



# UNDERSTANDING THE ISSUE 1/2007

Climate Change  
Threatens the Fight Against Poverty



## Acknowledgements:

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# CLIMATE CHANGE THREATENS THE FIGHT AGAINST POVERTY

Few warnings have been more dangerously ignored than that of climate change. Unlike a catastrophe that strikes once, climate change is a slowly unfolding disaster. The potential damage caused by climate change is so severe that it threatens the livelihoods of millions of people. Climate change speaks directly to poverty. Few other single issues present such a danger to the future welfare of the world's poor.

Climate change is a threat not only to the wellbeing of poor people. Its impact may increase violence in drought-hit areas in Kenya and, when increased quantities of melting water from the Himalayan glaciers sweep away their land and livelihoods, people in Bangladesh will be forced to abandon their homes.

Although the facts in this report are harsh, it is also our intention to bring a message of hope. The time span for reducing emissions is limited; however, decision makers now have the facts on the table and it is time to act.

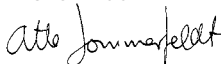
Norwegian Church Aid and Church of Sweden believe that we human beings have a duty to manage our natural resources and the global environment in a sustainable manner so we do not jeopardize the lives of future generations. God has given the earth, nature and the environment to the whole of mankind. No one generation or group has the right to exploit these resources for their own greed or at the cost of future generations.

We are now intensifying our advocacy work on the issue of climate change. We advocate that rich countries must bear the main responsibility for reducing greenhouse gas emissions and facilitate the development and transfer of climate-friendly technology that will benefit developing countries. It is no longer possible to ignore climate change adaptation as an element in development work. Increased support for developing countries that will enable them to adjust to climate change is urgently needed.

We also add our voices to those that demand that governments across the globe, and in particular our own governments, demonstrate bold leadership in working for a responsible and ambitious post-Kyoto agreement.

It is our hope that this report will add another perspective to the debate on climate change and stimulate much needed action.

March 2007



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# KEY FACTS

By Norwegian Church Aid and Church of Sweden



Disasters as drought, cold periods, fires and floods have always been a part of life in Bangladesh. The country has large rivers and poor inhabitants with houses that are very vulnerable for nature disasters.

Photo: Norwegian Church Aid

**“Friday, 2 February 2007 may go down in history as the day when the question mark was removed from the question of whether climate change has anything to do with human activities.”**

Achim Steiner, executive director of the United Nations Environment Programme.<sup>1</sup>

In 1988 the United Nations Environmental Programme (UNEP) and the World Meteorological Office (WMO) established the Intergovernmental Panel on Climate Change (IPCC) to provide independent scientific advice on the issue of climate change, its evidences and predictions. The first assessment report of the IPCC served as the basis for negotiating the United Nations Framework Convention on Climate Change (UNFCCC). The 4th assessment report, published in February 2007, has a level of confidence that is much greater than what could be achieved in 2001 when the IPCC issued its last major report: it makes the conclusion that the global climate changes are down to human activities and that the changes in the atmosphere, the oceans and glaciers and ice caps show indisputably that the world is warming.

The world’s average surface temperature has increased by around 0.74°C over the past 100 years. Dependent on future emissions scenarios, global temperatures could increase by 1,1-6,4°C by 2100. The increase is very likely to be in the range 2 to 4.5°C, with the best estimate of about 3°C, and is very unlikely to be less than 1.5°C. Values higher than 4.5°C cannot be excluded<sup>2</sup>.

<sup>1</sup> <http://news.bbc.co.uk/2/hi/science/nature/6324425.stm>  
<sup>2</sup> IPCC, 2007

For the first time, the report provides evidence that the ice sheets of Antarctica and Greenland are slowly losing mass and contributing to sea level rise. Glaciers are shrinking and sea levels are rising far more rapidly than anticipated. According to the IPCC sea-level rise might be 28-58 cm by 2100. However, the international research institute Met Office Hadley Centre predicts that a irreversible melting of the Greenland ice-cap will occur at a local increase of the temperature of 3°C, which equalize with a global increase of 1,5°C<sup>3</sup>. Met Office Hadley Centre further indicates that the melting of the Greenland ice-cap may lead to a yearly 5 mm sea level rise. In a time span of 100 years this prediction leads to a 50 cm sea level rise and up to 5 meter sea level rise during 1000 years<sup>4</sup>.

Most of the observed increase in global averaged temperatures since the mid-20th century is in IPCC language very likely due to the observed increase in greenhouse gas concentrations<sup>5</sup>. The global increases in carbon dioxide concentration are due primarily to fossil fuel use. The global atmospheric concentration of carbon dioxide has increased from a pre-industrial value of about 280 ppm to 379 ppm<sup>3</sup> in 2005 and GHG- emissions are still rising. In 2006, the International Energy Agency (IEA)<sup>6</sup> predicted that CO<sub>2</sub> emissions would increase by another 55% by the year 2030.

The 0.74 °C rise we have seen between 1906-2005 is already bringing hunger, destitution and death to millions of the world's most vulnerable people. A warming of about 0.2°C is projected for each of the next two decades.

- Sub-Saharan Africa: Dry areas will get drier and wet areas wetter, more extreme weather, more intense and longer droughts.
- Asia: Sea level rise and an increase in intensity of tropical cyclones as well as decrease in water supply, droughts, cyclones and intense rainfall events.
- Latin America: Increased droughts, increased floods and landslides, heat outbreaks, forest fires and loss of coastal land and biodiversity.
- The snow and glaciers that covered Mt. Kenya have almost disappeared and Kilimanjaro has lost some 82 percent of its mass since 1982<sup>7</sup>. This is devastating for the people on the African continent. They depend on the snow and glaciers of Mt. Kenya as a critical source of water for growing food and making a living. Because of large-scale groundwater reduction, the melting has led to more drought than floods pushing people to leave their land and migrate.
- Extreme weather events, such as tropical cyclones, are likely to become increasingly intense, involving heavy rainfall, high winds and storm surges<sup>8</sup>.

3 <http://www.metoffice.gov.uk/index.html>

4 <http://www.metoffice.gov.uk/index.html>

5 <http://www.ipcc.ch/SPM2feb07.pdf>

6 <http://www.worldenergyoutlook.org/summaries2006/English.pdf>

7 <http://www.grida.no/climate/vitalafrica/english/03.htm>

8 <http://www.ipcc.ch/SPM2feb07.pdf>

The Red Cross (2003) claims in a study that weather-related disasters are increasing and has affected 2.5 billion people and causing more than US\$ 400 billion of damage over the past decade<sup>9</sup>. At this present moment Mozambique experiences devastating floods. The floods have hit some 80,000 people. Flooding is common during the southern Africa rainy season, but OCHA states that this flood is more wide spread and also that it occurred earlier. An estimated 40,000 hectares of crops have been lost in Mozambique under the floods in February this year. Taken as a single episode, Mozambique's experience underlines how climatic events can roll back development gains across a broad front.

- The glaciers of the Himalayas and Tibet, the “Water Towers of Asia”, alone feed seven of the world's greatest rivers — Brahmaputra, the Ganges, Indus, Irrawady, Mekong, Salween and Yangtze — that provide water supplies for more than 2 billion people<sup>10</sup>.
- In the semi-arid Northeast Brazil, with the lowest level of human development in Latin America, global warming has accelerated desertification with the consequences of rising poverty, hunger and migration<sup>11</sup>. Up to 75% of land in the north east, which is plagued by periodic drought, is at risk of becoming desert<sup>12</sup>. The already harsh environment makes more intense droughts devastating for the already impoverish population, with recorded losses on agricultural production sometimes exceeding 60%<sup>13</sup>. One in five Brazilians born in the arid north-east of the country moved to another region within Brazil.
- The melting of the glaciers and the increased water flows are particularly affecting low-lying regions. Bangladesh lies at less than 5 meters above sea level and these regions support more than 110 million people. In most Pacific islands, the people, agricultural land, tourist resorts and infrastructure are concentrated in the coastal zones, and are especially vulnerable to any rise in sea level<sup>14</sup>. The population of Tuvalu, a group of eight Pacific islands north-east of Australia, is already being evacuated; nearly 3,000 Tuvalans have left so far<sup>15</sup>.
- The IPCC has estimated, in their report from 2001, that by 2050, a combination of rising sea levels, erosion and agricultural damage due to climate change could make 150 million people environmental refugees. A movement of people on this scale will cause major social and economic upheaval and conflict. It is very likely that global warming, more than war or political upheaval, stands to displace many millions of people.

9 [http://www.icrc.org/Web/eng/siteeng0.nsf/htmlall/5XRFZB/\\$File/ClimateChange\\_Report\\_FINAL\\_ENG.pdf](http://www.icrc.org/Web/eng/siteeng0.nsf/htmlall/5XRFZB/$File/ClimateChange_Report_FINAL_ENG.pdf)

10 <http://hdr.undp.org/>

11 <http://hdr.undp.org/>

12 <http://www.tearfund.org/webdocs/Website/News/Feeling%20the%20Heat%20Tearfund%20report.pdf>

13 <http://www.wmo.ch/Madrid07/confmadrid/Policy%20%20Planning%202.pdf>

14 <http://www.unescap.org/mced2000/pacific/background/AOSIS.htm>

15 A citizen's guide to climate refugees. Friends of the Earth Australia, 2005

- 2005 study by the World Health Organization indicated that global climate change is directly tied to increased rates of malaria, malnutrition, and diarrhoea. It estimated that climate change contributes to 150,000 deaths and 5 million illnesses each year<sup>16</sup>.
- Climate change impacts on agriculture could increase the number of people at risk of hunger. The impact of climate change on food security will be higher in those countries with low economic growth potential that currently have high malnourishment levels. In some 40 poor, developing countries, with a combined population of 2 billion, including 450 million undernourished people, production losses due to climate change may drastically increase the number of undernourished people, severely hindering progress in combating poverty and food insecurity<sup>17</sup>.
- For every degree Celsius increase in the tropics and subtropics agricultural harvests are expected to decrease by 10%<sup>18</sup>.
- An FAO/IIASA study indicates that the developing world would experience an 11% decrease in cultivable rainfed land, with consequent decline in cereal production. Sixty-five developing countries, representing more than half the developing world's total population in 1995, will lose about 280 million tons of potential cereal production as a result of climate change. This loss, valued at an average of US\$ 200 per ton, totals US\$ 56 billion, equivalent to some 16% of the agricultural gross domestic product of these countries in 1995. Some 29 African countries face an aggregate loss of around 35 million tons in potential cereal production. In the case of Asia, the impact of climate change is mixed: India loses 125 million tons, equivalent to 18% of its rainfed cereal production; China's rainfed cereal production potential of 360 million tons, on the other hand, increases by 15%<sup>19</sup>.

<sup>16</sup> <http://www.who.int/globalchange/publications/infectdiseases.pdf>

<sup>17</sup> Background document, FAO, 31st session of the Committee on World Food Security, 2005

<sup>18</sup> Brown, Lester, 2004, "Outgrowing the earth"

<sup>19</sup> Background document, FAO, 31st Session of the Committee on World Food Security, 2005

# KENYA: DROUGHT AND CONFLICT

By Katy Migiro and Dominic Nutt

**‘Climate change will make it impossible for the world to achieve the millennium development goals. Poverty is bound to increase. Food security is bound to get worse. People will be spending a lot of money trying to deal with food security and thereby deal with poverty and in the end there will be no solution.’**

Professor Richard Odingo, vice-chairman of the Intergovernmental Panel on Climate Change



Elim Lokeris, 45, was shot in the back and had his stomach slashed open by raiders who stole his entire herd of 380 animals. He was hospitalised for two years.

Photo: Christian Aid/  
Maxwell Agwanda

Once Sambarwawa had water, now it has bodies. Following prolonged drought, animal carcasses litter the valley and the stench of decay pervades the remote village of Sambarwawa in the heart of the northern Kenyan district of Isiolo.

But Sambarwawa is not only a graveyard for the animals of local livestock farmers. Some of these nomadic herders – known as pastoralists – have also died because of the drought; not from starvation or thirst, but as a result of escalating conflict in the area. They were murdered for their water.

Sambarwawa is a place where groups of pastoralists congregate in times of drought. Each group is allocated a space on the dry river bed to drill a bore-hole for water. They are allowed to bring their animals to drink here once every four days. ‘It’s a sort of cafeteria system to ensure everybody has a chance to get water for their animals,’ says local leader Wako Liba.



The lack of rain resulted in drought and hunger in West Africa the first months of 2006. In Manderu in the north of Kenya the situation got serious. Dead animals were lying all over the ground where there used to be fields. Now there's just sand and stones, and nothing to eat.

Photo: Norwegian Church Aid/Kirsten Engebak

But the system has been under extraordinary strain for years because of almost a decade of drought<sup>1</sup>. By December last year, some 10,000 herders with 200,000 animals had descended on tiny Sambarwawa, many trekking 400km from the epicentre of the drought in the east. Although the village had not seen rain for a year, they knew they could still find water under the riverbed. But then the boreholes began to dry up.

'As the water level dropped, I foresaw conflict,' says Liba. 'Some herders started encroaching on boreholes owned by different communities. As one group pushed to water its livestock, another moved to restrict access to the few boreholes that had enough water.'

In December, as the drought intensified, the pressure finally led to killings.

'Gunshots reverberated the whole night,' Liba recalls. 'By the time I came down, seven people had died. There were dozens of injuries. Animal carcasses littered almost a kilometre stretch of the valley.'

David Kheyile, 37, was queuing for water when fighting broke out. 'There was grumbling that evening. A good number of boreholes didn't have water so the queues were relentless,' he says.

'People were becoming impatient. Suddenly there was a scramble at the northern end of the valley... it was a free-for-all. But it later took on an ethnic dimension when people aligned with their kind to defend themselves.'

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<sup>1</sup> There have been successive poor rains since 1998, according to the Kenya Food Security Steering Group's Kenya Short Rains Assessment Report 2005, Nairobi, 9 February 2006.

Over the next 40 days, there were another four violent incidents that left at least two more people dead, according to government officials. More than 3,000 animals – pastoral communities' only assets – were stolen.

Arkan Athan Hussein, a lanky 18-year-old herder, was injured in one of the incidents while tending his family's livestock. His friend, Abdi Maalim, was killed.

'Six armed people emerged from nowhere. They wanted us to help them drive their livestock to the watering point. We couldn't do that. The use of boreholes is restricted so we couldn't push through someone else's herds.'

'As we resisted, one of them raised his AK-47 and shot Abdi in the chest and shoulder. As I fled, they shot at me.'

Arkan's father, 70-year-old Ibrahim Hussein, says that in the 40 years he has been coming to Sambarwawa, this is the first time there has been such violence. In response, the authorities have set up a police post manned by 12 specially-trained officers. But the area remains tense. The link between drought and conflict is widely recognised in Kenya.

Edwin Rutto of the Africa Peace Forum monitors violent incidents in the country. He says that there is an 'established correlation between drought and violent conflict... During times of drought, conflict between communities over water and pastures increases.'

It is a view echoed by Professor Richard Odingo, vicechairman of the UK's Intergovernmental Panel on Climate Change (IPCC), who has published work on drought-related conflict in north-eastern Kenya.

'During a period of drought, the strongest survive,' he says. 'It's survival of the fittest. You have a lot of conflict because of that. It is related to the struggle for resources, especially water and grazing.' As the climate changes, say experts that Christian Aid interviewed, this is certain to get worse.

Recent drought has also triggered violence between communities in Naivasha's Mai Mahiu area, 90 km north-west of Kenya's capital, Nairobi. In January and February 2005, 22 people were killed and more than a dozen hospitalised in fighting over a water point on Ewaso Kedong river. When farmers diverted water to irrigate their farms, Maasai pastoralists living downstream illegally occupied their land, stole livestock and destroyed waterpipes in protest.

The Maasai were desperate for water because Kajiado district, where they live, had received less than 20 per cent of its usual rainfall during 2004 and 2005<sup>2</sup>. The violence took on an ethnic dimension, as gangs from different tribes staged revenge attacks, pulling Maasai passengers out of buses and killing them with machetes, spears and arrows.

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2 USAID-funded Famine Early Warning System, cited in M Mutua, 'Mai Mahiu: Maasai leaders protest at killings', East African Standard, Nairobi, 25 February 2005.

Conflict over access to water, grazing and land has resulted in extreme violence between Borana and Gabra pastoralists in Kenya's Marsabit district, near the Ethiopian border. On 12 July 2005, 56 people, including 22 primary school children, were killed in Turbi village. Another 20 people died in revenge attacks as Borana passengers were pulled from buses and murdered.

