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Change magazine

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Buitenlandse Zaken

Coping with climate change

Opportunities and risks for developing countries

WIND UP THE RADIO BEFORE YOU GO TO BED

Times change. Where once you used to wind up the alarm clock before going to bed, now it's the radio. A fine example of how climate change influences our life. The no-battery, CO_2 neutral, wind-up radio as alarm clock for natural disasters in remote areas of Nicaragua.

It's daily practice in the Netherlands to be alert to extremes so we can adapt to them in time. We've been fighting the water for centuries, but the topic has attracted more than usual attention recently. It's even led to a national adaptation programme, with the collaboration of all climate ministries, to make the Netherlands climate proof. This national focus is distracting our attention from those areas where the consequences of climate change will be felt most: the third world, developing countries. Many of these countries are extra vulnerable because they are still at the start of modern development. The intergovernmental UN climate panel (IPCC) emphasises that Africa is one area where climate change will hit hardest, with major consequences for food supplies, biodiversity and rural development; agriculture, after all, makes a great contribution to the economy of developing countries.

I believe that a good example of a concrete approach is the CATALIST project, funded by the Netherlands, which is well described in this magazine. It's a practical example of sustainable development that allows entrepreneurs to get ahead. The project allows smallholders access to artificial fertiliser, they are instructed in its use, and the potential market is explored. This is tied in with the maintenance of biodiversity, food security and environmental protection. And – very important – the project makes an immense contribution to reinforcing stability in Rwanda and the surrounding countries.

Initially the project devoted relatively little attention to climate change, but over time this has come to dominate. From the Netherlands the 'Knowledge for Climate' programme is supplying the knowledge needed to make the project climate proof. We should test all our activities in developing countries for climate resistance and modify them where necessary. We at the Ministry of Agriculture, Nature Management and Food Quality can contribute by supplying knowledge and assistance in the areas of agriculture, biodiversity and rural development.

Ate Oostra
Director General, Ministry of Agriculture, Nature Management and Food Quality

PHOTO: MIEKE VAN ENGELEN

WE HAVE TO ADAPT; THE POLLUTER PAYS

When a nation is on the road to a more robust economy, the adverse effects of climate change can set things back for years. According to the World Bank, every year 300 million people in developing countries are impacted by extreme weather, while 20–40% of all aid and loans are exposed to climate risk. So climate change is a concern to us, too.

Last year, the Royal Netherlands Meteorological Institute (KNMI) presented climate scenarios for the Netherlands, setting out the probability of future extreme weather. The Dutch government is working to anticipate these extremes, for example by investing more, or sooner, in dyke maintenance or amending zoning plans. Developing countries don't have such scenarios and even if they did, such countries lack the both the capacity and means to protect themselves against extremes. The Netherlands can permit investments against a low risk of flooding. Bangladesh can't, simply because other claims on the public purse are more urgent.

We have to do two things in the adaptation area: first we have to ensure that development plans take account of climate change. This is important because we have to ensure that investments are not harmed, yield less, or make people more vulnerable to climate risks. So climate change has to be integrated into development aid. Secondly, we have to make up the account of the extra costs needed to protect people against climate change. Achieving the Millennium development goals will be more expensive due to a problem that has largely been caused by the rich West. These extra costs must not be to the detriment of the investments needed in any case, such as sending all children to school, combating HIV / AIDS, or affording the poor access to energy and other basic provisions. It's not just a Minister for Development Co-operation who has to offer an answer to the extra pressure from climate change in developing countries; it's up to the entire cabinet.

In my view we have to release money so as to influence policy and to build capacity and knowledge in the adaptation area; but the real solution is that the polluter must pay.

Ruud Treffers
Director General International Co-operation

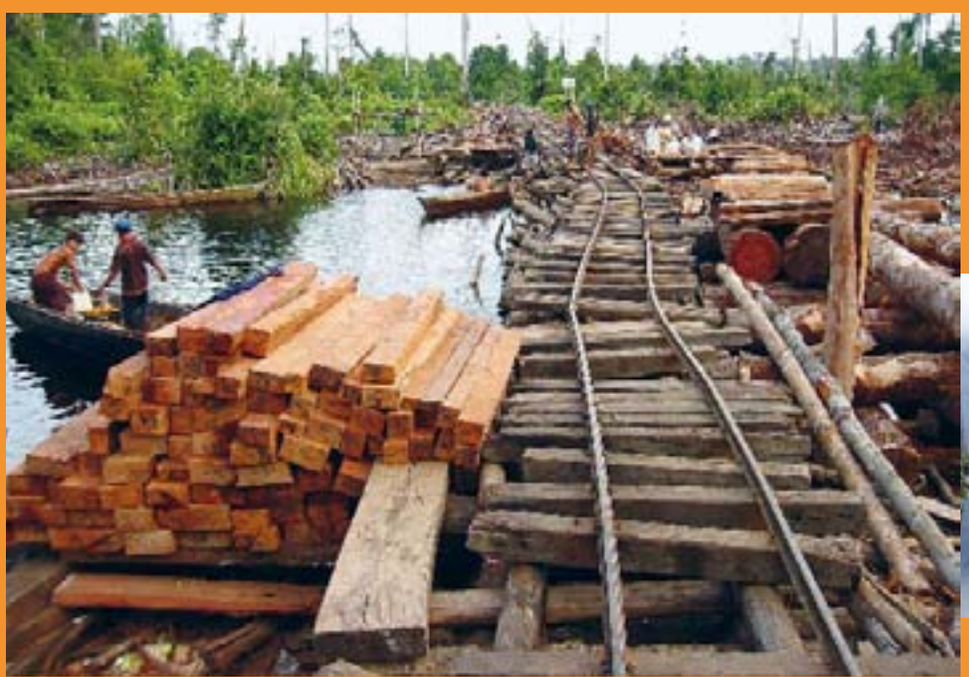
Advancing desert in Libië. Sanddunes threaten an oases in the Sahara desert.
PHOTO: LINEAIR

Contents

What does climate change mean for the poorest of the poor? They have no means to protect themselves against the consequences of climate change. But haven't they always known how to protect themselves against extreme, variable weather conditions? Are the poorest in developing countries victims or are they better prepared than everybody else?

Cover: Frugal with water. Irrigation of agricultural land in drought-hit Senegal (West Africa). Photo: Ron Giling (Lineair)

Yvo de Boer is the new chief of the UN climate bureau, UNFCCC. He is critical of the international negotiations on climate change – 'The negotiators completely mistrust each other' – and pleads for a world leaders' climate summit. The billions that adaptation in developing countries will cost must be paid in the short term by development aid ministers and after that by the fruits of emissions trading – among other things.



Twenty per cent of greenhouse gas emission is due to logging. The Coalition for Rainforest Nations is tackling deforestation by ensuring that countries are financially compensated if their forests are not felled. The Climate Convention's agenda now has an item on not felling timber.

20 Erratic weather

Dutch development projects are at risk from climate change. Scientists from Bolivia, Bangladesh and Ethiopia have looked at the relationship between climate change and poverty. The risks are sometimes so great that it would be better not to implement the projects.

46 A burning question

October 20: the flight to central Kalimantan is cancelled due to thick smoke. After hours in a car, the then Minister van Ardenne finally reached her destination: a project designed to halt the island's annual forest and peatland fires.

CONTENTS

Editorial

A quarter cent for adaptation

Holland is awash with climate news. Al Gore arrived with his uncomfortable truth, Bill Clinton with his climate urban initiative, science produced a fourth report. The UN panel of international climate scientists, IPCC, has stated that the energy-gobbling Westerner is an accomplice in the warming of the earth. The tidal wave of information has set climate change on the political agenda. Premier Balkenende's latest Dutch cabinet has also picked up the message and included the climate in its governing agreement, leading features of which are mitigation (stopping things getting worse) and adaptation (making our own country climate proof). And there's more. Al Gore is organising the climate pop star spectacle Life Earth, and shortly-about-to-become-ex Premier Tony Blair is soon to become the world's climate ambassador. It seems as if we're all in a Hooray! Climate! mood. The question is whether this rhetoric will lead to concrete measures and emission reductions.

Africa, the small island states and Bangladesh need action. Now. Innocent as they are of climate change, they will receive the hardest blows. Adaptation in developing countries will cost billions. The fourth IPCC report answers the question of who is to blame and provides implicit ways to bring an end to the squabbling about who is to pay these costs: the Polluter. Solutions are concerned with not making things worse. Mitigation is, after all, the best type of adaptation. A funding suggestion: the new Minister of Development Aid, Bert Koenders, starts talking to the automobile manufacturers. Every car with fuel consumption worse than one liter of fuel per 10 kilometers will attract an adaptation levy of 1/4 of a Eurocent per kilometer driven. An average SUV (Chelsea Tractor) has an average lifetime of 250,000 km. Several thousand are sold every year. Rake in the adaptation profit.

Baud Schoenmaeckers
Editor in Chief

Flooding on Tuvalu. The man is plodding through the debris on the flooded path to his house. This densely populated part of the island has no efficient sewage disposal system, so the tidal *taisala* or borrow pits become fouler every day. The pits were dug by the Americans in 1942 for a military base. No one has ever closed them. The Tuvalu Archipelago in the Pacific is flooded very month now the sea level has risen by 20 cm in the past century. In another few years Tuvalu will be uninhabitable and the 11,000 residents will become climate refugees.

PHOTO: JOCELYN CARLIN (PANOS / HOLLANDSE HOOGTE)

RIGHT: NASA

‘The ultimate adaptation is extinction’

Extremes of climate change hit hardest in vulnerable areas. Predictions arrive too late or not at all, so the residents are unable to prepare. The Royal Netherlands Meteorological Institute (KNMI) it trying to bridge the gap between a lack of predictions and usable information on extremes. BY BAUD SCHOENMAECKERS

Aid organisations would like to know what climate change means in about two or three months. That would allow the population to be warned in time and speedy action to be taken. ‘We’re interested most of all in extremes’, says Maarten van Aalst of the Red Cross Climate Centre. Van Aalst toured the European meteorological institutes, ending up at KNMI. According to Van Aalst, there they could ‘Answer questions about extremes within a couple of hours. We’re talking about a ‘strange’ disaster; one that doesn’t fit into the ‘normal’ picture – an out-of-season cyclone, rain in the dry season. Does this fit into the pattern of climate change or not?’

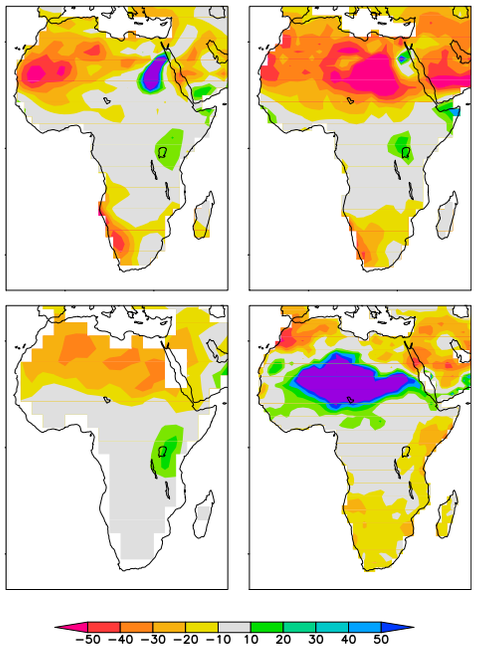
The KNMI was also rapidly able to supply a picture of changes in extreme weather in Africa. This is new, because the present climate models look at mean temperature and rainfall, but not at extremes in developing countries. Van Aalst: ‘The relationship between extremes and climate change has become increasingly clear in recent years: the fires in the Western USA, severe drought in Australia, the large numbers of hurricanes above the Atlantic in 2005. But not much has been done on developing countries.’

Erratic weather

The KNMI’s Geert Jan van Oldenborgh acknowledges this lack and understands the need aid organisations have for *rapid information*. ‘But climate is variable – rain especially. If there’s a trend towards wetter or dryer weather, that doesn’t mean that other extremes won’t happen any more. Last year Kenya had a severe drought, while floods hit them a few months later. The expectation is that it will slowly become wetter over the next century. That doesn’t mean that droughts won’t occur any more. In some areas we can see the weather becoming more extreme and erratic, that the difference between a drought and a flood year is becoming more pronounced. The present models allow us to state which way the climate’s going over the long term – from 50 years. Other effects are more important in the short term, such as the temperature of the Indian Ocean, which affects the short rains in Kenya in October–November. But it’s impossible

daily and monthly mean weather observations in 10,000 locations. The information comes from maps of precipitation, temperature, air pressure, snow cover, old seasonal forecasts and – where they have permission – the output of climate models that were run for the latest IPCC report. All data can be compared and the user's own data can be analysed.

http://climexp.knmi.nl



Changes in extreme weather in Africa. The maps show changes in precipitation around 2050 in comparison with the period 1971–2000 under different climate models. (Source: KNMI).

to give seasonal forecasts everywhere. So the long rains (March–May) are virtually unpredictable.

Climate research has paid more attention to extreme weather recently. 'This means we look closer at the consequences: floods, heatwaves, drought, gales. And we look at the associated trends,' Van Oldenborgh relates. 'After all, no one's bothered if it warms by a degree. But if the probability of a heatwave rises tenfold, then people start to worry.'

The Red Cross's question was translated into research into the predictability of extreme weather in terms of monthly and seasonal changes in Africa. Van Oldenborgh leads the project 'Changes in extreme weather in Africa under global warming', funded by the Directorate General International Co-operation of the Ministry of Foreign Affairs. They are using the Climate Explorer which he had developed (see box).

a rainstorm that wipes out half a village in a day,' says Van Aalst. 'Nor can you see severe rainfall due to cyclones. New scenarios are currently being developed for a World Bank project in Madagascar that do incorporate the cyclones.'

The technology's there, but making statements about local extremes demands more data on the local situation. It all takes time and money.

Six models and nothing to say

The outcomes of climate models can differ radically. Many a scientist is tying to find out why. A possible reason is that the model input isn't consistent throughout, or due to other uncertainties, such as the influence of clouds on local climate. If there's more certainty about that, then the question is how to parameterise the data, making it suitable for the computer. Throughout the world, thousands of scientists are working on climate models in dozens of institutes. This may well give

Nobody's bothered if it becomes a degree warmer. But if the probability of a heatwave rises tenfold, then people start to worry

The study shows it is certain that the start and end of the rainy season in Sudan and Ethiopia will be set back by two weeks. In southern Africa the rainy season starts later and the extremes will be less severe in Lesotho and south-east Africa. Some models predict 50% more rain for Ethiopia, while others give 50% less in 2100. Those models that predict more rain give no lessening in the severity of the droughts, but the periods of extreme rainfall are worse. A limitation of the study is that it can't see local extremes, 'Such as

a less black-and-white (and scientifically more responsible) picture of climate changes, but it's all too abstract for aid organisations and their adaptation programmes.

Aid organisation Cordaid can see the advantage of the models, but they have to progress more, says Sasja Kamil: 'It doesn't matter how interesting they are, I can't use six climate models at the same time. Over a period of two or three decades it's important to know what the average is and

if a given area will become dryer or wetter. We can use that when initiating large-scale adaptation projects; we can anticipate future droughts or floods. But we have to move towards local area predictions for the next few years, preferably even half-years. The work that KNMI has now done for Africa is a step in the right direction. Now they should match the presentation and the usefulness of the results to our needs and knowledge.'

Van Aalst is working with the KNMI team on making the data easier to use. 'What do you tell them and how do you communicate the outcomes, so that NGOs can understand them?' One way is to retrieve recent occurrences and give forecasts for them. Van Oldenborgh: 'For example, you ask, "Do you remember that serious drought last year? Now, that used to happen once every 50 years; now it's once every 20 years, and maybe even ten." People can relate to that better; it's more tangible.'

The Red Cross recognises the study's importance, also for the donors. Van Aalst: 'Many donors are sceptical about the relationship with climate change, shifting extremes. But knowledge about that is so important to avoid risks. Take Nicaragua. The hurricanes there have increased

In arid areas, adaptation means that cattle herders will have to switch to different animals. Camels and goats, for instance, need less water than cows.

in force and intensity. To warn the population in advance, the local Red Cross has provided wind-up radios, they've set up evacuation plans and signposted flight routes. Last year they were prepared for Hurricane Beta, so there were fewer casualties and less damage. And the food stocks were stored in hurricane proof locations. That's important because people want to resume their old life as soon as possible.'

