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Cover photo: Darfur - Waiting for water, October 2004

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Children in the Sudan

Photo: © Orphan Grain Train

Latin America up in smoke

Hannah Reid and Andrew Simms describe climate change impacts in Latin America and explain how to ensure climate change resilient development

In the late 1990s, the world's pre-eminent group of climate scientists gathered under the Intergovernmental Panel on Climate Change and predicted a devastating range of climate change impacts on Latin America and the Caribbean. These included an increase in the intensity and number of extreme weather events, forest die-off, melting glaciers and the desiccation of temperate grasslands. This article describes some of the impacts of climate change experienced by the people, plants, animals and habitats of Latin America and the Caribbean. It then makes nine recommendations to ensure that future development in the region is both 'climate proof' and 'climate friendly'. Information presented here has been collected by a group of leading environmental and development organizations called the Working Group on Climate Change and Development, and documented more fully in their third report, *Up in Smoke?*

Latin America and the Caribbean. The threat from climate change to the environment and human development.

Climate change impacts

Experiences from the Working Group on Climate Change and Development and the people they work with in the region confirms that temperature and rainfall patterns in Latin

MAIN POINTS

- **Hannah Reid and Andrew Simms summarize** climate change impacts on the people and ecosystems of Latin America and the Caribbean.
- **Poor people are most at risk** from expected extreme weather events,

water shortages, droughts and health impacts.

- **The authors make nine recommendations** to ensure that future development in the region is sustainable, equitable, 'climate proof' and 'climate friendly'.

America and the Caribbean, hitherto largely regular and predictable, are becoming less predictable and often more extreme.

The El Niño Southern Oscillation phenomenon is crucial. Happening around Christmas, it typically reverses weather patterns bringing more rainfall to coastal areas and bringing drought inland at higher altitudes. El Niño is often followed by La Niña, its cold counterpart, where climate patterns are generally opposite to those produced by El Niño. Both have major impacts in Latin America. Global warming is making El Niño events more frequent and more severe. The 1997/1998 El Niño led to severe drought in Brazil, worsening major forest fires. Fish harvests fell by five per cent and a significant percentage of corals along the Meso-American Reef suffered severe bleaching and death. It was also responsible for the collapse of a critical lagoon reef community in Belize.

Hurricanes and tropical storms are in-

creasing in intensity. In 2004, the south coast of Brazil was battered by its first ever hurricane, Hurricane Catarina, which struck 23 cities and caused roughly US\$350 million in economic losses. With six tropical storms and 14 hurricanes, the 2005 hurricane season was one of the most active and destructive in history. In Central America, the most destructive hurricane was Stan, the 18th cyclone of the season. The storm caused flooding and mudslides in Belize, Costa Rica, El Salvador, Guatemala, Haiti, Honduras, Mexico and Nicaragua.

Sea level rise is likely to be particularly problematic in vulnerable parts of the Caribbean, Central America, Venezuela and Uruguay, leading to loss of coastal land, infrastructure and biodiversity, as well as the intrusion of soil contaminating saltwater. Sixty of Latin America's 77 largest cities are located on the coast.

Snow and rainfall patterns are changing, creating extra stress on limited freshwater resources in Peru, Bolivia, Colombia, Chile and western Argentina. In subtropical South America, east of the Andes, rainfall has been increasing since about 1970 accompanied by more destructive sudden deluges. Unprecedented rainfall in May 2004 caused floods which took the lives of over 1000 people in Belle Anse, Haiti. More northern areas of South America are expected to experience greater warming than southern areas of the continent. Climate models predict more rainfall in eastern South America and less in



Burning forest

Photo: © Daniel Beltra/Greenpeace

central and southern Chile. The 2005 drought in the Amazon Basin was probably the worst since records began. At its peak, river levels in parts of the Amazon were at their lowest for 35 to 60 years.

Warming in high mountain regions melts glaciers, snow and ice, affecting farming and the availability of water for coastal cities and tourist activities. Glacial lake outbursts also threaten lives and livelihoods. Glaciers are currently disappearing fastest in the Venezuelan, Colombian and Peruvian Andes. The O'Higgins glacier has shrunk back 15 kilometres over the last century, and the Chacaltaya Glacier in Bolivia, which provides water to the city of La Paz, is predicted to melt completely within the next 15 years. By contrast, Peru's highlands are experiencing a new phenomenon called 'friaje', where, for example, in

2004, temperatures fell to -35° C. This killed 50 children, left about 13,000 people with bronchitis, pneumonia and hypothermia, and killed 50 to 70 per cent of alpacas, on which the locals depend for wealth, transport, milk, cheese and wool.

Impacts on the poorest

With or without global warming, extreme weather is a problem for the people of the region. For many people, climate change will make their already difficult lives impossible.

Poor people are more susceptible to the destruction caused by hurricanes and flooding for a variety of reasons. They typically live in poorly constructed houses that are more susceptible to damage. Poor or non-existent sewage facilities and potable water provision in poor areas can result in greater exposure to

water-borne diseases after flooding. The poor often inhabit areas that are historically prone to flooding or mudslides.

Climate change impacts are hugely magnified by abuse of the natural environment. This abuse is rarely due to the activities of poor communities, who have little say over 'mega-projects' conducted in the name of development, including illegal logging, deforestation, over-fishing and mining. But because of this environmental damage it is much harder for poor communities to cope with climate change. Women suffer most because they are the main providers of household food, fuel and water.

Water

Regardless of climate change, stress on water resources is set to increase because of rising human demand from growing populations and economic activity. Estimates of climate change impacts on freshwater availability in Mexico and South America indicate that by 2025 about 70 per cent of the population will live in regions with low water supply.

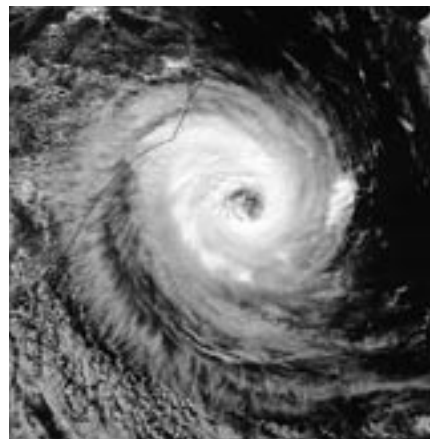
Farming

Farming employs 30 to 40 per cent of the working population of Latin America. Studies in Brazil, Chile, Argentina and Uruguay show yield decreases in a number of key crops – barley, grapes, maize, potatoes, soya beans and wheat – potentially linked to global warming. Climate change could also lead to more damaging impacts from plant and ani-

mal diseases and pests. It could therefore endanger the livelihoods of subsistence farmers and pastoralists who constitute a large portion of the rural populations of the Andean plateaus and tropical and subtropical forest areas. Urban populations that depend on food and other resources from rural areas are also at risk.

Health

Projected changes in climate could increase the impacts of already serious chronic malnutrition and diseases affecting a large sector of the Latin American population. Vector-borne diseases like malaria, dengue and Chagas' disease, as well as infectious diseases like cholera, will spread. Higher surface temperatures will worsen the effects of pollution and



Tropical storm from space

high concentrations of ground-level ozone, especially in urban areas. Wider impacts on access to food and safe drinking water will interact with direct health impacts with potentially lethal results.

Global feedback concerns

Latin American forests cover over one fifth of the region and account for over one quarter of global forests. They strongly influence local and regional climates. More permanent temperature increases or El Niño-type conditions could lead to long-term drying out and death of the Amazon rainforest. Although the whole Latin American region has only contributed around four per cent of global greenhouse gas emissions from human activities to date, the subsequent release of carbon to the atmosphere from forest die-off could trigger an environmental feedback mechanism leading to irreversible and catastrophic global warming.

Recommendations for Latin America and the Caribbean

1. Cut greenhouse gas emissions

Rich countries need to meet and exceed their targets for reducing greenhouse gas emissions set under the Kyoto Protocol. They need to cut emissions so that global temperature rises are kept well below 2°C above pre-industrial levels. Commitments to cut emissions should be progressively raised after 2012 so that industrialized countries reach cuts of up

to 80 per cent by 2050. Energy efficiency and more sustainable lifestyles are priorities.

Latin American countries should implement sustainable development policies that prioritize energy efficiency and renewable energy. To help mitigate climate change and maintain valuable ecosystems, they should reduce, and eventually halt, deforestation. Developed countries should support climate

links with climatic change. Help is needed to map the complex impacts of global warming on health and to ensure that resources are available to tackle them. It is also important that development policies do not inadvertently make things worse, for example by prioritizing the market-based re-engineering of health systems and access to water above human need. All policies and programmes

example, drought early warning systems can help prevent sudden migration.