The problem has even begun to cross international borders, raising the fearsome spectre of war. In recent weeks, drought has caused conflict between Ugandan and Kenyan pastoralists. And Ethiopian troops have moved into parts of northern Somalia to stop Somalis crossing the border in search of pasture and water for their livestock.

## CLIMATE CHANGE

As part of his work for the IPCC, Richard Odingo has been monitoring climate change in Africa. 'We have rather frightening evidence. If you go back 50 years, climate is changing and is changing fairly rapidly for the worse,' he says.

The melting of the glaciers on Mount Kenya provides the clearest evidence of climate change. 'The glaciers on Mount Kenya have always been there,' he says. 'They have fluctuated during periods of drought. They have come back during periods of heavy rain. But for the first time we are seeing almost the disappearance of the glaciers.'

Professor Eric Odada, the regional director for climate change research in Africa at the Paris-based International Council for Science, argues that the melting of the glaciers on Mount Kilimanjaro, just across Kenya's southern border with Tanzania, will have further devastating implications for some of Kenya's most fertile lands. They provide the source for many local rivers, but they are disappearing. Professor Odada warns that rain-fed lakes will dry up, hitting some of the most populated parts of east Africa.

'Cities like Mombasa [Kenya's second largest city] will be put in a difficult situation because [it] is getting water from Mzima Springs which is fed by the glaciers on Mount Kilimanjaro,' he says.

The rapidity with which glaciers are melting shows that Kenya is getting warmer. This is confirmed by measurements on the ground. For example, the maximum temperature in Kericho, a highland area in the Rift Valley province where most of Kenya's tea exports are grown, has increased by 3.5°C during the past 20 years<sup>3</sup>. In Lamu, on Kenya's north-eastern coast near Somalia, the maximum temperature has increased by more than 3°C since the 1940s<sup>4</sup>.

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3 S Wandiga, 'Assessment of Impact and Adaptation to Climate Change', AIACC Regional Workshop, Dakar, 23 March 2004.

4 Kinguyu and Ogallo (1999) cited in Coping with Floods in Kenya, DCMN-UNEP report, Nairobi, April 2004.

Peter Ambenje, head of forecasting at Kenya Meteorological Department, says: 'There seems to be increased frequency and intensity of severe weather and extreme climate events. Just by looking at rainfall patterns for the last 25 years... severe drought... seem[s] to be becoming more prevalent. We can [also] see very high variability in rainfall.'

Dr Jesse Njoka of the University of Nairobi is an expert on the ecology of Kenya's arid and semi-arid lands. His analysis backs up Ambenje's observations. 'The beginning and end of the rains are no longer that predictable,' he explains. 'Even drought within the rainy season is an issue. For example, we always expect rains to start at the end of March. Now they are predicted for April. We expected grass rains [rains which allow grass to grow] in the middle of February and now it appears the rains we had in March are grass rains.'

The implications are serious. Crops die during these prolonged dry spells and animals have no grass to feed on and perish.

## POVERTY AND CLIMATE

In Kenya, where 56 per cent of the population live on less than US\$ 2 a day, it is the poor who will be hardest hit by climate change.

Pastoralists are among the poorest and least educated people in Kenya. They spend their lives traversing the arid and semi-arid lands that make up 80 per cent of the country, looking for water and pasture. Most of the herders in Sambarwawa have never stepped inside a classroom and cannot speak either of Kenya's national languages, English or Swahili.

With the recurring droughts brought by climate change, poor pastoralists are stuck in an ever-tightening poverty-trap. 'After people go through a period of relative recovery, then another drought hits. People are living in a state of perpetual suffering,' says Edwin Rutto of the Africa Peace Forum.

If the climate cannot sustain you, then you tend to spend a lifetime careering from crisis to crisis, periodically relying on emergency aid. This is undermining the government's development efforts. 'It is extremely expensive to feed people. The government has diverted all its development money to emergency money,' says Fatuma Abdikadir, national coordinator of the government's Arid Lands Resource Management Project.

People are left with very few choices when drought strikes – women and children fewest of all. As Dominic Kariuki of the peace-negotiating organisation Chemchemi Ya Ukweli puts it; You can't sell your animals – you don't have [any]. You can't sell your labour – you don't have skills. So you are left with your body.

'Prostitution has fast become not just the last but the only resort for many women and children – some as young as seven, according to Kariuki. He says: 'They have lost their relatives. They are on their own. There is nobody to protect them. They come to work almost as slaves in urban centres where they work for food and nothing else. When those jobs are not available and they are getting used to urban life, they broaden their survival skills.'

## WAR

Prospects for the future are grim. Experts agree that conflict is likely to become more widespread, particularly as water shortages worsen. Cross-border conflict in the Horn of Africa, already existing on a small-scale, is likely to escalate.

Traditionally, young men in pastoralist groups attack their neighbours to steal their cattle. This is part of the culture of communities like the Turkana and Pokot from Kenya, the Karamajong from Uganda, Toposa from Sudan, Oromo and Merille from Ethiopia and numerous Somali clans. But these raids have become increasingly deadly in recent years with the influx of cheap guns from nearby war zones. Communities are becoming caught up in an endless cycle of revenge attacks.

Nomads are used to crossing borders in search of scarce water and pasture. As drought tightens its grip on the region, the pressure to search for water is intensifying, leading to armed violence and deaths. In March, for example, Kenyan Pokots raided a Ugandan settlement, killing 16 people. In retaliation, the Ugandan army sent in a helicopter to pursue the Pokot raiders. Increasingly, soldiers are being used to protect communities, for example, around Soroti in eastern Uganda. A military response is one small step closer to state-backed conflict – or war.

Water shortages could also lead to conflict between Kenya and Ethiopia. Kenya's arid Turkana district, which borders Ethiopia, has only two sources of freshwater – the Turkwell and Omo rivers. The Turkwell, in Kenya, has been dammed to generate electricity, reducing its flow downstream. The Omo originates in the Ethiopian highlands.

Professor Eric Odada of the International Council for Science, says: 'On the Ethiopian side, they're now diverting this water for irrigation and very little is coming into Lake Turkana. Turkana people are now very worried because [the river] is turning saline. The lake level has dropped by 60 metres over the last ten years.'

Another likely water war is over the River Nile which flows through Sudan to Egypt and the Mediterranean Sea. Lake Victoria, in western Kenya, is one of

its sources. Yet, under the rules of a treaty drawn up by British colonialists, Kenyans are not allowed to use the water for irrigation. Only Egypt, further downstream has this right.

Peace negotiator Dominic Kariuki says: 'Due to that treaty, which was written without our consent, some people are dying of drought in Kenya. Conflict will explode as the water lessens. If it's not worked out that we share the little that is there, then people will start fighting. It's just a matter of time.'

Experts are increasingly concerned about the widening impacts of climate change. Professor Eric Odada foresees a doomsday' when 'there will be mass migrations by people from Africa in search of food'.

'Europe should be prepared,' he says.

'We are either going to prosper together or perish together when climate change comes. They should not think that the barrier between Morocco and Spain will stop people from the south moving into Europe.'



In the northeast of Kenya are lack of food and water threatening 3,5 million people. Maryan Hussein Salat (15) wishes most of all an education, but the drought has killed all their animals and she can't afford to go to school. Now she has to walk a long distance to bring water to her family.

Photo: Norwegian Church Aid/Hege Opseth

# BANGLADESH: EROSION AND FLOOD

by Anjali Kwatra, Christian Aid

**“Of course I am worried about the future for those who live and work on our coastlines. There is a disaster coming and all that we can do is try to make people better able to cope.”**

Dr M Rafique Islam of the Bangladesh Intergovernmental Coastal Zone Management body



**Mazeda Begum, 35, from northern Bangladesh, stands in front of her home on a raised flood-protection embankment. She sent her nine year-old daughter to the capital Dhaka to work as a servant, as the family could not afford to feed her after they lost their home and land six years ago because of river erosion.**

Photo: Christian Aid/Anjali Kwatra

Begum's eyes well with tears as she describes how desperate poverty forced her to send her nine-year-old daughter to work as a servant in a strange city hundreds of miles away. That was five years ago and Mazeda has only been able to see Shada Rani once a year since. "I think she is being well looked after and she is getting enough to eat, which is more than I could provide for her," she says as she sits on the ground in the shade of a banyan tree. Mazeda, 35, had spent her whole life in Balashighat, a village in the Gaibandha district of northern Bangladesh, until the river Tista began to erode the land she lived on. For three years in a row, she and her husband and three children were forced to abandon their house and build a new shelter further back from the crumbling riverbank. Then, in 2000, the river finally swallowed all that remained of their small plot of farmland. Saving only what they could carry, the family had to flee by boat to a raised embankment a kilometre away, built by the government to protect a nearby town from floods.

Ever since, they have lived on the seven-metre high, five metres wide embankment which winds through waterlogged paddy fields, camping alongside 200 other families who also lost their homes to river erosion. For the first few days after they arrived they sheltered under a tree, using plastic sheets to keep off the heavy rain. A few weeks later Mazeda's husband built a house with palm leaves and straw. But without their land, where they used to grow wheat, rice and jute, they had no way of earning an income. So Mazeda decided to send Shada Rani to Dhaka. "I had no choice but to send her as we could not afford to feed the whole family," she says. "I did the right thing for her."

## COPING WITH EROSION

River erosion and flooding are part of everyday life in many areas of Bangladesh. Most of the 200 families on the embankment have moved two or three times because of erosion and some say they have had to move as many as ten or 11 times during their lives. They also say these events have become more common in the past few years. "Before, my father could predict how the river would change course over the years. But now it happens too fast for us to be able to predict," Mazeda says. Surveys conducted in villages and rural areas show that people in Bangladesh are aware that their weather patterns are changing, even though they may not understand why, and many are worried. They are right to be. Bangladesh will be one of the countries hit hardest by climate change. More frequent floods, erosion and rising sea levels could reduce its landmass by more than a fifth, forcing millions of people to leave their homes and migrate in search of food, water and shelter<sup>1</sup>. Climate change could also cause droughts in some parts of the country and lead to more and stronger cyclones.

The Tista is one of 230 rivers that criss-cross the country. Further downstream it becomes the Brahmaputra, one of three great rivers – the others are the Ganges and the Meghna – which together drain 175 million hectares of land<sup>2</sup>. The outflow of water from Bangladesh is the third highest in the world after the Amazon and Congo systems. Although it is only the size of Greece, as much water flows through the country as through the whole of Europe. And with more than 140 million people, Bangladesh is among the most densely populated agricultural nations in the world. People must use every available piece of fertile land, including riverbanks – where they are at greater risk from flooding.

Each year during the monsoon season, which runs from July to September, roughly a fifth of the country is flooded. People have become used to coping with the inundation. In fact they welcome this regular flooding as it deposits essential nutrients on the soil, allowing them to grow crops year after year.

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<sup>1</sup> World Bank, 2000, "Bangladesh: Climate change and sustainable development"

<sup>2</sup> Leahy, Stephen, 2003, "Rising rivers set to wreck Bangladesh", New Scientist



Pancha Bala, 45, stands on the place where her home used to be until it was washed away by the sea during the monsoon season in 2005. Sand now covers the spot where the house stood on Kutubdia, an island off the southern coast of Bangladesh that has shrunk by almost half in the past 50 years due to coastal erosion

Photo: Christian Aid/Anjali Kwatra

River erosion is also a natural process caused by the scouring action of the water as it flows downstream. Also, as floodwaters recede, the riverbank often breaks up and tens of metres of land can be washed downstream. At the same time deposits of silt can create new land, which is particularly vulnerable to erosion. Although flooding and erosion are nothing new to the people of Bangladesh, the past 20 years have seen the incidences of both intensify. In 1987, 1988, 1995, 1998 and 2004, severe floods left vast swathes (more than two-thirds in 1988 and 1998) of the country under water. The 2004 floods destroyed 80 per cent of the country's crops, killed 747 people and left 30 million homeless or stranded<sup>3</sup>.

A good number of scientists and non-governmental organisations working with flood and river-erosion victims are certain that climate change is increasing the frequency of floods and the speed of erosion. Others agree that weather patterns are changing but are more circumspect about drawing a direct link between climate change and more erosion or floods. "We simply do not know if climate change is definitely increasing the erosion by our rivers. There are many complex factors involved," says Dr Atiq Rahman, executive director of the Bangladesh Centre for Advanced Studies (BCAS), the country's leading environmental research group. But, he adds, "what we can say is that patterns of rainfall and flooding have changed in the past few years. Severe floods used to come once every 20 years, but now seem to occur around every five to seven years. This could very well be linked with climate change."

<sup>3</sup> Asian Development Bank, 2004, "Bangladesh; 2004 floods, Response, Damage and Recovery needs"

But while the debate continues over whether Bangladesh is already feeling the effects of climate change, the forecast of what is to come for the country is indisputably dire.

## PREDICTIONS

Climate models developed by the IPCC indicate that Bangladesh could experience ten to 15 per cent more rainfall by 2030<sup>4</sup>. This heavier rainfall will flood between 20 and 40 per cent more land than today, according to Monirul Qader Mirza, a Bangladeshi water-resources expert within the University of Toronto's Adaptation and Impacts Research Group<sup>5</sup>. This flooding will be exacerbated as increasing global temperatures melt more snow in the Himalayan mountains in Nepal and India each summer. Already studies have shown that the Himalayan glaciers are retreating at a rate of about ten to 15 metres per year<sup>6</sup>. The huge amount of water created runs into rivers, many of which eventually flow through Bangladesh on their way to the sea. At the same time higher sea levels and higher tidal surges caused by more intense cyclones – which are also predicted to become worse with climate change – will decrease the rate at which water is discharged into the sea. This 'back-water effect' means floodwater will continue to accumulate, inundating more parts of the country and increasing the depth and area of flooding in those places already affected. "Anything which increases the flow of water through the rivers – such as more rain, more glacial melt or higher sea levels – will cause more river erosion and more flooding," says Dr Rahman from BCAS. "The amount of water coming from the Himalayas is huge and flows through the three main rivers which end in the Bay of Bengal. "When the sea level is higher, the flow of that water will be restricted and it will only be able to spread sideways which means more severe and prolonged floods. Bangladesh is already a flood-prone country but it will become much worse in future."

However, eventually if the glaciers melt completely, runoff will decrease rather than increase, leading to water shortages rather than floods<sup>7</sup>. Nazmul Chowdhury, from UK-based development agency Practical Action, runs a project that helps Mazedra and those like her who have lost their land find permanent homes and new ways of earning a living. He is in no doubt that floods and river erosion are getting worse and that this is linked to climate change. "The intensity of the floods is increasing year by year and the river erosion is happening much more in recent years," he says. "Of course the people who are facing the brunt of this process are the villagers who are poor to start with. Now they are in an even more vulnerable situation. Forget about making poverty history. Climate change will make poverty permanent."

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4 IPCC, 2001

5 Qader, M Monirul, R A Warrick, and N J Ericksen, 2003. "The Implications of Climate Change on Floods of the Ganges, Brahmaputra and Meghna Rivers in Bangladesh"

6 World Wildlife Fund, 2005, "An Overview of Glaciers, Glacier Retreat, and Subsequent Impacts in Nepal, India and China"

7 Dr R K Pachauri and Dr Madan Shrestha, 2005

Flood victims get some support from the government. But those affected by river erosion get very little financial compensation, even if they permanently lose their home or land, according to Charles Sarkar of the Christian Commission for Development in Bangladesh (CCDB). “They have nowhere to go and end up living on relatives’ land or by the roadside or on embankments,” he says.

CCDB estimates that each year a million people are displaced by river erosion, many permanently. But this would be nothing compared to the numbers who may have to migrate in the future. Experts have forecast that climate change could result in 150 million environmental refugees by 2050, including around 15 million from Bangladesh<sup>8</sup>.

## ENCROACHING SEAS

Most of Bangladesh is less than ten metres above sea level<sup>9</sup>. A rise in sea levels of between nine and 95 centimetres by the year 2100 – which is towards the top end of the IPCC’s predictions – would leave about 18 per cent (or 25,000 square kilometres) of Bangladesh under water<sup>10</sup>. About 35 million people live in the country’s coastal areas<sup>11</sup> and many could be forced to migrate inland as sea levels rise. This will put pressure on non-coastal areas, where land is scarce and the population density already high – and where climate change could already be causing more flooding and erosion.