Camels, cynicism and survival

Cordaid is doing practical things, too, though, as Kamil explains. 'In northern Kenya we've succeeded in getting smallholders who only kept cows to switch to other animals, combined in some cases with arable farming, simply because cows don't survive drought. It meant we had to persuade them they had to herd goats or camels because they were better. That's difficult because it's not just about income, but traditions going back centuries. That's why local partners are so important. We're seeing a slow turnround. Villagers who acknowledge that's it's not realistic to live as they used to, that some traditions have to be abandoned.'

Grounded in scientific scenarios and adaptation, but with both feet on the ground. A whole lot of bridgebuilding is still needed to bring these two together. Science has supplied new indicators. February 2007 saw the delivery of Part I of the fourth report by the Intergovernmental Panel on Climate Change, IPCC. This, the latest view on climate science, pays greater attention to the impacts and vulnerabilities in developing countries (this part of the report is due to appear in Autumn 2007).

The IPCC bases its report on a global average temperature rise of between 1.8 and 5.6 degrees Celsius. The report states that the probability is that we are going towards the higher limit. According to Rik Leemans, Professor at Wageningen University, a temperature increase of three degrees means that adaptation will scarcely be possible. 'That will mean survival, for both ecosystems and people in the most vulnerable areas' – the people living in the coastal zone and arid areas of Latin America, Asia, Africa and the small island states. The Tuvalu archipelago in the Pacific is flooded monthly now the sea has risen 20 centimeters in the last century. A further rise of 20–40 centimeters will make Tuvalu uninhabitable and the inhabitants will become climate refugees.

Where it's already arid there will be scarcely any increase in temperature and precipitation, so these areas will become even more arid, as in the Sahel (according to one of the KNMI participants). As Leemans puts it, 'The people who live there will become highly vulnerable. But I don't despair. There will be famine, local problems, but people are flexible, resilient. They'll adapt or leave. Many plant and animal species can't do that and they will die out – which, after all, is the ultimate type of adaptation. I know it sounds amoral, but Article 2 of the Climate Convention states that ecosystems must be able to adapt naturally to change. Extinction of species is a sort of adaptation to environmental change. Going bankrupt, not being able to carry on.'

Leemans acknowledges the cynicism. 'Of course. Adaptation is taken to imply survival. But for me it also implies a good quality of life. Now, this has a different value for everybody. Survival is possible, given enough food for your needs, economic activity, and free access to water without conflict. Switching to drought-resistant arable crops with better water retention, herding fewer cattle, if any, moving to the cities or becoming nomads. People seek survival strategies, even if they don't guarantee the best quality of life.' ●

GAP BETWEEN SCIENCE AND PRACTICE

Pablo Suarez is a Red Cross technical advisor for Africa and Latin America. 'The greatest challenge in the adaptation process? Communicating with the most vulnerable communities. That includes climate scenarios and their implications, but not putting it in those terms. I use video to let people participate in disaster preparedness – being better prepared for climate change. Sharing the experiences of local populations, discussing their own 'warning system', going through ideas on techniques and options. We listen, discuss, record video clips, integrate it all in an information film and show it in other locations, too, so that people can learn from each other. We studied the rainy season in Zimbabwe. We talked to smallholders about it, about their own experience of climate change and what science has to say about it. Lesson One: take the time to reduce the gap between science and practice, to share science with people at a level they can understand. In the field we speak the same language as the local population. If they are aware of possible disasters, then there's a good chance they will also change their behaviour.'

Masters of adaptation?

What does climate change mean for the poorest of the poor? The fisherman on a low-lying coast or a villager in the arid Sahel? Since ancient times, such people have felt climate change coming and have prepared for the consequences. But do the traditional warning mechanisms still work when confronted with a rapidly changing climate?

BY HANS VAN DE VEEN / PHOTO: TACO ANEMA, TALES OF WATER

'There's still a lot of vagueness about the measures needed to adapt to climate change,' says Ian Tellam. 'Are they different from the projects that are now being implemented to protect countries and people against the violence of nature, or is it just more of the same? That's what's being investigated, by us and others.'

When Britisher Tellam talks about 'us' in his office at ETC International consultancy, he means the Netherlands Climate Assistance Program (NCAP), which he co-ordinates. The programme is being pursued in 14 countries, partners with the Netherlands, helping them to prepare, formulate and implement an international climate policy. Put concretely, national study teams are formed to organise workshops and formulate policy recommendations. Their findings can be seen at www.nlcap.net and are shared in international workshops, so that experience is communicated as widely as possible.

The NCAP programme will be completed in mid-2008. It was set up by the Ministry of Foreign Affairs. As Christine Pirenne, member of the Ministry's Climate Policy staff, says, 'Climate change affects areas that are important for a country's development: water management, agriculture, education. We want all information on climate change to form part of the decisions made in these areas. That's important if the investments made are not to be harmed or even lost entirely thanks to weather extremes. The Climate Convention (see also p. 36) asks developing countries to develop policy and a plan for action. We set up the NCAP to help countries do this and thus to comply with the obligations under the convention. The problem is that the policy is often part of environmental policy, while what you really need is action from people working in other areas. It's not always easy to motivate these people to take account of the adverse effects of climate change. That's mainly because the information we have is still to crude for a specific region, it's not accessible enough to policy staff, or it's based on a large degree of uncertainty, which leads to inertia. Other matters are more urgent, which is logical.' The programme is costing the Dutch government € 6.3 million.

Infrastructure and glacier lakes

'The idea is to build capacity and awareness,' says Tellam. 'We're trying to support the people in a country who are concerned with adaptation. Usually there are only a few of them and they don't have much clout. With our support they get a bit more influence, which can lead to changes in government policy. But it takes a lot of time to make our approach clear.

Weather's unpredictability renders ancient wisdom useless

Focusing on the lower echelons, the very poor, is not really very common.' But that's what the NCAP is asking the study teams to do. 'With adaptation one's thoughts rapidly turn to infrastructure,' says Tellam. 'Things like bridges, dykes and storm barriers. The meteorological, water management approach. We don't ignore that, but it's not our first priority.' Examples of the water management approach are studies of the consequences to the local population of a reduced water supply in rivers.

In Bhutan money has been spent on purchasing computers, with which they calculate when the overfull glacier lakes will overflow. And in Guatemala, after Hurricane Stan, thoughts turned to the coastal roads that had been washed out. 'The question was whether you should rebuild these roads in the same place, if you know that the probability of similar hurricanes is increasing. Maybe you should build them higher up the mountain. It's important to know how high, though, because every meter higher costs more money,' says Tellam.

Folk wisdom

The emphasis of the NCAP programme is on the social component, which can be captured in the question, 'What does climate change do to people's livelihood?' Tellam says that, 'To clarify this, we don't offer top-down solutions; rather, we go into the villages and ask the local population how they've always protected themselves and adapted to climate change.'

Following this idea, research was done in three communities in Mali, West Africa, into the way water was used (such as washing, cooking, irrigation, and watering cattle) and the way consumption was expected to increase. Consumption was calculated for different climate scenarios. The information was sufficient to allow the development of alternative technologies, offering a considerable decrease in water usage. Government officials were also trained in water management.

In several low-lying coastal provinces in Central Vietnam, an NCAP team investigated how the inhabitants protected themselves against storms and floods. One of the conclusions was that people mainly rely on their own experience: they 'felt' the changing weather coming, or knew when it was to be expected, and prepared for it. The problem is that this knowledge has become inadequate in recent years. Storms are increasingly unpredictable, it's getting warmer and dryer, and the rains and associated floods are happening more often outside the normal rainy season – precisely when they are no longer expected. So the climate change that the locals state is very evident right now, is rendering ancient experience (in the form of stories, proverbs, songs and folk wisdom) useless.

The government is trying to deal with the changing situation with early warning systems. Not everybody is happy with that. A storm warning, for instance, involves a three-day ban on putting out to sea and compulsory removal of the entire family to high ground in the area. This brings poor fishing families into immediate financial difficulty. If such a warning turns out to be a false alarm (it is difficult to predict precisely where a tropical storm will touch land) then there's a fair chance that the following warning will be ignored.

This is one of the many examples of the radical way in which climate change is influencing the life of 'ordinary' people. The challenge is to help them formulate their responses to it. ●

In brief

BAUD SCHOENMAECKERS

Bangladesh
Life no longer safe in the chars

Five million people live in Bangladesh, an area of mudflats formed by the sand and silt deposited by the great rivers. They are vulnerable to sudden flooding, erosion and loss of land due to the powerful flow of the river, which constantly changes course. This makes life in the chars dangerous and uncertain.

Climate change impacts the water budget in the chars. Changing precipitation patterns and the accelerated melting of the Himalayan glaciers mean that more water is flowing to the sea, less regularly. The ever-changing floods that have impacted the chars since time immemorial are becoming more unpredictable and more severe. Ironically enough, between the floods the plains are drying out more thanks to measures taken to prevent flooding, like canals dug to carry the river water away faster. In the north-western district of Gaibandha, Oxfam Novib is supporting the local organisations BELA and GUK, which are trying to prepare the local population better against flooding and cyclones. For example, they are creating mounds to serve as refuges and changing agricultural methods. Young children receive swimming lessons and the people are given lifesaving floats.

The UK development aid programme DfID is also active in the region with the Chars Livelihood Program, which has raised more than 10,000 dwellings so that they lie above a water level that is expected to be exceeded only once a century. (HvD)

(HvdV)

RWANDA
‘After so many deaths, too many births’

In February, Rwandan President Paul Kagame announced he wanted drastic birth restrictions. The population has quadrupled in 50 years; Rwandan women are bearing an average of 6.1 children. It will be difficult to implement the proposal because of the 1994 genocide, religion, children as status symbol and the suspicion that one ethnic group will become more populous than the other, all of which ensure that birth control remains taboo. After the slaughter in 1994, when 80,000 Rwandans met their end, it seemed impossible that overpopulation would ever become a problem. Reality (too many people on too little fertile land) is compelling the government to take measures.

(Source: Rwanda News Agency (ARI/RNA))

CAMEROON: Logging for biodiesel

To take advantage of the increasing demand for biofuels, Cameroon wants to see a spectacular increase in palm oil production. Between 2001 and 2006, 30,000 hectares of forest were stripped for palm trees, partly financed by the World Bank in a drive to modernise agriculture. The expanding plantations are leading to conflicts with the land’s original owners. Besides logging for fuel, the creation of plantations is the primary cause of Cameroon’s deforestation. The monoculture is causing a drastic alteration in the ecosystem, forced removal of native populations, and the destruction of centuries-old traditions. **(Source: IPS)**

The sustainability of biomass

Biomass is seen as a sustainable source of energy. Governments seek to use it on a large scale for transport and energy. But how sustainable is biomass?

BY LAURA VAN DEN BRINK

There is a growing need for energy. The consequences are well known: increasing fossil fuel consumption; more CO_2 emissions; enhanced greenhouse effect. Biomass is one of the serious options for resolving the energy problem while reducing CO_2 emissions. After all, the carbon released when burning biomass is taken up by the newly planted crops. Biomass is not yet completely CO_2 neutral because it's usually used in combination with fossil fuels.

The sustainability of biomass is a matter for debate in society. On 27 January the headline in the Dutch newspaper *de Volkskrant* read, 'Food dearer thanks to biofuel popularity'. In Mexico the people's No. 1 food is the tortilla, made from maize flour, and it has risen so much in price that Mexico's President Calderon has announced a price ceiling for maize, because maize fetches more as bioethanol than as tortilla flour.

To get a better insight into sustainability dilemmas, in 2006 the project group Sustainable Biomass Production presented the Dutch Government with 'A long-term, socially acceptable view of what sustainably produced biomass is, when it is imported as raw material and energy source', as the official mandate has it (see box on p. 16).

The demand for biomass in Europe has risen to meet the targets for sustainable energy. In the Netherlands, 10% of the total energy produced in 2020 must be sustainable, of which at least one-half will come from biomass.

Prices are rising because maize fetches more as bioethanol than as flour for food. Mexico has set a price ceiling to prevent a 'tortilla revolution'

There is a European agreement that petrol and diesel must contain 2% biofuel from 2007. This share has to rise to 5.75% in 2010. Experts state that this ambition can only be realised with new technologies and cropping methods.

Undermining subsidies

Government subsidies are available to encourage the electricity producers to generate low-environmental-burden ('green') electricity. One of them is the Dutch MEP – Environmental Quality Electricity Production, which is available for wind energy, biomass, solar energy and hydropower, and for combined heat and power (CHP) plants. The subsidy amounts to between 0 and 9.7 Eurocents per kilowatt-hour generated. The subsidy has been stopped for new arrivals after

Offloading palm oil fruits at a processing plant in Dengkil, Malaysia.
The oil palm is the most despised plant in the world, held responsible for the destruction of tropical forests, the disappearance of the orang-utan, widespread air pollution in Asia, and exploitation of labour. At the same time the palm is seen as a saviour of the environment because the tree fruits often and vigorously, yielding palm oil. The tree is a symbol of how sustainable the large-scale production of biomass is.

PHOTO: AHMAD YUSNI (EPA/ANP)

August 2006, because the MEP target of 9% sustainable electricity in 2010 will be achieved with the present investments, so why do more than the accountants tell us is necessary?

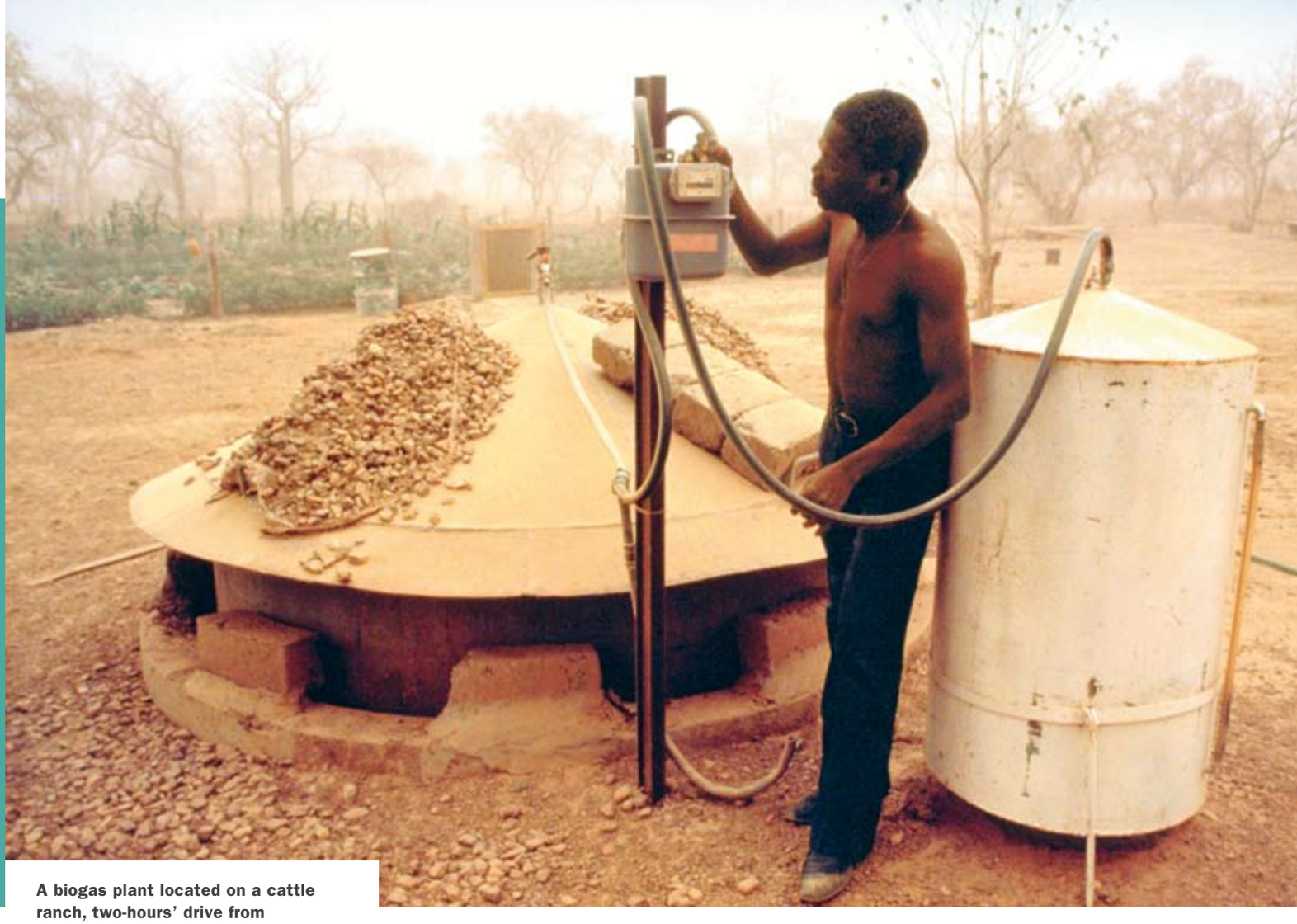
As Wolter Elbersen, biomass researcher at Wageningen University (WUR), puts it, 'Sometimes subsidies tend to undermine rather than encourage. The present MEP subsidy, for example, is time-limited and uncertain because the government can stop it. Subsidies provide short-term incentives that don't encourage business to make large-scale investments.' Examples are thermal processes such as torrefaction (see box Biomass), and technologies that use wastes, like palm-oil production by-products or straw from agriculture.