4. Increase support for small-scale agriculture

Dramatically increased support for small-scale agriculture is needed, with encouragement of diversification because diverse systems are more resilient and more productive than monocultures. Farming based on expensive and energy-intensive artificial inputs will be vulnerable to fuel price rises and will add to the problem of climate change and environmental vulnerability. Vitality, small-scale farmers need support from a favourable policy environment and research that addresses problems that they, themselves, have identified. Boosting production requires systems that combine new insights and technologies with the wisdom of tradition. Dangers associated with clearing forest land and planting biofuels as opposed to food crops should be avoided.

5. Conserve biodiversity and stop deforestation and illegal logging

More stringent measures to protect Latin America's rainforests from unsustainable logging and environmentally destructive development, including agricultural expansion, are needed. Deforestation in Brazil alone accounts for about three-quarters of the country's total emissions, and forest conversion alone, not including burning, is enough to make Brazil the fourth largest

“for many people, climate change will make their already difficult lives impossible”

friendly development in the region with actions ranging from technology transfer to financial support.

2. Map national vulnerabilities and apply the 'climate test'

Developing countries are the most vulnerable to climate change. Their economies are heavily dependent on climate vulnerable sectors, such as agriculture, and they are also the least able to cope with the impacts of extreme weather conditions. There is limited analysis, however, of climate vulnerability and what approaches could maximize resilience at regional, national and local levels. Consequently, there is an urgent need to develop detailed maps of the complex impacts of global warming, integrating climate change related risks with other vulnerabilities. For example, many diseases have demonstrated

should face the test of whether they will leave people in Latin America and the Caribbean more or less vulnerable to the effects of global warming. The test will be: is this initiative 'climate proof' and 'climate friendly'?

3. Support community-based coping strategies and disaster risk reduction

Global warming presents a huge challenge to the coherence and coordination of aid. Many donors are focusing on the role of technology, but experience shows that promoting disaster risk reduction at local levels by supporting community-based coping strategies is far more effective. It also yields benefits that go beyond just tackling climate related disasters. 'Good adaptation' is usually also 'good development'. Responsible knowledge sharing between communities is required, and this needs facilitation and resources. For

carbon polluter in the world. About 80 per cent of logging in the Brazilian Amazon is illegal, and an area the size of a football pitch is lost every eight seconds. Latin American countries must adopt clear targets, timetables and pro-poor strategies for reducing deforestation. The international community must support Latin American countries in this effort.

More protection for biodiversity and ecosystem integrity in mountain regions and the Meso-American Reef system is also needed. Conservation must allow for the necessary movement of species that will occur as a result of climate change. New measures need

to respect the centuries of knowledge accumulated by indigenous people.

6. Develop and implement clean and efficient energy

Wealthy countries must act first to cut greenhouse gas emissions. But emerging Latin American countries also need to help mitigate climate change by implementing sustainable development policies that include halting deforestation and development of energy efficiency and renewable energy. The exploitation of fossil fuels in Latin America and the Caribbean does little for the development or security of its people. But the

potential to produce and market sustainable and renewable energy on the continent is enormous, especially in poor communities. To meet people's need for energy, to improve health at the household level and to help Latin America avoid further 'dirty development', international donors, financial institutions, energy companies and transnational corporations should switch investment from fossil fuels to renewable and sustainable energy. They should adopt targets and timetables to achieve this.

The successful development of biofuels in Latin America is both an opportunity and a threat. The benefit of increased energy independence is offset by greater pressure on tropical forests from agriculture. Europe, for example, is one of the largest buyers of soya grown on former Brazilian Amazon rainforest. Growth of soya and other biofuels should not come with irreversible environmental costs. An assessment is needed of the carbon benefits of different biofuel schemes, the risks of deforestation and socially negative impacts, and whether there is competition between use of land for fuel or food.

7. Promote sustainable urban development

With 75 per cent of Latin America's people living in urban areas, reducing urban greenhouse gas emissions is vital. Projects that promote low carbon city development, protect water resources and green areas, and reduce greenhouse gas emissions should be



Deforestation in Brazil

Photo: © Daniel Beltra/Greenpeace

instigated. Case studies from cities such as Curitiba and Porto Alegre in Brazil illustrate how to integrate sustainable transport considerations into business, road infrastructure and local community development. There are numerous possibilities for alternative energy technologies, such as solar heating and cooling systems. Good water management practices should also be supported.

8. Implement existing agreements on environment and development

The Johannesburg Plan of Implementation agreed at the World Summit on Sustainable Development contains many commitments to 'protecting and managing the natural resource base of economic and social development'. These relate to water, disaster management, agriculture, desertification, drought, mountain ecosystems, biodiversity and forestry. The international community should implement these agreements. They include action on reducing risks from flooding and drought in vulnerable countries, encouraging the dissemination and use of traditional knowledge to mitigate the impact of disasters, and implementing the Hyogo Framework for Action agreed at the World Conference on Disaster Reduction.

9. Apply new private sector standards

Corporate involvement in Latin America in such sectors as energy, logging, mining, water and infrastructure construction must en-

sure that development meets sustainability criteria. For example, as climate change puts stress on scarce water resources, a dogmatic approach to water privatization could easily increase the vulnerability of millions of people. Consultation with local communities is central to ensuring benefits are distributed effectively.

Achieving development resilient to climate change

Latin America and the Caribbean need to be freed from a 'one-size-fits-all' development approach. Effective responses to climate change depend on local circumstances, so a new flexibility is needed. The greatest challenge is to build climate resilience and resistance and to secure local livelihoods. Recognizing local knowledge is key. Incorporating gender issues into programmes and projects will help identify where specific vulnerabilities to climate change lie, and where most opportunities for mitigating and adapting to climate change can be found. Cancelling outstanding international debt and promoting fair and sustainable trade systems would help tackle deepening poverty and environmental degradation in the region. As Juan Mayr, one of the world's leading environmentalists, writes: "It is the right time to re-think the development model for Latin America and the Caribbean... Without question, it's about an ethical commitment that can be put off no longer." ■

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FURTHER INFORMATION

● **On the Web:** The report: *Up in Smoke? Latin America and the Caribbean. The threat from climate change to the environment and human development* is written by Andrew Simms, Hannah Reid and the Working Group on Climate Change and Development, and was published by nef in 2006. It can be ordered or downloaded from: <http://www.iied.org/pubs/display.php?o=10017IIE D&n=2&l=11&c=climate&k=smoke>

Climate and disaster reduction

Sarah Granich reports on the recognition of the need for appropriate disaster reduction strategies in the face of climate change

Increasingly, the international community is recognizing that disaster reduction strategies must be developed to provide long-term risk and capacity management that encompasses the complexity of interdependent systems and strengthens resilience in the face of climate change.

Over the past few years, almost every region of the world has experienced some form of disaster. Hundreds of thousands of lives have been lost, infrastructure destroyed and livelihoods reduced to survival levels of existence. Not all of the disasters have been caused by natural events, many have been of technological origin. Whatever the cause, it is clear that the global community urgently needs to develop management strategies that immediately and effectively deal with the potential cause of disasters and the immediate response and recovery from them.

At the World Conference on Disaster Reduction, held in Kobe, Japan, in January 2005,

168 governments adopted a ten-year plan to make the world safer from natural hazards.

The Hyogo Framework is “a global blueprint for disaster risk reduction efforts during the next decade. Its goal is to substantially reduce disaster losses by 2015 - in lives, and in the social, economic, and environmental assets of communities and countries. The Hyogo Framework offers guiding principles, priorities for action, and practical means for achieving disaster resilience for vulnerable communities.”

MAIN POINTS

- **The author describes recent initiatives** by the international community intended to reduce the impact of natural hazards.
- **Recognition that** disaster reduction

must take account of climate change is relatively recent.

- **The Davos Declaration calls for** an integrated and participatory approach in coping with disasters and risks.

A number of priorities for action are outlined in the Hyogo Framework to serve as guidance for states, regional organizations, institutions, civil society, the scientific community, the media, the private sector and individuals, all of whom are vital stakeholders in cooperating on disaster risk reduction. Action points include:

- make disaster risk reduction a priority - ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation;
- know the risks and take action - identify, assess and monitor disaster risks, and enhance early warning;
- build understanding and awareness - use knowledge, innovation and education to build a culture of safety and resilience at all levels;
- reduce risk - reduce the underlying risk factors; and,
- be prepared and ready to act - strengthen

disaster preparedness for effective response at all levels.

