and
- setting up a supporting social and institutional structure.

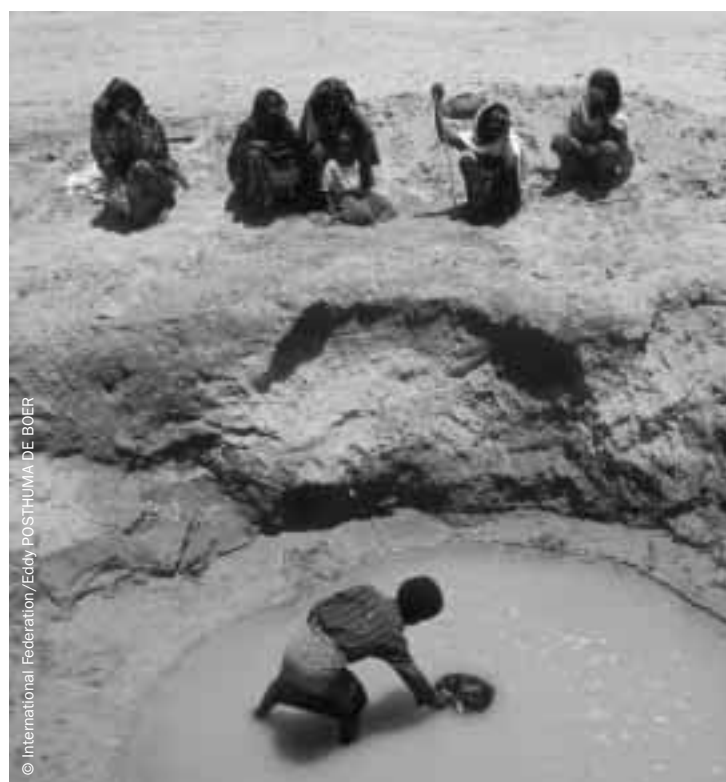
Trees and woody species are critical components of pastoralists' drought mitigation systems, as they stay greener longer and continue to produce foliage and fruits. Like mangroves along the tropical shorelines, trees are a critically important buffer in pastoralists' livelihoods. They provide an enormous array of goods and services including fuelwood, charcoal, building timber, livestock fodder (particularly in the dry season), wild fruits and foods, human and veterinary medicines, shade and a variety of cultural and ceremonial values and services. Pastoralists have a deep understanding of trees. They know which species are more palatable, how to prepare them as food, and which species can be used during dry and drought periods.

To support sustainable dryland natural resource management and mitigate the effects of drought, we need to build on these value and knowledge systems, not substitute or replace them. This is especially important given the very real threat of climate change across Africa. What needs to be fostered is not tree planting *per se* but sustainable management and restoration of these resources, through natural regeneration, better land-use and improved access rights. In particular, tree and natural resource tenure and usufruct rights have to be understood, given legal and policy support, and strengthened. If these rights are ignored, abrogated and replaced, a 'free for all' will ensue and local controls will be weakened.

Pastoralism and dryland natural resource management desperately needs to be better understood and supported. The role of trees and woody species in drought management and coping strategies needs to be given more attention and recognition. The drylands of Africa are going to become drier and larger and extreme weather events more frequent and severe, according to the results of climate change modelling. Trees will continue to be a critical resource to help many societies cope with drought, and buffer them from the worst effects of natural disasters, so should be at the heart of any real strategy for sustainable dryland natural resource management.

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Pastoralists in Eritrea collecting water during a drought.





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focus

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WWF's Response to the Tsunami Disaster

Destroyed houses in Banda Aceh. WWF is calling on donors to donate sustainably-sourced timber for reconstruction.

While the tsunami's destruction of ecological resources is on a different level to the appalling loss of human life, its significance should not be underestimated. In responding to the tsunami disaster, WWF is focusing its efforts on restoring damaged ecosystems and finding sustainable solutions for the enormous task of reconstruction. Here we report on the key tsunami-related activities of WWF's offices in the region.