In de markt investeren

New technologies most often supply cheaper, more sustainable biomass, but they also demand larger, longer-term investments. They are therefore slower to penetrate, while more is done with familiar and thus cheaper techniques. These, however, use high-value (food) crops, such as grain and oil. The CO_2 reductions are achieved, true, but this scores lower on other sustainability criteria, such as competition with food crops.

Jan Willem Erisman, manager of the Biomass, Coal and Environmental Research unit of the Netherlands Energy Research Centre (ECN) says that, 'Subsidies have to focus on accelerating and introducing innovations, and sometimes on developing the market, too.' An example of a market that could have done with a push is the present generation of solar cells. For a long time solar panels were installed with the help of grants, while subsidies went to panels that never saw the light of day. A lot of money went into technological development, but too little went into a market. The market collapsed when they stopped the grants for panels. The small market meant that the sustainable energy yield was too small in relation to the costs.

Erisman believes that there is a gap between a technology's availability and its introduction onto the market. 'That puts a brake on the innovation of sustainable and relatively sustainable technologies for



A biogas plant located on a cattle ranch, two-hours' drive from Ouagadougou, capital of Burkina Faso. Employees aid the nomadic Peuhl people by vaccinating their cows and with advice. The cow dung is used in the biogas plant. Energy from the plant is a sustainable success story of the small-scale use of biomass.

PHOTO: RON GILING (LINEAIR)

biomass production. Entrepreneurs have to invest a great deal in that development. So if the market for the products produced with the new technology is too small, then they become too expensive to continue with. Subsidising the products or the production chain can make the step to the market more attractive and increase the share of sustainable energy. So – albeit unintentionally – subsidies ensure that more sustainable techniques are often not developed to maturity, which means that it's not clear which techniques are most sustainable.'

The world large or small

The cause of vagueness about sustainability is that basic premises differ, the criteria for sustainability are still being developed, and even simple questions aren't straightforward. For example, how much land is needed to meet the current requirement for the use of biomass as vehicle fuel?

Too much, according to Martijn Katan, Professor of Nutrition at the Free University. 'Fossil fuels are the organic remains of millions of years, which we are burning up in a short time. It's impossible to produce an equivalent quantity of organic material in a modern, short cycle of growth and combustion. Even new technologies can't offer a biomass-based solution to the transport fuel energy problem.'

Katan believes that we have to cut consumption because the world simply isn't big enough to provide for the growing demand for transport fuel. 'If you want to meet the EU target of 5.75% in 2010, then with the current technology for converting rapeseed you'd need nearly two-thirds of all the arable land in the Netherlands.'

Johan Sanders, agrotechnologist and food scientist at Wageningen University, thinks this is too gloomy. 'The basic premises underlying the calculation could be different. For example, they don't take account of the fact that a lot of good and marginal land in Africa is either underutilised or not used at all. Or that it's fine to use the entire plant, rather than just the seeds. Or that a lot of waste can be used as biomass. Do that and you get a different computation of the areas needed.' Other aspects that can influence the calculation are the utilisation of products with a greater energy yield per hectare (high-grade biomass) such as aquaculture of commercial seaweed fields, and increasing the efficiency of production using machines and artificial

POWER STATIONS AND OIL LAMPS

Biomass is a collective name for organic material that can be used as fuel: waste from food and plants, trees, rapeseed, organic wastes. Throughout the world biomass has been used from time immemorial for cooking, lighting and heating. It is still used today, both in developing countries and here in the Netherlands on domestic hearths, wood stoves and oil lamps.

Unprocessed biomass is not suitable for large-scale use in power stations or as transport fuel, but processing techniques are available and more are under development. Some processes supply a biomass product that can also be used locally as fuel, being cleaner than coal or charcoal, while using material that would otherwise go to waste. Jan Willem Erisman has an example of a product that ECN is developing. 'Torrefaction is a technology that makes large grains of biomass by roasting and pelletising. The pellets can be used in power stations as well as stoves or small ovens, as in developing countries. It's clean, has a high energy yield, it's easy to transport and can be stored for a long time. If small-scale roasting plants are built, they can use local waste products to make the grains. That's a pretty good contribution to a sustainable energy supply.'

fertiliser. As Sanders puts is, 'There are several answers to the problem of space; there is no single best answer for the entire world and so we have to hedge our bets. I'm certain that the use of food crops for fuel production does not cause famine in developing countries.'

Continuing debate

The growing demand for biomass offers opportunities to developing countries. Extra planting absorbs carbon and contributes to compensating the CO_2 emissions. If planted in the right place, biomass cultivation can serve in the fight against erosion or as a flood defence. Greater use of the waste material from food crops will increase the local food supply. Creating plantations can result in improvements to infrastructure and the provision of public utilities. But risks are attached to a rapid growth of biomass production, while too little is known to be able to assess the risks and take countermeasures. That demands more research, more information on the consequences of our desire to replace fossil fuels by biomass, and on further improving the sustainability concept. Completely sustainable biomass will be a long time coming, but the debate continues. ●

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SIX HARD REQUIREMENTS

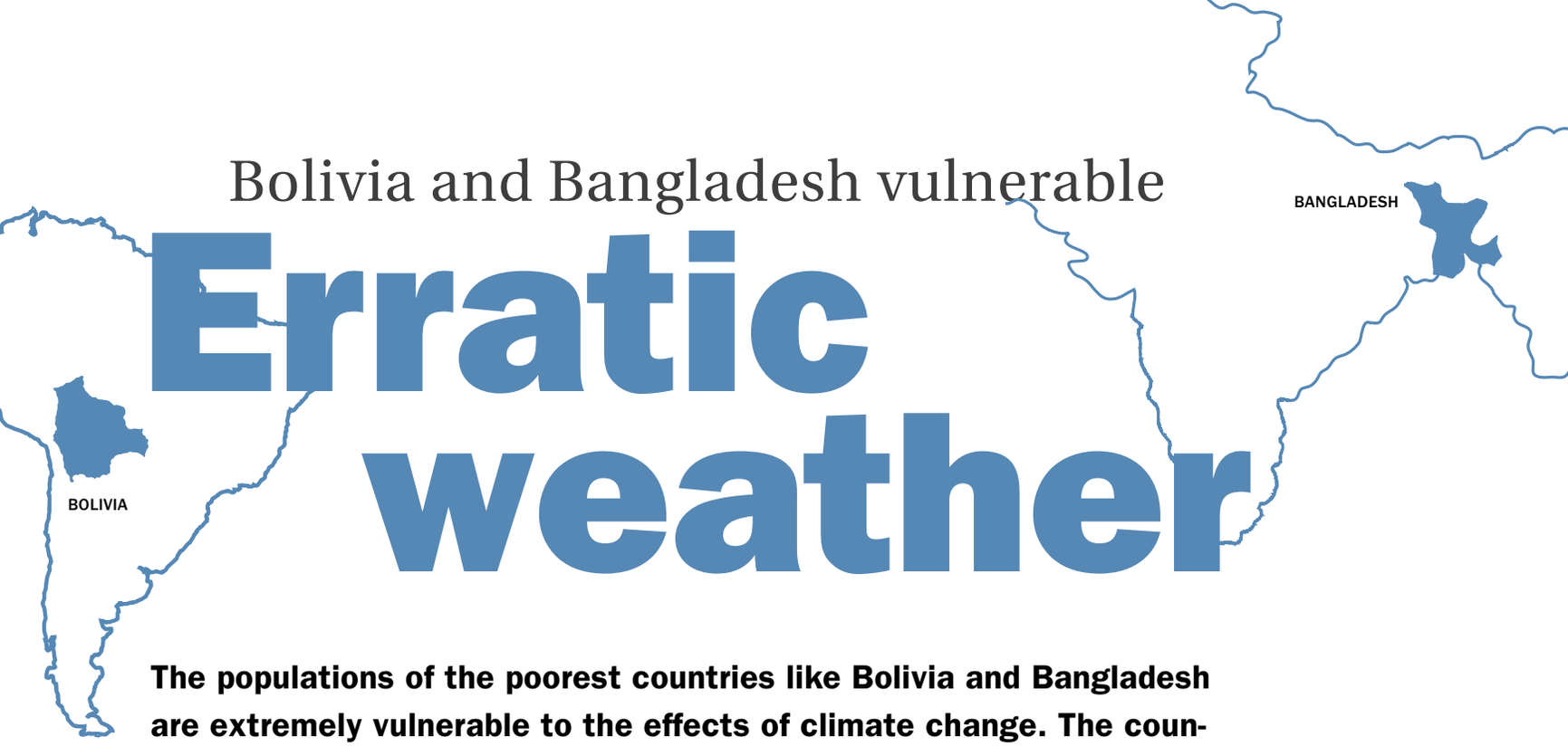
The criteria in the report rest on six interlinked themes. Artificial fertiliser, for example, particularly in the form of high concentrations of the raw material, ammonia, leads to soil acidification, while the excess drains into water, leading to algal growth. Incorrect application releases N20, a greenhouse gas that is 300 times more powerful than CO_2. From 2007 the production and use of biomass must meet the requirements for greenhouse compensation, competition, biodiversity, environment, public health and welfare. Four of these themes are explained in greater detail below.

GREENHOUSE GAS BALANCE: The goal here is to cut greenhouse gas emissions by 30% compared to the use of fossil fuels. The calculation is based on emissions throughout the entire chain: whether or not artificial fertiliser is used; how the soil is treated (tractor); transport (long distance or local).

COMPETITION: Data must be supplied on the availability of biomass for food, local energy supply, building material or medicines. Land, water and fertiliser will more likely be used for the production of food, medicines or building materials if the prices are high. The societal debate on food for fuel gave a significant impetus to drafting competition criteria.

WELFARE: There must be no adverse effects on the welfare of employees and local populations, taking account of working conditions, human rights, ownership and use rights, local social conditions, integrity (such as common usage entitlements). The local population must have a voice and must be able to see the consequences if (virgin) land is sold for plantations.

ENVIRONMENT: There must be no adverse effects on the local environment, taking account of waste management, chemical use, erosion prevention and soil exhaustion, active improvement of the quality and quantity of surface and ground water, and atmospheric emissions.



Bolivia and Bangladesh vulnerable

Erratic weather

The populations of the poorest countries like Bolivia and Bangladesh are extremely vulnerable to the effects of climate change. The countries themselves are scarcely aware of this, while most international donors just look on. The Netherlands wants to change things.

BY HAN VAN DE WIEL / PHOTO: ADEK BERRY (AFP)

What are the risks to Netherlands' development projects from climate change? Early in 2007 scientists from Bolivia, Bangladesh and Ethiopia came to The Hague to explain their research in this area. Their report should move the relationship between climate change and poverty issues higher up the agenda. The research is funded by the Ministry of Foreign Affairs / Development Aid.

Climate change impacts most severely on the poorest in developing countries because it is they who live in the most vulnerable areas and have no money to protect themselves. The Netherlands is one of the few OECD nations to be concerned with the risks from climate change to investments in development projects, says the Argentine consultant Pablo Suarez, a specialist in adaptation. With Javier Gonzales Iwanciw he investigated the situation in Bolivia. He tells us, 'Building a school in an area that floods regularly is a mistaken investment. Peasants who are helped to acquire land don't benefit much if it can't be used for farming because of flooding. Developing crop species that are vulnerable to changes in the weather isn't sensible.'

Erratic and urgent

Bolivia is barely aware of climate change, Suarez believes. 'Every Bolivian can see that the weather's different. The glaciers are melting, precipitation patterns are changing; water flow in the rivers is different. But the events are seen as independent, erratic variations in the weather. They've happened before. They're not viewed as symptoms of global climate change.' Bolivia has no scientific data to make better forecasts, Gonzales says: 'The universities started to collect systematic data only very recently. That's not easy in Bolivia. There's great geographical diversity, from rainforest to glaciers, and the meteorological service is weak. Anyway, there are so many other, more urgent problems in this country, the poorest in Latin America.'

The consequences may be gigantic, Gonzales says: 'It expected that the glaciers will completely melt away. That will lead to problems with the drinking water supply in cities like La Paz and El Alto. Higher temperatures will lead to less snowfall and more rain, increasing the probability of flooding in the valleys. The flow in the rivers will reduce sharply in the dry season as there is no melt water.'

Grapes and hailstorms

The report assesses the climate risks to 17 development projects to which the Netherlands contributes financially. Five are high risk, five have an average risk, while two are low risk.

In one of the case studies the scientists assessed the climate risks to a Dutch project that seeks to raise viticulture in Southern Bolivia to a higher level, the goal being to increase the income of the poor grape farmers. Suarez explains, 'The basic idea underlying the project is that grapes do well in this part of Bolivia and that they will continue to do so. But we think that's not certain at all. There's a greater probability of hailstorms, earth slides and epidemics. Climate change is also responsible for increasing the area of the region where grapes grow, so more grapes

Jakarta flooded in February 2007. Dozens of people died, tens of thousands lost their homes, all of them dwelling in the city's low-lying, poorest areas.

go to market and prices fall. These are factors that have to be taken into account when choosing to invest in viticulture. But the main thing that's needed is more research.'

Bangladesh is similar to Bolivia. 'Ordinary people see the seasons change, but they don't get the reasons,' says Ahsan Uddin Ahmed. This specialist in atmospheric pollution, with Dutch consultant Rob Koudstaal, is responsible for the Bangladesh study. A difference here is the good scientific knowledge about climate change. Whether that makes much difference in practice is the question, though. 'Politicians are mainly concerned with acute problems. They want to fight poverty, send more children to school, improve health care. But the consequences of climate change will more or less wipe out any gains they may make.' That's why Ahmed and Koudstaal recommend making adaptation a fixed component of a sustainable development strategy for Bangladesh.

Ground water with arsenic

An assessment of the Dutch development projects tells us that climate change does not pose a risk, with the exception of the WASH programme (Water, Sanitation and Hygiene), which the Netherlands is conducting jointly with BRAC, one of the largest Bengali development organisations. WASH provides drinking water to tens of millions of people by large-scale well digging into aquifers – underground water-bearing strata. There are serious objections to this method, one of which is arsenic poisoning. Another is the infiltration of salt water into the aquifers, which is now apparent in many locations. Above all, nobody knows how much ground water there is. What they do know is that it is not being replenished. The problem of climate change comes on top of all this, says Koudstaal. 'The rising sea level and reduced water run-off are becoming increasingly significant for the drinking water supply. You have to view this problem strategically, but donors have their own agenda and the Bangladesh government doesn't have the institutional capacity to manage water.'

Melting glaciers cause drinking water problems in major cities. More rain causes flooding in the valleys

Koudstaal views with trepidation the moment when the international donor community embraces adaptation en masse. 'With even a bit of bad luck you'll see the same mechanism: donors start building locally, because they all want to have something tangible to show.' What they lack is the long-term planning and institutions to systematically test all activities against the plans. 'Decent research has to be done into peoples' vulnerability and then the government has to take over the reins. You can't impose insights from above, they have to arise spontaneously.' ●

DEVELOPMENT FIRST

Climate as

Does climate fit on the same agenda as gender, environment, good governance and corruption? All popular themes with Western donors, but do they link up with the priorities of Southern policy makers? What's needed is an approach where climate policy and development reinforce each other. BY HANS VAN DE VEEN / PHOTO: DAVID H. WELLS (ANP)

A point to note: greenhouse emissions in China dropped by 15% between 1996 and 2000, while the economy grew by 35%. The drop in emissions was due to a combination of price reforms, improved environmental management, and restructuring of the energy industry; measures with economic and societal advantages. Concern for the climate played no part.

Marcel Kok of the Environment and Nature Planning Bureau (MNP) thinks that the Chinese approach is a fine example of development with beneficial climate effects. The same holds for the Brazilian ethanol policy. So many cars driving on biofuel is not only good for employment and the state's treasury (less imported oil), it also results in considerably less greenhouse gas. (Biomass sustainability is discussed on p. 14, Ed.) Kok explains, 'A lot goes on in developing countries that's good for the climate. Western donors have to link up with that rather than drone on about priorities in developing countries. For instance, energy security keeps far more countries busy than the climate. Help them with that.' Besides the Brazilian and Chinese examples, there are others that show how development policies are beneficial to the climate (see www.developmentfirst.org).