The International Strategy for Disaster Reduction (ISDR) was ratified by the United Nations Economic and Social Council and the General Assembly during the 1999 meeting of its Commission on Sustainable Develop-



Storm damage in Vietnam

Photo: © Luong Quang Huy

ment. The Secretary-General's report on ISDR implementation and the Hyogo Framework for Action were discussed at the United Nations General Assembly in October 2006. When presenting the Secretary-General's report, Under-Secretary-General for Humani-

tarian Affairs Jan Egeland made the following remarks.

"At the international level, climate change and early warning are two areas where national concerns are being matched by new thinking. Disaster risk reduction policies and practices offer proven win-win approaches for adapting to changing climate risks. Meanwhile, the Global Survey of Early Warning Systems sets out a strong set of recommendations to implement a globally comprehensive early warning system.

"To make real progress, States must abide by their commitments to make real their commitments under the Hyogo Framework for Action. States agreed that they are primarily responsible for the effective implementation of the Hyogo Framework for Action. Reports to the International Strategy for Disaster Reduction secretariat show that more and more countries are engaging actively, but also that some are still not. In August this year, when the report in front of you was produced, 60 countries had officially nominated focal points. Today that number has risen to 87. The benefit of these focal points is to enhance multi stakeholder as well as regional and international coordination for more effective risk reduction."

He noted that "in keeping with the Hyogo Framework, risk awareness and education have been highlighted in national agendas. Bangladesh, Cuba, Romania, Iran, India, Nepal, Vietnam, Indonesia, Malawi, Haiti and Nepal - to mention some - have started initia-

tives to build knowledge of local hazards and risks through primary and secondary public education."

In recognition of the increasing vulnerability of societies world-wide, a growing number of institutions and alliances are working together to design and integrate state-of-the-art coping and management strategies.

The Global Alliance for Disaster Reduction comprises of more than 1000 experts on disaster reduction and related aspects of sustainable development. These experts come from a broad range of regional, national and international organizations, such as the United Nations, environmental and disaster mitigation agencies, institutes and relief organizations and the World Bank. The Alliance is headquartered at the University of North Carolina Charlotte in the United States under the institutional leadership of the Global Institute for Energy and Environmental Systems.

The Global Alliance for Disaster Reduction has three main objectives:

- to mobilize intellectual and material resources to address several issues that will enable businesses and public agencies to mitigate the impacts of natural and technological hazards;
- to serve as a catalyst for ongoing national and international projects by providing opportunities for expansion of technical and political capacity, building of multinational networks, convening of forums and



Floods in Bangladesh

Photo: © EG/ECHO

conferences and capacity enhancements for centres of excellence to implement programmes to reduce the impacts of disasters; and,

- to cause major paradigm shifts in disaster control from disaster impact focus (*posterior*) to disaster prevention (*anterior*) in all disciplines, national and regional infrastructure plans and educational programmes.

“The right information, in the right format, to the right people, at the right time” is the working plan of the Global Disaster Information Network (GDIN). The Network grew from the shared frustrations of experts of many lands who either found it hard to find relevant, existing information in short

order, or could not efficiently or cost-effectively change existing information into more useful formats. In addition, because less than three per cent of the world has effective access to the Internet, disaster managers have often been frustrated by poor telecommunications.

The Network focuses on providing assistance in natural or technological disasters, helping in complex humanitarian emergencies and is, throughout, politically neutral. A collaborative association of experts from international organizations, non-governmental organizations, governments, industry, academia and donor organizations, it is a voluntary, independent, self-sustaining, non-profit association with all acting execu-

tives and committees elected at the annual conferences.

As an informal international body and facilitator of information, GDIN:

- offers a suite of services or acts as a one-stop centre linking users with the appropriate information provider;
- pays, on special occasions, for information when the disaster manager cannot;
- fosters the development of pilot projects; and,
- provides integration across disaster regions to share information quickly.

GDIN promotes pilot projects to illustrate the usefulness of emerging technologies in the field of disaster management and to demonstrate GDIN standards and procedures. In Turkey, one pilot project, the Rapid Deployable Emergency Housing Initiative, is exploring the use of a unique flat-pack, prefabricated, mobile field accommodation, which can be used as a shelter, temporary home or as a supplementary unit for field facilities.

In late August 2006, the International Disaster Reduction Conference was held in Davos, Switzerland. The conference was jointly organized by the Global Alliance for Disaster Reduction, the Global Disaster Information Network, the United Nations Educational, Scientific and Cultural Organization (UNESCO) and ISDR.

The meeting took an integrated, interdisciplinary approach to address risks affecting society such as natural hazards and technological failures as well as human-induced risk

factors such as climate change, pandemics and terrorism.

The conference participants produced the Davos 2006 Declaration, which calls on the international community to join in an integrated and participatory approach to coping with disasters and risks. The Declaration includes the following recommendations:

- To achieve the Millennium Development Goals, disaster risk reduction has to become an important and comprehensive part of the whole planning process for poverty reduction, food and water security, education and health.
- National strategies that integrate all types of measures and risks are needed. Disaster risk management and natural resource management have to go hand in hand.
- When designing community and rural risk management plans, people, livestock and other agricultural assets must be protected in order to preserve livelihoods and reduce poverty, hunger, water shortage and the spread of zoonotic diseases.
- Environmental degradation, whether creeping change or acute emergencies, poses grave risks to human communities. Protection of vital ecosystem services is fundamental to reducing vulnerability to disasters and strengthening community resilience.
- A better working relationship between the scientific community and end-users, be they mitigators, planners, educators, communicators or responders, is of prime

importance. The end-user's needs have to be better articulated and knowledge management improved.

At Davos, participants from Africa advanced plans for promoting mutual interest and cooperation in disaster risk reduction for safer, disaster-resilient communities. The Central Asian delegation considered that adopting the principles of integrated water resources management and increasing coordination at the national, interstate and global level will offer a good chance to reduce vulnerability.

The ISDR Secretariat and its partners, UNESCO, the United Nations Children's Fund, ActionAid International and the International Federation of Red Cross and Red Crescent Societies have made disaster risk reduction education and safer school facilities the two key themes of the 2006-2007 World Disaster Reduction Campaign.

United Nations Secretary-General Kofi Annan, in his message on the International Day for Disaster Reduction in 2003, said: "Natural hazards are a part of life. But hazards only become disasters when people's lives and livelihoods are swept away... Let us remind ourselves that we can and must reduce the impact of disasters by building sustainable communities that have long-term capacity to live with risk." These words remain as relevant today as they were three years ago. ■

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FURTHER INFORMATION

● **On the Web:** The International Strategy for Disaster Reduction can be contacted at International Environment House II, 7-9 Chemin de Balexert, CH 1219 Chatelaine, Geneva 10, Switzerland (fax: +41-22-9178964; email: isdr@un.org). Their website can be found at www.unisdr.org/isdrindex.htm, where there is an online newsletter covering disaster reduction and climate change, DR+CC Infolink, which aims to facilitate, share and disseminate information and includes news and dialogue on related issues. The Global Alliance for Disaster Reduction website is at www.gadr.giees.uncc.edu and that of the Global Disaster Information Network at www.gdin.org. Finally, further information about the World Disaster Reduction Campaign can be found at www.unisdr.org/eng/public_aware/world_camp/2006-2007/wdrc-2006-2007.htm

SMALL ISLANDS

Small Island Developing States have stressed their vulnerability to climate change and the need for energy efficiency and fair trade to protect their people against economic and environmental shocks during recent United Nations debates.

"To a Small Island Developing State, there are few things more important than securing the necessary assistance in order to build resilience against the many hazards that afflict the country on a consistent basis, including the violent storms that pass through our region even more frequently as a result of global warming," said Frederick Mitchell, Foreign Minister of the Bahamas.

Read more:
www.tiempocyberclimate.org/newswatch/arnews06.htm#061008

STERN REVIEW

According to the Stern Review of climate economics, "our actions over the coming few decades could create risks of major disruption to economic and social activity, later in this century and in the next, on a scale similar to those associated with the great wars and the economic depression of the first half of the 20th Century."

Commenting on the report, British Prime Minister Tony Blair said that "this disaster is not set to happen in some science fiction future many years ahead, but in our lifetime." He continued "For every £1 invested now we can save £5, or possibly more."

Read more:
www.tiempocyberclimate.org/newswatch/arnews06.htm#061105

AFRICA

A new report concludes that the vulnerability of the African continent to climate change is even greater than previously estimated.

Thirty per cent of Africa's coastal infrastructure could be inundated and between 25 and 40 per cent of species' habitats lost by 2085. "We are already seeing climate-related changes in my country," said lead author Balgis Osman Elasha of the Sudanese Ministry of the Environment. "The Gum Arabic belt has shifted southwards below latitude 14 degrees north and the rains which used to occur from mid June to the end of August now come from mid July until the end of September."