WWF Thailand is developing activities in three priority areas: rehabilitation and restoration of conservation infrastructure; environmental education; and restoration and improved management of coastal habitats. The office is developing a range of activities and tools, such as providing online information for foreign divers planning on visiting Thailand to volunteer in cleaning up the debris on coral reefs. The office is also communicating the importance of mangroves in lessening the impact of the tsunami. In parallel to these conservation activities, WWF Thailand is also assisting families of deceased or injured staff of partner organizations.

WWF India is focusing its efforts on the Andaman and Nicobar islands, which suffered the worst damage from the tsunami. The office is calling for debris piling up from relief aid on the islands not to be dumped in the mangroves, coral reefs or in the coastal areas. Instead, the office is urging that the plastic debris be shipped back to the mainland. WWF India is also collecting data on the role of mangroves in reducing the tsunami's impact in certain areas and is calling for an immediate moratorium on mangrove destruction and the immediate restoration of mangroves that have been destroyed. The office is also encouraging the government to strengthen development regulations in coastal zones.

WWF Indonesia is working with the Aceh Forum, a coalition of local NGOs, which is helping with the management of refugee camps and aid distribution. The office is also working closely with the Ministry of Environment on the upcoming assessments of the tsunami's environmental impact.

The major concern of the WWF network is to help 'green' the reconstruction and rehabilitation efforts by encouraging countries to adopt a sustainable, ecosystem approach. Thus for example, WWF is calling for local fisheries to be re-established on a sustainable basis and for appropriate coastal zone management plans (including mangrove and coral reef conservation) to be drawn up and implemented. "Poorly planned coastal development has compounded the impact of the tsunami," said Mubariq Ahmad, Head of WWF Indonesia. "It is vital that we don't make the mistakes of the past. We need to rebuild in a sustainable and safe way."

WWF is also calling for the use of sustainable timber supplies in the reconstruction of Aceh. A report by Greenomics Indonesia, the policy research institute, and WWF shows that the reconstruction needs in Aceh will require as much as 260,000 ha of timber (see page 4 of this issue). The two organizations are proposing that some of the aid already pledged by donors for the reconstruction of Aceh should be made in the form of timber. They calculate that this would amount to one million cubic metres per year, an amount that could quite easily be met by the donors' joint efforts. "The option of sourcing timber as aid from other countries is much more rational than accelerating land clearing of natural forests in the name of the reconstruction of Aceh" said Elfian Efendi, the Executive Director of Greenomics.

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WWF news in brief

As reported in *arborvitæ* 26, Mark Aldrich has taken over as Target Manager – Forest Landscape Restoration in the Forests for Life Programme at WWF International. With this move, Mark has now passed on the managing editor responsibility for *arborvitæ* to Chng Soh Koon, Communications and Marketing Manager for the Programme. Many thanks Mark for your great support for *arborvitæ* and welcome Soh Koon!

IUCN's Response to the Tsunami Disaster

IUCN gathered evidence on whether estuarine mangroves such as this one reduced damage to inland areas.

The damage wrought by the tsunami was vast both in terms of human lives as well as impacts on the environment. IUCN has been marshalling its global network of over 1000 government, state agency and NGO members, over 10,000 commission experts and its various offices in the affected region to assess, advise and help plan the rehabilitation of coastal environments and livelihoods.

In Sri Lanka, IUCN supported emergency relief efforts in the immediate aftermath of the tsunami by providing resources and transport to the affected communities. Since then it has undertaken rapid environmental assessments of both terrestrial and marine ecosystems (see news article in this *arborvitae*). The assessment teams also gathered scientific evidence on whether natural coastal ecosystems such as sand dunes, estuarine mangroves and lagoons contributed to reducing the damage caused to inland landscapes. At the request of the Departments of Wildlife Conservation and Coast Conservation, IUCN also assessed the damage caused to five Protected Areas and provided recommendations for management action. It is currently assisting the Sri Lankan government on an initiative to *Develop a Coastal Green Belt* and an *Integrated Coastal Zone Development Plan*. Damage to ecosystems as a result of the reconstruction and rehabilitation efforts is emerging as a major concern in the post-tsunami phase. IUCN, which has been monitoring these developments, is working closely with the Urban Development Authority (UDA) – the focal agency for post-tsunami reconstruction and resettlement – to help integrate environmental concerns into the country's redevelopment activities.