Resistance in climate negotiations

The examples illustrate in a nutshell the philosophy underlying Development First, in which 12 research institutes from industry and developing countries collaborate. Co-ordination is in the hands of the UN Climate Centre in Risø, Denmark, MNP in Bilthoven, the Netherlands, and the International Institute for Environment and Development (IIED) in London, UK. The Dutch Ministries of Public Health, Spatial Planning and Environment (VROM: environment) and Agriculture, Nature Management and Fisheries (LNV: agriculture) are the major funding agencies.

In many developing countries there is a resistance to action in areas that they don't see as their problem, even though they are the most vulnerable to climate change. In international climate negotiations this resistance regularly leads to an unproductive North–South stand-off. Kok explains, 'You reduce polarisation by acknowledging that climate change is a marginal topic in many developing countries, even though

Urban traffic in the centre of Dhaka, Bangladesh. Tackling traffic congestion in megacities cuts local air pollution and health problems and contributes to a reduction of greenhouse gases.

a side issue

things are changing. It's subordinate to urgent issues like food security, combating poverty, access to energy and urban transport. With Development First we show what types of development are good for the climate, both in terms of reducing vulnerability and making progress on reducing greenhouse gas emissions.'

Don't force priorities

The Development First project fits in with new thinking about development aid. This involves not forcing priorities and as far as possible avoiding preconditions. The basic premise is that aid is only effective if the countries themselves are responsible for their development process. Maarten Brouwer of the Ministry of Foreign Affairs watches over this premise, 'In combination with our own priorities and policy agenda. We try to achieve these where our partners can agree with them. If there's a gap, then we see if it can be bridged. Success or failure depends on whether the other party can identify an interest, becomes convinced of the advantages.'

Right to cars and refrigerators

According to Brouwer there are two themes that invoke resistance among partners: gender and environment. He explains, 'The position of women – that can be resolved ultimately. But there's always an accusation with environment: why can't we fell our forests when you've been doing it for ages? And don't we have a right to cars and 'fridges? That's a difficult one to fend off. And then climate has an extra dimension, in that the present difficulties have largely been caused by the industrialised countries.

Above all, the difficulty is that climate plays no part in national plans for combating poverty, the Poverty Reduction Strategy Plans that form the basis for development co-operation. As far as they can, donors support these plans collectively, rather than coming along with their own priorities and projects. As Brouwer says, 'We try to show the advantages of a climate approach, for instance by looking at what an appropriate energy supply is and how energy can be used more efficiently. What about the vulnerability of developing countries if the climate changes? What you absolutely must not do is rattle a sack full of money. That doesn't get you commitment and certainly not ownership.' ●

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PARIS DECLARATION

After three days of talks, rich and poor countries and international development agencies accepted the Paris Declaration in March 2005. In it, the international community formulated ambitions for development co-operation and drafted indicators. Measurable targets and a time-frame were written in. For example, in 2010, three-quarters of aid funding will be paid out according to an agreed schedule, so that the recipient countries have a better idea of what they can expect

In turn, developing countries promise to set up a national development strategy, devoted in part to combating poverty, to which donors can agree. According to Van Ardenne, ex-Minister of Development Co-operation, the Paris declaration will lead to 'less fragmentation and waste, greater direction in developing countries, more collaboration between donors, with more effective aid as a result.'

Some goals were not clearly formulated in Paris, so the EU agreed that in 2010 at least one-half of all aid would be transferred directly to the recipient countries, as budget support or in support of a broad sector such as education rather than being earmarked for projects or services. A precondition is that the country works seriously on good governance. The developing countries' needs and priorities for combating poverty must take priority rather than the wishes of the donor community.

AGRICULTURE ROUND THE GREAT LAKES

Fertiliser for peace

Too many people, too little land. A time bomb that last exploded in Rwanda in 1994. A drastic agricultural reform can ensure stability – and prevent the next explosion. The most important tool? Fertiliser. BY BAUD SCHOENMAECKERS / PHOTO'S: HELPAGE

Agriculture, environment and population growth mean battle in the region. Maresa Oosterman, of the Netherlands Embassy in the Rwandan capital, Kigali, tells us that, 'The underlying tension in eighty per cent of the conflicts in Rwanda, Burundi and some eastern parts of the Democratic Republic of Congo (DRC) is about land. There's great pressure on scarce land, which was one of the causes of the 1994 genocide. If the fertile land just washes away from under your feet you also lose the foundations of stability. If the region wants to advance the land will have to be made more productive. Birth control is out of the question because one ethnic group wants to be stronger than the other, and that includes numbers. And you can't create more land because there isn't any.'

Rwanda attempted to do just this in 1995, when two-thirds of the Akagera game reserve was opened up for use. It was an infertile area at the time and it's still on the decline. Cattle wander in what's left of the preserve, grazing everything bare, while intensive use is exhausting the soil. Moreover, 40% of the water for Lake Victoria flows through the area, so further decline must be prevented.

The soil in the area is exhausted and the consequences are dramatic: the food supply is uncertain, there's poverty, erosion and pressure on surrounding nature reserves. 'Where there's grass you have grazing cattle. Where's there's water there's fishing. There's poaching and illegal logging in the game reserve. Biodiversity and water supplies are under threat. If you want to tackle the problem you have to look at its roots: make the land more fertile.'

Great ambitions

The answer seems to have been found in CATALIST (see box), Oosterman says. 'The project is set up regionally. It's all about stability, agriculture, environment, cross-border trade and jobs. It can help compensate for the consequences of climate change and it will stop further

SWISS AFRICA

Rwanda, Africa's Switzerland, is centrally located in the Great Lakes area. It's a country of a thousand hills, where tourists are attracted by the volcanoes and nature reserves, with a unique biodiversity, and where the world's largest rivers, the Congo and the Nile, obtain their water. The social unit in Rwanda isn't the village but the colline – hills of innumerable, picturesque huts built up against the rock faces. The people are reserved and decent. Many women smoke pipes. Rwanda is also the country that the world knows from the 1994 genocide. Between 800,000 and 1 million people were slaughtered in 100 days by extremist Hutus. Since 2001 it's been quiet in this central African country, three-quarters the size of the Netherlands, with a population of 8 million, situated between Uganda, Burundi, Tanzania and the Democratic Republic of Congo. The Rwandan population comprises 84% Hutu and 15% Tutsi, but no-one knows this for sure: it's officially forbidden to discriminate.

The land in the Great Lakes area is exhausted, resulting in poverty, food insecurity, unemployment, instability, and pressure on surrounding nature reserves.

The land on the innumerable slopes is farmed by thousands of smallholders. One heavy rainfall and everything is washed away – both the crops and the fertile soil layer. Climate change means that heavy rains are increasing in frequency and intensity. Clear-running streams change into rivers of mud, further eroding and degrading the soil.

By using artificial fertiliser, the limited area of agricultural land in Rwanda will be used to the full, leading to increased yields. The greenhouse gas released (N_2O, laughing gas) can be limited if fertiliser is mixed in the right proportion with organic manure and used at the right dose. In the CATALIST project they are careful to give the soil exactly what it needs. Other conditions for success are good public information, careful purchasing of the right materials, correct use of the prescribed methods, and good legislation.

damage to the forests and preserves. It helps to ensure that the climate problem won't get any worse and is preventing the loss of one of the 'water towers' supplying the Nile and Congo river basins. It looks ambitious but we believe this project has a chance of success thanks to the integral approach.'

'We' in this case is not only the Netherlands Directorate General International Affairs (DGIS) but many partners, present and future (see box 'From local smallholder to FAO').

The most important tool is fertiliser. IFDC's Henk Breman: 'The area has many steep slopes that are farmed in the traditional way. So there aren't any terraces and everything's washed away after a single rainfall. The average landholding in Rwanda is 0.75 hectare, with five or six people living off it. Rwanda uses less than 10 kg of fertiliser per hectare per year, which is far too little in proportion to what the land has to supply for the increasing population. As the jargon has it, Rwanda has one of the most adverse nutrient balances in the world.' Artificial fertiliser use in the rest of Africa is 40% greater on average, while it is a factor 10 higher in the rest of the world!

Manuring is also necessary because the ground is losing organic matter, so water is taken up and stored with increasing difficulty. 'The consequence is that water pours down from the slopes, taking the soil up there with it,' says Rwandan Gaspard Ndagijimana, who works at the Netherlands Embassy. Logging and intensive use of marginal lands are aggravating the process, Breman says. 'I haven't yet seen a clear-running river; they all carry a stream of thin mud.'

If the fertile soil washes away under your feet you also lose the foundations of stability

Carbon absorption and falling lakes

Arresting further soil exhaustion and environmental degradation has an immediate climate component. The project has planted planted, combated logging, made agriculture more productive and exhausted soil more fertile. More forest and improved soil take up more carbon; adaptations to climate change reinforce efforts to ensure the climate problem doesn't become worse. Ndagijimana: 'In the project we're looking for sustainable crops that are resistant to climate change. This year, for instance, the dry season in Rwanda was months too long, after which far more rain fell than usual. Soils have to retain rain from more intense, short rains and the crops will have to be able to cope with that. If you want to prevent erosion you will have to work on reforestation. Forests prevent erosion and take up carbon.'

Research is being done to see if it's plausible that the dropping water level in the lakes is one of the consequences of climate change in the Great Lake area. Oosterman: 'The water in Lake Kivu is four meters lower than it was 15 years ago. Lake Tanganyika, which feeds the Congo, has fallen so low that large vessels can't use the docks in Bujumbura, capital of Burundi. Lake Victoria, which feeds the Nile, is only 60 meters deep at most, and has dropped many meters. The consequences for the 30 million people living round the lake are immense because they rely on the lake for their food and water. The consequences for the water flowing into the Nile and the Congo are also severe (see box 'Water towers and rivers of mud'). We're working with the Nile countries in the Nile Basin Initiative (see p. 46) on a programme to tackle this.'

Climate not homogeneous

Breman recently signed the project contract with the Rwandan government. 'I've set up similar projects in Ghana and Mali. It cost more than a year to get an agreement with the government then. Two months here.' That's proof to Oosterman that Rwanda wants a stable future and is working hard to achieve one. 'But they're hampered by an unstable climate. People in Rwanda have learned to balance on the edge of survival. If harvests fail due to a changed climate, then they get pushed over the edge. That's nothing new; it's the same in many developing countries. But in Rwanda tensions like that can lead to major conflicts.'

Breman: 'Climate change is increasing the likelihood of more frequent, heavier rains. But Rwanda and the surrounding countries aren't homogeneous in climate terms. There's a factor of at least three between the rainfall in the wettest and driest region. For instance, they can grow potatoes round the volcanoes in the area where Uganda, Rwanda and DRC meet, without using antifungal chemicals. So increasing rainfall has totally different effects throughout the region. What's certain is that it will be difficult to take advantage of more water. What could be a blessing becomes a problem if everything gets washed away.'

FROM LOCAL SMALLHOLDER TO FAO

DGIS is the principal source of funding for CATALIST (Catalyzing Acceleration of Agricultural Intensification for Stability and Sustainability). The Netherlands is paying out €22 million in the period 2006–2011. Contractor IFDC (International Center for Soil Fertility and Agricultural Development) is investing $ 1.5 million. Co-operation is with local (smallholders') organisations, businesses and NGOs. Japan, the Clinton Foundation, Denmark, Canada and Belgium are involved, as is the UN's FAO (Food and Agriculture Organisation). Since this is a regional problem, there is collaboration with the Great Lakes countries Rwanda, Tanzania, Burundi, Uganda and DRC. Wageningen University is also investigating the vulnerability of the Nile basin to climate change and the options for adaptation in the economic sector and water management.

When CATALIST is on track, agricultural yields will climb thanks to the use of artificial fertiliser. The smallholders' productivity should increase by 60% between 2006 and 2012. Since this doesn't involve gifts, but their own investments, increasing numbers of smallholders can participate. Breman expects a large takeup when they see that the investments are more than repaid. This leads to increased incomes – provided the market is there. Oosterman: 'That's why the project is looking to create good markets and is seeking new ones.'

Food aid and imports will make way for national and regional production. Breman: 'Collaboration between the countries should lead to improved competitiveness on the world market. We're talking to Tanzania and Uganda, where the economies are healthier and there's a demand for agricultural products and a supply of fertiliser.'

It's not just the smallholders who can profit from the project, but the nature reserves too. If CATALIST has an effect, the smallholders' own land will make a profit, so they and their families won't go into the reserves any more. That reduces the pressure: less hunting, less poaching, less harm to forest and animals. It's also good for conserving the gorillas. The reserves are very important, both to the region itself and outside. Besides their great biodiversity, the parks are wet and act as a water tower for the Nile and the Congo.

Reducing population pressure

Overpopulation is a touchy subject. The annual population growth in Rwanda is about 3%, meaning that the population will climb to 12 million in 15 years, in an area two-thirds the size of the Netherlands. Ndagijimana: 'It's a sensitive issue, true, but birth control isn't a pressing topic for the government. HIV / AIDS, preventing conflict – this project included – they're the urgent issues. The government's vision for the future is that the smallholders' prosperity will rise due to better yields. That around 2020 one-half of the population will be working in other industries than agriculture.'

Oosterman: 'No simple matter for a country with no seaports and not much in the way of mineral resources. They're thinking about the services sector, IT. The country's bilingual, which might play a positive role.'

CATALIST won't bring about a population decline, nor will the land area increase, but yields will. According to Bremen, land productivity can certainly be increased five-fold, while Oosterman states that overpopulation is a development problem. "More income means increased prosperity with more opportunities for schooling, for girls especially. They can and will opt for fewer children. With a bit of good will, this project can make an indirect contribution to birth control.'

There's a touch of missionary zeal about her as she states that, 'CATALIST tries to take account of climate change. But it's swimming against the tide. The rich countries have to make drastic cuts in their emissions and they have to indemnify developing countries for the extra costs of adaptation. Sadly, the reality is that Africa will have to absorb many of the blows itself. Even serious research on the consequences of climate change in Africa is asking too much.' ●

WATER TOWERS AND RIVERS OF MUD

Eighty per cent of agriculture is done on slopes; much of the land is marginal. The water isn't retained so the soil washes away. The area is the source of supply for the Congo and Nile rivers and so is one of the three most important Water Towers of Africa, the other two being Lesotho and Ethiopia. Land use and climate change are causing the area to lose its storage capacity, while such flow as there is, is polluted. The once clear streams have changed into rivers of mud. There is less water downstream, of poorer quality. At the same time, weather extremes will cause area flooding at times. New sources of conflict will arise in an already vulnerable area.

TAKE THE BAD GUYS TO COURT

Are lawyers going to save the climate? A ridiculous question, but the number of climate cases before the courts is climbing steadily. The subject gets specialist attorneys excited. Are we witnessing the juridification of the greenhouse effect? BY HAN VAN DE WIEL / ILLUSTRATION: COEN MULDER

Amsterdam, 6 November 2006. The great hall in De Balie, the Amsterdam centre for culture and politics, has been converted for the occasion into what might be called a courtroom – with a little good will. The debate is about climate guilt: if there is such a thing as climate change, who's responsible for it? Can states and businesses be held accountable for the damage done?

That there is considerable damage is certain. It was recently assessed by Nicholas Stern, ex-vice president of the World Bank. If no action is taken now, then in the worst case there will be a permanent, global loss of prosperity of 20%. That's the bad news. The good news is that the damage can be avoided by starting immediately to devote 1% of the world's gross national product per annum to measures to counter the greenhouse effect.

Climate as part of liability law

In De Balie Professor of European Law Leigh Hancher, the presiding judge, concludes that the causal relationship between climate change and the occurrence of damage has not been made clear, that possible damage cannot be ascribed unequivocally to one single nation or company, and that it is not actually clear whose interests are at stake. So the defendants won, partly thanks to the chaotic nature of the evening, which left no time to weigh the arguments. But to the ultimate question whether this sort of court case against governments and businesses might be successful in the near future, the Judge and her two assistants answered in the affirmative. That might well be the most surprising statement of the evening.

One of the Judge's assistants is Geert van Calster, Professor of European Environmental and Energy Law, Catholic University of Leuven and Oxford University. Besides being a professor he is also co-director of the Institute for Environment and Energy Law and practices at DLA Piper, international attorneys-at-law. On the telephone, some weeks after the debate in De Balie, he explains further.