Read more:
www.tiempocyberclimate.org/newswatch/arnews06.htm#061126

SOLAR POWER

China is to build one of the world's largest solar power stations. The 100MW facility will be located near Dunhuang, in Gansu province in northwest China.

"Covering a total area of 31,200 square metres, Dunhuang boasts 3,362 hours of sunshine every year and is hailed as a prime area for solar energy development, with its easy access to electricity transmission and communications," reports the Xinhua news agency. According to Gan Lin of WWF, the global conservation organization, such desert areas are suitable for large solar projects.

Read more:
www.tiempocyberclimate.org/newswatch/arnews06.htm#061203

FORESTS

A new report from the World Bank argues that, if left standing to provide carbon storage, forests may be worth five times as much as when felled.

"The trees are worth more alive, storing carbon, than they would be worth if burned and transformed to unproductive fields," says lead author Kenneth Chomitz. "Right now, people living at the forest's edge can't tap that value." Tropical deforestation accounts for about a fifth of carbon emissions, with five per cent or more of these forests lost a decade. "By the middle of the century, vast tropical forests may be reduced to just shreds of what they once were," warns Chomitz.

Read more:
www.tiempocyberclimate.org/newswatch/arnews06.htm#061112

Vulnerability in Sudan

Sumaya Ahmed Zaki-Eldeen calls for improved policy process integration to support adaptation in Sudan

With an area of 2.5 million square kilometres, Sudan is the largest country in Africa and the ninth largest in the world. It shares borders with nine countries and is divided administratively into 26 states. The River Nile and its headstreams, the White Nile and the Blue Nile, are Sudan's most prominent topographical features. Large areas of cultivable land exist around these rivers and irrigation is used extensively. Some 21 per cent of Sudan is cultivated. Over 40 per cent of Sudan is pasture and forests, which provide food for livestock and wildlife. Yield is limited mainly by the spatial and temporal distribution of rainfall. Seasonal fire outbreaks strongly influence natural vegetation, especially in Savannah areas.

Sudan's climate varies from desert in the northern areas, where it seldom rains, through a southern belt of varying summer

rainfall, to an almost equatorial climate in the extreme southwest, where the dry season is very short. The diversity of Sudan's climate and geography is also reflected in its people. The country's 30 million inhabitants consist of many cultures, ethnic groups, languages and religions. Most people (about 70 per cent according to the 1993 census) live in rural areas, but there has been substantial rural

to urban migration in recent years. Educational levels are low and the burden of disease is heavy and widespread. Infrastructure is either non-existent or inadequate and run down. Gender segregation and inequity are common in rural areas where, for example, enrolment for girls in education can be as low as eight per cent (compared to over 80 per cent in the capital, Khartoum).

MAIN POINTS

- **Sumaya Ahmed Zaki-Eldeen characterizes** Sudan's vulnerability to climate change.
- **She describes the policy processes in Sudan** surrounding climate change, poverty reduction, desertification, biodiversity conservation and

sustainable development.

- **To support adaptation she calls for** increased integration between these policy processes as well as improved involvement with communities and non-government organizations.

How is Sudan vulnerable?

With an annual per capita income of less than US\$400, Sudan is part of the group of Least Developed Countries (LDCs). LDCs are particularly vulnerable to climate change because of the overwhelming dependence of their economies on nature, and their low adaptive capacity. Sudan is also in Africa, which is acknowledged as being particularly vulnerable to climate change due to the low adaptive capacity of the African population. This is due to the extreme poverty of many

Africans, frequent natural disasters, such as droughts and floods, and heavy dependence on rain-fed agriculture.

Most land in Sudan is quite sensitive to changes in temperature and precipitation. Food security is mainly determined by rainfall and more than 70 per cent of Sudan's people are directly dependent on climate sensitive resources for their livelihoods. Forested areas in Sudan have already been degraded with forest cover falling from between 36 to 43 per cent of the total country area in 1958 to 19 per cent in 1990.

Drought

Sudan is part of the Sudano-Sahel Region, which has been exposed to a series of recur-

ring dry years and drought in recent times. Relations between desertification, drought and human influences are complex. Demand for land has increased and the spread of cash-crop farming has been to the detriment of subsistence farming and rangelands used by nomadic people. The most vulnerable people are farmers in western, central and eastern Sudan, whose livelihoods depend on the severity of drought and variability (in terms of amount, distribution and frequency) of rainfall. Drought threatens approximately 12 million hectares of rain-fed land, particularly in the northern Kordofan and Darfur states. Between 1971 and 2001, over ten million people in Sudan were affected by drought. In 2000, drought reduced food stocks and

caused prices to rise three-fold compared to the same period in the previous year.

Floods

Floods in Sudan can be localized, caused by exceptionally heavy rainfall, or more widespread, caused by overflow of the River Nile and its tributaries. Sudan is one of the driest but also the most variable countries in Africa in terms of rainfall. Extreme years (either good or bad) are more common than average years. During 2001, heavy rain in the Blue Nile catchment areas in the Ethiopian highlands caused the Nile to overflow, which submerged many villages and settlements. Northern and eastern areas along the Nile are worst affected, including land around Khartoum. South Darfur State has also suffered from flash floods due to torrential rains. Between 1971 and 2001, floods affected five million people in Sudan.

The first National Communication

Sudan is party to the United Nations Framework Convention on Climate Change (UNFCCC) but has no commitment towards reducing greenhouse gas emissions under it. Sudan's first National Communication to the UNFCCC showed that at approximately 0.1 per cent, the nation's contribution to global greenhouse gas emissions is minute. The land use change and forest sector constitutes more than 75 per cent of these emissions, with energy contributing 22 per cent. This latter figure is likely to increase as oil production



Sudanese women carrying firewood

Photo: © Morne van Wyk/SAPS

is flourishing in Sudan. Improved energy efficiency, use of alternative energy sources, increasing forest cover, reforesting degraded areas and sustainable forest management were suggested as ways to reduce emissions.

The first National Communication focuses on the impacts of climate change on crop production, food security, health and development. It showed that in the next 30 to 60 years both agriculture (sorghum and millet) and forestry (gum arabic) sectors will shrink in terms of crop production area. Declines in sorghum production could be as much as 29 to 71 per cent. Ecological zones are expected to shift southward. Water deficits are likely to increase due to expected declines

in rainfall and increases in evapotranspiration as the result of temperature increases. Climate change is also expected to alter the current distribution and intensity of malaria in Sudan. Malaria transmission is likely to increase, particularly in winter, because of high temperatures, although fewer cases are expected between April and July because temperature increases will be beyond the maximum tolerance limits of malaria parasites.

Preparing the first National Communication involved considerable capacity building of various national institutes in order to ensure the dissemination of climate change knowledge. This helped ensure future integration of climate change issues into policies and development programmes in all sectors.

A national plan for the implementation of the UNFCCC was drawn up. The Strategies for Increasing Human Resilience in Sudan Project was funded as part of this national plan. This project was motivated by the observation that existing strategies to increase household, community, sectoral or ecosystem resilience can help increase capacity to cope with and adapt to climate change related impacts. The project was one of 24 regional studies under the Assessment of Impacts and Adaptations to Climate Change in multiple regions and sectors programme. The studies confirmed that adaptive capacity improved where people had better access to resources, markets, technology, informa-

tion, social services, high levels of awareness, skills, security, strong institutions and effective organizations.

National Adaptation Programme of Action

Most focus in the international negotiations has been on mitigation, with adaptation only recently gaining profile. Many developing countries, in particular the LDCs, feel that adaptation has been treated inadequately and that adaptation plans need to be better integrated into national planning for sustainable development. Under the UNFCCC, the LDCs have their own separate work programme, which includes the preparation of National Adaptation Programmes of Action (NAPAs). These help LDCs inform the international community about their urgent and immediate adaptation needs. Sudan's NAPA is being prepared and will cover five areas representing different ecological zones. It will also cover three main sectors identified by the first National Communication: food security, water and health.

Activities indirectly related to climate change

Poverty Reduction Strategy Process

The Poverty Reduction Strategy Process (PRSP) began in 1999. It aims to maintain economic, political and social stability, increase living standards, help achieve debt relief, and help with the flow of external funding. It developed set of indicators for



Darfur - Makeshift shelter, Kutum, October 2004

Photo: © Ivo Freijisen/EC/ECHO

basic education (enrolment and illiteracy rates), health (rates of infant mortality, child mortality, mother mortality, malaria and AIDS) and water (drinking water provision and sanitation coverage). Current indicator levels were determined and target levels were defined, based on the Millennium Development Goals.