Scientists also predict that global warming will increase the frequency and intensity of tropical storms. If the surface temperature of the sea rises, cyclones – which already hit Bangladesh regularly, with devastating consequences – are more likely to form.

The island of Kutubdia, just off the coast of the southern district of Cox’s Bazar, has shrunk by half in less than 50 years because of coastal erosion, according to the Coastal Association for Social Transformation (Coast) Trust. In 1959 it covered an area of 36 square kilometres, but in 2005 was just 18 square kilometres, according to Coast, which has analysed maps from the Bangladesh Water Development Board. Much of the erosion happened as a result of a devastating cyclone in 1991, which killed 140,000 people across Bangladesh, including 22,000 in Kutubdia. But erosion also occurs every year during the high monsoon tides. A government-built embankment has held off the erosion in recent years. But where the embankment does not exist or is broken, the sea continues to swallow up land.

In June 2005, Pancha Bala saw her home broken apart by the waves. Sand covers the place where the house stood and where she used to sleep is now part of the beach. Pancha, 45, whose husband died of cancer a year ago, says that

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8 Myers, Norman, 2003, “Environmental Refugees in a Globally Warmed World”

9 World Bank, 2000, “Bangladesh: Climate change and sustainable development”

10 IBID

11 Anwar, Ali, 1999, “Vulnerability of Bangladesh coastal region to climate change with adaptation.

when she moved into the bamboo house about quarter of a century ago, the sea was nearly 1km away. "I had lived in the house for many years. It was destroyed in the cyclone in 1991, but we rebuilt it on the same spot," she recalls. "Over the years the sea was coming closer and closer, but in the end the waves took it in one night. The waves and rain started at ten in the morning. That first day, the kitchen was washed away. We thought we might drown, so we left." She took her six children to her sister-in-law's house further inland, but the final memories of her home still haunt her. "I didn't sleep at all that night. The wind was howling and I could hear the roar of the sea. I was only thinking about the future and how we would live. When it became light I went outside and could not even see my house. The water covered it. I just sat and cried. Still I am angry with the sea for destroying my house."

There is anecdotal evidence that the rate of erosion has increased in Kutubdia in the past few years. The Coast trust estimates that if the erosion continues at the same rate, Kutubdia will vanish from the map completely in 70 years, forcing the remaining population of around 150,000 to find shelter and work elsewhere. Again, the factors involved in coastal erosion are complex. But if sea levels rise, tidal surges are likely to be stronger which increases the rate of erosion. "Over the last 20 years erosion has increased in coastal areas," says Dr M Rafique Islam, leader of Intergovernmental Coastal Zone Management (ICZM), a body which advises the government on coastal issues. "Why exactly this is happening we are not sure, but certainly climate change is something that we believe is one of the factors. "As climate change gets worse, coastal erosion will get worse. Of course I am worried about the future for those who live and work on our coastlines. There is a disaster coming and all that we can do is try to make people better able to cope."

Work is already underway to mitigate the effects of climate change and help those at risk adapt. CCDB have for example built numerous multipurpose cyclone shelters in the country's coastal areas and islands. They and other partners, including Gono Unnayan Prochesta, the Church of Bangladesh and UBINIG also build raised platforms to provide shelter for people and livestock during emergencies, and help communities diversify their crops and find alternative employment.

## **FAR FROM HOME**

Although Pancha has only left Kutubdia twice in her life, she says she will soon have to move away from the island. "We cannot stay with my sister-in-law forever. We have no house, no land and no money," she says. This year, Pancha's 24-year-old son decided to move to Kutubdia Para, a slum area of Cox's Bazar on the mainland. It is home to around 20,000 people from the island that lost their homes after the cyclone or because of erosion. Nur Hussain is among them. He left the island where his family had lived for

generations, after losing his house. During the monsoon of July 2005, heavy rains and two-metre-high waves lashed the island. Within the space of 24 hours, Nur's house and the land it stood on had gone. "I did not know how my family would survive or where we would live. I was filled with despair. The sea had swallowed my home," he says. The family stayed with relatives for six months until they made the hard decision to move to the mainland. "Kutubdia is my home, my motherland," says Nur, "but I had to leave. Sometimes I cry for what I have lost." Others are facing different problems that seem to point to climate change.

A rise in sea levels will enable saline water to intrude further inland during high tides and salt in the groundwater will increase, leaving fields near the coast useless for farming, according to Dr Rahman from BCAS. On Kutubdia and the mainland, there are signs that this is already happening. Saiful Islam used to grow rice on his farm near Moghnama village in Cox's Bazar district. Gradually his rice production decreased until, eventually, the rice seedlings failed to grow at all because of the increased salinity of the land. "Now I cultivate salt because nothing else will grow," he says as he scrapes his fresh 'crop' across the plastic sheeting laid out over his fields, which are around 1.5 km from the sea. "Salinity is increasing in land near the coast," says ICZM's Dr Islam. "Some people blame contamination for this – that as one person cultivates salt on their land, saline water will move into neighbouring fields. Contamination can be a localised issue, but that could not cause the big shifts that we are seeing now." Mazeda, Pancha, Nur and Saiful have never heard of the terms climate change, global warming or carbon dioxide emissions. They have never even been in a car. But it is people like these – who are already the most vulnerable – that will be hardest hit by climate change. As Rezaul Karim Chowdhury, executive director of Coast, says, 'It is the rich that cause climate change and it is the poor here in Bangladesh who will pay the price.'

# VULNERABILITY AND ADAPTATION TO CLIMATE CHANGE

## New challenges for poverty eradication

By Kirsten Ulsrud and Siri Eriksen<sup>1</sup>



Extreme droughts and floods are hitting Malawi. The crops are destroyed, but Anesa Dosi is trying to save what's left of it.

Photo: Norwegian Church Aid/Hege Opseth

### 1. INTRODUCTION

It is no longer possible to ignore climate change adaptation as an element in development work as there is a serious danger that climate change in the form of more extreme droughts, floods and storms, sea level rise and more intense rainfalls will undermine development interventions, millennium development goals and increase poverty (Schipper and Pelling 2006, IPCC 2007). Adaptation to climate change is the adjustment of practices, processes and structures to reduce the negative effects and take advantage of any opportunities associated with climate change. Although greenhouse gas emissions need

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<sup>1</sup> Kirsten Ulsrud and Siri Eriksen, Department of Sociology and Human Geography University of Oslo, would like to thank Lars Otto Næss and Turid Hallstrøm for useful comments on an earlier draft of this chapter. The responsibility for views and any errors in this chapter rests with the authors, however.

to be reduced to mitigate climate change and avoid future human suffering, adaptation to climate change is also necessary. We are already committed to some extent of human-induced climate change over the next decades because of past greenhouse gas emissions. Furthermore, societal changes such as privatisation of natural resources, declining health, and conflicts and insecurity are in some instances making populations increasingly vulnerable even to present climatic variability such as seasonal droughts as well as extreme events. This is because these developments may have placed people's livelihoods at the brink of collapse or undermined their existing adaptation strategies.

These same societal processes are likely to make populations equally, if not more, vulnerable to future climate changes. In this chapter, we focus on vulnerability to climatic variability and change since people who are vulnerable to climatic variability are likely to be vulnerable to future changes, and since future changes in average conditions to a large extent will involve an intensification of present variability and extremes. Many serious problems have arisen because climate conditions and variability have been ignored in development projects, and many societies are not well adapted to their current climate, thereby even less prepared for additional climate change.

This chapter suggests that the issue of climate change should be treated as an issue of development which is relevant to all sectors of society since these all affect people's vulnerability and their ability to adapt to climate variability and change. It should be noted that not all poor people are necessarily vulnerable, and non-poor people can also be vulnerable, in industrialised as well as in developing countries. In this chapter, we focus on the vulnerability of poor people in developing countries because of the specific challenges that they meet, and we highlight that adaptation to climate change among poor people will involve measures that differ from conventional poverty eradication measures. We suggest that development and poverty eradication efforts need to make specific considerations of the vulnerability of their target groups and enhance the ability of these groups to adapt to climate variability and change. Poverty can thus be reduced in ways that may be more effective than the current strategies.

## **2. WHO IS VULNERABLE TO CLIMATE CHANGE AND WHY?**

In order to identify the implications of climate change for poor people and poverty eradication strategies, it is important to understand the context of poor people's lives. The social and ecological conditions within which people live influence the way they are affected by climate change. The causes of vulnerability to climate change are therefore to a large extent societal and resulting from political and economical in addition to environmental processes. Social and ecological conditions that influence poor people's lives and can make people vulnerable to climate change include lack of access to basic social services, loss of employment opportunities, lack of empowerment to participate in political processes, violence and insecurity as well as environmental degradation

and loss of access to important natural resources. Simply stated, the range of other challenges that people face besides climate influences the ways in which they can manage and adapt to climate related problems. This means that people are in a pre-existing or inherent state of vulnerability which can lead to severe negative effects (such as loss of lives and property, hunger and reduced health) when a particular change in climate conditions strikes.

Since it is very dependent on the local context, the degree of vulnerability varies between individuals and social groups as well as over time. Some people in areas that may experience relatively less dramatic physical changes in the climate can be more vulnerable to climate change than other people who experience more severe changes in the climate but for whom the social and ecological conditions are more favourable. There is little doubt that sea level rise leading to erosion and inundation of farmlands and settlements leads to some extreme effects of climate change. However, groups for whom incomes from farming and fishing have been steadily falling due to market conditions and ecological decline may feel equally severe effects when faced by a relatively slight increases in the incidence of droughts or ocean temperatures. Poor people differ in their vulnerability because they differ in their livelihood strategies, social and political relations, and the types of stressors to which they are exposed, and they differ in their attempts and capacity to adapt to changing conditions (Coetze 2002).

It can therefore be misleading to describe whole regions as particularly vulnerable to climate change. For example, Africa is described as very vulnerable to climate change because of a high dependence on natural resources and because large poor populations live in marginal (drought or flood-prone) climates. In addition, many African countries' capacity to adapt to climate change is said to be limited by a lack of resources, poor institutions and inadequate infrastructure (Smith et al. 2003). There is no doubt that many people in Africa are vulnerable. In specific, many poor people are vulnerable to climate change, and droughts or floods can indeed force individuals and families into destitution (Lind and Eriksen 2006). However, rather than categorising all poor countries and all poor people as vulnerable, it is more useful to focus on which specific populations are vulnerable and why they are vulnerable. For example, people outside the most flood or drought prone areas can be very vulnerable, including urban populations in informal settlements (Bull-Kamanga et al. 2003), and in Mozambique, it was found that in some villages, the relatively richer households were the most vulnerable to the 2000 floods (Brouwer and Nhassengo 2006).

Table 1 exemplifies groups that, due to different social and ecological conditions, are vulnerable to climate variability and change. Why, for example, are some parts of urban populations especially vulnerable? First, all urban inhabitants are more or less vulnerable to extreme heat and following disease

**Table 1.** Exemplification of vulnerable groups

Vulnerable group	Vulnerability context
Pastoralists with declining herds and incomes are vulnerable to drought and will be severely impacted by any increased incidence of drought and changing seasonality due to climate change	Insecurity, lack of government services, policies discouraging pastoralism, reduced access to drought grazing and water resources, conversion of grazing land into private farmland and ranches
Pastoralists with large herds in insecure areas are vulnerable to drought because seasonal grazing areas are unsafe and because conflict may decimate herds	Raids and thefts leading to loss of livestock and key grazing areas being unsafe, inadequate veterinary services making herds prone to disease, droughts, conversion of grazing land into private farmland and ranches
Small-scale farmers with no formal employment, especially women, are vulnerable to drought, floods, changing seasonality, melting glaciers threatening future water supplies as well as increased incidence of malaria and infectious diseases related to climate change	Poor land rights, little household labour, fluctuating prices for farm products, rising costs of farm inputs, little political influence, reorganization of water sector leading to loss of traditional water rights for small-scale irrigators, difficult to afford water fees, lack of access to useful farming techniques from relevant experiences in other places
Farmers in low-lying areas with little alternative land in higher areas or other income options may be vulnerable to sea level rise and salt water intrusion	Inability to access new land elsewhere or invest in alternative livelihoods when farmland is lost, low incomes in the informal sector, poor conditions in nearby slums, weakening social networks and declining assistance from relatives
Urban poor in informal settlements are vulnerable to flooding, flash rains, sea level rise and infectious diseases, all of which may intensify under climate change	Inadequate water, roads and sanitation infrastructure, few and inadequate disaster management polices, housing in areas prone to floods and landslides, high exposure to health problems, only casual employment, high living expenses, lack of simple water harvesting and storing devices
Orphans and old caring for orphans are vulnerable to droughts, floods, cyclones, increased incidence of malaria and infectious diseases	Lack of income, spread of HIV/AIDS, little household labour, loss of knowledge regarding adaptation strategies, lack of education, hunger, illness, destitution
Local inhabitants in areas affected by hydro-power projects are vulnerable to droughts and changing seasonality as livelihood options dwindle	Water diverted from side rivers, reduced access to pasture and forest products, relocation, loss of land and livelihoods
Small-scale farmers with few assets and deteriorating access to natural resources are vulnerable to drought, floods, changing seasonality, as well as increased incidence of malaria and infectious diseases related to climate change	Degraded ecosystems, loss of biodiversity, loss of natural resources, land rights and valuable trees, leading to lack of materials for handicraft and housing, lack of wild foods, fodder for animals, gardening plots, water for drinking, watering gardens and animals, opportunities for fishing, wood for cooking, increased risk of landslides, reduced protection against natural disasters
Unskilled urban workers are vulnerable to floods and intense rainfall that disrupt infrastructure, make it difficult to get to work and make living conditions difficult	Heavily polluted air and water, increasing health problems, declining numbers of formal jobs, weakening workers' rights
Small-scale fishers may be vulnerable to cyclones and loss of equipment, changing sea temperatures and fish stocks as well as drying up of freshwater lakes due to increased temperatures and increased extraction of water for irrigation	Insufficient income and market access to be able to re-invest in equipment and fish other species or in other areas, poor rights to ensure their own interests in competition with irrigation agriculture

and deaths, as well as other types of extreme weather. Second, people living in informal settlements, such as the 2 million people living in slums in Nairobi, are in situations characterised by lacking or inadequate infrastructure for water, roads and sanitation, high exposure to health problems, only casual employment, high living expenses, and lack of simple techniques for water harvesting or organic toilet techniques (for composting of sewage) (Weru and Bodewes 2001). When flash rains, droughts, storms and extreme temperatures hit, as they increasingly do in this region, they will have more devastating consequences on the livelihoods, health and well-being of most of these people, compared to an imagined situation where they were not loaded by serious problems in the first hand. Many among the urban poor are also in an especially vulnerable situation because of heavily polluted air and water, seriously affecting their health. Furthermore, in box 1 below, the vulnerability of pastoralists in the rural drylands of Kenya is explained, illustrating the diversity of societal factors influencing the outcomes of severe droughts for poor people.

Despite the high vulnerability to climate change among many groups of poor people, it is important to be aware of the distinction between poverty and vulnerability since development measures commonly used in order to reduce poverty do not necessarily reduce vulnerability to climate challenges. There are even well-documented cases of projects aimed at reducing poverty that have increased vulnerability to difficult climate conditions. Economic growth and technological change does not necessarily reduce vulnerability to climate variability and change, and can increase it. For example, the conversion of mangroves into shrimp farms may generate economic gains but leave coastal communities more vulnerable to coastal hazards such as storm surges (Adger et al. 2003; Klein et al. forthcoming).

Important causes of vulnerability to climate change, such as limited labour availability in women-headed households during drought, reduced access to specific drought resources such as shallow wells or forest products, or increased reliance on drought-sensitive crops, may be ignored in an approach that only focuses on poverty. Therefore, making some technological adjustments for extreme weather conditions, with the expectation that general poverty reduction will automatically reduce vulnerability to climate change is not sufficient. On the contrary, climate change adaptation should be addressed more broadly, through three types of measures. First, the efforts should reduce the direct risks of climate change, for example storms or flooding, to people's strategies to secure their material and non-material needs. Second, the ways that poor people cope with climate stresses in the short term and adapt their livelihood systems in the long term should be understood, facilitated and the opportunities broadened. Finally, the specific social and environmental factors and changes leading to inability to cope or adapt should be understood and addressed. In this way "sustainable adaptation measures" can be achieved, by reducing both poverty and vulnerability to climate variability and change at the same time (Eriksen et al. 2007).