Inextricable legal tangle makes indicting climate criminals difficult

According to him, it will be difficult to bring a nation or company to court because the legal tangle is 'incredible'. Under classical liability law the plaintiff must prove damage, show who is at fault, and demonstrate a causal link between damage and fault. 'The first difficulty is demonstrating that damage has occurred due to climate change. Thanks to the IPCC's scientific consensus we've made progress during the last five years, when there was still no consensus on the question of whether climate change was occurring, nor humanity's part in it. But the key question is, 'What is the damage?' It's getting warmer? More floods and storms are occurring? More rainfall? That's not yet been demonstrated clearly.'

Plaintiffs seeking damages can appeal to scientific predictions, which show that there is an increased probability of flooding and that therefore dykes must be built along the coastline. After all, waiting until the predictions have been proved beyond reasonable doubt would be irresponsible. The economic damage – building the dykes – can be claimed from the defendants. In Van Calster's view, such a suit would stand little chance in countries with a Napoleonic legal system (Belgium, France): the courts will accept only crystal clear evidence and above all they are hesitant to put themselves in the government's place, making overly dynamic pronouncements with major consequences for society. In the Anglo-Saxon countries, which operate under common law, the court has greater freedom and is less hesitant in calling the government to order. The Netherlands legal system sits somewhere between these two: the New Civil Code has introduced such concepts as reasonableness and fairness as a corrective to any excessively literal interpretation of the law by the courts.

The next legal obstacle is to demonstrate who is at fault. Whether deliberately or negligently is not an issue here: liability law punishes both deliberate fault (illegal dumping, for instance) as well as negligence. Broadly speaking, two directions are possible in 'climate cases': bring either a state or a polluting business before the court. Van Calster: 'The problem with a state – the United States, for example – is that they can appeal to the uncertainty about the problem of climate change that existed up to the mid-1990s. At that time there was absolutely no certainty about the human component. In its defence the USA can also state that it's still open to question whether the Kyoto Protocol is the only way to do something

about climate change. Better instruments exist, such as more research, technological advances. The route pursued by the Bush administration, you might say.'

Nor does Van Calster believe that legal proceedings between nation states before the International Court of Justice in The Hague would have much chance of success, since the treaty on which this court is founded can easily be terminated unilaterally. 'If the USA smells a rat, they just quit.'

California wants to reclaim vehicular damage from six car manufacturers

Passing the buck

Businesses that are sued 'will immediately pass the buck to the government. They will state that they comply with their environmental permits and that nothing in there forces them to attend to greenhouse gases. They will say that the government must first lay down the standards in law.'

In strictly legal terms, Van Calster isn't too hopeful. 'But now something remarkable is happening,' he says. 'Thanks to the legal system in the USA, you don't need to be right to win a case. The art of the plaintiff is to play the game intelligently. For instance, seek a judge in a state who is prepared to pronounce against business or the government, despite the difficult legal evidence. Looking for a 'suitable' judge is called forum shopping. So you don't rush to a high, federal level, because then the case will be closed tight. A favourable decision from a lower court allows the PR and media machine to get fired up. Over time the businesses get tired of all the court cases – they're bad for the image and cost pots of money. So a moment can arrive when they say, 'OK, let's ignore the legal niceties. We're going to set up a Climate Fund for Developing Countries'. You can see how the tide is turning in the tobacco industry. Legally speaking, the tobacco companies were on pretty firm ground, but still they acknowledged their liability.'

In late September 2006 the State of California sued six major American and Japanese automobile manufacturers. The complaint stated that the millions of vehicles made by General Motors, Ford, Chrysler, Honda, Toyota and Nissan emitted large quantities of carbon dioxide. In California, which is the sixth richest economy in the world, road traffic is responsible for one-third of all greenhouse gas emissions. California is vulnerable to the consequences of climate change and spends millions of dollars combating climate damage, involving modifications to the infrastructure, fighting coastal erosion, safeguarding fresh water supplies, and conserving threatened species. California wants to claim the damage caused by automobiles from the six manufacturers. The complaint does not specify a concrete sum in damages, but according to prosecuting attorney Bill Lockyer the sum must run into 'hundreds of millions of dollars.'

Roda Verheyen of Climate Justice, an international organisation that draws the attention of states, organisations and communities to the possibilities offered by the law to bring climate change before the courts, is excited about the case, which she calls the 'most spectacular yet.' 'This is the first time that damages are being claimed. Initially it was mainly about public pressure, but now there's increasing scientific evidence that climate change is causing harm, there's interest from the communities under threat. It's not about media attention but about preventing and repairing harm. That's what makes the California case so interesting.'

Decision may take years

Legal scholar Verheyen's thesis is entitled – appropriately – Climate Damage and International Law. Verheyen: 'I view the law as an instrument that increases the pressure to do the right thing. It can take years before the final decision is handed down, but in American law you can have interim decisions, such as on how convincing the evidence is. Right now the automobile manufacturers are digging their heels in, but if there's an increasing chance they will lose, then they'll be prepared to do a deal. If California wins the consequences will be huge.'

Van Calster expects a legal breakthrough between now and five years hence. 'A decision will also have an effect on Europe, just because of the simple fact that you're dealing with multinationals, conducting corporate policy according to the same standards throughout the world.'

If government leaders are unsuccessful in setting up a robust climate policy, then the law is an instrument to compel them. ●

VIETNAM OPTS FOR BIOGAS

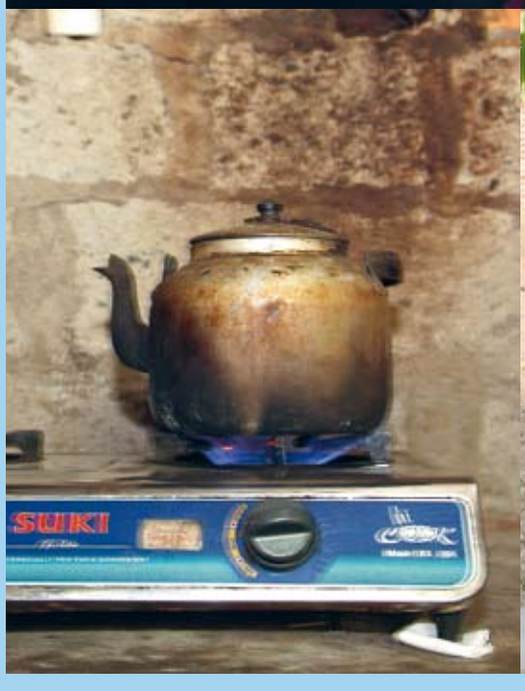
BY HANS VAN DE VEEN / PHOTO'S: BAS JONGERIUS

The Vietnamese government is seeking to encourage the use of biogas. Development organisation SNV is supporting a programme that makes use of experience gained in Nepal, where 60 local businesses produce biogas plants, 155,000 of which are now being used by smallholders. The project provides work for more than 11,000 people. The Netherlands wants to provide 10 million people with modern energy before 2015, which is why the Ministry of Foreign Affairs asked SNV to expand the Nepal programme. Besides Nepal and Vietnam, programmes are also being set up in Laos, Cambodia and Bangladesh.

Biogas programme wins!
The Vietnam biogas programme came out first of the 700 submissions nominated for the 2006 Energy Globe Award, the most prestigious international award for energy and environment.

'Do you know what's so great?' asks Le Phu Ca, as he proudly shows off his two-burner stove, 'I can wear a white shirt while cooking. Everything used to get blackened by the soot.' Besides pollution, using wood and other biomass leads to serious eye and lung problems for many people (photo top left).

Bricklayer Hoang Huu Ehinh has built more than 1000 biogas plants in and around the Vietnamese capital. He set up his own business after receiving training. Now he employs 12 people. There's a big demand for the plants with a waiting list of more than a month. The pit in which the manure is gasified (holding between 6 and 10 m3) can be built in 2 days (photo bottom left).



Hoang Thi Nga (37) lives in a suburb of Hué and has had her biogas plant for 2 months. She's glad she no longer has to gather wood every day. She took out a loan with the women's union to build the pig sty. She is paying off the loan by selling piglets (photo top right).

The plant works on the dung from as few as four or five pigs. A family can cook with the gas, with enough over for two lamps. The toilet is often also coupled to the plant. Escaping from poverty involves a jump to about 20 animals. Biogas saves the costs of fuel and artificial fertiliser (photo right centre).

Dang Van Xuan uses the gas for producing rice wine as well as cooking. It's a profitable trade that gives him money to buy fruit trees. He tells us that the recent drought has dried out many orchards and vegetable patches. 'But they survive well here because I can manure them from the biogas pit' (photo bottom right).

Deeds, not words

The world of water is becoming aware of the risks climate change poses to achieving the Millennium goals. Following the awareness it's now time for action: climate-proofing the water infrastructure. Things could go faster.

BY HAN VAN DE WIEL / PHOTO: WETLANDS INTERNATIONAL

'We're pursuing the Millennium goals blindfold.' Pavel Kabat, Professor of Earth Systems Science and Climatology, Wageningen University, gives us a meaningful look. 'Because it's odd, to put it mildly, that the Millennium goals don't have a thing to say about climate change.'

If we want to achieve the Millennium goals, then the least developed countries need to achieve a percentage growth far higher than the population growth, which is often around 2 or 3 per cent per annum. Kapat's figures are disturbing. 'In Mozambique the serious floods of 1999–2000 have led to a serious delay in growth: in 2000 GNP grew by 1.6%, which is dramatically less than the 7.5% of 1999 and the 13.9% of 2001. In Ethiopia, changing precipitation patterns are expected to lead to less growth in GNP in 2003–2015. Calculations for Kenya show that the consequences of La Niña–El Niño, which lead to droughts and flooding (see also p. 6, Ed.), have cost the economy an average of 22% of GNP in 1997–2000.'

It's not just the Millennium goals that fail to mention climate change. It is significant that other reports, such as the UN Water Development Report, the World Water Vision and the Human Development Report, make no explicit mention of the risks of climate change. Even plans based on the handbook for integral water management fail to pay attention to climate risks.

'Climate change doesn't have any priority in the developing world,' concludes Henk van Schaik, co-ordinator of the Co-operative Programme on Water and Climate (CPWC), of which Pavel Klabat is scientific director. 'For them it's chiefly about access to drinking water and distributing water between sectors of the economy. But the climate world has by now garnered so much information about the hazardous relationship between climate change and water that the water people will have to get up off their backsides now.'

Because both worlds were standing with their backs to each other, CPWC's predecessor organised a series of 18 multi-stakeholder dialogues between 2001 and 2003. These concentrated on the question of how water managers should deal with climate variability today and climate change tomorrow. The dialogues were conducted at several levels, from regional to national. The research was one of the principal themes during the Third World Water Forum in Kyoto, 2003.

Awareness and permanence

'That was the awareness raising phase,' says Van Schaik. 'The water sector actually thought it was doing enough. After all, what is water management if not coping with climate variability? That's why we opted for dialogues: the climate scientists have to start talking to the practical water sector. Our message is that the sector must prepare itself for weather conditions

SHARING NILE WATER

The Nile Basin Initiative (set up in 1999) is a forum of 10 Nile countries that seek a fair distribution of the Nile's waters. The Netherlands is one of 18 partners in the initiative. One of the projects involved seeks to encourage efficient water use in agriculture, which will improve food security in the region, consume less water, cut wastage due to irrigation, and allow best agricultural practices to be implemented.

that we've not yet experienced. Knowledge of the climate must be an integral component of their planning.'

The climate scientists also acknowledged their own faults. Van Schaik: 'The water sector can't do anything with long-term climate predictions and trends in the changes. They also need operational, seasonal forecasts. The water people want to know the probability that heatwaves

An Ethiopian has 43 m³ water available per year, an American 6150 m³

will occur next summer or in 2050. Or the likelihood of droughts in summer. The chance of extreme precipitation. Now you can see water managers asking specific questions like these, while climate science has gone pretty far in being able to answer them. That's progress.'

The information will allow water managers, drinking water utilities, smallholders and hydropower suppliers to make timely provision for investments in the short (seasonal) and long (investment) term.

Six months' warning

So the time seems ripe to make water management and water infrastructure climate proof, or to 'mainstream' it, as the jargon has it. According to Kabat the climate proofing consists of a drastic increase in water storage capacity in acknowledged 'drought countries'. He tells us, 'In Africa we're talking about a level of 2,000 cubic meters of water per person per annum.' A level that's far off in the future in most African countries. According to a World Bank report, Ethiopia is at the 43 m3 level, and South Africa at 750 m3. For comparison, the USA has a buffer capacity of 6150 m3 per head of the population.

In most cases, planning is still in its infancy. The 10 countries, for instance, that together form the Nile Basin Initiative, have put climate variability on the agenda. Kabat: 'We can only hope that's enough.'

More is happening here and there, with some success. Work has been going on for the last five years on seasonal forecasts for northern Brazil. Kabat: 'It's a six-month warning system. The Brazilian meteorological institute is among the best in the world and the forecasts are so good that the federal Brazilian government can base its policy on them, importing extra grain, for instance, when extreme drought is expected. So the government is absorbing the risks. The forecast will certainly get it wrong sooner or later, and that's when we shall see whether or not people lose their confidence.'

While climate proofing the water infrastructure in developing countries is still in its infancy, it doesn't mean that people are merely standing by, suffering, while waiting for the government and water managers to take action.

Born adapters

One successful local project for buffering water is the sand dam project in the Kenyan province Kitui. CPWC's Fulco Ludwig tells us, 'Despite the severe drought in Kenya, there's water available here thanks to the use of a centuries' old water technology. This has given about 100,000 people in Kitui access to drinking water for people, animals and irrigation.'

With support from a local NGO, Kitui residents have built 500 concrete dams in river beds that dry out during the dry season. During the wet season the river banks erode, forming sandbanks. The sand can retain large quantities of water (about 40% of its volume). The stored water is covered over to prevent evaporation and pollution. A pump allows the people to extract water. Investment costs? $ 35 per person.

Humans are born adapters. According to Kabat, they are 'adapting autonomously' in the Sahel. The precipitation there has been changing radically during the last decade: there are fewer showers and when they occur they are heavier. 'Smallholders are spreading their risks by, for instance, sowing sorghum over a longer period. That increases the chance that the crop will succeed, at least on part of their land.'

Best, says Kabat, is a combination of such local knowledge with co-ordination by central government. 'But there's not much of that in Africa yet.' ●

FEELING SAFE

It's not just developing countries that are struggling with adaptation. 'The Dutch place blind faith in the dykes and their government', says Fulco Ludwig. 'I grew up in a polder in the coastal conurbation. We looked out on the dyke of the surrounding waterway, which was higher than our house. I never felt unsafe. But even good dykes can collapse, and then the Dutch don't know what to do. There's no evacuation plan for the urban developments along the coast, or else it's a secret, which isn't much use.'

Pavel Kabat: 'There's not a one single water authority that tells its residents what to do in case of a disaster. What does someone living in the Betuwe do if a dyke collapses? Where should he go? How do you stop evacuation turning into chaos? A number of countries – Japan among them – practice their evacuation plans regularly. Not in Holland. Never.'

‘World lacks leadership’

It will cost developing countries billions to adapt to climate change ‘But there’s no money available.’ Yvo de Boer, chief of the UN’s climate bureau, is critical of the international climate negotiators, who are ‘full of mistrust’. Conversation with a highly placed UN official who doesn’t pull his punches.

BY BAUD SCHOENMAECKERS / PHOTO: TONY KARUMBA (AFP)

UNFCCC
The secretariat of the United Nations Framework Convention on Climate Change (UNFCCC) in Bonn is the executive organ of the Climate Convention, which went into effect in 1994 and to which 186 nations are signatories. The Convention’s goal is to stabilise the concentration of greenhouse gases in the atmosphere. To achieve this, the signatories negotiate annually at UN climate meetings – The Conference of the Parties.

In November 2006 Yvo de Boer attended his first Conference of the Parties as Executive Secretary of the United Nations Framework Convention on Climate Change (UNFCCC). The 12th round of negotiations on the Climate Convention, held in Nairobi, produced mediocre results (see p. 36). Yvo de Boer was encouraged to work out his challenges further.

De Boer: ‘I have three. The first is to restore the developing countries’ trust in the industrialised ones and the Climate Convention. Second, to draw in the world outside. I think ‘climateland’ is rather incestuous: the negotiators in the annual climate conferences only have to do with each other. New ideas have to come from scientists, the World Bank, the international energy agency, economists like Nicholas Stern. But they’re no part of the plenary sessions where the decisions are made. Their input is only peripheral. Three: setting down future policy. You need leadership for that, and there’s a lack of it everywhere.’