National Action Programme

Sudan was one of the first countries to sign the United Nations Convention to Combat Desertification. Government agencies in Sudan then prepared a National Action Programme (NAP) to help the government present its plans to combat desertification and reduce the effects of drought. The NAP recommends a range of actions including: awareness-raising and popular participation; policy priorities for combating desertification; private sector involvement for funding desertification related programmes; and, an institutional framework for complementary activities to combat desertification.

To reduce the effects of drought the NAP suggested a national strategy for drought periods to help affected communities and protect resources. This strategy is expected to lead to the establishment of committees and improved integration of non-government and community based organizations at local and national levels. The NAP focused on programmes and projects which formed part of a long-term strategy to ensure that the NAP is in harmony with, and forms an integral



Boys at the SOS School in Umbadada, Sudan

Photo: © SOS Children's Villages

component of, national efforts to achieve food security and sustainable development.

National Biodiversity Strategy and Action Plan

The National Biodiversity Strategy and Action Plan (NBSAP) aims to conserve and enhance biological diversity for the prosperity and development of Sudan. It also aims to alleviate poverty by adopting participatory ap-

proaches to development. Actions include: *in-situ* and *ex-situ* conservation, documentation, training, education and extension, and institutional and legislative arrangements.

Environment and development links

Environmental issues have only been considered in development planning relatively recently. Following the worst period of drought and famine in Sudan's history (1984 to 1985) the importance of environmental issues was recognized and a four-year programme incorporating projects of an environmental nature (prioritizing arresting environmental degradation, enhancing food security and combating desertification) was launched. However, plans and policies before 1992 treated problems as environmental issues rather than as environment and development concerns. They ignored the important role played by non-government organizations, they were not integrated and comprehensive enough to tackle environmental problems, and they focused on the effects rather than root causes of environmental degradation.

The National Comprehensive Strategy (1999 to 2002) spelled out primary objectives and priorities for sustainable development. It states clearly that environmental issues must be embodied in all development projects. It focuses on poverty alleviation and calls for incorporation of community based organizations and indigenous knowledge into the development process. It emphasizes protec-

tion and improvement of the environment in development work and recommends the use of Environmental Impact Assessments. It devotes considerable attention to biodiversity conservation and encourages the private sector to invest in conservation activities.

Legal and institutional issues

Most laws, acts or ordinances that deal with the environment in Sudan are sector based. Thus Sudan has separate environmental legislation dealing with land tenure, health, forestry, wildlife, fisheries, agriculture, livestock, public health *et cetera*. The sectoral nature of legislation is closely connected to the sectoral structure of government ministries and departments. The Environmental Protection Act (2001) aims to provide a crowning legal framework for policies, legislation and federal executive action. After Sudan committed to Agenda 21, it established a number of institutions, strategies, policies and programmes that could act as building blocks for sustainable development:

- the Higher Council for Environment and Natural Resources,
- the National Strategic Planning Council,
- the National Drought and Desertification Control Unit,
- other sectoral institutions, and
- various civil society institutions.

The main role of the Higher Council for Environment and National Resources is coordination between the different ministries that have roles in protecting, developing and



Darfur - Displaced child in Kutum taking care of her baby, October 2004

Photo: © Ivo Freijisen/EC/ECHO

sustainably using Sudan's resources. There is, however, still room to improve government institutional structures. For example, clarification regarding which level of government (federal, state or local) is responsible for planning the development of natural resources such as forests is urgently needed.

For many years local communities have practiced natural resource use based on traditional customs and regulations. Supported

by these traditions, local institutions have organized the use of natural resources and helped prevent conflict between farmers and pastoralists. Formal non-government organizations were later established under the Society Registration Act of 1957. Since then, non-government organization activities have been through ups and downs according to the political climate. The early 1980s witnessed a surge of indigenous and international non-government organization activity in response to the famine that hit Western Sudan.

Adaptation in Sudan Opportunities

Similar to many other LDCs, work on adaptation in Sudan so far includes: National Communication of emissions, vulnerability and adaptation case studies and the ongoing NAPA process. Like other LDCs, Sudan could benefit significantly from other international and local adaptation opportunities. Under the terms of UNFCCC, developed countries must "assist the developing country parties that are particularly vulnerable to the adverse effects of climate change in meeting the costs of adaptation". The NAPA tells the international community about Sudan's urgent and immediate adaptation needs, and in many ways has the same objectives as the NAP. This presents opportunities for coordination and integration of activities. The same is true for the PRSP and activities under the Convention on Biodiversity. Activities under all these

programmes can feed into the adaptation building process, but this requires coordination and integration of activities. In addition to these programmes there are other regional projects, such as the Nile Basin Initiative, and international programmes, such as the Millennium Development Goals, which could improve the resilience of vulnerable communities in the face of present and future climate hazards.

Adaptation to current climate risks is generally consistent with adaptation to future changed conditions. Development interventions in different parts of Sudan confirm the fact that coping capacity improves when community assets increase. Understanding the processes, priorities and dynamics of local communities will help with formulating

Constraints

Significant challenges exist in developing adaptation strategies. There are uncertainties in the climate change science related to the extent and rate of climate change impacts. Many strategies (the NAP, PRSP, NBSAP and other development strategies) do not particularly address adaptation. Adaptation strategies often indirectly benefit from these strategies, but broad integration is lacking. The strategies, in addition to the NAPA, all face financial constraints as no implementation funding is guaranteed. The NAPA is just the first step on the road to the practical application of action on adaptation. The first National Communication emphasizes the Kordofan Region of Sudan, so a thorough national assessment of future climate change

“the NAPA is just the first step on the road to the practical application of action on adaptation”

practical adaptation strategies. Both indigenous and project-based knowledge could be considered, evaluated, strengthened and introduced to comparable areas so lessons can be shared.

Non-government organizations such as the Sudanese Environment Conservation Society own a wealth of information that has accumulated through years of their continuous work with vulnerable communities. This could provide a good base for adaptation strategies.

impacts is lacking. This means future vulnerability to climate change (which facilitates the preparation of adaptation strategies) is hard to assess. There is a real need for capacity strengthening and developing of climate scenarios. For example, much of the Sudanese population lives around the Nile, and modeling climate change impacts on the Nile and its tributaries would provide insights into appropriate adaptation options. ■

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FURTHER INFORMATION

● **On the Web:** For the first Sudanese National Communications see: http://unfccc.int/national_reports/non-annex_i_natcom/items/2979.php. Sudan's National Biodiversity Strategy and Action Plan can be downloaded here: www.biodiv.org/doc/world/sd/sd-nbsap-01-p1-en.pdf. For more information on the Strategies for Increasing Human Resilience in Sudan Project, see <http://se-dac.ciesin.columbia.edu/aiacc/>

Operating the Adaptation Fund

Amjad Abdullah, Bubu Pateh Jallow and Mohammad Reazuddin describe a new proposal for operating the Kyoto Protocol Adaptation Fund

The 1997 Kyoto Protocol states that “a share of the proceeds from certified project activities” of the Clean Development Mechanism (CDM) should be used “to assist developing country Parties that are particularly vulnerable to the adverse effects of climate change to meet the costs of adaptation.” The Marrakech Accords specified this share as two per cent of Certified Emission Reductions, to be administered through a special Kyoto Protocol Adaptation Fund. However, due to the delay in coming into force of the Kyoto Protocol, this fund lay dormant. Two other funds for adaptation under the United Nations Framework Convention on Climate Change (UNFCCC) - namely the Least Developed Countries Fund and the Special Climate Change Fund - became operational under the Marrakech Accords, and were given to the Global Environment Facility (GEF) to manage.

Making the Adaptation Fund operational was discussed at the Conference of the Parties (COP) to the UNFCCC and Meeting of the Parties (MOP) to the Kyoto Protocol in December 2005, but there was no agreement. One of the main sticking points was the role given to the GEF in managing the UNFCCC funds. Many assumed that the Adaptation Fund should be managed by the GEF but a number of developing countries opposed this.

MAIN POINTS

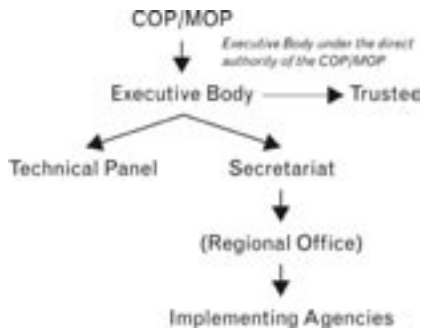
- **The Adaptation Fund was established** under the Kyoto Protocol to fund adaptation activities.
- **The authors describe** a new proposal for operating the Adaptation Fund.
- **Key proposal components**

include ensuring the 'sovereignty' of the Conference of the Parties / Meeting of the Parties over any Adaptation Fund executive body, and ensuring good regional representation, including vulnerable nations, on the body.