### **Box 1:**

#### **The relationship between poverty and vulnerability to climate variability and change in the drylands of Kenya**

The relationship between poverty and vulnerability to climate related challenges is illustrated by the case of vulnerability among populations in drylands in Kenya (Eriksen et al. 2006a). Their current vulnerability to drought is instructive also to vulnerability to climate change. Drought has occurred from time to time in these areas and is not a phenomenon only related to climate change. However there is now evidence that droughts are increasing in African drylands and may increase further with climate change (IPCC 2007). Furthermore, factors that undermine current adaptation to drought are likely to cause vulnerability to any future changes in the climate, including an increase in drought or incidence in new types of events such as change in seasonality. In the research project conducted in Kenyan drylands, it was found that several processes had led to people being vulnerable to drought. Conflict and insecurity, loss of farmland through government gazettment, poor provision of public services and water provision, increasing economic inequalities and weak social and political relations in formal and informal institutions were processes that had led to certain households and individuals in Kitui District being unable to access coping strategies during drought. The impact of drought, in particular in combination with conflict, had pushed some people into destitution and extreme poverty. In Turkana District, raids and insecurity, gradual conversion from nomadic pastoralism to settled farming or fishing, and drought, had made some people extremely poor. At the same time, it was not necessarily the poorest that had been the most vulnerable to these events. Both in Kitui and Turkana, some of the richer livestock owners had been targeted by raids; eviction from government lands and migration to areas safe from conflict led to loss of access to dry season grazing and farm-lands for both rich and poor households; while some individuals from poorer households in Kitui had successfully started trading businesses that gave high drought incomes. Many of the destitute were unable to access opportunities from aid interventions, however, because such adaptations, such as planting new types of seeds, were premised on a minimum of capital investment and access to land and labour. The destitute would therefore need particular measures, such as social welfare measures as well as facilitation of participation in drought economic activities such as processing of local drought-resistant fruits, in order to adapt to climate change.

### **3. THE MAIN CLIMATIC CHANGE CHALLENGES FACED BY POOR POPULATIONS**

The latest report from United Nations expert group on climate change, the Intergovernmental Panel on Climate Change (IPCC), concludes that it is very likely that most of the increase in temperatures over the past decades is due to human emissions of greenhouse gases. Changes in weather patterns related to this increase in global average temperatures have already been observed (IPCC 2007). Mountain glaciers and snow cover have declined all over the world. The warming of oceans and the melting of glaciers have together contributed to sea

level rise. Precipitation has increased significantly in northern and central Asia while in the Sahel, southern Africa and parts of southern Asia, drying has been observed. In fact, more intense and longer droughts have been observed since the 1970s, particularly in the tropics and subtropics, influenced by higher temperatures and decreased precipitation. Heavy rainfall events have become more frequent, and hot days, hot nights, and heat waves have also become more frequent. With further increases in global temperatures of 1.1 to 6.4°C in this century, many of these trends are expected to continue. It is very likely (more than 95% likely) that hot extremes, heat waves, droughts and heavy precipitation events will continue to become more frequent. It is likely that future tropical cyclones (typhoons and hurricanes) will become more intense, with larger peak wind speeds and more heavy precipitation. The global sea level is expected to increase between 19 and 58 cm this century, mostly caused by warming of sea water (IPCC 2007).

Changes in global average climate conditions will manifest themselves in very different ways locally. Specific regional and local predictions are still difficult for climate experts to provide. One of the most critical uncertainties is the problem of predicting the effects of climate change on either the Asian monsoon or the El Niño Southern Oscillation (ENSO), which have great influence in east Asia, Latin America and southern and eastern Africa (Watson 1997, Mc Carthy et al. 2001). Nevertheless, there is little doubt that in sub-Saharan Africa, prolonged droughts represent an already observed and increasing challenge, along with other climate related risks like increased intensity of precipitation events, sea level rise and salt water intrusion. Other climatic events that are likely to increase in some areas of Africa with climate change include floods and resulting landslides, extreme storm events and tidal waves, reduced runoff and increased water stress. Some of the consequences are disruption of water dependent activities, reduced hydropower production, threats to arid and semi-arid ecosystems, and increased incidences of vector-borne diseases and reduced nutritional status (Joubert and Hewitson 1997, Hulme et al. 2001, Tyson et al. 2002). A warming may also lead to significant changes in forest and rangeland cover.

In Asia, sea level rise is a critical issue for large populations in coastal areas and islands. Inhabitants living on low-lying coastal plains are also at risk from floods, and displacement from the coastal zone. Rising temperatures in the region are likely to continue with global warming, becoming more pronounced in arid and semi-arid regions than in coastal areas (Watson et al. 1997; McCarthy et al. 2001). The effect on future rainfall is uncertain, but future climate change could have a profound impact on the monsoon, which underpins the rainfall regime. Melting of glaciers, with potentially dramatic consequences for downstream hydrology, ecology and human activities, as well as decrease in water supply, are other critical threats associated with climate

change. In addition, droughts, cyclones and intense rainfall events, saltwater intrusion, and erosion are likely to continue to increase (Lebel 2002; IPCC 2007).

Different areas of Latin America are expected to experience increased droughts, increased floods and resulting landslides, heat outbreaks, forest fires and loss of coastal land and biodiversity. Mountain regions and plateaus play an important role in maintaining the continent's climate, and warming will affect the hydrological cycle and biodiversity, ecosystem shifts and the melting of glaciers. Glaciers are melting at an accelerated rate in the Venezuelan and Peruvian Andes. Rainfall may increase in some areas of the continent, such as north western parts (McCarthy et al. 2001). Climate change could have important implications for natural ecosystems (e.g. rangelands, wetlands), water resources, coastal zones, agriculture, and human health. Temperate grasslands will be negatively affected by drought, in which case livestock production is projected to drop dramatically. The combined effects of deforestation, fragmentation of habitats and climate change potentially pose a threat to the biodiversity of the region.

In all the three regions, damages to infrastructure and settlements, increased malnutrition, and increased geographic distribution of vector-borne diseases are among the risks that may increase with climate change. Shantytowns are at risk from floods and landslides, and sea level rise represents a threat through saltwater intrusion and coastal erosion. For example in the coastal nations of west, central and southeast Africa, coastal erosion is expected to steal land from settlements, cities and economic activities (McCarthy et al. 2001). The speed of change, as well as any increase in the unpredictability of weather patterns or frequency of extreme events, may pose the greatest demands on the capacity of people and communities to make adjustments. As mentioned earlier, a number of social and ecological conditions have made many individuals and groups vulnerable to current climate variability and future change. Some of the central challenges that may worsen under climate change are found within the three fields of water supply, agriculture and income generation, and health.

### **Water supply and drought**

More than one billion people lack access to safe and affordable water. As highlighted in the Human Development report 2006, the global water crisis is not first and foremost about absolute shortages of physical supply. The report argues that the roots of the water crisis can be traced to poverty, inequality and unequal power relationships, as well as mistaken water management policies that exacerbate scarcity (UNDP 2006). Nevertheless, 19 countries are classified as water stressed, and more of these are in Africa than in any other region (Watson 1997). Water stress is likely to increase regardless of climate change, due to increases in demand from agriculture, industry and domestic

use, degradation of watersheds caused by land-use change, and siltation of river basins. As climate change exacerbates water stress, it reveals the importance of the underlying water management problems, and underlines the urgency of addressing them. This means that on the one hand, water problems can be solved by addressing social issues, but on the other hand, the challenges of water supply increase with climate change, and put even higher pressure on society for addressing the problems in fruitful ways.

Although the effects of warming of global temperatures on precipitation are difficult to predict, current observed trends and scientific knowledge leave little doubt that some areas already severely affected by drought will experience further reduction of rainfall and increased temperatures which will exacerbate drying (IPCC 2007). Changes to the timing of rainy seasons, making them more difficult to predict and more rainfall coming in intense episodes, means that it may become more difficult to make use of water resources in rain-fed agriculture, hydropower and water supply systems. In Nepal, rising temperatures have increased glacial retreat and glacial lake outburst floods, which reduce the availability of water and hydropower energy (OECD 2003). Extreme events strain people's capacity to cope with subsequent



**Flooding of road and farms after intense rain is likely to become an even more common feature under future climate change. Access to diverse plots at different altitude and distance from the river is important to current local adaptation to variable climate conditions.**

Photo: Siri Eriksen



Village water pipes for domestic supply are critical for securing a decent life under current climate variability, and even more so under future climate change and increased risk of droughts. In addition to satisfying domestic water needs during drought and freeing up household work time, equitable access to water for poor people is important to be able to engage in alternative non-farm economic activities such as small scale business and reduce their vulnerability to future climate change.

Photo: Siri Eriksen

events, exemplified by the recent flooding in parts of East Africa that arrived on the back of several dry years. Water scarcity, as well as flooding, tend to be associated with outbreaks of diarrhoea, malaria and other health problems both in rural and urban areas. Unclean water is already the world's second biggest killer of children (UNDP 2006).

The fact that women and young girls, especially among poor people, often have the main responsibility for collecting water for their families reinforces gender inequalities in employment and education (UNDP 2006). Droughts often disrupt piped water supply, and more frequent droughts due to climate change will increase the problem. However, lack of access to piped water in the first place affects many people both in the cities and in rural areas, who have to rely on other sources of water for consumption, feeding and watering animals and other economic activities. Local streams and rivers, ponds and shallow wells are common water sources in rural areas, while urban populations often have to buy water from traders, which often become more expensive or unreliable during drought. Rural water sources sometimes become more polluted or dry up completely, forcing people to trek long distances to access water (Eriksen 2005). Drought often only highlights a general marginalisation of drylands undermining local capacity to adapt, through a lack of government or aid investment in water infrastructure, lack of local incomes sufficient to drill private boreholes, as well

as lack of local influence over development decisions. Inequality of access to water during drought also leads to vulnerability. Shallow wells may be privately owned by a few families, which means that other families have to pay or can only access wells after the owners have satisfied their needs. Economic liberalisation policies, such as privatisation of water resources or decreasing government expenses and services, have increased the cost and often made water inaccessible to poor people (Orindi and Murray 2005). While it is sometimes expected that increased drought will lead to conflicts over water resources, the opposite has also been observed at the local level, that is, drought leading to increased cooperation and trade over water resources (Eriksen et al. 2006b).

It has been suggested that famines are in fact created mainly by economic and political processes, rather than climate-induced harvest failure. When incomes from production decline and basic goods that people have to buy become more expensive, it only takes a very small meteorological event to trigger a crisis (Sen 1981). Famines are also often used politically, for example to buy political loyalties. Droughts are sometimes used to absolve government responsibility for poverty generated by lack of investment and government inaction, as droughts or floods are explained as 'external' factors for which no one could prepare. Democratisation at the local level may increase local influence over water supply, as well as the accountability of governments in poverty eradication efforts. For the case of Kenya, Eriksen et al. (2006b) show that democratic election of water committees and other village committees, with representation of vulnerable groups, is critical to securing a stable water supply during drought.

In addition to democratisation and economic processes, the case of Kenya shows that access to new technologies is critical to local adaptive capacity in the context of water supply and drought as well as climate change. People have always adapted to climatic variability and drought. Local technologies such as digging of shallow wells in dry river beds form the backbone of strategies to survive. However, a lack of further development of dryland technology is a cause of vulnerability. Sub-surface dams in seasonal rivers and water harvesting are cheap technologies that have been implemented in dryland areas in order to make better use of irregular rainfall. Access to water is critical not only for domestic consumption and hygiene, but also for economic activities including cattle rearing, business, brick making or small scale irrigated vegetable production that people often rely on when the harvest fails (Eriksen et al 2006b; Osbahr and Viner 2006).

### **Agriculture and income generating activities**

Climate change is likely to be a particular challenge for the agricultural sector and other income generating activities for rural populations, due to increased variability, heat stress, flooding and drought caused by climate change (McCarthy et al. 2001; IPCC 2007). The changes will reduce yields in many lo-

cations, for example in tropical Asia, while improving them in others. But even if the net effects are uncertain, there is little doubt that many areas will be adversely affected (McCarthy et al. 2001). Productive assets and infrastructure may be damaged by extreme weather events and floods can cut people off from markets. Although the role of farming in rural livelihoods appears to be declining (Rigg 2005), agriculture is an important source of income for many poor people. It is thus predicted that climate change and climate variability can increase poverty levels particularly in tropical regions (Mathur et al. 2004). In Africa, estimates indicate that nearly 60-70% of the population is dependent on the agriculture sector for employment. According to the IPCC (McCarthy et al. 2001), the overall economic impact of climate change on the agriculture sector could be (on average) up to 10% of the gross domestic products of the 40 of the poorest and most food insecure countries of the world – mostly in Africa. People who try to make a living in marginal areas are likely to be severely affected (Mathur et al. 2004). Farming in Africa is highly dependent on rainfed agriculture, and increased droughts can seriously impact the availability of food (Watson 1997).

Focus is often placed on the need for adjustments in climate sensitive economic activities, and people may shift cultivation and herding practices, farming new crops and grazing in new areas. But actual adaptation is less straightforward than simple adjustments. For example, it has been observed that people often cannot make use of seasonal forecasts and climate information to make necessary adjustments to production due to a lack of capital and labour, access to required inputs, and insufficient training (O'Brien and Vogel 2003). The strategies that people have developed to manage such climate variability must be strengthened. This means that adjustments that are required are multi-sectoral rather than pertaining to just one economic sector or activity. Even in rural areas, people normally rely on a number of different activities for food and income in addition to, for example, agriculture. Common for most groups of poor people, either urban workers, unemployed slum dwellers, smallholders in agriculture, rural workers or pastoralists, are livelihoods based on multiple activities and diversification of sources of income and food (Chambers 1995, Hesselberg 1996, Ellis 1998). Poor people are also increasingly living in several places and splitting up families, living both in rural and urban areas, moving between city employment, small-town work and agricultural labour, seasonally or more sporadically, in search for an income (Hesselberg 2005).

The challenges posed by climate risk to people's income generating activities are met by a range of different coping and adaptation strategies. This often involves increased multiactivity when households and individuals diversify into many activities in order to secure basic needs. Moreover, the need for coping and adaptation strategies often lead to reinforced need for access to com-



Shallow wells for domestic and livestock use are critical for survival of farming as well as nomadic pastoralist groups during drought. Drought time watering of livestock here provide opportunities for trade, suggesting that facilitating mobility and interaction between farming and nomadic pastoralist groups is critical to adapting to climate change.

Photo: Siri Eriksen

mon pool resources. The dependence and need for local, informal economic opportunities and remittances also increase. People report doing a number of tasks-for-cash to survive, such as producing charcoal, fetching water, collecting and selling wild foods, fuel wood, seeds from trees, and construction poles, and participation on public workfare schemes. Multilocality and migration also characterise coping or climate adaptation, as people migrate to other rural or urban areas where casual labour is available.

Diversification is no guarantee of successful adaptation in terms of securing basic needs in the face of climate variability or change, however. It has been observed that when a main activity such as agriculture fails, households try to specialise to another activity that can take its place as primary income source. However, most people lack either the skills, labour or capital necessary for such specialisation and instead resort to a range of opportunistic activities, including poultry sale, collecting wild foods and doing small scale business such as selling cakes. Adaptive capacity is therefore undermined by a lack of access to alternative income sources that yield a viable income, due to exploitative marketing arrangements, ecosystem degradation, decline in formal employment, and increase in HIV/AIDS and other health problems that restrict household capital and labour availability. Much of the infrastructure needed to start alternative income generating strategies, including electricity, water, and transport, is lacking, and there is a need for developing marketing structures, as well as research, development and diffusion of value adding technologies.

Facilitating multiple incomes and addressing the processes that weaken local adaptation mechanisms are critical to reducing vulnerability among poor people (as exemplified in the next section and in Table 2).

The pattern of diversification observed during the 2003 drought in two villages in Mozambique exemplifies that many diversification strategies become unviable as drought intensifies (Eriksen and Silva 2003). Although local trade had initially increased at the start of the drought, alternatives dwindled and the village economy more or less closed down. People resorted to sale of charcoal and other local products that involved engaging with outside and urban markets, but in relations that were highly exploitative. The poorer groups who could not afford to irrigate crops nor transport products to markets that offered good prices all resorted to similar activities, typically growing pumpkin leaves in river beds for consumption and sale in the local market, producing charcoal for informal trade and taking casual employment on commercial farms. These activities had marginal and decreasing returns with the increasing number of people engaging in them (Eriksen and Silva 2007).