‘Netherlands’ Premier Balkenende has discovered climate change since Al Gore and Bill Clinton arrived in the Netherlands in late 2006. That’s great, but what does it mean in terms of concrete policy? The environment was higher up the agenda in the talks leading to the formation of Balkenede’s fourth cabinet, but I’m intrigued as to what will actually be achieved. Nor has climate really played any role at the top of the UN. I’m currently trying to get Ban Ki-moon, the new Secretary General, to go so far as to organise international climate meeting for government leaders. He’s in a position to bring them together and establish a mandate that rises above the authority of the people currently conducting the negotiations.’

What’s damaged the trust of the developing countries?

‘In 1994, when the Climate Convention went into force, there were absolutely firm agreements on cutting greenhouse gas emissions – mitigation. Only six industrialised countries have met their commitments. The support promised for technology and building a capacity to adapt to climate change (adaptation) hasn’t materialised. And industrialised countries are trying to seduce developing ones to accept a target fore reducing greenhouse gas emissions.’

Can that trust be restored?

‘Yes. In Nairobi Kofi Annan took the initiative for the Nairobi Framework, which is a programme to support developing countries in further preventing and adapting to climate change. Africa is to receive

CLIMATE CHIEF

UN Secretary General Kofi Annan appointed Yvo de Boer as Executive Secretary of the UNFCCC, the UN's climate bureau, on 10 August 2006.

As Director of International Affairs (Environment) at the Netherlands Ministry of Public Health, Spatial Planning and Environment (VROM), De Boer played a prominent role in international environmental negotiations. He advised Environment Minister Jan Pronk during the world summit on sustainable development in Johannesburg and the Netherlands chairmanship of the UN Climate Conference (2000). He was a negotiator on behalf of the EU at the Buenos Aires Climate Conference. This year he was co-chair of the UN Commission for Sustainable Development in New York.

Yvo de Boer (53) was born in Vienna, son of a diplomat, and is used to travelling. During the week he lives in Bonn while he spends

Yvo de Boer at a press conference after a 12-day meeting on 17 November in Nairobi.

extra aid under the CDM, the Clean Development Mechanism (see box: Kyoto Protocol). Applying for CDM projects is expensive and very complicated, while the allocation is uneven – most projects are in Brazil and China. There are only four in Africa. This Framework has to change that.'

Agreement was also reached in Nairobi on the management of the Adaptation Fund, which pays for adaptation in developing countries. Developing countries are to gain a majority vote on the board, following the one nation–one vote principle. No agreement was reached on the Fund's administration. The Adaptation Fund is to be paid for by a levy of 2% on all CDM projects, which is expected to amount to $ 300 million in 2012, which is not enough. The fact that the Adaptation Fund currently has only $ 3 million available is an indication that no major projects will get off the ground in the near future. Both the CDM and the Adaptation Fund are part of the Kyoto Protocol.

CONFERENEREN VOOR HET KLIMAAT

Rond de zevenduizend deelnemers waarvan duizend onderhandelaars, waren op de twaalfde conferentie van de partijen die het Klimaatverdrag hebben ondertekend - tevens de tweede bijeenkomst van de ondertekenaars van het Kyoto Protocol. De uitkomst was matig. Er is een overeenkomst over het Adaptatiefonds. Maar niet over de hoeveelheid geld dat in het fonds gestort moet worden en wie het beheer ervan gaat doen. Evenmin is overeenstemming bereikt over een opvolger van het Kyoto Protocol dat in 2012 afloopt. Afspraken over Kyoto II zijn van groot belang voor de handel in emissierechten, want als de verplichting voor reductie wegvalt, stort de markt voor emissiehandel ineen. Positief is de doelstelling dat emissies tegen 2050 met meer dan vijftig procent moeten zijn teruggebracht.

You said that the international negotiating process has soured, riddled with suspicion and mistrust …

'Yes, many negotiators are looking for a hidden agenda, a false bottom, behind every idea. By opening this up to discussion we can start to cut through it. Space must be made for creativity, which you get by reasoning differently. Start out with the adaptation and mitigation needs of the developing countries rather than the ideas of the industrialised ones. Take a look at how climate policy can contribute to the developing countries' goals.'

The Development and Climate Project shows that this approach works. This seeks to reduce the contrast between 'North and South' in international negotiations by placing the priorities of the developing countries above those of the industrialised ones. The idea is that less polarisation leads to better development results. Actions to cut poverty, improve the energy supply and food security often have a positive side-effect on the climate (see also p. 18).

Does the climate negotiating system have to change?

'… What's needed is different skills. I'm taken by the concept of the WTO, the World Trade Organisation, where there they state that, 'If you meet certain standards, you gain access to a number of advantages.' Translate that into climate terms and you get a system where developing countries indicate what their plans are to provide for their energy and food needs and what they can do to turn emissions round. If these plans are satisfactory, then they gain access to the means. We have to provide a big pot of cash with the West's reduction policy, partly from the returns from emissions trading.'

De Boer doesn't think much of the industrialised world's current sanctions system. He cites a statement by Jan Pronk, made when he was Minister of the Environment: Who's going to shoot me if the Netherlands doesn't meet its targets? De Boer feels more for a reward structure: if, as a nation, you realise your reduction targets, then you gain access to international emissions trading.

You gave two examples of disasters in Nairobi. Thirty million people around Lake Victoria as it slowly dries up and climate refugees in Asia. You stated that we have to act now. The conference forms part of a long-term negotiating process; that doesn't produce 'action now' results.

'That's right. It won't come up with adaptation solutions for vulnerable areas. There's no money for that. It's one of the defects of the climate process. All around the negotiating table you find dirt poor environment ministers, while the solution – for the time being at least – has to come out of the pockets of the development aid ministers. But the going's tough there, too. I see some of them on the retreat, and that includes the Netherlands. The cry is that development aid mustn't be used for adaptation because the cause (climate change) lies with the industrialised world.'

So is the Climate Convention the right forum for regulating adaptation?

'I believe so. But adaptation in developing countries will cost billions. In the short term you have to look to the development aid budgets to fund measures. Over the long term, money has to come from climate policy – that pot of money I just mentioned. I can see possibilities for a cash flow to the developing countries of the order of $ 100 billion a year. And they can get it with their present climate policy. The Adaptation Fund is fed from a levy on the CDM,

which could rise by 2% – point one. Europe is seeking to cut greenhouse gas emissions by 60–80% by the middle of the present century. Half of that will be achieved in developing countries because that's cheaper – point two. And thirdly, if a ton of CO_2 is worth $ 10 or more in the emissions trade after 2012, then you have enough money for greening energy policy in developing countries and adaptation.'

How do you encourage development aid?

'Climate and development aid are two totally different worlds. I was in Washington recently to tell the Global Environment Facility about the Nairobi outcome. As soon as I got into the matter of the relationship with development aid, the large majority of those present looked at me with a 'What's he talking about?' expression. At the informal EU Environment Council in Luxembourg I told the members that I had the strong impression that they don't know how unfamiliar their delegates are with the development aid portfolios. They were aware of it, but still … .' When they chaired the EU, the Finns had different people negotiate on the development portfolios – different from the regular people, that is. That turned out to be a good stimulus.'

He sees other stimuli coming from an emphasis on the relationship between climate change and meeting the millennium development goals. As De Boer puts it, 'Studies are available which show that these goals are under threat, and that the costs of achieving them have multiplied many times. The second thing that needs to be done is to show even more clearly what the relationship is between environmental disasters and poverty. Thirdly, the relationship between climate change and political stability / instability must be made clearer. Margaret Beckett, the UK's Foreign Secretary, has said that the war in Sudan and the problems in Darfur partly originate in climate problems – scarcity of water.'

De Boer can see more conflicts throughout the world as a result of climate change. Less snow in the mountains in China means a drop in the quantity of melt water that provides large areas of the country with drinking water – with political instability as a possible result. De Boer: 'And further: take a pencil and draw a line on a map of the world to show the coastline after the sea level has risen by one meter. Then look at how many 'climagrants' you get. I even wonder about the Africans who try to climb the fences in the Spanish enclaves: to what degree are they climate refugees?'

4 THE STANDARD • MONDAY, NOVEMBER 6, 2006

NATIONAL NEWS

UNITED NATIONS CLIMATE CHANGE CONFERENCE NAIROBI 2006 SPECIAL REPORT

Rivers could dry in 15 years, United Nations report warns

BY WANDERA OJANJI AND SAMUEL OTIENO

RIVERS flowing from Mt Kenya and other water towers in East Africa will run dry in the next 15 years if the current trends in climate change are not reversed, the United Nations Framework Convention on Climate Change (UNFCCC) has warned.

The convention says that icecaps on Mt Kenya, Mt Kilimanjaro in Tanzania and Uganda's Rwenzori have been disappearing.

A new report, Vulnerability and Adaptation in Africa, says icecap on Mt. Kilimanjaro, for instance, has reduced by 82 per cent since 1912, and might disappear completely within 15 years.

According to the convention, the continent's vulnerability to climate change is more acute than had previously been supposed. Production of staple crops

6,000 in city as climate conference starts today

BY STANDARD REPORTER

MORE than 6,000 delegates, including ministers and United Nations officials, gather in Nairobi today for an international conference on climate change.

The meeting at the United Nations Complex in Gigiri will discuss, among other issues, adaptation to climate change, funding and the Clean Development Mechanisms.

Environment minister, Mr Kivutha Kibwana, will open the conference, the second Conference of Parties (COP) to the 1997 Kyoto Protocol.

The United Nations Framework Convention on Climate Change (UNFCCC) has organised the talks, which end on November 17.

The convention hopes to reduce greenhouse effects as stipulated in the Kyoto Protocol. Under the treaty

Does the UN have a role in all this?

'Yes. I even made the headlines in Nairobi by saying I was against a fund for Africa. They quoted me correctly, but the headline was far too tempting, of course! What I said was that I would sooner see money going to the existing UN funds rather than opening yet another empty bank account. I'm cynical about the increasing number of funds, where scarce resources compete with each other. The greatest thing about the climate regime is that the polluter pays. So there's also a part for the UN in preventing climate conflicts. Take Lake Victoria, which is under threat. That's not a region where you want 30 million refugees. The Nairobi Framework, which focuses on adaptation, is exactly right for this.'

So just make that concrete. We can no longer prevent Lake Victoria drying out. So how do you see 30 million people adapting?

'Small-scale projects. We're looking at how to do small-scale adaptation projects in Africa. Simple, basic things, like building dams to catch rainwater better and retain it longer. Teach smallholders to harvest a number of times a year, familiarise them with crops that need less water, or that retain water better.'

Before returning to Bonn, Yvo de Boer is to attend two meetings and four appointments that day – and he drops in on his former secretary at the environment ministry. ●

KYOTO PROTOCOL

During the Third UN Climate Conference in Kyoto, 1997, the stabilisation goals from the Climate Convention were translated into firm agreements between industrialised nations: between 2008 and 2012 they are to cut greenhouse gas emissions by an average of 5.2% below 1990 levels. The Kyoto Protocol also states that developing countries do not have to accept any reduction obligations. The instruments – also called the Kyoto Mechanisms – are the tools with which the industrialised nations seek to meet their targets (with the exception of the USA and Australia, which refuse to ratify the Protocol). One such is the Clean Development Mechanism (CDM), through which industrialised countries invest in sustainable development projects in developing countries. In exchange they receive part of the emission reduction achieved in the developing countries, expressed as CERs, Certified Emission Reduction units.

Assess development for climate risks

Millions of developm

Research shows that development planners take too little account of the local and regional consequences of climate change. Will development policy have to be abandoned?

BY HANS VAN DE VEEN /
PHOTO: ODD ANDERSEN (EPA/AFP)

In Bangladesh and Nepal, both existing and planned bridges are too low to resist the rising waters from the melting Himalayan glaciers in the future. In Fiji the mangrove forests are vanishing entirely, with major consequences for the fishing industry. The Nile, Egypt's life blood, may well dry up in the future. Planned timber plantations in Uruguay are turning into a fiasco as aridity increases. Both governments and private donors fail to take much account of natural changes that climate experts tell us can no longer be avoided.

The OECD's 2005 report 'Bridge over Troubled Water: Linking Climate Change and Development' reveals which development activities in six countries are vulnerable to climate change. It appears to affect a considerable fraction of the aid to those countries, which is devoted to

A South African rescue team hoists a man out of a tree just outside the flooded city of Chibuto, Mozambique. The country suffered flooding in 2000 and 2007. In 2007 a warning was issued to 500,000 people to leave their homes. Most stayed put. Water management, an early warning system and good public information can save lives.

ent Euros wasted

vulnerable activities. It affects more than half of Nepal's aid funding and a quarter of Tanzania's. Taking the six countries as a whole, perhaps as much as $ 1.5 billion may be wasted money.

According to OECD scientist Shardul Agarwal, it would be too simple to state that a lack of knowledge and money is the reason why no account is taken of climate change. He states that, 'In many governments, climate knowledge is concentrated in environment departments. These often have little influence on other sectors that have more influence on policy.' Moreover, the time frame of many development activities stretches to no more than five years or so, so much of the predicted climate change isn't yet visible. Seeing is believing, after all. So it's logical that they opt for the visible needs of the present.

To integrate the consequences of climate change into development plans, Agarwal believes that we need to work out information on future weather conditions in terms of industrial sectors and regions. The costs of doing nothing or of adaptation must be set out far more clearly. And instruments must be developed for assessing development activities in light of climate scenarios. As Agarwal puts it, 'Environmental impact statements are part of daily practice. But now it's not just about getting a handle on the project's environmental impact, but also the environment's effects on the planned activities.'

Ancient mechanisms no longer work

A short list teaches us that, apart from countries such as the UK and the Netherlands and the World Bank, very few NGOs are preoccupied with climate adaptation. There are a few isolated projects, but incorporating it as an integral part of policy is something that is only contemplated – at most. 'We have a programme, Disaster Risk Management, and we want to spread that gradually throughout the entire organisation,' says Lilianne Ploumen, international programme director at development organisation Cordaid. 'But I don't want to imply that we're integrating climate change into all activities. It's too complex for that. Partly because we don't know enough about what exactly is going to happen in specific regions, partly because it's not yet a priority in many of our plans.'

But the theme certainly does play a role with some of our southern partners, says Plouman. 'We're increasingly often receiving signals from people in vulnerable areas that their ancient mechanisms for adapting to changing weather conditions are no longer adequate. Memisma and People in Need, which focus on health care and emergency aid, are involved with a major project in southern Ethiopia and Kenya, helping nomadic groups to become more resilient in the face of more frequent periods of drought.'

Taking greater account of climate change is also a matter of money. For example, it costs more to build houses. Together with Oxfam Novib and the Red Cross, Cordaid sent a letter to the politicians, the core message of which was, 'Take climate adaptation seriously, not just in your own country but also in developing nations. And free up the necessary funds to do so.'

At Oxfam Novib, 'There is a movement towards climate policy,' says policy staffer Bertrand Zagema. 'We're becoming increasingly active in lobbying and awareness raising and we're active participants in the Netherlands Post Code Lottery's HIER climate campaign. We haven't yet gone so far as to chart what climate change means to our activities, but there's a growing realisation that we have to move in that direction.'

Disaster or nuisance

The International Red Cross has gone further. As early as 2001, after the sixth international conference of the signatories to the Climate Convention (CoP) in the Netherlands, it was decided to set up an International Climate Centre. 'It was

BRITISH PLAN OF ACTION

The UK government is playing an active part in the international climate debate. Prime Minister Tony Blair personally placed climate change at the top of the agenda during the 2005 G8 meeting in Gleneagles, Scotland. The Department for International Development (DfID), responsible to the British Government for international aid, brought out a White Paper on the relief of poverty in 2006 ('Eliminating World Poverty'), in which a number of commitments were made. For instance, from 2008 all the Ministry's own development plans will be assessed for their sensitivity to climate change. The necessary tools to do this must be developed in association with multilateral development banks, such as the World Bank. The UK government also promised, in association with these financial institutions, the EU and the UN, to assist developing countries to investigate what climate change means to them in terms of economic growth, the fight against poverty, and vulnerability to natural disasters. More money is being made available for adaptation. From now on, at least 10% of the money set aside for help after natural disasters will be devoted to preventing future disasters.

The White Paper's chapter on climate change can be found at www.dfid.gov.uk/pubs/files/whitepaper2006/wp2006section4.pdf

increasingly clear,' says Madeleen Helmer, chief of the Hague bureau, 'that global warming will have a major influence on our organisation's work. Millions of people, mainly in developing countries, are experiencing floods and droughts, severe storms and the spread of such diseases as malaria and dengue fever. The Red Cross and the Red Crescent aren't prepared for risks. That was the reason for setting up the centre.'