Instead of debating the merits of different institutions suggested as potential Adaptation Fund operating entities, we propose some necessary operating entity characteristics based on two principles:

- The decision-making processes of the Adaptation Fund should be flexible, transparent and uncomplicated. They should be balanced and reflect the needs of developing country Parties to the Kyoto Protocol.
- Funding should be reliable, adequate and cover the full costs of adaptation.

Two aspects of Adaptation Fund governance are of critical importance: the 'sovereignty' of the COP/MOP over any Adaptation Fund executive body, and the representational composition of any such body. We propose that the Adaptation Fund executive body be under the direct authority of the COP/MOP and that the COP/MOP should be able to give legally binding instructions to the body rather than just 'providing guidance'.



Proposed Adaptation Fund governance structure

To ensure balanced representation of the Kyoto Protocol Parties on the executive body, we propose applying the formula used by the Compliance Committee and the CDM Executive Board. This would involve one member from each regional group (Africa, Asia and the Pacific, Central and Eastern Europe, Latin America and the Caribbean, Western Europe and others), one Association of Small Island States member, one Least Development Country member, two Annex One members, two non-Annex One members and 11 alternate members. Regional representation is important, but any Adaptation Fund executive body should also have special representatives for groups such as the Least Developed Countries group and the Association of Small Island States, to ensure their

interests are heard, particularly if decision-making is to be primarily by consensus. We, therefore, propose that the executive body has an additional Least Developed Country representative. Moreover, executive body members should have experience in climate change and adaptation.

Procedurally, the executive body would follow the example of the Joint Implementation Supervisory Committee, CDM Executive Board and Compliance Committee. This would involve taking decisions by consensus and, if impossible, by a three quarters majority of the members present and voting. Adaptation Fund funding should focus on activities benefiting the most vulnerable developing country communities, helping them meet the costs of adapting to climate change.

The Adaptation Fund is unique because of its private sector replenishment though the CDM levy. Adaptation funding needs are unlikely to be covered by intergovernmental aid, but could benefit from additional private sector contributions. The Adaptation Fund, as the 'natural home' for these contributions, could therefore become more important than the other climate change funds. We should therefore avoid rushing to try and make the Adaptation Fund operational by forcing a choice between existing agencies. It is more important to decide on a satisfactory governance structure, which institutions would have to satisfy to operate the Fund. ■

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DISCLAIMER

● The views expressed in this article are the authors' personal views and do not represent their respective countries or negotiating groups. All authors are fellows of the ecbi fellowship programme. For information on the ecbi, see www.eurocapacity.org

CONFERENCES

EVENTS

Carbon Markets Americas

Rio de Janeiro, Brazil: 02-04-2007 to 04-04-2007

Aims to address the challenges and opportunities of launching new carbon mitigation projects across the region. First day will be a seminar on developing successful CDM projects. Days two and three will include the Biofuels Markets Americas Exhibition. Topics for discussion include: Latin American market update; country case studies; project financing; project development and verification; future uncertainties; and, energy vs. forests.

Details: Greenpower Conferences, Shakespeare House, 168 Lavender Hill, London SW11 5TF, UK. Email: info@greenpowerconferences.com
On the Web: www.greenpowerconferences.com

Climate Reconstructions: From Land to Sea

San Francisco, USA: 17-04-2007 to 21-04-2007

Conference is part of the Association of American Geographers' annual meetings. Dialogue and presentations will focus on examining the climate record on a variety of timescales and resolutions, either through analysis of the biologic or geomorphic proxy record or by climate simulations through modelling. Will cover international perspectives on all paleoclimate reconstruction and modelling.

Details: Michelle Goman, Dept. of Earth and Atmospheric Sciences, 3134

Snee Hall, Cornell University, Ithaca, NY 14853, USA. Fax: +1-607-2544780. Email: mg254@cornell.edu
On the Web: www.aag.org/annualmeetings/SF2007/index.cfm

World Environmental & Water Resources Congress

Tampa, USA: 15-05-2007 to 19-05-2007

Participants will share insights to generate best practices for the future with focus on habitat restoration.
Details: Diane Pane, Conference Coordinator, ASCE World Headquarters, 1801 Alexander Bell Drive, Reston, Virginia 20191-4400, USA. Fax: +1-703-2956222. Email: dpane@asce.org
On the Web: www.asce.org

2nd International European Water Association Conference: Water in Protected Areas

Dubrovnik, Croatia: 25-04-2007 to 27-04-2007

Co-organized by UNESCO and the International Water Association. Conference aims to discuss important issues, challenges and strategies together with threats to the conservation and rational use of protected water ecosystems. Topics will cover: water management in national parks; protected resources; threats to islands and coastal zones; and, water infrastructure in ancient cities.

Details: Croatian Water Pollution Control Society, Ulica grada Vukovara 220, 10000 Zagreb, Croatia. Fax: +385-1-6118570. Email: hdzv@voda.hr

On the Web: www.hdzv.hr

International Wind Energy Workshop: Wind Energy in the Energy Revolution in Cuba

Havana, Cuba: 22-05-2007 to 25-05-2007

Workshop will provide a forum for discussion of updates in topics related to renewable energy technology, business, market and policies in renewable energy, energy efficiency and energy education. Special emphasis will be placed on wind energy. Aimed at energy professionals as well as those working in the field from academia.
Details: Antonio Sarmiento Sera Centro de Estudios de Tecnologías Energy Renewable, ISPJAE, Calle 127 s/n Marianao, CP 19 390, Havana, Cuba. Fax: +53-7-2671644. Email: cier_2007@ceter.cujae.edu.cu
On the Web: www.cujae.edu.cu/eventos/cier

2007 Conference on the Human Dimensions of Global Environmental Change

Amsterdam, The Netherlands: 24-05-2007 to 26-05-2007

Will be the seventh event in the series of European Conferences on the Human Dimensions of Global Environmental Change. Theme for this year's discussions will be "Earth System Governance: Theories and Strategies for Sustainability". Will include plenary sessions, academic presentations and presentations of research papers.
Details: Conference Manager, Institute

for Environmental Studies (IVM), Vrije Universiteit, De Boelelaan 1085, 1081 HV Amsterdam, The Netherlands. Fax: +31-20-5989553. Email: info@ivm.falw.vu.nl

On the Web: www.2007amsterdamconference.org

Session of the Subsidiary Bodies Bonn, Germany

07-05-2007 to 18-05-2007

The twenty-fifth sessions of the Subsidiary Body for Scientific and Technological Advice (SBSTA) and the Subsidiary Body for Implementation (SBI) of the United Nations Framework Convention on Climate Change will move forward negotiations on key aspects of the implementation of the climate treaty.

Details: UNFCCC Secretariat, PO Box 260 124, D-53153 Bonn, Germany. Fax: +49-228-8151999. Email: info@unfccc.int
On the Web: www.unfccc.int

Clima 2007 Congress

Helsinki, Finland: 10-06-2007 to 14-06-2007

Working theme of the conference is "WellBeing Indoors" and focus will be on improving well being of buildings in a sustainable manner by applying latest research results and technical innovations. Main topics are: healthy and productive indoor climate; comfort and safety by modern piping systems; sustainable energy use of buildings; and, intelligent building management.