When faced with severe and prolonged climatic events, some of the most vulnerable people have to sell key productive assets such as land, livestock, farm tools, roof of the house or even resort to prostitution, thereby endangering their livelihoods in the long term. In Bangladesh, during the floods in 1998, some of the affected households were able to use emergency food and change their employment away from agriculture. However, poorer households coped through reducing food consumption and through the sale of assets, reducing their resilience to future shocks. As a result of social or political restrictions, the poor may also be forced to remain in exposed areas (DFID 2004). Among vulnerable populations, many coping and crisis strategies become routine or permanent in such a situation.

## Health

Health is a fundamental issue to the vulnerability of the poor since it is both an element of quality of life and prerequisite for securing other aspects of a decent life, including material needs and social rights. Climate change is expected to lead to increasing incidence and extent of some vector borne diseases, like malaria, schistosomiasis, and dengue-fever. These are very sensitive to climate conditions and are likely to spread into new regions. Furthermore, waterborne and water-related infectious diseases like cholera are also expected to increase due to higher temperatures and higher humidity, interacting with other factors as increases in population, urbanisation rates, water quality declines, and other factors (Watson 1997, Garcia-Herrera et al. 2005; Watson et al. 2005) Climate change may also exacerbate air pollution, currently already a serious health problem in many cities. Extreme weather events, which may increase under climate change, already represent a health threat because they lead to injuries, disabilities and deaths. Climate related loss of coastal resources, reduction in

ecosystem productivity and decline in agricultural productivity can also have negative health impacts (ADB 2005). Heat stress can lead to mortality and inability to work, as observed during past severe events such as the 650 deaths that occurred in Orissa in northern India in 1998 (McMichael et al. 2003, Greenpeace 2007<sup>2</sup>). Drought and floods, which are increasing due to climate change, often lead to poor water supply, unsanitary conditions and the spread of disease. The concentrations of sewage waste and industrial effluents, can increase when water level drops in dams and rivers (Watson 1997). Ill health due to all problems mentioned above have far-reaching economic consequences, through decreased productivity and economic growth, reinforced inequalities and poverty (UNDP 2006)

Many people commonly lack access to formal health care, partly due to the poor coverage of health facilities. People try to manage health problems by seeking casual labour or selling assets to cover increased cash needs for hospital bills, using indigenous medicinal plants, and increased reliance on social networks to cover costs. Poor health, for example due to the spread of HIV/AIDS, increases vulnerability to climate change and was a major reason that the 2002 drought in southern Africa, which was not exceptional from a meteorological point of view, had such serious consequences. Due to the extra stress of HIV/AIDS and loss of household labour due to illness/death as well as need to care for the ill, traditional coping mechanisms in some families had to some extent broken down. There are now more children-headed households, who lack the skills and strength to cope with stress situations such as drought and floods. Indigenous knowledge regarding how to manage climatic variability is lost as the parent generation dies. When the immune system is already compromised, prolonged hunger can have far more drastic consequences than when a person is in good health. The weakened health state of many poor people due to inadequate nutrition often leads to disease outbreaks during onset of rains after prolonged drought.

The case of malaria illustrates that the most important reasons for high vulnerability among many poor in terms of negative health effects from climate change are social rather than climatological in nature. Malaria can be eradicated through spraying and mosquito nets, and people can be cured through medicines regardless of any spread due to climate change, but poor households, and children in particular, often have no mosquito nets. In addition, poor are often unable to access or pay for adequate medical treatment during malaria epidemics. Malaria epidemics seriously affects adaptive capacity because many households sell their food crops to cover the cost of treatment, others borrow money or rely on remittances, while some resort to selling their land (Olago 2005). These coping mechanisms may lead to an increase in food shortages, debts and material poverty.

2 <http://www.greenpeace.org/india/campaigns/choose-positive-energy/what-is-climate-change/climate-change-its-possible>

## 4. WINNERS AND LOSERS FROM CLIMATE CHANGE LIMITS TO ADAPTATION AND EQUITY ISSUES

Climate change has been framed as an equity issue because poor people contribute negligibly to the problem, but are vulnerable and will be most adversely affected by climate change. Adaptation is in itself also an issue of equity because some adaptation measures, whilst reducing the vulnerability to climate change of some people, may unintentionally increase the vulnerability of many others. For example, new coastal infrastructure could disturb the offshore sediment balance, resulting in erosion in nearby coastal areas. Constructing dams and irrigation infrastructure can benefit irrigation farmers and electricity consumers in cities, but is likely to increase the vulnerability of poor people evicted from farmland and resources that are critical to their own adaptive strategies.

Adaptation is a political process since the support of a particular type of adaptation measure can favour one social group or area over another. Adaptation efforts can also have negative effects in the long term. Irrigation, though enabling harvests in the short term, can lead to the salinisation of soil and the degradation of wetlands, as well as reduced access to groundwater and productive land. Such maladaptation, which often affects those with little power and limited access to resources, could be avoided by seeking to understand the relevant social and environmental processes.

Negative effects of climate change will furthermore be felt because there are limits to adaptation. For example, there may be physical changes, such as in frequency of flooding or extent of inundation due to sea level rise, that are so large that sufficient adjustments cannot be made. Other people may be unable to adapt due to social and structural limitations. Although options for adaptation to climate change exist, it does not mean that every vulnerable community, sector or country can manage to adapt (Smit et al. 2000, Smith et al. 2003). Migration may be the only form of adaptation for many. The press has pointed out that 'climate refugees' in terms of tourists fleeing heat waves in southern Europe may seek cooler summers in Scandinavia. If this becomes the case, these are a privileged few who can pay for travel. The real climate refugees, however, are poor people who have to leave their farmland or homes due to floods, droughts or sea level rise, salt water intrusion and erosion, or fishers and pastoralists and other groups whose livelihoods become unviable.

Experience from Mozambique and Bangladesh shows that the large majorities of these refugees are, and are likely to continue to be, internally displaced people (Mallick et al. 2005; Lucio et al 2007). Developing countries already house millions of displaced people due to conflicts and natural disasters. Apart from a few who are housed in resettlement schemes, people who have left their home due to climatic stress normally end up in neighbouring villages or more marginal rural areas as landless destitutes with few productive assets or in

urban informal settlements. Some migrate to neighbouring countries and are housed in refugee camps or work illegally in towns. Those who adapt to climate stress through migration therefore often end up with few economic and political rights, often losing their cultural and social affinity and security, as well as their sources of livelihoods, and may in turn become vulnerable to a wide range of stressors.

Climate change adaptation also has the potential to create “winners and losers”. Taking the Kenyan example described in Box 1, renting out wells to visiting groups of herders has become a new source of income for some people in Kitui, Kenya, while people who are not owners of wells find it increasingly difficult to access sufficient water and grazing for their cattle. But very few people can be considered ‘winners’ in the context of frequent armed violence and drought. Instead, there are gradations among those who are considered to be ‘losers’ (Sharp et al. 2003, Lind & Eriksen 2006).

It cannot be assumed that each and every adaptation measure automatically benefits the poor. Particular consideration should be given to how development action, unintentionally, may contribute to the creation of “losers” by worsening the vulnerability of certain individuals and groups in society. If, for example, new sources of livelihoods promoted by development agencies prove unreliable and people no longer have the traditional livelihoods to fall back on, the vulnerability to climate change may increase. Furthermore, biased power structures can be reinforced by some types of adaptation measures, thereby increasing vulnerability of the poor. Vulnerable people are by definition not in powerful positions. It is necessary to find out how pro-poor adaptation can be effectively implemented despite power structures biased against the poor.

## **5. WHAT NEW MEASURES ARE NEEDED FOR POOR PEOPLE IN ORDER TO ADAPT?**

As explained above, individuals and households employ strategies to adapt to climate change. In addition, the challenges of poor people in the face of climate change necessitate climate adaptation measures from central and local governments, development agencies and NGOs. Such interventions can make several considerations. Addressing climate risk, strengthening adaptive capacity, and targeting the factors making people vulnerable, represent what has to be done different in poverty eradication or development aid in order to strengthen adaptation to climate change among the poor. There is a potential for win-win solutions because climate change adaptation interventions can lead to improved ways of reducing poverty. The design and implementation of adaptation measures can also benefit from the experience of decades of development work, including the realisation that measures targeting local needs are more likely to be successful than large-scale measures implemented through a top-down approach (Adger et al. 2003).

Successful climate change adaptation interventions relate to very diverse

vulnerability contexts and existing strategies. We here highlight three practical ways that climate change adaptation can add to development and poverty eradication efforts. These are examples of measures that can both reduce risk, enhance local adaptation strategies, and address vulnerability factors. First, we will focus on the need for sufficient understanding of experiences and strategies of poor people and communities. Second we will suggest some potential measures of adaptation through improved management and innovative ways of utilising and maintaining local ecosystems. Third, we will attempt to illustrate the importance of removing structural and regulatory barriers to the adaptation strategies of poor people. Table 2 summarises some of the practical adaptation measures that may be useful in different local contexts.

### **In depth knowledge about local livelihoods is crucial for adaptation**

The previous sections demonstrate that in order to identify how poor people can be supported in adaptation efforts, it is necessary to understand their livelihoods and strategies to cope and adapt to climate change and other challenges. Although it is commonly understood that the livelihoods of the poor should be considered in development planning, there is still often a lack of understanding of the ways that people respond to new and evolving threats nor of local ways of sustainable natural resource use. Without this understanding, development interventions may worsen an already difficult situation. For example, in some areas, local varieties of seeds which are well adapted to local climate conditions are disappearing because of agricultural development projects (Orindi and Ochieng 2005). If based on sufficient interaction with affected populations and insights into their problems, strengths and potentials, however, interventions can improve local adaptation (Orindi and Murray 2005). Some of the coping measures developed by households and communities can only be of help in the short term and cannot deal with increased and more severe shocks. Nevertheless, it is becoming increasingly clear that many traditional strategies for coping with extreme climate events provide an important lesson for how society can better prepare and adapt to climate change in the long-term, and such strategies need to be strengthened.

In the case of dryland populations, it should be considered how existing development initiatives can better target those who are most vulnerable to climate stress. For example, current economic structures encourage the spreading of “modernized”, but often precarious, farming systems into increasingly arid environments, to the detriment of supposedly “backward”, customary forms of pastoralism or forest uses. There is a need for incentives and structures to encourage the adoption of production systems that are adapted to climatic variations and change, such as pastoralism and investment in valuable trees in drylands. Creating and facilitating marketing outlets for processed forest products, provision of infrastructure including hospitals, schools, roads and decentralised watering points (through piping water into different areas) would lead to economic structures that are better adapted to

climate change. In particular, such measures should be implemented simultaneously, in a coordinated way (Eriksen et al. 2006b). Such adaptation measures founded on in-depth knowledge about local knowledge systems and livelihoods, has the potential for sustainable reduction of vulnerability and increased capacity to adapt to new challenges. Adaptation strategies to climate change in all the three sectors of water supply, income generating activities as well as health, can potentially be strengthened and maintained through such an approach.

The urban centres in Africa, Asia and Latin America, where three quarters of the world's urban population live, contain a large proportion of the people most at risk from storms, floods, sea level rise and other climate-related impacts. A third to half of the population in many cities in Africa, Asia and Latin America lack good provision of water and sanitation and live in informal and often illegal settlements. It needs to be considered how investments for adaptation to climate change can avoid undermining the housing and income generating strategies of poor people. By understanding the problems and needs of urban habitants living in very poor quality shelter (approximately 900 million people), it is possible to find strategies for reducing risk to climate change that also have the potential to reduce other risks. For example, relocation should be avoided wherever possible because it often leads to loss of income options. In stead, programmes can be implemented for upgrading current settlements wherever possible. Such upgrading involves the government working with the inhabitants of the informal settlement areas to find solutions for improving infrastructure, for instance for water, sanitation, drainage, and support for house improvements, combined with lowering flooding risks. Where low-income groups must be moved from hazardous sites, cooperation between the inhabitants and the government in deciding where to move and how to organise the move is important. Current policy making regarding informal settlements usually fail to take people's experiences and strategies into account, as city governments tend to push inhabitants to peripheral areas, destroying their homes, asset base, social networks and their incomes (Satterthwaite 2006).

### **Adaptation through local and innovative ecosystem management**

Climate change makes it even more important than before to stimulate a type of economic and social development that is adapted to climate change. One example is to manage, maintain and strengthen ecosystems in ways that enhance ecosystem services and improve access by the poor to these services. An ecosystem is a community of interacting organisms and the physical environment they live in; the forests, grasslands, wetlands, deserts, coral reefs, rivers, estuaries, and other living environments. They also include the farms, pastures, and rangelands – collectively known as agroecosystems. Ecosystem services are products obtained from ecosystems, like food, fresh water, fuelwood, fiber, biochemicals, and genetic resources. They also provide benefits

obtained from regulation of ecosystem processes, like improved local climate conditions, disease regulation, water supply and water purification. Approximately 1.6 billion people are currently dependent on forests in some way. The full potential of ecosystems as a wealth-creating asset for the poor has yet to be effectively tapped (World Resources Institute 2005). It is therefore crucial to strengthen people's opportunities for taking advantage of ecosystem services, both in traditional and new ways, in order to achieve economically, socially and climate resilient development. Such strategies can potentially reduce vulnerability and increase adaptive capacity in key sectors such as water supply, agriculture and income generation, and health.

Social organisation and community management of natural resources are shown to play an important role for promoting sustainable management of natural resources in poor communities (World Resources Institute 2005, Robledo and Forner 2005). It has also been pointed out that clarification of land tenure and land-use rights are key elements in promoting sustainable management, as well as facilitation from governments for improving access to markets for agricultural and other ecosystem products and providing relevant and timely market information. The state can also help by supporting small-scale processing plants to diversify and add value to natural products, such as by making timber into furniture, and by removing burdensome regulations and other barriers to the establishment of local enterprises based on ecosystem products (World Resources Institute 2005).

Efforts to take advantage of the untapped potential for wealth creation by use of ecosystems can involve the use of environmental technologies adapted to local needs and conditions, which can reduce vulnerability and increase adaptive capacity of poor communities and people. Such technologies consist of practices that combine local and introduced knowledge, such as agro-forestry, organic farming techniques, like mulching, terracing, planting of cover crops, improved ways of using animal manure and intercropping (e.g. shade grown coffee). Water harvesting and decentralised energy supply are other technological solutions with a large untapped potential (Orindi and Murray 2005, Venema and Cisse 2004, Mathur et al. 2004). The sale of treadle powered water irrigation pumps in Kenya has surpassed 36,000, and is shown to substantially increase peri-urban and rural incomes, while 70% of the pumps are managed and controlled by women (Karekezi et al. 2005). Other measures are planting of valuable trees adapted to the climate and growing of oil-seeds, such as *Jatropha* for biodiesel-production, which can be grown for fencing and in areas not suited for agriculture. Another emerging opportunity is to facilitate selling of millet for bio-ethanol production in addition to food markets). Millet is a drought crop and where new markets give a better price, purchasing power of farmers also increases.

Renewable energy technologies, such as solar, biomass, wind and geothermal

energy, which are treated in the next chapter of this report, are usually seen as climate change mitigation technologies, but are also highly relevant to sustainable economic and social development, included climate change adaptation. They make it possible to harvest rich natural resources like the sun, surplus biomass, wind, and geothermal energy. The diversity of new renewable energy technologies makes it possible to choose energy sources which are resilient to changes in local climate conditions. An implication is that in order to promote adaptation that is sensitive to local livelihoods, the widespread focus on large hydro projects should be replaced by a broader approach that increases the technological diversity of the energy sector.

**Box 2: Examples of local ecosystem management for enhanced adaptive capacity**

Increased access to knowledge and experiences from other communities about sustainable practices for using ecosystems, such as through south-south transfer of experiences can enhance adaptive capacity. There is also an urgent need for governments to support such local measures to make ecosystems healthier and more resilient to climate variability and change (AfDB et al. 2003). An example of how improvements of ecosystems have reduced vulnerability is provided by the case of Machacos, Kenya. The area had extensive soil erosion in the 1930s, believed to be caused by overpopulation. 60 years later, with a population that had increased five-fold, erosion was substantially reduced, due to measures implemented by local inhabitants, including terracing, use of various grasses to stabilise embankments, tree planting, manuring and soil management techniques. The increased number of people had made it possible to intensify and improve agricultural production. In addition to the changes in agricultural techniques, access to markets due to the relatively close distance to Nairobi played an important role in these changes (Tiffen et al. 1994, Benjaminsen and Svarstad 1998). In areas in China where land is subject to severe land degradation, the government has recently undertaken integrated ecosystems management. Eco-farming integrates renewable energy use such as solar power, vineyard cultivation, and legume planting for fixing sand and providing forage. In Vietnam, mangrove planting led to improved resilience of the local population to climatic extremes and provided livelihood opportunities through harvesting of shellfish among the mangroves.