In Thailand, besides providing humanitarian assistance through the Thai Red Cross Society, IUCN has been working closely with the Royal Thai Government in the rehabilitation of the environment in the affected provinces. On the request of the Thai Ministry of Natural Resources and Environment, IUCN, in association with various government departments, NGOs and local stakeholders, undertook a rapid assessment mission to Koh Phrathong, an island in Phang Nga Province which was severely affected. It is now entering into a partnership with the Swiss Government, which will fund reconstruction of villages on the island, to ensure that environmental concerns in rehabilitation of ecosystems, livelihoods and infrastructure are adequately met. Similar assessments have also been undertaken by IUCN and its partners in the Seychelles, Yemen and in parts of India and East Africa.

In addition to supporting its members and developing common rapid assessment methodologies, IUCN has also been collaborating with a number of key international organizations at the global level, including the UNEP Asian



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Tsunami Disaster Task Force and, and on mangrove assessments, with FAO and ITTO. It is also working closely with many of its large NGO members such as WWF, Conservation International, Birdlife International and Wetlands International to jointly share, analyze and feed the findings of their various assessments into the government-led environmental assessments being coordinated by UNEP.

As attention begins to shift to the longer-term needs of rebuilding shattered communities and ecosystems, generating knowledge about ecosystem rehabilitation that incorporates local livelihoods has become a key priority. To address this, IUCN has prepared a Decision-Makers Guide to help policy-makers and project managers design and manage post-tsunami reconstruction, taking into account ecosystem rehabilitation that restores the livelihoods of survivors. "Houses, schools, hospitals and hotels have all been damaged, along with fishing grounds, forests, beaches and other natural environments," said Dr Bill Jackson, Director of the IUCN Global Programme. "All of these support the livelihoods of people in the affected areas, so the buildings and the ecosystems need to be restored at the same time for people to regain their daily income and standard of living". Specific sectoral summaries are also being prepared for restoring sustainable tourism and sustainable housing.

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or visit www.iucn.org/tsunami

IUCN news in brief

Restoring Forest Landscapes: The Global Partnership on Forest Landscape Restoration, coordinated by IUCN, will hold an Implementation Workshop on Forest Landscape Restoration (FLR) in Pétropolis, Brazil from 4-8 April this year. Invited participants will include practitioners, policy-makers, representatives from the public and private sectors, NGOs and multilateral organizations. The workshop aims to build momentum and facilitate partnerships for FLR and share experience and lessons learned in the implementation of FLR activities. This event is a country and organization-led initiative in support of the UN Forum on Forests (UNFF) and will contribute to the UNFF review of progress.



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Back issues of arborvitae can be found on: www.iucn.org/themes/fcp/publications/arborvitae/avnewsletter/avnewsletter26_30.htm

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The editors and authors are responsible for their own articles. Their opinions do not necessarily represent the views of IUCN and WWF.

Reviews in brief

Forests and Floods: Collecting the Evidence

Available from: www.cambridge.org

The flood prevention qualities of forests are given a thorough examination in *Forests, Water and People in the Humid Tropics: Past, Present and Future Hydrological Research for Integrated Land and Water Management*. Editors Mike Bonell and Sampurno Bruijnzeel have pulled together contributions from a wide range of specialists, covering fields as diverse as tropical anthropology, environmental economics, human geography, climatology, hydrology, meteorology and forestry. The editors’ overview chapters of the book’s main sections and their own concluding chapter make this a remarkably coherent compilation of, and commentary on, the state of research into the hydrological and physical functioning of tropical rainforests and the environmental impacts of forest disturbance and conversion.