Details: Clima 2007 Congress, c/o FISIQA, PO Box 25, FIN-02131 Espoo, Finland. Fax: +358-9-43555655. Email: info@clima2007.org
On the Web: www.clima2007.org/portal/

International Symposium on Integrated Coastal Zone Management Arendal, Norway: 11-06-2007 to 14-06-2007

The multi-disciplinary conference aims to present current knowledge and address issues on advice and management related to the coastal zone. Will provide a venue for scientists, engineers, policy makers and managers to discuss advances and innovative ideas and develop networks. Four main working themes are: coastal habitats; impacts on coastal systems; integrated coastal zone management; and, coastal governance.
Details: 2007ICZM Coordinator, Institute of Marine Research, PO Box 1870, Nordnes, 5817 Bergen, Norway. Fax: +47-55-238531. Email: iczm2007@imr.no
On the Web: www.imr.no/iczm

Sharing Indigenous Wisdom: International Dialogue on Sustainable Development Green Bay, USA: 11-06-2007 to 15-06-2007

Conference is designed to bring together scholars, policy makers, practitioners and other concerned individuals who are committed to the concepts of sustainable development. Will include a forum to encourage dia-

logue, learning, solidarity and the cross-fertilization of ideas. Will focus on the natural environment.
Details: Dale Kakkak, Conference Coordinator, Sustainable Development Institute, College of Menominee Nation, PO Box 1179, Keshena WI 54135, USA. Fax: +1-715-7995951. Email: dkakkak@menominee.edu
On the Web: www.sharingindigenouswisdom.org

3rd International Green Energy Conference

Vasteras, Sweden: 18-06-2007 to 20-06-2007

A multidisciplinary international conference on the use of energy with no or reduced environmental impact. Will provide a forum for the exchange of latest technical information, for the dissemination of highquality research results, for the presentation of new developments in energy and environment, and for debate and discussion on shaping future directions and priorities.
Details: Secretariat of IGEC 111, Mälardalen University, Department of Public Technology, Box 883, SE 721 23 Vasteras, Sweden. Fax: +46-21-101370. Email: info@igec.info
On the Web: www.igec.info

Analysis of Regional Climate Change & Response Options

Nadi, Fiji: 20-06-2007 to 22-06-2007

Organized by the IPCC Task Group on Data and Scenario Support for Impact and Climate Analysis. The expert's

meeting will focus on climate-society-environment interactions that are important to understanding climate change and its potential implications. Overall aim is to explore and stimulate innovative research on connections and feedbacks across space, time and systems at scales appropriate to mitigation and adaptation decision making.

Details: Neil Leary, International START Secretariat, 2000 Florida Avenue NW, Suite 200, Washington DC 20009, USA. Fax: +1-202-4575859. Email: nleary@agu.org
On the Web: www.start.org | www.aiac-project.org

Environmental Protection into the Future

Czestochowa, Poland: 25-06-2007 to 27-06-2007

Main working themes of the conference will be: energy, renewable energy sources, power generation, clean coal; wastewater management, sewage sludge and waste utilization; environmental engineering - new approaches; economics and policy; education; and, micro-pollutants in human environment. Conference will also hold the 10th anniversary of the Faculty of Environmental Protection and Engineering.

Details: Ewa Neczaj, Faculty of Environmental Protection and Engineering, Czestochowa University of Technology, ul. Brzeznicza 60a, 42-200 Czestochowa, Poland. Fax: +48-34-3721303. Email: enecz@is.pcz.czyst.pl

On the Web: www.is.pcz.czyst.pl/konferencjelep/2007/epf_en_php

4th World Environmental Education Congress: Learning in a Changing World

Durban, South Africa: 02-07-2007 to 06-07-2007

Organizers hope to extend creative opportunities for dialogue, reflection and evaluation in the growing field that is currently engaging with the outcomes of the World Summit on Sustainable Development and the implications of the UN Decade on Education for Sustainable Development. Aimed at individuals involved in education, community organizations, businesses and government.

Details: Nina Freyssen Pretorius, The Conference Company, PO Box 47156, Greyville 4023, South Africa. Fax: +27-31-3039856. Email: nina@confco.co.za
On the Web: www.weec2007.com

13th Conference of the Parties to the UNFCCC & 3rd Meeting of the Parties to the Kyoto Protocol

Venue to be announced

03-12-2007 to 14-12-2007

Will continue the annual process of dialogue and debate over the climate treaty process. The post-Kyoto agreement will be high on the agenda.

Details: UNFCCC Secretariat, PO Box 260 124, D-53153 Bonn, Germany. Fax: +49-228-8151999. Email: info@unfccc.int
On the Web: www.unfccc.int

The Nairobi Framework

UNITED NATIONS CONVENTION

Mick Kelly reports on the latest round of negotiations on implementation of the United Nations Framework Convention on Climate Change, which took place in Nairobi, Kenya, during November 2006.

NEWS

“Climate change is rapidly emerging as one of the most serious threats that humanity may ever face,” said Kenyan environment minister Kivutha Kibwana, president of the 2006 United Nations Climate Change Conference, as he opened the meeting. “We face a genuine danger that recent gains in poverty reduction will be thrown into reverse in coming decades, particularly for the poorest communities on the continent of Africa.”

The conference, which took place November 6-17th, consisted of the second meeting of the Parties to the Kyoto Protocol in conjunction with the 12th session of the Conference of the Parties to the Climate Change Convention. The conference also included the 25th session of the Subsidiary Body for Scientific and Technological Advice, the 25th session

of the Subsidiary Body for Implementation, and the second session of the *Ad Hoc* Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol.

“Instead of being economically defensive, let us start being more politically courageous,” said Kofi Annan, secretary-general of the United Nations, in an address to the meeting. The conference “must send a clear, credible signal that the world’s political leaders take climate change seriously,” he continued. “The question is not whether climate change is happening, but whether, in the face of this emergency, we ourselves can change fast enough.”

He attacked those critical of the case for action. “A few diehard sceptics continue trying to sow doubt. They should be seen for what they are: out of step, out of arguments and out of time.” Calling on the governments of the industrialized nations to “do much more to bring their emissions down,” he referred to a “frightening lack of leadership” in meeting the challenge of climate change. Finally, he introduced the new Nairobi Framework.

The Nairobi Framework has been assembled by six United Nations agencies to help

developing nations, particularly in Africa, obtain increased funding to promote clean energy technology, such as wind and hydropower, and manage the climate threat. As part of the initiative, the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP) have set up a partnership to build country capacity to take part in carbon finance funds - the World Bank has estimated that developing nations could earn as much as US\$100 billion a year by 2050 selling carbon credits - and to decrease vulnerability to climate change.

The UNDP/UNEP partnership will operate under the banner “Helping countries achieve sustainable development in the face of a changing climate.” “Investments in roads, railways, hospitals, fisheries and power systems are underway across the sub-Saharan African region but few if any are being planned with future climatic impacts in mind,” commented Achim Steiner, UNEP head. “Some of these projects, for example a new dam, may be increasingly vulnerable as a result of more intense droughts whereas others - for example a coastal road scheme

- may be at risk from sea level rise,” he continued. “We need in-depth studies and national adaptation plans but we also need a rapid response service so that a minister, faced with a planning application, can pick up the phone and have ‘climate proofing’ expertise on his or her doorstep within a matter of days.”

The first week of the conference saw disagreement between delegates on the deadline for agreeing a post-Kyoto accord with targets ranging from the end of 2008, through 2009 to 2010. The fact that the United States President, George W. Bush, steps down in January 2009 may prove a critical factor. Harlan Watson, United States climate negotiator, said that he did not see any change in policy as a result of the mid-term elections that saw the Republican Party lose control of the House of Representatives and the Senate.

There is concern that late agreement on a post-2012 emissions reduction schedule will adversely affect the market for carbon

credits, as the industry will not be able to set the future price of carbon, and, hence, investment in clean energy. “I think it’s important to the market that an agreement is reached without delay,” said Ron Levi of brokers GFI. “If we don’t make a set of numbers by at least 2009 then the chances of the market functioning in 2012 will be very slim indeed,” predicted Henry Derwent, from the United Kingdom’s environment ministry, speaking in London recently. But 2009 is “two years too late,” according to Neil Eckert at Climate Exchange plc.

The conference eventually re-affirmed the goal of agreeing an extension to the Kyoto Protocol for the post-2012 period. This would be achieved “as early as possible and in time to ensure that there is no gap” before the new agreement comes into force. No deadline was set, disappointing some observers.

“Ministers are simply not reflecting the urgency which is being felt in the real world,”

charged Catherine Pearce of Friends of the Earth. “We are still not seeing the bold leadership which is needed here.”

There has been discussion of increasing flexibility within the post-2012 agreement in order to draw in Kyoto outsiders such as the United States and major developing nations such as China and India.

South Africa, speaking on behalf of the G-77/China group, argued that the developed nations should cap emissions first, while developing countries should first be “empowered”. Indian environment minister Namo Narain Meena described demands that developing nations take on emissions reduction commitments post-2012 as “surreal”. “Our emissions of carbon dioxide are but three per cent of the world’s total, while we have 17 per cent of the global population,” he said. “Even with eight per cent annual Gross Domestic Product growth, which we hope to attain in the near future, and which is absolutely essential to sustain if we are to succeed in eliminating mass poverty in our lifetime, it will be many decades before India’s greenhouse gas emissions approach anything like the current world average.”

Conference participants agreed a minimal review of existing measures under the Kyoto Protocol. The review will take place in 2008 and will not result in any changes to existing commitments. Developing countries had also been concerned that this review might result in demands that they adopt binding emissions targets, but a “root and branch”



Nam Dinh, Vietnam, after the Damrey tropical storm

Photo: © Luong Quang Huy

examination of emissions targets and other aspects of the Protocol was rejected.