**Table 2. Summary of practical examples of how climate change adaptation can add to development and poverty eradication efforts**

<b>Challenges weakening poor people's adaptation strategies</b>	<b>Measures that may contribute to both adaptation and poverty reduction</b>
<b>1) Development interventions inadequately taking account of poor peoples' livelihoods and adaptation strategies</b>	<b>Measures to strengthen poor people's livelihood and adaptation strategies</b>
Imposition of external technologies, such as large scale water dams, spreading of 'modernized' farming systems and seeds and exotic tree species into arid environments	Support and develop local technologies, including shallow wells, sub-surface dams, water harvesting techniques, local seed varieties and planting of indigenous tree species. Support marketing of local products

Underutilisation of knowledge accumulated from adaptation to local climate conditions	Document past and present adaptation strategies and supplement them with relevant strategies and technologies, support local knowledge systems
Little research infrastructure and support for adapted production systems such as nomadic pastoralism and indigenous tree products	Facilitate improvements of production systems adapted to normal climate stress, like pastoralism and indigenous tree products, through strengthening marketing infrastructure, veterinary services, research and development, processing and value adding
Isolated and large-scale infrastructure provision projects such as irrigation neglecting other pressing needs, especially those of the poor	Evaluate how infrastructure provision may affect the climate change vulnerability of the poor, ensure poor people's needs, for example water access for adaptation strategies
Forced relocation of people in informal city settlements, pushing poor city dwellers to peripheral areas away from livelihood options	Improve drainage systems and flooding protection in low-income areas, avoid relocation if possible and ensure continued access to livelihoods. Cooperate with the inhabitants on infrastructure and house improvements or if necessary, on relocation
<b>2) Consequences of degraded ecosystems for vulnerability</b>	<b>Climate change adaptation through improved and innovative management and use of local ecosystems</b>
Lost potential for the use of ecosystem products and services for economic and social development	Maintain and strengthen ecosystems, improve access for poor people. Emphasise community management and access to protected areas and counteract privatisation and large scale commercial exploitation of crucial adaptation resources, such as water or forest
Lack of innovative use of ecosystem services and neglect of the importance of forest products in adapting to climate variability and change	Strengthen people's opportunities for both traditional and new ways of taking advantage of ecosystem services. Clarify land tenure and land use rights. Promote raw materials like Jatropha and other hardy biofuel crops and local collection and processing
Lack of access to existing and relevant knowledge and technologies, one-sided focus on conventional, centralised energy supply	Facilitate the use of environmental technologies, including agroforestry, organic farming techniques like mulching and planting of cover crops, harvest local resources like solar power, surplus biomass, wind and geothermal energy

<b>3) Barriers hindering poor people's adaptation strategies</b>	<b>Measures for removing structural and regulatory barriers</b>
Lack of attention to the income sources of poor people	Provide facts about the economic importance of income generating activities performed by the poor. Facilitate south-south transfer of experiences
Income generating activities during drought such as charcoal limited by the ambiguous legal framework, which siphons profits away from the poor producers, discourages investment and encourages unsustainable practices	Change the poor legal structures of the sector, promote efficient kilns for charcoal burning, promote sustainable practices of wood harvesting and growing
Discourses labelling adaptation strategies of the poor as unsustainable or primitive	Uncover myths and exaggerations, identify underlying reasons for unsustainable practices, invest in research and development of livelihood and adaptation strategies based on local resources
Little value adding to natural products and poor market position of products. Lack of infrastructure for transportation and information exchange adapted to the needs of the poor	Support small-scale processing plants products. Improve transport facilities (trains, buses, roads planned for cycles, carts and pedestrians) and other factors to access markets, provide relevant and timely market information
Marginalisation of nomadic pastoralism and barriers to migration	Ensuring access to drought grazing areas, facilitating migration and seasonal trade through providing security and infrastructure (like water points, markets, roads, and health and veterinary services)
Poor health limiting household labour and engaging in adaptation strategies	Measures to reduce the incidence of malaria among poor, enhanced health systems, make treatment for HIV/AIDS available to poor
Conflicts and insecurity leading to loss of lives and productive assets and making access to key resources for adaptation, such as drought grazing, unsafe	Strengthen police posts and security in marginal areas, enhance conflict resolution and civil society such as peace committees

## Removing barriers to people's adaptation strategies

People's responses in the face of shocks and longer term changes can be both facilitated and hindered by government policies and measures, as well as development projects. Many of the coping and adaptation strategies used by poor people are currently undermined by political, economic and legal structures. Such structures need to be targeted in efforts to reduce vulnerability. Economic structures that increase vulnerability include those creating increasing marginality of on- and off-farm livelihoods and natural resource based activities, growing local inequality, environmental degradation, spread of HIV/AIDS, conflict and insecurity, and decreasing employment opportunities.

Charcoal production, an increasingly widespread drought adaptation strategy in many places in eastern and southern Africa, exemplifies how legal and economic structures limit the profitability of the activities for poor rural producers, increasing their vulnerability. Charcoal production has been blamed for dry-land forest loss but is the main energy source for cooking for a growing urban population. In Kenya, wood fuel, particularly charcoal production and trade, is providing direct employment for around 200,000 people and it is estimated that the total number of people involved in the charcoal trade during the year (including traders and vendors) is over 500,000, supporting two million dependents. The contribution from charcoal to the Kenyan economy is comparable to the annual returns from tea exports (2002) (ESDA 2005). Contrary to popular belief, most of the charcoal produced in Kenya is sourced from individual farms and private land, mostly ranches. It is illegal to produce and transport charcoal in Kenya, but legal to sell, buy and consume in towns and cities. The banning of charcoal production is based on the assumption that charcoal is sourced from government land, leading to deforestation, while this accounts for less than a tenth of the total trees sourced for charcoal. This banning is a central barrier to charcoal production as a viable adaptation strategy as it channels the largest profits to traders and the authorities, discourages investment in the trade and encourages unsustainable practices of tree-felling without tree-planting as well as inefficient ways of producing the coal. In order to achieve a sustainable use of this potentially renewable energy resource, and improve the opportunities of income-generation for the poor, legal and economic structures of the sector must be changed (ESDA 2005, Bailis et al. 2006).

In the longer term, if a transition to other cooking fuels is promoted, there are many opportunities for simultaneous transitions to other and modern uses of biomass resources, which have the potential for other income generation activities (ESMAP 2005). Biomass (included charcoal) is an indigenous, potentially sustainable renewable natural resource, but it must be managed and harvested effectively.

## 6. WHAT SHOULD AGENCIES DO IN ORDER TO REDUCE THE VULNERABILITY OF THE POOR?

This chapter has highlighted particular challenges and sources of vulnerability for poor populations in the face of climate variability and change, and presented emerging insights into ways that potential adaptation efforts can be designed and supported by government and development agency efforts. These provide a point of departure for discussing and developing ways of integrating climate change adaptation in the development work of agencies.

One of the key challenges for development agencies in integrating climate change adaptation in development efforts is approaching climate change adaptation as a development issue. First, adaptation requires very different measures from emission reduction efforts, and needs to be treated as an independent issue, rather than as an add-on, to emission mitigation. Second, adaptation efforts need to be comprehensive, focusing on enhancing adaptive capacity and reducing the societal factors causing vulnerability in addition to reducing climate risk itself (Eriksen et al. 2007). We have suggested that such changes specifically require understanding of the livelihoods and strategies to cope and adapt to climate change and other challenges; identification of innovative ecosystem management options; and removing barriers to local adaptation strategies. This means that understanding of adaptation to climate change needs to be enhanced among governmental and non-governmental agencies involved in development aid, as well as in the country offices in developing countries. Since climate change adaptation affects all sectors of development, the issue cannot be delegated to an isolated sector or part of the organisation while it is ignored by the rest. Making good use of the poverty and development expertise that exist in these organisations is crucial in developing procedures for integrating climate change adaptation into development work. Climate change vulnerability concerns must be integrated into individual projects, and rather than applying “one-size-fits-all” solutions, it is necessary to evaluate what local factors create vulnerability in each context.

Given the need to learn from emerging experiences, collaboration internationally between development agencies can enhance efforts to integration of climate change concerns. Agencies can also play a role in lifting adaptation issues higher on the agenda of international meetings and negotiation processes. Climate change and climate change adaptation in particular is not always high on developing countries’ agenda as here, too, climate has often been framed as an emissions and environmental issue only, and vulnerability of poor people is not well understood. Organisations can contribute to capacity building through research and south-south exchange of experiences and scholarships can fund students of the affected countries for higher educational level studies on the issue of climate change. Collaboration with development country research and civil society is likely to build capacity for both.

Equally if not more important is the role that agencies can play in bringing climate change adaptation into dialogues with recipient countries, for example in Poverty Reduction Strategy Papers and other development policy processes. The countries can be supported in their work for strengthening political leadership and enacting legislation related to climate change, vulnerability reduction and building of adaptive capacity among the poor. Agencies can also assist countries in increasing the budget for adaptation measures. Essentially, a type of poverty reduction planning less premised on economic growth, and more premised on reducing vulnerability of the poor needs to be promoted. It is necessary to challenge some political and economic structures as well as developments currently exacerbating vulnerability.

## 7. CONCLUSION

The climate challenge highlights societal problems that are currently insufficiently addressed - the social and environmental conditions that make people vulnerable to a changing climate. To put it simply, fundamental societal changes are required to adapt in a way that makes the poor more able to secure a decent life in the face of climate change. Therefore, governments and development organisations also need to refocus their activities as a response to the climate challenge.

Increasing efforts for understanding and strengthening existing livelihood adaptation strategies related to climate challenges is an important first step to this end. This is a strategy that makes a broad integration of climate change into the development agenda possible and also helps identify the vulnerability context that needs to be addressed, such as HIV/AIDS, disempowerment processes, or conflicts. It is a strategy that has the potential of reducing vulnerability of the poor, eradicate poverty and strengthen the capacity of poor people to handle multiple challenges. Such an approach also helps highlight potential conflicting interests and winners and losers from different types of adaptation interventions. Furthermore, interventions can focus on enhancing poor people's access to natural resources, promotion of community management practices of ecosystems, facilitation of income generating activities through innovative use of ecosystem services and improved access to markets, as well as facilitating access to environmental technologies and south-south transfer of experiences, technologies and practices adapted to local needs and natural resources. Finally, the barriers to local adaptation strategies can be addressed. Adaptation interventions and poverty reduction measures that do not take the above concerns into account run the risk of unintentionally increasing the vulnerability of some people and groups, especially the poor.

The practical examples of adaptation measures presented in this chapter show that a diversity of adaptation efforts are needed because of the range of challenges from climate change and the diversity of local contexts and existing

strategies. Some of the measures outlined in Table 2, such as enhanced access to water and health infrastructure, are in line with what is already considered 'good practice' in development interventions and underwrite the need to ensure that such good practice is implemented in practice. Other measures such as enhanced common property management rather than privatisation of resources challenge current development and liberalisation discourses. Importantly, some measures, including enhancing use and processing of local plant products are seldom prioritised in current development measures. Reducing the vulnerability of poor people involves refocusing measures towards strengthening climate-adapted strategies and technologies. Imposition of large scale measures and external technologies are likely to both marginalise local technologies and incomes further, make livelihoods more sensitive to climate variability and change, and potentially increase the vulnerability of many poor people. This latter observation represents one of the key challenges to agencies in the context of supporting adaptation in developing countries: the needs of the poor are often least heard, and often involve measures that may be perceived by some national authorities to attract less prestige, western technology and capital. Identifying the actual needs and interests of different poor groups in relation to climate change, and promoting these in the planning and implementation of development measures is therefore important in reducing vulnerability to climate change. Addressing the social factors that make any particular poor group vulnerable to climate change, be they privatisation of natural resources, declining health, and conflicts and insecurity, may well involve challenging existing political and economic structures.



Extreme droughts and floods are hitting Malawi. In Chikwawa in the south, people are desperate.

Photo: Norwegian Church Aid/Hege Opseth

## References

Adger, W. N., Huq, S. Brown, K., Conway, D. and Hulme M. 2003. Adaptation to climate change in the developing world. *Progress in Development Studies*, 3(3): 179-195.

African Development Bank; Asian Development Bank; Department for International Development, United Kingdom; Federal Ministry for Economic Cooperation and Development Germany; Ministry of Foreign Affairs – Development Cooperation, The Netherlands; Organization for Economic Cooperation and Development; United Nations Development Programme; United Nations Environment Programme; The World Bank 2003. Poverty and Climate Change. Reducing the vulnerability of the poor through adaptation..

Bailis, R., Kirubi, C. and Jacobsen, A. 2006. Searching for sustainability. Kenya's energy past and future. ACTS policy brief. African Centre for Technology Studies, Nairobi.

Brouwer, R., Nhassengo, J. 2006. About Bridges and Bonds: Community Responses to The 2000 Floods in Mabalane District, Mozambique. *Disasters*, 30(2): 234-255.

DFID 2004. The impact of climate change on the vulnerability of the poor. DFID key sheet. Department for International Development, DFID.

Eriksen, S. Owuor, B. Nyukuri, E. and Orindi, V. (eds.) 2006a. Vulnerability to climate stress – local and regional perspectives. Proceedings of two workshops. CICERO Report, Oslo. [www.cicero.uio.no](http://www.cicero.uio.no)

Eriksen, S., Ulsrud, K., Lind, J. and Muok, B. 2006b. The Urgent Need to Increase Adaptive Capacities, Policy Brief, Nairobi, ACTS.

Eriksen, S., Klein, R. J. T., Ulsrud, K., Næss, L. O. and O'Brien, K. 2007. Climate change adaptation and poverty reduction: Key interactions and critical measures. Paper prepared for the Norwegian Agency for Development Cooperation (NORAD).

Eriksen, S. and Silva, J. 2007. The effect of market integration on household vulnerability to climate stress in Mozambique: Empirical evidence of multiple stressors. Submitted to *Environmental Science and Policy*.

ESMAP 2005. Advancing bioenergy for sustainable development. Guideline for Policymakers and Investors. Volumes I, II and III. Energy Sector Management Assistance Programme, ESMAP, Stockholm Environment Institute.

IPCC 2007. Climate Change 2007: The Physical Science Basis. Summary for Policymakers, WMO, Geneva.

Karezeki, S., Kimani, J., Wambille, A., Balla P., Magessa, F. Kithyoma, W., and Ochieng, X.. 2005. The potential contribution of non-electrical renewable energy technologies (RETs) to poverty reduction in East Africa. AFREPREN/FWD, Nairobi, Kenya.

Lind, J. and Eriksen, S. 2006. The impacts of conflict on household coping strategies: evidence from Turkana and Kitui districts in Kenya. *Die Erde* 137 2006 (3) pp.223-240.

Lucio, F., Muianga, A. and Muller, M. 2007. Flood Management in Mozambique. In: *Climate Risk Management in Africa: Learning from Practice*. Edited by M. E. Hellmuth, A. Moorhead, M. C. Thomson, and J. Williams. IRI, New York.

Mallick, D.L., Rahman, A., Alam, M., Juel, A.S.M., Ahmad, A.N. and Alam, S.S. 2005. Bangladesh floods in Bangladesh: A shift from disaster management towards disaster preparedness. *IDS Bulletin*, 36 (4): 53-+

Mathur, A., Burton, I. and van Aalst, M. (eds.), 2004. An Adaptation Mosaic: An Example of Emerging Bank Work in Climate Change Adaptation. Final Draft. The World Bank. Washington, D.C.

McCarthy, J.J., Canziani, O.F., Leary, N.A., Dokken, D.J. and White, K.S. 2001 (eds). Climate change 2001: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change. WMO and UNEP.

McMichael, A.J., Campbell-Lendrum, D.H., Corvolán, C.F., Ebi, K.L., Githeko, A.K., Scheraga, J.D., and Woodward, A. 2003. Climate change and human health. Risks and responses. World Health Organisation, Geneva.

O'Brien, Karen and Vogel C.H. (eds), 2003. Coping with climate variability: User responses to seasonal climate forecasts in Southern Africa. Ashgate. Burlington.