She continues, 'The debate on climate change is knowledge driven. One scenario appears after the other. Executive organisations can't do much with that, they have to understand what it means for their country and then develop a plan of action. It's all about preparing for extreme weather. A better warning system can gain you a couple of hours, which can make the difference between a disaster and a nuisance.'

After pilot projects in Nicaragua and Vietnam, the Climate Centre embarked on the programme 'Preparedness for Climate Change', funded by the Netherlands Ministry of Foreign Affairs / Development Co-operation. National Red Cross organisations are joining the programme, which consists of four steps, from organising a workshop on the hazards threatening the country in question to recruiting expertise to develop a programme and build up internal skills. The programme can be completed in a year. Means are available to support 40 organisations this way. Agreements have already been made with 20.

War in Iraq dearer

There is great enthusiasm for participation, but working with uncertainties is difficult. Helmer says, 'We're always preoccupied with preparing for the last disaster. Mozambique was hit by floods in 2000. They're trying to arm themselves against that now. It's a big challenge to know better what you can expect.' In early 2007 the Zambezi river burst its banks yet again. The damage was worse than the 2000 event, with dozens of people killed by the water. The Mozambique government has called to people living alongside the major rivers to move away. That's about half a million people, mainly smallholders, who have been warned, but in vain. They refuse to leave their land.

According to the World Bank, between 10 and 40 billion dollars is needed to limit the consequences of higher temperatures, changing precipitation patterns and more severe storms. The figure comes from 'Investment Framework for Clean Energy and Development', which the Bank produced at the request of the G8. Developing countries will have to bear most of the costs because they're the most vulnerable to climate change. Note: this money is independent of the costs of switching to cleaner energy and other measures to prevent any escalation of global warming, which lies between 10 and 200 billion dollars per annum, depending on the stabilisation target selected and the time frame. Dizzying sums, even though they are relatively modest in light of the 400 billion dollars that the war in Iraq has cost the USA already.

> A good warning system can gain a couple of hours, which can make the difference between a disaster and a nuisance

In the Bank's view, priority must be given to forecasts per country if good, cost-effective adaptation is to be secured. Moreover, new planning and validation instruments are needed, especially for managing water and other natural resources. Agriculture has to be climate proofed by developing a new generation of drought and water resistant seeds and crops. Much of the technology and knowledge needed for adaptation is already available, according to the Investment Framework, or else it can be developed at relatively low cost, although serious investment is needed in disaster relief and warning systems, given the extreme weather that is predicted. ●

DANES FRONTRUNNERS

The Danish Ministry of Foreign Affairs has put together a plan of action on Climate and Development, the objective of which is to integrate the consequences of climate change into development policy and assistance with the development of an adaptation policy. Pilot projects are being conducted in three partner countries. The experience gained will allow UNEP Risø (the UN climate organisation headquartered in Copenhagen) to test a screening tool kit via Danish embassies. The pilot programme is set to run until 2008 (www.um.dk/da).

In September 2006 the same Danish Ministry, in association with the World Bank and OECD, held an international conference on Climate Resilient Development Strategies to discuss the links between climate change and the Millennium development goals (http://uneprisoe.org/strategies/index.htm). The conference's conclusion was that taking account of climate change can help achieve the goals while simultaneously helping to reduce the vulnerabilities of societies.

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Turkana, just roads and a population

BY ILONA EVELEENS

In a round hut of woven branches four young men lie snoozing. The open weave lets every breath of wind through. In Turkana both humans and livestock seek the shade in the hottest part of the day, just like the four young herders in this north-western province of Kenya. They've abandoned their camels and goats for the time being. The animals are crammed together in the shade cast by a few trees beside a dry river bed just outside Lokitaung, not far from the jade-coloured Lake Turkana.

Turkana's landscape consists of a white, exhausted sandy plain crammed between mountain peaks and ridges. Trees are scarce. Only a fast ripening species of sorghum grows in the arid landscape. Everywhere alongside the main roads – often no more than strips of asphalt separated by sand – there are bags of charcoal. Drivers heading for the southern part of Kenya buy the charcoal, which is markedly cheaper here than in the rest of the country. 'There are frequent droughts here, which kill our livestock. The charcoal allows us to make a little money,' says a woman sitting beside a big bag of charcoal beside the road into Lokitaung. Turkanans are being forced to fell their scarce trees. The people need money to buy food.

Northern Kenya, where many other herding tribes also live, has been neglected by the government. If someone from the north goes to the capital, Nairobi, they talk of it as a trip to 'Kenya'. The northerners feel they don't belong. Development agencies are just as scarce as trees in the province. The Turkana region is viewed as just roads and a population, feared for the merciless response to cattle theft, in which all nomadic tribes participate. The churches and Veterinaries without Borders are among the very few organisations that try to help. They have sunk wells and laid sand dams. The reservoirs fill up in the rainy season when the usually dry river beds swell into fierce rapids. The water projects ensure that the population will not die of thirst, but the landscape remains bare and infertile.

But Turkana was not always that way. One man in Lokitaung, too old to search for water and grazing for the cattle, lives beside the secondary school and relates, 'My grandfather told me how he played in the Turkana acacia forests as a child. Where have all the trees gone? Have we burned them all?' The pupils, who often drop in at his hut in the hope of hearing tales of old, know the answer. A boy from the fourth grade sums it up: 'Someone must give us trees to plant beside the sand dams. Trees attract rain. The roots hold the sand together so that it doesn't blow away and if there are more trees it doesn't matter if we cut down a few for firewood.'

About twenty years ago an Israeli aid agency got fruit trees to bloom in Turkana, with just a little irrigation. For political reasons the Kenyan government of the time killed off the project and the Israelis departed. But they had proved that orchards can survive. The Green Belt Movement, the environmental organisation of the Kenyan Nobel laureate Wangari Maathi, has encouraged several women's groups to grow trees, but the project's small scale means it doesn't amount to much, while Turkana's sandy desert continues to creep southwards towards Kenya's fertile hill country.

Ilona Eveleens is the Associated Press correspondent in Africa.

The Coalition for Rainforest Nations has made a breakthrough: no logging in the forests is on the Climate Convention agenda. Thirty developing countries with tropical forests have joined together in the Coalition. Forest conservation to drive the economy.

WETLANDS INTERNATIONAL / WIM GIESEN

GREEN

Illegal logging is an industry worth billions. Every year the Netherlands imports more than a million m3 of illegally felled timber from Russia, Indonesia, Central Africa and the Amazon region. The photo shows logging in Kalimantan.

GOLD

Twenty per cent of global greenhouse gas emission is due to logging. The Coalition for Rainforest Nations started to tackle deforestation in May 2005. Countries that do not fell their forests receive financial compensation. That's the goal; now they just have to work out how.

BY WILFRIED KOCKEN / PHOTO'S: WETLANDS INTERNATIONAL

Burning forests, virgin forests logged bare, leaving only the forest floor or new agricultural land. It's all very familiar now. As long as there's no price ticket on the CO_2 stored in the trees, forests have value as timber, grazing or arable land. That's why they're rapidly disappearing throughout the world, while nations receive little encouragement to conserve them. According to UK Minister of State Ian Pearson, 7.3 million hectares of forest vanished in the first six years of this century. That's an area as large as Panama every year – about 80,000 square km, more than twice the land area of the Netherlands. It's disturbing for a number of reasons. 'Forests offer shelter, food and water to people and animals,' says Bas Clabbers, senior policy worker at the Netherlands Ministry of Agriculture, Nature Management and Food Quality. 'They act as fuel supply, combat desertification and maintain biodiversity. For many people the virgin forest has a religious significance and is a source of medicines. Besides their role in the climate issue, there are thus plenty of reasons to place discouraging deforestation on the agenda of various international treaties, including the Climate Convention.'

Common interests, common goal

Deforestation is the second largest source of greenhouse gas emissions, exceeded only by heat and power generation. It's a larger source than international transport, but difficult to tackle using existing measures. The 189 nations that united under the Climate Convention in 1994 to do something about climate change agreed on the need for decisive action. This found expression in the Kyoto Protocol, which they willingly turned into concrete figures. Clabbers: 'The signatories agreed that between 2008 and 2012 they would cut greenhouse gas emissions by

5.2% below 1990 levels.' It's a good start, but the Kyoto Protocol contains no measure by which deforestation can be compensated. Moreover, the USA – the world's largest producer of greenhouse gas – has not yet ratified the treaty.

The Coalition for Rainforest Nations wants to take the 'decisive action' a step further. The Coalition embraces developing countries with tropical forests. They focus on the sole alternative that can preserve the forests: not logging them. In exchange they want co-operating governments to receive financial compensation. In that way, the CO_2 that would be released by timber logging remains bound, while preventing deforestation contributes to reducing greenhouse gas emissions. The Rainbow Forest Coalition is an initiative of Papua New Guinea and Costa Rica.

Felling and burning one single tree, 30 cm diameter and 12 m high, releases as much CO_2 as a 7,500 km flight

The Coalition derives its strength from the unequivocal nature of its goal: prevent deforestation. The collaboration between the forest nations transcends regional and national boundaries as well as other interests: it's what gives the Coalition its punch. It's far more effective, for instance, than the regional co-operation between African or Asian countries, where the multitude of topics and often conflicting interests impede the achievement of their goals.

During the 2005 UN Climate Conference in Montreal, the Coalition officially requested the signatories to the Climate Convention to declare that combating deforestation forms part of emission reduction. The request was honoured and since then the theme has been on the Climate Convention agenda.

This initiative indicates that developing countries are becoming more interested in tackling climate change. It also offers forest nations the opportunity to contribute to resolving the climate issue.

Agreements

One of the instruments for compensating greenhouse gas emissions is the Clean Development Mechanism (CDM), whereby industrialised nations can invest in emission reduction projects in developing countries, on the condition that the projects support sustainable development – economic growth that takes account of the environment. As Clabbers puts is, 'The majority of CDM projects fall in the energy sector. It's clear where these projects are being conducted. Forestation does indeed fall within the CDM norm because the planting can be closely tracked, but the prevention of logging can't. The Rainforest Coalition's idea is that that we should abandon the demand for territorial restriction, which means that deforestation could be qualified as CDM.'

COALITION FOR RAINFOREST NATIONS

The Rainforest Coalition currently has 26 participant nations: Bolivia, Central African Republic, Cameroon, Colombia, Costa Rica, Democratic Republic of Congo, Dominican Republic, Ecuador, Fiji, Gabon, Ghana, Guatemala, Honduras, Indonesia, Kenya, Lesotho, Nicaragua, Nigeria, Panama, Papua New Guinea, Peru, Samoa, Solomon Islands, Uganda and Vanuatu. The participating nations represent the world's three largest areas of rainforest: The Amazon, the Congo Basin and Papua New Guinea.

THE WORLD'S LUNGS

Forests are the lungs of the world. Photosynthesis causes an average tree to take up 12 kg CO_2 per year, while supplying sufficient oxygen for a family of four. The CO_2 absorbed by trees and plants is released when trees are felled, partly due to burning. To determine the contribution of deforestation to CO_2 emission reduction it is important to have a clear picture of the changes in forest areas, such as tree density.

RIO BRAVO CONSERVATION AND MANAGEMENT AREA, BELIZE

According the world's largest agency for the conservation of nature, The Nature Conservancy, governments and businesses annually receive around $ 10 billion for emission reducing projects that comply with the conditions of the global CO_2 emissions market.

Throughout the world the organisation is running projects that prevent the emission of 17.5 million tons of CO_2, equivalent to the annual emission from 3.1 million automobiles.

In Belize, Central America, The Nature Conservancy is running a project in the Rio Bravo Conservation and Management Area, which occupies more than 60,000 ha. Here sustainable forest management is preventing the emission of 8.8 million tons of CO_2 for the next four decades. A number of energy producers have already invested $ 5.6 million for the first ten years. This is the first project to be conducted under the US Initiative on Joint Implementation.

CARBON DOLLARS

A quick calculation is enough to show that not felling trees is economically viable. According to UN food organisation FAO, Bolivia lost an average of 270,000 ha of forest in the last five years. The amount of CO_2 stored in the above-ground biomass of every hectare of forest is 67 tons on average. This is released when the forest is felled. Current deforestation in this South American country releases about 18 million tons of CO_2 a year. If Bolivia were not to log this area, then the country could earn €737 million a year, based on a rate of €11 per ton of CO2 emission avoided.

Jos Cozijnsen is a CO_2 consultant to the international climate negotiations for organisations such as Environmental Defense: 'It was a mistake when the prevention of tropical deforestation wasn't included in the Kyoto Protocol. When it came up in 1997 it was a problem for Brazil. Just stating the problem was seen by Brazil as an attack on its forests. Happily, the Brazilian government is now looking further ahead.'

Cozijnsen doesn't see much benefit in linking the prevention of deforestation to the CDM mechanism, which is one of the instruments for achieving the Kyoto targets. 'It should come into the Climate Convention as a separate issue, for a variety of reasons. Preventing deforestation involves national agreements, so an approach along CDM lines is too limited. CDM will only be amended in 2012, but the Rainforest Coalition wants to give countries the opportunity to cut deforestation in 2008. There's a conflict there. Moreover, it's just not done to speak about obligations on developing countries under the Kyoto Protocol. The nice thing about the Coalition's proposal is that they want it brought in under the 'neutral' Climate Convention. It's not insignificant that the USA is involved with the Climate Convention but not the Kyoto Protocol. So they're in on the talks.'

Environmental Defense, one of the world's largest environmental organisations, which unites science, economics and legislation to seek solutions for the most urgent environmental problems, sees the CDM mechanism as in decline. Cozijnsen: 'Countries like China, India, Mexico and Korea shouldn't be kept sweet with CDM any longer. They're emerging industrial nations with which agreements should be made on energy-related emissions. You can't put deforestation in the same line; you have to deal with it separately.'

Earning money by not logging

Yvo de Boer, Chief of the UN Climate Bureau UNFCCC (see also p. 34) feels that forests have to play their part, from the viewpoint of the environment and biodiversity, and the affordability of future reduction targets: 'It's foolish not to involve forests in the climate negotiations. The question is how and when it can be done. After 2012, if the world has to realise even more drastic reductions, then we shall need to come down hard on deforestation, for financial reasons, too.' Climate credits have to be made available to help fund cuts in deforestation. 'That's why the Coalition's initiative is so good. It draws the idea into the present climate regime.'

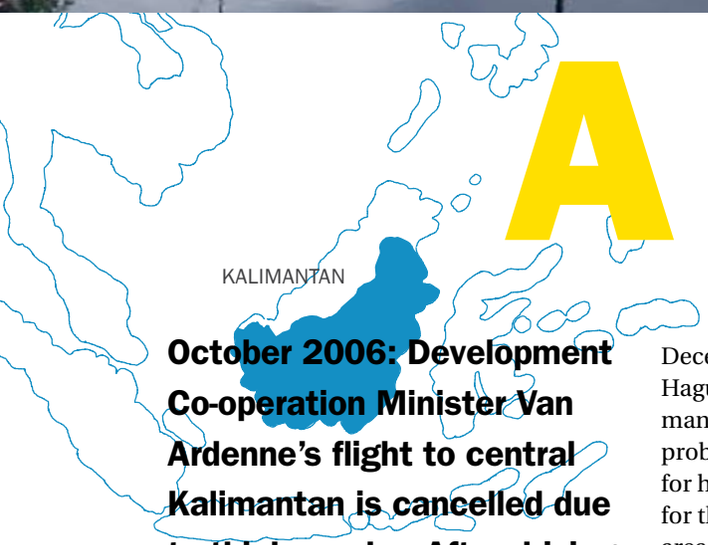
The Netherlands can agree with the line set out by the Rainforest Coalition, but the initiative isn't embraced by the EU as a whole. The political signal that the Rainforest Coalition is sending out is important, not least because we need to close ranks, but most of all to prevent further deforestation. ●

More information:
www.rainforestcoalition.com
www.nature.org
www.environmentaldefense.org
www.emissierechten.nl

WETLANDS INTERNATIONAL (WI)

After the fire

A burning



October 2006: Development Co-operation Minister Van Ardenne's flight to central Kalimantan is cancelled due to thick smoke. After driving for hours she manages to reach her destination, a project to stop the annual forest and peatland fires on the Indonesian Island. The fires destroy the natural habitat, pollute the air and are a major source of CO_2 emission.