The conference did approve the first amendment to the Protocol, by allowing Belarus to join the agreement in such a way as to permit it to sell surplus credits (albeit only after a stronger emissions reduction target was agreed). The issue of voluntary commitments was a hot topic throughout the meeting, with a proposal from the Russian Federation eventually deferred for consideration at a workshop in May 2007.

Disagreement between developed and developing countries regarding the climate treaty's financial mechanism, the Global Environment Facility (GEF), continued. While

the context of adaptation projects, support technology transfer and produce guidelines on educational aspects of project proposals.

The African focus of the 2006 Climate Change Conference did result in tangible gains for the continent. This included an explicit reference to financial resources to assist the Least Developed Countries, African countries and Small Island Developing States with start-up costs to gain access to Clean Development Mechanism projects. The conference ended with a range of decisions supporting developing country efforts to respond to the threat of climate change. The Nairobi Work Programme on Impacts, Vulnerability and Adaptation was agreed, as was management

ties. The meeting also set the rules for the Special Climate Change Fund.

"The conference has delivered on its promise to support the needs of developing countries," said Kivutha Kibwana. "The spirit of Nairobi has been truly remarkable."

There was criticism of the level of financial support currently committed. "The Adaptation Fund... may raise at most 300 million Euros for the period between 2008 and 2012. But the World Bank predicts that the most vulnerable developing countries would actually need one hundred times this amount, annually," commented Jan Kowalzig of Friends of the Earth Europe. "Rich countries are largely responsible for the climate crisis. As a matter of justice, they must now commit to far greater contributions to this fund."

"While progress was made in Nairobi, our leaders must recognize that scientific evidence and public opinion demands much stronger action than what was agreed," said Hans Verolme of WWF, the global conservation organization, capturing the mood of many observers.

● **Further information:** Additional information can be found on the Climate Change Secretariat website at http://unfccc.int/meetings/cop_12/items/3754.php. Earth Negotiations Bulletin has published daily reports and a summary of the outcome of the meeting at www.iisd.ca/climate/cop12. The Tiempo Climate Cyberlibrary lists related websites at www.tiempocyberclimate.org/portal/t25web.htm

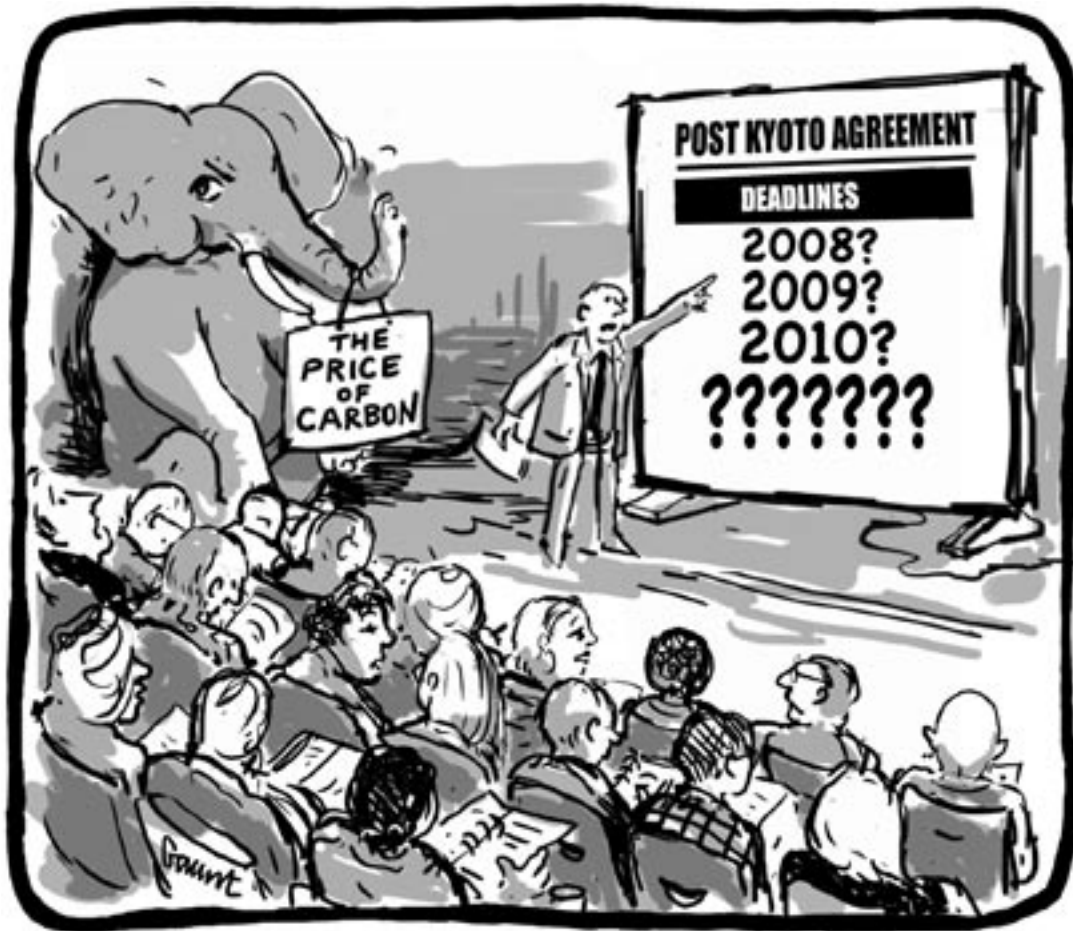
“it will be many decades before India’s greenhouse-gas emissions approach anything like the current world average”

developed countries were generally satisfied with the GEF's performance, developing countries expressed a number of concerns regarding resource allocation, conclusions of the recent performance review of the GEF, conditionalities attached to funding, and the replenishment process. In addition, there was debate over the relative weight attached to mitigation and adaptation support. Responding, in part, to these concerns, the meeting called on the GEF to simplify its procedures, address concerns over financing and resource allocation, particularly in

of the Adaptation Fund. The principles and modalities of the Adaptation Fund include:

- funding on a full adaptation cost basis;
- accountability in management, operation and use of the funds;
- facilitative procedures for accessing funds;
- country-driven projects; and,
- competency in adaptation and financial management.

Membership of the Fund's governing body will follow a one-country-one-vote rule with the majority consisting of non-Annex I par-



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Modelling adaptation?

Climate modellers regularly call for ‘downscaling’ to help provide finer resolution of projected climate variables in order to model impacts with less uncertainty. For adaptation the need is for ‘upscaling’ to cumulate and integrate the fragmentary knowledge from myriad local studies. Until we can upscale adaptation we will have no adequate measure of what adaptation could really do economy-wide to reduce impacts and vulnerability. Such measures would greatly strengthen the case for the serious incorporation of adaptation into the post-2012 regime.

The Stern Review (www.sternreview.org.uk) suffers from this deficiency of adaptation models and economy-wide measures. It provides one scenario of what could follow from a failure to restrain greenhouse gas emissions. But the consequences described are largely gross impacts and not impacts net of adaptation. The review provides de-

tailed economic analysis of the costs of ‘business as usual’ and only subsequently goes on to offer a very lukewarm endorsement of adaptation. Adaptation is described as crucial, especially in developing countries, but “it cannot solve the problem by itself” (but nor can mitigation) and “there are limits to

THE FINAL WORD

Ian Burton calls for adaptation modelling to inform a new Stern-like review quantifying economy-wide adaptation benefits

what it can achieve” (so also with mitigation). Adaptation costs are discussed primarily to show that they would rise rapidly without mitigation, not to show the need for adaptation now. Stern also states that “adaptation is complex and many constraints have to be overcome”, and “even with an appropriate policy framework, adaptation will be constrained both by uncertainty and technical limits”. Hello! Whereas mitigation is simple and straightforward with no technical limits?

Describing worst case scenarios to inform the policy process about the extreme consequences of inaction is legitimate, but less so if it fails to consider human ingenuity. It is

true that there is unequal access to modern capital-intensive and technology-dependent adaptation. But this can be changed. It is also true that there are few studies of the economy-wide benefits and costs of adaptation, and that these provide very outdated estimates of impacts reduction based on Olympian top-down ‘analysis’ and heroic assumptions, but Stern fails to give adaptation the big helping hand it needs.

More serious efforts are needed to model adaptation including the ‘upscaling’ of local knowledge. But modelling adaptation is not an end in itself. It is needed quickly to inform a new Stern-like Review devoted to adaptation. If adaptation is to be taken seriously in the policy-relevant economic literature it will have to be quantitatively modelled at national, sectoral and global levels. A start might best be made through a sectoral approach.



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