Olago, D. 2005. Climate Change, Malaria and Cholera in Lake Victoria Basin, presented at Workshop Vulnerability to climate stress – local and regional perspectives, Nairobi, January 2005. [www.cicero.uio.no](http://www.cicero.uio.no)

Orindi, V. A. and Murray, L. A. 2005. Adapting to climate change in East Africa: A strategic Approach. Gatekeeper series 117, International Institute for Environment and Development.

Osbahr, H. and Viner, D. 2006. Linking Climate Change Adaptation and Disaster Risk Management for Sustainable Poverty Reduction. Kenya Country Study. VARG, Washington DC.

Preston, A. 2005. SN Power i Nord India. Vann & konflikter. FIVAS mai/juni 2005. Foreningen for Internasjonale vannstudier.

Robledo C. and Forner, C. 2005. Adaptation of Forest Ecosystems and the Forest Sector to Climate Change. Forests and Climate Change Working Paper 2, Food and Agricultural Organisation, Rome, Italy, viii+88 pp.

Satterthwaite, D. 2006. Climate change and cities. Sustainable development opinion, International Institute for Environment and Development, IIED.

Schipper, E.L.F. and Pelling, M. 2006. Disaster risk, climate change and international development: scope for, and challenges to, integration. *Disaster*, 30(7), 19-38.

Tiffen, M. Mortimore, M. and Gichuki, F. 1994. More people, less erosion. Environmental recovery in Kenya. ACTS press, African Centre For Technology Studies, Nairobi, Kenya.

UNDP 2006. Human development report.. Beyond scarcity: Power, poverty and the global water crisis. <http://hdr-beta.undp.org/hdr2006/pdfs/report/HDR06-complete.pdf>. United Nations Development Program (UNDP).

Venema, H. D. and Cisse, M. 2004. Seing the light. Adapting to climate change with decentralized renewable energy in developing countries. International Institute for Sustainable Development, IISD.

Watson R. T. 1997. The regional impacts of climate change: An assessment of vulnerability. Cambridge University Press.

Weru, J. and Bodewes, C. 2001. Housing rigths: A Kenyan Perspective. United Nations Chronicle, online edition, Volume XXXVIII Number 1 2001, Department of public information. <http://www.un.org/Pubs/chronicle/2001/issue1/0101p42.html>

# THE NORWEGIAN CLIMATE POLICY – A HISTORY OF BROKEN PROMISES?

By Lars Haltbrekken, Chairman of Friends of the Earth Norway  
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**“I am more worried about global warming than I am of any major military conflict.”**

These words were spoken by a former weapons inspector in Iraq to the New York Times right after he had left Iraq in the beginning of 2003.



The river in Keren in Eritrea is dry, and the people of Keren work hard to get access to clean water since the water level has decreased dramatically in this part of the country. When droughts strike Eastern Africa, Keren is very vulnerable. The wells are empty, the river is dry six months a year, and people have to collect rain water to cover their needs for water.

Photo: Norwegian Church Aid/Laurie McGregor

The climate threat is not only the biggest environmental problem in the world. According to the UN Environment Programme we will not be able to solve other problems such as famine and severe poverty, without resolving the climate problem. In other words, it is the world's biggest problem and the world's biggest challenge.

If we are to take the words spoken by Hans Blix seriously, it must have consequences. We must spend at least the same amount on fighting climate change as we do on the military and on combating terrorism. Are there politicians who dare bring about such a fundamental change to our way of thinking regarding national defence? Norway spends about ten times as much money on the Ministry of Defence as on the Ministry of the Environment. Even though a cold war from East is no longer the main threat, there is a lurking heat from all sides. Perhaps the heat is mostly from the West?



On the picture emissions from different regions in the USA are compared to emissions from other countries. Today, the USA is the world's largest polluter of climate-changing gases. However, in a few years' time, the nation will be surpassed by China.

The above picture compares the emissions of the different regions of the United States of America with the emissions from other countries. At present, the US is the world's biggest polluter of greenhouse gases, however, in a few years it will be surpassed by China.

The international climate negotiations, which the USA has more or less withdrawn from, are characterized by stagnation. In this situation it is more imperative than ever that some countries become a role model, assume responsibility and show that it is possible to reduce the greenhouse gas emissions. As the richest country in the world, Norway has every opportunity for once again playing an important role in the international environment work. However, in that case, there is a need for redefining the climate policy. A review of the Norwegian climate policy shows that 16 years have passed since the Norwegian Parliament (Stortinget) and government made any significant decisions regarding climate measures. That occurred in 1991, when Gro Harlem Brundtland, with the present Prime Minister Jens Stoltenberg as State Secretary in the Ministry of the Environment, introduced the CO<sub>2</sub> tax. The tax has been of great importance in limiting the growth of the Norwegian CO<sub>2</sub> emissions. Without this tax, the emissions could have been 15-20% higher than they are at present.

Since the introduction of this tax, the evidence of man's impact on the changing climate have become increasingly stronger. And the tax has not reduced the emissions, merely prevented a bigger growth than the one we have experienced. It has slowed down the speed of, but not reversed, the development the way that the situation requires.

## THE NORWEGIAN CLIMATE HISTORY – A HISTORY OF BROKEN PROMISES

The elections to the Parliament (Storting) in 1989 became a Norwegian championship in promises regarding the environment. The parties competed in giving the most ambitious environmental promises. On the climate issue, The Centre Party (Senterpartiet) went the furthest. They promised us a 50%

reduction in the CO<sub>2</sub> emissions within the year 2000. The result of the parliamentary negotiations on June 14th 1989 was that Norway, after a proposal from the Conservative Party (Høyre), would stabilise its emissions at the 1989 level within 2000. In 2000, the CO<sub>2</sub> emissions were 22% higher than they were in 1989, and the total greenhouse gas emissions were 10% higher. What had happened in the meantime? Little had been done to reduce the emissions, more to undermine the objective. The Confederation of Norwegian Enterprise (NHO) had been more or less non-participatory when the Parliament discussed the CO<sub>2</sub> target; however, little by little they became aware of what the consequences would entail. As a following, they worked hard to undermine the objective.

The Norwegian proposal was the first of its kind in the world, but still not good enough to solve the enormous challenges we were faced with and still are facing. If the Norwegian authorities had maintained the target and seen to it that measures were introduced to reach it, Norway would have been one of the few countries today that stood a good chance of obtaining our international obligations. Instead we have become one of the countries that are furthest away from fulfilling our obligations.

After the International Panel on Climate Change presented its first main report in 1990, the UN Conference on Environment and Development in Rio de Janeiro in 1992, where the UN Framework Convention on Climate Change was signed and the first demonstrations against the construction of a gas power plant in North-Western Norway in the early 1990ies, a great deal of the climate debate faded out.

After the decision by the Parliament (Storting) to stabilise the emissions, two ministers of the environment spent 6 years to present a white paper on climate describing how to go about stabilising the emissions. The conclusion of this paper can be described in the following: The CO<sub>2</sub> target is upheld, but we will not achieve it. The minister of the environment, at that time, Thorbjørn Berntsen used all his rhetorical skills to emphasize how little Norway was in the big context and that whatever we did, it would not make a difference.

In the following years, this argument has been repeated over and over. Norway's emissions correspond to 0,16% of the total emissions in the world. If we include the emissions from the combustion of the oil and gas that we export, our share will be 2% of the total emissions. Most countries in the world can present a similar argumentation. Last year the Prime Minister of Great Britain, Tony Blair, tried to excuse his country since they only represented 2% of the total emissions. China is repeatedly pointed out as one of the big sinners. What if China's leaders decided to divide the country into small provinces? Each province would only have contributed to a small share of the total emissions and thereby they could refrain from doing something.

I can use the same argument myself in regards to my tax contribution to the Norwegian state. Even though I pay a substantial portion of my wages in taxes, it would have little impact if I stopped paying tax. My contribution is probably much lower than 0,16% of the total tax income to the Norwegian state.

It goes without saying that there is no hold to such an argument. It is the accumulated total of all emissions that defines the problem.

Even though the white paper of Berntsen did not have any importance in the form of reduced emissions in Norway, it revived the climate debate. Another issue contributing to the debate was the planned construction of gas plants. This time a company called Naturkraft made a conscious use of environmental arguments in order to gain accept for its plans. The slogan became Gas Power Replaces Coal and later on it was discovered that the slogan was the work of the communication bureau Geelmuyden/Kiese.

Coincidentally, the Storting opened for the construction of gas power plants in Norway on the 7th anniversary for having adopted a resolution to stabilise the CO<sub>2</sub> emissions at the 1989 level.

In the autumn of 1996, the Norwegian Water Resources and Energy Directorate gave the go-ahead for the gas power plant plans of Naturkraft. An appeal concerning the case was made to the government, and in the spring of 1997, an enormous opposition against the plans arose. The gas plant issue became the symbol of the new environment debate. Nearly 3000 people were willing to resort to civil disobedience to stop the plans, and the Prime Minister, at that time, Thorbjørn Jagland received a letter from former Alta campaigners asking him to reconsider. The memories of the Alta conflict 16 years previously were probably a significant contributing factor when Jagland asked the contractors to postpone the building start that was planned for the summer of 1997. In this way, Jagland avoided a messy conflict that would have had a strong effect on the elections that took place in the autumn that same year.

In December 1997, the ministers of the environment gathered in the Japanese emperor city Kyoto for the final negotiations of what has later become known as the Kyoto protocol. The suspense was present to the very last minute of the negotiations and Al Gore himself, the Vice President of the United States, participated in order to reach an agreement. The outcome was that the rich countries committed themselves to an approximate 5% total emissions reduction. As one of only a few countries, Norway was allowed to increase its emissions by 1% compared to the 1990 level. Even this allocation would later on prove very difficult for us to comply with.

Due to the gas power debate in Norway, the Norwegian journalists were well represented in Kyoto. The climate issue overshadowed the other issues of the environment debate.

The 1997 elections in Norway resulted in a new government, the first Bondevik government. All three parties in this government, The Christian Democratic Party (Kristelig Folkeparti), The Liberals (Venstre) and The Centre Party (Senterpartiet) had entered the elections with a promise to put an end to gas power plant plans. They kept this promise by setting very strict requirements to the levels of emissions permitted to escape from the gas power plants. The requirement was for a 90% removal of all CO<sub>2</sub> emissions. These requirements were based on plans presented by Hydro for the first gas

power plant handling CO<sub>2</sub> in April 1998. The strict requirements for emission reductions eventually led the Labour Party (Arbeiderpartiet) and the Conservative Party (Høyre) to demand the resignation of the Bondevik government on March 9th, 2000.

The new Labour Party government made sure that the new allocations given to Naturkraft were in accordance with the wishes of the company and they also gave permission for the construction of a polluting gas power plant in Skogn in Northern Trøndelag. The Norwegian Pollution Control Authority (Statens Forurensningstilsyn, SFT) was overruled by Prime Minister Stoltenberg, who forced them to allocate emissions in agreement with the application from the gas power plant contractors. SFT was unable to provide a professional explanation for this allowance and expressed that quite clearly when the issue was presented for the media.

In the spring of 2002, the Minister of the Environment, at that time, Børge Brende presented his white paper on climate. It proposed a series of greenhouse gas emission reduction measures. One of the measures was to reduce oil heating by 25%. At the present time, five years after the presentation of this paper a government programme for economic support to those who choose to replace their oil heaters with pellet heaters will be offered. Offshore electrification, that would have provided a substantial emission reduction, has yet to become in demand, in spite of it being listed as one of the key measures in the white paper on climate.

In the autumn of 2005, the Norwegian Pollution Control Authority (SFT) presented its plan of action for reduced greenhouse gas emissions. The plan presented a great potential for a reduction in the emissions. The report by The Norwegian Commission on Low Emissions (Lavutslippsutvalget) published in the following year, the autumn of 2006, drew the same conclusion. In this report, measures to be taken for a 2/3 reduction within 2050 is recommended. According to the report, it can be done and at a reasonable cost.

### **Quota based emission trading**

The purchase of quotas and support for climate measures in other countries, issues that many bring in to the debate, are of course important. However, it is important to emphasize that this must be in addition to the emission reduction measures in the rich countries. Without a substantial reduction of the emissions in the rich countries, we will not be able to deal with the climate threat in a proper way. It is obvious that the rich countries must contribute to ensure a welfare growth in the developing countries without the same environmental consequences that our welfare has had. However, to believe that this is sufficient is absolutely wrong. Even with extensive quota purchases and transference of technology, the emissions from the developing countries will increase. If the world is to succeed in halving its emissions within 2050, and at the same time increase the welfare level in the poor countries, we cannot evade the fact that the most substantial emission reductions must be made in the rich countries. Without these reductions there is no room for the expected increase in emissions to come from the poor part of the world. In

order to obtain an equal distribution of the resources in the world, the emissions of the rich countries must be reduced by 70-90%, in addition to extensive climate change measures in the developing countries.

Through the Kyoto protocol the countries that are to reduce their emissions have in part been given the possibility to do so by purchasing emission reductions made elsewhere. The protocol has three flexible mechanisms that can be used, presupposing that this is only a supplement to national emission reduction measures. The three flexible mechanisms are quota trading between countries with emission obligation, possibilities for supporting emission reduction measures in countries with an economy in a transition phase, and the green development mechanism regarding support to emission reduction measures in developing countries.

In the climate debate the quota trading and the other two flexible mechanisms are regarded by many as the only possible solution. It is often claimed that we should direct all our economic resources at the purchase of quotas from other countries. This would be both cheaper and would also give a greater emission reduction for the money spent. If used in the right way, the flexible mechanisms will be very important when it comes to reducing emissions. However, we must not fool ourselves in to believing that it is sufficient to have emission reductions in big developing countries such as China and India. If we are to reduce the world's total greenhouse emission to half, it means that we need to implement significant emission reductions in the rich countries. Presupposing that we through the flexible mechanisms will be able to reduce the emissions in the big developing countries by 20% in comparison to today's level - probably a most unrealistic presupposition since they most likely will have to increase their emissions - the rich countries must reduce their emissions by 70-80% in order to succeed in cutting the world's total emissions to half. This illustrates how important it is to not only purchase quotas in other countries, but that this is done in addition to a significant emission reduction at the national level. This is the only way we can overcome the climate change.

Through the white paper of Brende, it was approved to establish a quota system for CO<sub>2</sub> in Norway, which was supposed to be a forerunner for the international quota trading market that will commence on January 1st, 2008. The quota system for CO<sub>2</sub> has now been functioning for two years, but unfortunately, without us registering considerable emissions reductions. The main reason for this is that the allocation of quotas has been too generous, and that they have been allocated for free. The quota trading system was introduced on January 1st, 2005 and will be in function up to December 31st, 2007. Thereafter, Norway will probably co-ordinate with the European Union Trading Quota System and thus become a more important part of the international quota trading market.

In 2006, quotas were allotted to the quota-bound companies in Norway corresponding to a total emission that was 10% higher than that of 2005, and for 2007 the allocated emission quotas corresponded to a 16% increase. In 2005 the industries of the EU were allotted quotas for the emission of

approximately 100 millions of tons of CO<sub>2</sub> more than they actually needed. This corresponds to almost twice the amount of the Norwegian emissions. The industries in the EU have in fact received permission for the emissions of more than they presently do, and that for free. This extensive allocation resulted in a dramatic fall in the prices of CO<sub>2</sub> quotas in the spring of 2006. Again, this results in a lack of emission reductions because it becomes less profitable to reduce them.

In the course of the spring 2007, the government will present a proposal for a quota system for the period of 2008-2012. This system must take into account the lessons learned from the present test system and must ensure emission reductions. If not, then there is no reason for using a quota trading system as a measure in the climate policy.

A quota system for greenhouse gases must be based on that fewer quotas than needed are allocated. So far, the politicians in both the EU and in Norway have done the opposite.

Today the Norwegian oil and gas industry is exempt from the quota system, but is eager to be included. In so doing, the companies hope to avoid the CO<sub>2</sub> tax. If the quota system replaces the CO<sub>2</sub> tax, it will become considerably cheaper to pay for the CO<sub>2</sub> emissions from the continental shelf than it is today. If so, a significant weakening of the Norwegian climate change policy would be the result. Therefore, the government must ensure the use of double measures. It must not become less costly than today to produce CO<sub>2</sub> from the Norwegian platforms.

A main problem with the quota system is that the quotas are allocated for free. Thus, the environment policy has been turned up-side down. The pollutor will no longer pay, but be paid. The climate problem is serious, and the effects of the greenhouse gas emissions are costly for society. Naturally, those who cause the emissions should also be the ones who have to pay for them.