BY HANS VAN DE VEEN

December 2006: during a visit to The Hague, the Governor of Central Kalimantan requests Dutch support for this problem, which is out of control. He asks for help in putting together a master plan for the sustainable management of the area in his province, which is one-third the size of the Netherlands. The area had in the past been designated for large-scale rice production. Minister Van Ardenne agrees to provide technical and financial support.

The fires are also on the agenda during the budget negotiations at the Environment Ministry (VROM): Parliament has submitted a motion asking the government to make efforts to get peat fires like those on Kalimantan included under the Kyoto Climate Convention. If that succeeds, then investment in peatlands will become attractive as it will yield CO_2 credits for nations or businesses that may need them.

The increasing attention didn't just materialise out of thin air. Every year, fires destroy vast tracts of the Indonesian island. The situation last year was nearly as bad as in 1997 and 1998, when 1.2 million ha of peatland was destroyed. According to Wetlands International and Delft Hydraulics, at that time Indonesia was responsible for 15–40% of the entire world's CO_2 emissions. And still today, Indonesian emissions are higher than those of such industrialised countries as Russia or India. Wetlands International drew attention to this underilluminated problem during the Climate summit in Nairobi, November 2006, when the NGO advocated the creation of a Global Peatlands Fund, financed from both public and private sources.

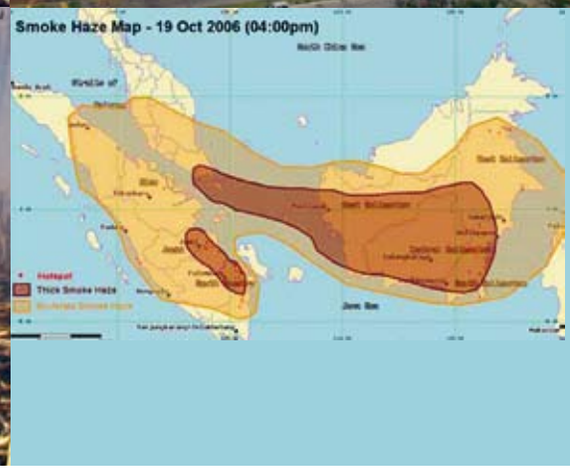
The smoke also causes air pollution in the region (to the fury of neighbouring countries), and inflicts major economic damage. The population of Kalimantan and Suma-

THE END OF THE PEATLANDS?

Large areas of Southeast Asia consist of swampland forests. The layer of peat in the forests – often as thick as 10 m – consists of ancient, partly decomposed plant remains in which vast quantities of CO_2 are still absorbed. The peatland forests are stripped bare on a huge scale before converting them into oil palm plantations. The land is drained because it must not be too wet for the cultivation of oil palms, nor can heavy forestry machinery be used on swamplands, while the felled tree trunks can be carried off via the drainage canals. Drainage means the end for the swamps as they dry out and decompose. These processes are amplified by the fires, which consume hundreds of thousands of hectares of degraded swampland. The fires rage underground for a long time, consuming the thick peat layer, and are difficult to extinguish.

MARCUS SILVIUS (WI)

MARCUS SILVIUS (WI)



question

PARTNERS

The Central Kalimantan Peatlands Project is being conducted by a consortium of NGOs comprising: Wetlands International, WWF, CARE and BOS. The Kalimantan provincial government and the University of Palangkaraya are also involved with the project, which is lead from the Wetlands International HQ in Wageningen, which is already managing a similar project on Sumatra.

tra are most afflicted by the fire and pollution: 30% of all children under five suffer from bronchial conditions.

Fire tracking teams active in peatlands

As early as 2005 the Dutch parliament called on the government to take action. This gave the green light for an investment of € 5 million in two years to protect and restore several peatlands and forests in Central Kalimantan. The Central Kalimantan Peatlands Project is implemented by a consortium of NGOs (see box Partners).

The first fire tracking teams have now been set up and have started to replant the incinerated areas. These measures only make sense as part of a structured approach, though, and for that the water level in the peatlands has to rise again so that the peat no longer dries out and doesn't catch fire so easily. The local government and the local population have dammed drainage canals to close them off. Project Leader Marcel Silvius says that, 'There is some resistance because you're closing down a transport canal, but a fishpond comes into existence between two dams, which brings food and income with it. That breeds a lot of good will. The effects are visible: there are fewer fires in areas where the water level has risen. The local population, of course, mainly want their standard of living to improve. That's why the project doesn't work on firefighting alone; it also contributes to alleviating poverty.'

Satellite images

One of the biggest obstacles to stopping the fires on Kalimantan is illegal logging, which is done to make room for plantations as well as agricultural land. The NGOs involved in the Peatland Project are lobbying for a province-wide approach and expect satellite monitoring to contribute a lot. The Wageningen, Netherlands company Sarvision can use satellite pictures to show where logging is going on. Video images taken during the last seven years reveal that the red spots showing logged areas are steadily increasing in size. Kalimantan's governor is a great supporter of this monitoring system: 'These data allow us to act more quickly and prevent fires.' ●

More information:

www.wetlands.org/ckpp

NATURE UNDER PRESSURE

Help, The Tiger's drowning!

The sea is steadily eating away at the Sundarbans. This swampy, densely forested coastal area on the border between India and Bangladesh is one of the last strongholds of the Bengal tiger. The rising sea level means the animal is losing the low-lying mangrove forests as a hunting ground.

BY MARION DE BOO

The Sundarbans are the world's largest delta, formed by the silt from such rivers as the Ganges and the Brahmaputra. The mangrove trees there perch on high, bizarre buttress roots like stilts in the sea. The mangrove forest serves as a brooding area for numberless fish, shrimp, crab and lobster. There are also crocodiles, cobras, pythons, immense lizards, river sharks and other rare species. Satellite observations show that the sea level here has risen 3 cm every year over the last 20 years, which is faster than average. As the sea level rises the delta silts up, but not fast enough. Furthermore, the high waves pound the coast with increasing severity, which then starts to crumble. Within a space of 20 years all four islands will have disappeared under the waves; three are threatened now, while in the next three decades it is likely that thousands of square kilometers of the Sundarbans will be lost. So climate change means the death blow to the tigers in the densely populated archipelago, where illegal logging, poaching and overgrazing have already made their mark. More than half the mangrove forests have been stripped bare for agriculture and shrimp farms for export to the West. Storm floods penetrate ever further inland, threatening Calcutta with its population of millions. The rising sea level is causing massive population movements, putting even more pressure on the Bengal tiger.

Poverty agenda

It's not just the tiger that's threatened by climate change. If the polar icecaps melt, polar bears and penguins will vanish. If the sea warms up by more than 2°C the coral reefs will die off. A dryer climate means the disappearance of the rainforest. 'A new rainforest has been planted near Kuala Lumpur, a sort of open air arboretum,' says Hans Wessels, head of natural resources and ecosystem management at the Environmental and Water Directorate (DMW) of the Ministry of Foreign Affairs. 'But we simply care more for real, virgin nature. The Netherlands didn't sign the Rio de Jañeiro Biodiversity Treaty for nothing. Loss of biodiversity is accompanied by loss of natural resources. If it gets warmer or colder, or if the water level rises, then the existence of smallholders throughout the world comes under threat.' Twenty years ago Wessels was in Colombia at the source of several major rivers. 'With at least 12 m rainfall a year the area was originally absolutely soaking wet. It's now dried out completely thanks to deforestation. El Niño and La Niña cause similar effects.'

Along the equator in the Eastern Pacific the normally cool seawater sometimes warms up. This influences the weather in large areas of the world. The phenomenon is called El Niño (The Christmas Child), a name given by the fishermen in Peru. What it implies is that the warm water that appears of the Peruvian coast in January marks the end of the fishing season. It's irregular, but on average once every three to seven years El Niño leads to such extensive, powerful warming of the ocean water that the entire atmosphere is influenced for a long period. In physical terms, La Niña is the opposite effect to El Niño.

Death blow

DMW is not just concerned with nature management, but also with sustainable consumption and the conservation of natural resources. Moreover, the environment and thus climate projects, too, must contribute to the alleviation of poverty. Many Development Aid projects thus also touch climate change and biodiversity. For instance, they are working on sustainable land use and sustainable forestry, often in co-operation with the UN Food and Agriculture Organisation (FAO). Major projects in the Amazon are being conducted with German colleagues. In the forest and water areas there is collaboration with the International Union for the Conservation of Nature (IUCN), which is investing in the natural recuperation of damaged mist forests, tropical grasslands and wetlands. In vulnerable ecosystems already suffering from logging, water drainage, overgrazing and pollution, rapid climate change is often a death blow. The IUCN's efforts are devoted to robust, interconnected ecosystems that afford plant and animal species the opportunity to survive climate change.

There are partnerships with Wageningen in such areas as competing claims, making the production chain more sustainable, and biodiversity. A key factor in the tropical forest projects is biodiversity. The issue of peatland forests is a problem in Indonesia and

ALARMING REPORT

The results of the largest environmental research programme in the world, the Millennium Ecosystem Assessment, are cause for alarm. According to the report, humans are influencing nature more than ever before. 'We're succeeding in feeding 6.5 billion people better than we did 4 billion people 30 years ago, but it's costing us biodiversity and ecosystems,' says Rik Leemans, Chair of the Responses Working Group and Professor of Environmental Systems Analysis in Wageningen. 'People's welfare has improved, but nature and biodiversity are the poorer for it. The report shows that the future lies in our hands. Sustainable development is possible, but only with major changes in politics, legislation, investment and behaviour.' The environmental research is the biggest programme ever: more than 1,300 scientists from 95 countries worked on it, in four groups for four years. Besides the working group on subsequent activities, there was one that charted out the present situation and one that set out future scenarios. The fourth working group was devoted to concrete regional developments. According to Leemans the report was innovative in that it didn't just look through environmental conservation spectacles. A great deal of attention was devoted to the relationship between ecological and economic developments and collaboration between scientists from the rich countries and their colleagues from poorer ones.

www.milleniumassessment.org

BURKINO FASO TO PROTECT WETLANDS

During the winter godwits, ruffs, common teal, purple herons and other 'traditional' Dutch nesting birds commonly stay in the bird-rich wetlands around Oursi, Burkina Faso. These wetlands in the northern Sahel zone are of great natural significance and as such are recognised as a Ramsar site, but a dryer climate threatens them with disappearance. In a nature conservation project run by climate campaign HIER, funded by the Dutch Post Code Lottery, the Netherlands Society for the Protection of Birds (Vogelbescherming Nederland) is working through Birdlife International with counterpart Naturama in Burkina Faso. The area plays an important role in the living of the local peoples, but is now significantly threatened by overexploitation. It is being overfished and overhunted, trees are logged illegally, and too much water is being extracted.

The project is setting up a network of volunteer 'wetland guards' who monitor the activities that threaten the area. Because they live in the surrounding villages there is a direct link with the area's users and protectors. This link is used to provide targeted information to the native population about the need and opportunities for nature conservation. The wetland guards also conduct regular bird censuses. Finally, a management plan for the entire area is being set up in co-operation with as many parties as possible, including the local government. Alternative economic activities are being developed, such as beekeeping and tree nurseries. Teaching programmes are also being developed for local schools. This approach is a model for other threatened wetlands in Burkina Faso.

www.vogelbescherming.nl
www.hier.nu

Malaysia. These forests in the wetland areas are torched to make room for oil plantations (see p. 40). Wessels: 'These fires affect their immediate environment, if only because of the enormous amount of smoke and the CO_2 emission. We want to influence policy and thus contribute to the solution; we're concerned with forest conservation and possible regeneration.'

The extensive cattle ranching in Western Kenya is increasingly suffering from drought, which is why the Ministry is experimenting with mini-dams, built to retain rainwater and river water longer. This can later be used as drinking water or for irrigation.

African savannahs persist because people burn off trees and bushes to keep the area open. If they were to stop, then the rainforest would probably expand

Wetter or dryer?

Wageningen University's Marc Sosef: 'It's not clear what the consequences are for the ecosystems in developing countries: things can go two ways. Areas may become warmer and dryer, or else warmer and wetter, depending on changes in the ocean flows. If it gets warmer and wetter, then the tropical rainforest may even expand, creeping up the slopes from the valleys – if there's enough room. Historical pollen analyses have shown that it happened that way in the distant past. But areas where it becomes warmer and dryer will turn into savannah or desert.'

Information is scarce on exactly what is going on, and which species are already dying out due to climate change, according to Sosef. 'We are witnessing changes, but it's difficult to point at the cause because of the great influence of human land use.' Many African savannahs persist, for instance, not because of a lack of rainfall but mainly due to human management. Local populations burn off trees and bushes to keep the area open and grass covered, and to attract game. If they were to stop, then the rainforest would probably expand, as research in the Ivory Coast has shown.

A few years ago Sosef conducted long-term vegetation research in Gabon. Nearly every year a scientific expedition was sent from Wageningen to make an inventory of the species-rich rainforest for the Flora in Gabon project. More than 8000 species of tracheophytes are known in Gabon, compared with 1400 in the Netherlands. Sosef showed on the basis of historical climate research that the area of tropical rainforest in central Africa must have been smaller in the ice age, because the climate then was dryer and maybe three or four degrees colder than now. Tropical species withdrew to the core areas, which biologists call refuges. When the climate became warmer and wetter, they spread out once again from the refuges. These can still be recognised as hotspots of biodiversity, as revealed by the inventories made by Sosef and his colleagues in co-operation with nature conservation agencies such as the Wildlife Conservation Society. In 2002 the Gabonese government decided to protect these areas of very great biological diversity. Gabon gained a network of 13 national parks, together totalling about 10% of the total land area. The gorillas, elephants and chimpanzees that dwell there are making ecotourism a useful new source of income. 'It's a real success story for nature conservation,' says Marc Sosef. ●

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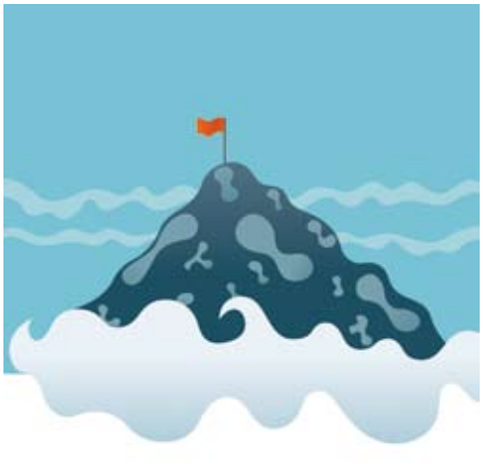
In brief

AOSIS
Tuvalu wants insurance

'We've been talking about adaptation for a long time now, but the first adaptation project in Tuvalu still has to get off the ground, even though our immediate future's at stake,' says Enele Sosene Sopoaga, Tuvalu's Ambassador to the UN and Vice Chair of the Alliance of Small Island States (AOSIS). The region is experiencing the first wave of climate refugees: the low-lying island states Vanuatu and Papua New Guinea have started to move population groups to higher land.

'Adaptation projects have to help alleviate the vulnerability of small island states to sea level rise and to repair the damage already done,' says Sosene Sopoaga. The new adaptation fund set up by the UN is, he says, 'A good step,' but too little. A solution he has more confidence in is the creation of an insurance fund for small island states, to help carry the financial burden of climate change. In February Sosene Sopoaga spoke in The Hague at a meeting organised by the UN University for Peace on the vulnerability of low-lying islands and deltas to climate change.
(HvdV)



China
13.3. million ha of land for biomass

China wants to make 13.3 million ha of land ready for biomass production: an area about triple the size of the Netherlands. What is still unclear is how much biofuel it can produce. Most Chinese power stations run on coal. The use of biomass is being subsidised to cut CO_2 emissions and local air pollution. By 2010 China wants to produce 2 million tons of liquid biofuel, while moving from 2 to 5 GW of biomass-fuelled electricity generation. A 1 GW capacity power station can supply power for around 1 million households.

Salt water agriculture

In Mexico ODE is using salt water to irrigate desert land to grow salt-tolerant plants. Salt water agriculture is set to take off thanks to climate change and increasing demands for food and fresh water. This sort of agriculture conserves fresh water, uses infertile land, creates CO_2 sinks and aids local communities.
More information: www.oceandesertenterprise.com

colophon

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Pruning trees in Rajasthan, India. The branches are used as cooking fuel. The advantage of this technique is that the trees are not cut down. There is a serious problem if too many people attack too few trees. In many cases the branches are burned to give charcoal, which offers a source of income. This is not efficient, though, as making one unit of charcoal needs about twice as much wood. PHOTO: JOERG BOETHLING (LINEAIR)