The final chapter, authored by Sampurno Bruijnzeel, Mike Bonell, Don Gilmour and David Lamb, pinpoints the current gaps in the research. It also provides an interesting and very pertinent analysis on the discrepancies between the perceived and proven links between forests and natural disasters such as floods, erosion, landslides and droughts. The authors argue that the perceptions held by the public and policy-makers on the one hand and researchers on the other are not as different as some have claimed. On the deforestation-floods issue for example, they consider the difference between the public view (that floods invariably increase after forest clearance) and the scientists’ view (that deforestation does increase storm flows for small and medium-sized floods but has little or no impact on extreme floods) to be almost bordering on semantics. However, one issue on which the authors find a major mismatch is on the perceived hydrological benefits of reforestation. The commonly-held perception, that reforestation causes rivers to flow again, contrasts with the scientific evidence that shows that reforestation actually decreases river flows in the short term. The editors blame this discrepancy on a lack of effective communication between researchers and the forest management and policy-making communities. They suggest ways in which research results can better reach the different stakeholder groups and stress the importance of bottom-up approaches that involve local communities in natural resource management research and decision-making. This local involvement, they say, gives research results a much better chance of having a real policy impact.

Barking Up the Wrong Tree?

Available from: www.wrm.org

The environmental and human health risks of genetically modified organisms have been hotly debated for the past decade. Chris Lang’s *Genetically Modified Trees: The Ultimate Threat to Forests* is a forceful presentation of how many environmental activists view the dangers of genetically modified trees. Lang’s principal argument is that GM trees are an extension of plantation technology and offer no solution to current environmental challenges including tackling deforestation, mitigating greenhouse gas emissions

and reducing industrial and agricultural pollution. Lang states that in preparing the book, several leading biotechnology scientists refused to answer his questions. If this is the case, then it is a shame for the book clearly lacks balance and the reader is left with no sense of the current status of research in this field. One is also left wondering how GM trees really constitute the ‘ultimate threat’ to forests given that rampant deforestation and degradation have been going on for well over half a century, driven not by technology but by more fundamental economic, political and social factors.

Mangroves vs. Shrimps

Available from: www.e-elgar.com

Shrimp Farming and Mangrove Loss in Thailand is probably the first-ever comprehensive study of the economic, ecological and social issues involved in shrimp farm expansion and the corresponding impacts on mangroves. Editors Edward Barbier and Suthawan Sathirathai led a collaborative effort by Thai and international researchers that looked not only at the worldwide and national trends but also at the local realities of four coastal communities in Thailand. The researchers found that although shrimp farming is hugely attractive at a national scale (generating US\$1-2 billion in foreign exchange annually in Thailand) it is very costly to local communities. The results of the economic analyses are startling. The net present value of local uses of mangrove forests is calculated at around US\$632 to \$823 per hectare – and this does not include the indirect use values of offshore fishery linkages and coastal protection. In contrast, the economic returns of shrimp farming are calculated at only about US\$200 per hectare – and if shrimp farmers are required to cover the costs of mangrove rehabilitation, then the economic returns are actually negative.

The policy implications of this study are far-reaching. The editors point out that as long as government policies continue to subsidize shrimp farming by under-pricing inputs and not requiring shrimp pond owners to cover the external costs of water pollution and mangrove deforestation, this activity will remain financially profitable to commercial investors. The editors propose several concrete policy recommendations to adjust these incentives, impose effective and fair controls on mangrove use, improve mangrove replanting efforts, and make shrimp farming more sustainable.

Global Forest Update

Available from: www.fao.org

The State of the World’s Forests 2005 is the sixth edition of this FAO annual update on forest-related issues. The theme this time is ‘realizing the economic benefits from forests’ and the topics covered include the economic benefits of agroforestry, the economics of wood energy, and the impacts of tariffs and non-tariff measures on forest products trade. The bottom-line message is that the economic viability of the forest sector is a critical requirement for safeguarding the environmental, social and cultural functions of forest resources.