Today's quota system may also reduce the willingness of the industry to cut its emissions. Trade and industry expect that the extent of the future free quota allocation decisions, will be based on today's emissions. In that case, it does not pay to reduce the emissions, because as a result you reduce the extent of the free quotas you are allocated in the future. This speaks out the urgent need for abolishing the system of free quotas.

Besides, the system of free quotas to new business establishments undermines the need for structural changes to reduce emissions. Part of the intention of a quota system for greenhouse gas emissions, is to stimulate for growth in environment-friendly industries and to restrain the growth in industries with high emissions. In short, the system is to stimulate to a shift from fossil to renewable energy.

Within the European Union an auction of 10% of the quotas for the period of 2008 – 2012 will be allowed. Norway has been given the opportunity for auctioning far more than that. In order to obtain the most well functioning

system possible, all the quotas should be sold. Then the problem with allocating too many quotas would be avoided. If Norway, starting in 2008, is able to establish an effective system for auctioning quotas, then Norway will assume a lead role in the international development of measures to combat climate change.

The necessary emission reductions required will not be obtained through a quota system which, at best, reduces the emission growth and makes Norwegian industrial leaders refrain from reducing emissions, for fear of obtaining fewer quotas in the next round.

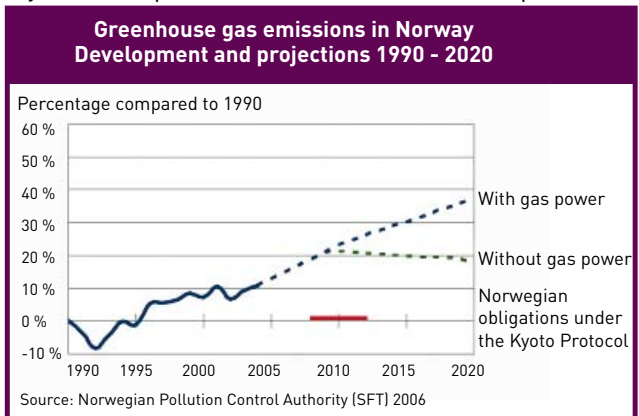
## WHY ARE EMISSIONS INCREASING?

We use increasingly more energy. Since 1990, our energy consumption has increased by 14%. This energy comes to a great extent from fossil fuels, leading to an increase in emissions. The fact that we travel increasingly more and build bigger houses and vacation homes, are the main reasons for the rising emissions, as long as the wealth is based on fossil fuels.

In a few years Norway will comply with its climate obligations. Presently, Norwegian emissions are at 8,5% above the 1990 level. The Norwegian emissions are expected to continue increasing. According to the latest prognosis from the Ministry of Finance in the national budget for 2007, it is expected that in 2010 emissions will have increased by 18%. This increase does not take into account the construction of the gas power plant at Mongstad that will not have CO<sub>2</sub> capture and storage (CCS) until 2014 nor the emissions released from the gas power plant at Kårstø, for which at present a waste treatment plan is being discussed. In total, these two development projects will increase emissions by more than 4% for every year they are in operation without waste handling. According to the Kyoto protocol, Norway was allowed to increase its emissions by 1% in the same period. The increase is to a great extent due to more road traffic and an increased activity at the continental shelf.

### Increased emissions from the petroleum sector

While the gas power debate was taking place, emissions from other parts of society increased, especially from the petroleum sector and the transport sector. From 1990 to 2004, emissions from the petroleum industry increased by 79%. Emission caused by road traffic increased by nearly 30% in the same period. This growth contributes to a great extent to the fact that we are removing us further and further away from the obligations we have according to the Kyoto protocol.



## PRESENT AND FUTURE EMISSIONS

The future emissions have not yet been created. The cars that we drive, the heaters we use in our houses and the big industrial plants are all nearing their expiration date and will be replaced by new and better alternatives. This will be our great opportunity for change. If we are able to ensure that the new car we buy is an environment-friendly one, society will become increasingly more environment-friendly.

At present there are mainly three emission sources in Norway; Oil and gas, transport and industry. For all emissions, environment-friendly alternatives exist. Measures must be taken to stimulate the consumers to choose the environment-friendly alternative. Polluting should be made expensive and choosing environment-friendly alternatives should be less costly. Moreover, the use of fossil energy should be prohibited when other environment-friendly alternatives exist, for example heating of buildings.

### Oil and gas

The oil and gas industry causes emissions both by the production of oil and gas and later on when it is burned to heat a house or run a car engine. In Norway, the exploration of oil and gas represents about 20% of the emissions. Together with the road traffic, these are the fastest growing emissions. However, Norway is not where the Norwegian exploration of oil and gas is the greatest. As much as 93% of the emissions take place where the oil is consumed, and that is primarily in other countries. Since we are a significant exporter of oil, number three in the world, it makes us a considerable contributor to the global climate change.

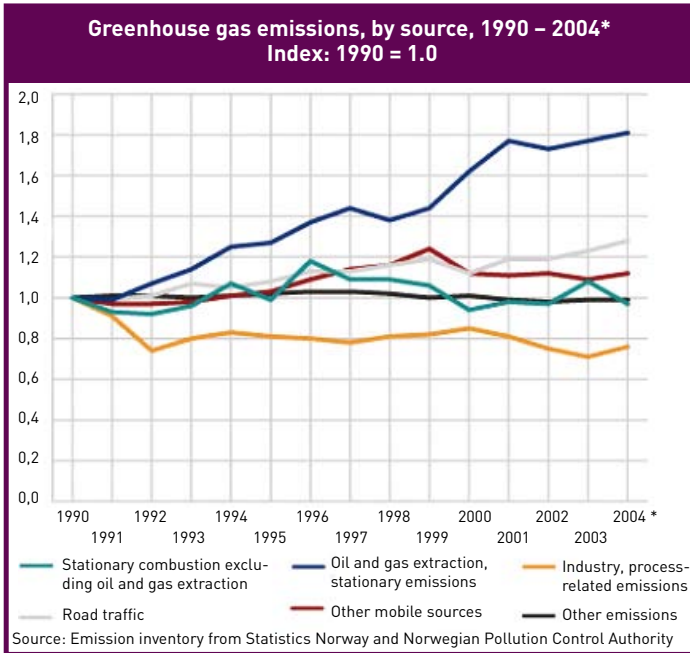
In order to reduce emissions from the petroleum industry, there are first and foremost two possible solutions that can contribute to this. Firstly, we have to limit the exploration of oil and gas, and the best way to do so is to deny the petroleum industry access to new areas. This is a crucial argument for preventing the petroleum industry from operating in our most vulnerable ocean areas, the Barents Sea and Lofoten/Vesterålen. An effective measure for reducing the exploration speed is by establishing petroleum free fishing areas, which are areas from which no oil or gas will be extracted. Lofoten/Vesterålen is such an area.

The emissions from oil and gas extraction come from small gas power plants that produce energy at the offshore oil platforms. Instead of individual gas power plants supplying the energy needed to run the oil platform, alternative environment-friendly generated energy should be provided. Electrification of the offshore oil platforms implies pulling a power cable from onshore to the platforms. This would then replace the polluting gas power plants running the platform. The gas power plants that supply energy for the oil production have a very low efficiency rate and have a CO<sub>2</sub> emission per utilized energy unit that can be compared to coal-fired power plants.

## Road traffic

In Norway, one fourth of greenhouse gas emissions are caused by the transport sector. When 40 people travel in a bus, each one of them is causing an emission of only 1/10 compared to if they had been driving separate cars. Therefore, the politicians must make it more efficient and less expensive to travel by bus and by train than by car. Travelling by train is much more environment-friendly than travelling by plane. The politicians must ensure that new houses, schools, shops and work places are located in a short distance from each other, so that more people can walk and travel by bicycle to and from their daily tasks.

In 2006, the Norwegian Pollution Control Authority (SFT) made a report to the Norwegian government recommending that a requirement was imposed for the share of bio-fuels sold to be at least 4% of the total fuel sales within 2010. So far, no such legislation has been proposed.



## Air traffic

The number of passengers travelling to and from Norwegian airports is increasing rapidly. Inexpensive tickets create a growth in the traffic and cause new damaging climate change trends. And our domestic travel is at the top of the list when we take into account the number of flights made per person, compared to other European countries. Avinor (operator of airports and air traffic control in Norway) estimates that the number of passengers travelling via Norwegian airports will increase by as much as 370% from 1990-2040. This is more than a fourfold increase.

There are no taxes imposed on the aircraft fuel used for international traffic, and the Kyoto protocols have no emission requirements for planes flying between countries. Then polluting becomes cheap. The strong increase in traffic has caused a 73% increase in the EU's CO<sub>2</sub> emissions due to aircraft fuel in the time period 1990-2003. The increase is expected to be 150% for the period of 1990 to 2012. In addition to emissions of CO<sub>2</sub> the air traffic is also responsible for causing climate change by the emission of other causative agents such as nitrogen oxides and water vapour. Together with other effects this makes the air traffic's influence on climate change approximately the double of the effect caused by the CO<sub>2</sub> emissions.

It is necessary to restrict international air traffic, either by imposing taxes or by a requirement for the purchase of emissions rights in a quota market, a measure the EU is considering establishing. Also for the domestic traffic the taxes must be increased so that the principle of the pollutor paying the costs, will apply. Taxes imposed on air traffic services can become an important source of income for development assistance, an initiative that has been taken, and partly implemented, by France and a few other countries. Environment and development issues are closely interlinked, and it is therefore natural to impose a tax on activities that cause climate change, activities that pay little or no environment taxes.

Together with increased taxes and/or trades with emissions quotas, efforts should be made to strengthen alternative and more environment-friendly forms of transport. The railway connections between the biggest cities in Southern Norway should be improved with more frequent departures and shorter travel time. The same goes for the connections to our neighbouring countries' capitals.

## **SWEDEN – THE PIONEER COUNTRY THAT NORWAY SHOULD HAVE BEEN?**

Sweden has by far surpassed the role of Norway as a pioneer country in regards to environmental policy in practice. During the period of 1990 – 2005, Sweden reduced its emissions by 7,5%. In the same time period Norway increased its emissions by 8,5%. What have the Swedes done that we should have been doing?

### **Tougher climate targets**

In order to succeed with emissions reductions it is important to have objectives. Sweden has as its target a 25% reduction of greenhouse gases within 2020. The great majority of the Swedish parliament (Riksdagen) supports this target. For the time being, Norway has no such climate target. Minister of the Environment, Bjørnøy, has pronounced that we will not be less ambitious than the EU. When the EU presented its proposal for climate policy they said that in any case they would cut emissions by 20%. Provided that a new climate policy was agreed upon, they would work for a 30% cut in emissions.

In addition, Sweden has an objective for freeing themselves from their dependency on oil for heating and transport within 2020. Right before the summer

of 2006 the “Kommissionen mot oljeberoende” (the Commission Against Oil Dependence) presented its report, stating how Sweden would be able to fulfil these targets.

According to the Kyoto protocol the Swedes are allowed a 4% increase within 2010 compared to the 1990 levels. The Swedish Riksdagen expressed the need for a more ambitious objective and imposed a reduction target of 4%. In the Swedish white paper on climate of 2006, this target remained locked. It was also concluded that the target will be obtained without the use of quota trading or other flexible mechanisms mentioned in the Kyoto protocol. At the present time it seems likely that they will over comply with this target.

Neither the Norwegian Parliament (Storting) nor the government has ever spoken for a more stringent national target the way Sweden has. Furthermore it is clear that we will make use of the purchase of quotas to comply with our international obligations.

### **Bio-energy**

It is especially in the efforts of promoting bio-energy that the Swedes are far ahead of us. In Norway 15TWh bio-energy is produced per year. In comparison, 110 TWh is produced in Sweden. The main reason for the higher share in Sweden is a higher tax on polluting energy resources, and a higher tax on electricity. The el tax in Sweden is more than double the tax in Norway.

### **Bio-fuel**

In Sweden 5% bio-ethanol is blended in with nearly all kinds of petrol that is sold. There are more than 600 petrol stations with separate bio-ethanol pumps. In Norway there are two. Besides, every sixth car sold in Sweden is an environment-friendly car. This is possible because of the tax exemption for bio-fuels. In the revised budget in the spring of 2006 the Norwegian Minister of Finance announced a similar exemption. Hopefully this will also result in an increase in the sales of cars run on bio-fuels in Norway. However, it will not help much if the authorities do not follow up and impose a requirement for a percentage rate on the sale of bio-fuels.

### **Tax on fossil energy sources**

In Sweden the tax imposed on fuel oil is 28,2 øre/Kwh (NOK), whereas in Norway it is 11,8 øre/Kwh<sup>1</sup>. Since 1990, the tax imposed on fuel oil in Sweden has resulted in a 40% reduction in emissions from household heating due to the conversion from oil to bio-energy<sup>2</sup>.

Norway introduces a CO<sub>2</sub> tax on the use of natural gas from July 1st, 2007. This will be 4-5 øre/Kwh. In Sweden it is 16,7 øre/Kwh (NOK).

### **Local investment programmes**

In the past few years Sweden has carried out big environment investment

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<sup>1</sup> The Ministry of Finance

<sup>2</sup> Sweden's 4th national report on the climate, 2003

programmes. In the period from 1998 to 2004 NOK 3,5 billion has been invested in measures to reduce the effects of climate change. In Norway, no such investment programme exists, however, ENOVA contributes some funds to similar measures (Enova SF is a public enterprise owned by the Royal Norwegian Ministry of Petroleum and Energy.).

### Energy conservation

One of the most important climate measures is to reduce the energy consumption. Sweden aims to have a 20% reduction in the energy consumption per heated area surface within 2020, and a 50% reduction with in 2050. In order to achieve this, there are a series of support programmes for energy saving:

- NOK 450 million is allocated per year for municipal energy advisor service
- Investments for increased energy efficiency in public buildings give a 30% tax reduction. This represents NOK 1,67 billion per year.
- NOK 250 million per year is given to support the conversion from electrical heating to other sources of renewable heating.
- NOK 75 million per year is allocated for support to convert from oil heaters to other environment-friendly heating installations

In Norway, funds for energy efficiency measures are channelled through ENOVA. In 2004, this represented NOK 204 million<sup>3</sup>.

### Information

In 2002 and 2003 Sweden spent NOK 50 million on an information campaign regarding climate change. Presently, Norway is about to launch a similar campaign, but has so far only allocated NOK 6 million for the first year.

### Railway

Sweden will spend 3-4 times as much on expanding the railway in 2007 as Norway will. They already have a railway network in place making it possible to travel between the two biggest cities, Stockholm and Gothenburg in three hours. In Norway, it takes more than double the time to travel between Oslo and Bergen, in spite of the distance being only a few metric miles longer.

## A NATIONAL CLIMATE AGREEMENT

The Prime Minister Stoltenberg's new year speech on January 1st, 2007, will hopefully become a turning point in regards to the Norwegian climate policy. The first new year's speech he held, on January 1st, 2001 became historical for the Norwegian watercourse conflict. At the time he said that "The time for extensive hydroelectric power plant building has passed". This stopped the development of valuable watercourses in Nordland, where the excavators were ready to start. This resulted in the conservation of several watercourses, most recently the Vefsna watercourse flowing from Sweden through Norway and into Mosjøen. It is our hope that the new year's speech of 2007 becomes the same important milestone for the Norwegian climate policy and that we will have a government that proposes ambitious plans for the reduction of

greenhouse gas emissions.

After his speech, the Prime Minister stated that one of the most important tasks for this government is to reduce greenhouse gas emissions. It is most agreeable that Mr. Stoltenberg emphasized this responsibility so strongly. Only one year previously we find a new year's speech without any reference to the environment.

On important issues where a Parliamentary resolution affects the majority of the inhabitants in a country and extends over a long time period, the political parties seek to reach a broad agreement. The discussion concerning the pension agreement is one example of this. The government seeks to have the broadest possible majority to ensure that the coming pension system will not be ratified after the parliamentary elections in 2009. The National Insurance Scheme was introduced in 1967, and also in this case a broad agreement was important. The National Insurance Scheme was not to become a sacrifice in continuing political rematches. And in 1945, after the war, there was a broad agreement in the Storting (the Norwegian Parliament) that the plan for the reconstruction of Norway should not become an arena for political rematches.

Why is it that this is not the case for environmental issues? At present, the climate threat is the biggest challenge of mankind, and it is much too important to become a mere political argument between the parties. The opposition states that everything was better before, whereas the government states that everything is better now. However, emissions increased before and they are increasing now. We have to put an end to this game of who is or was the worst. If we do not manage to agree upon an ambitious climate policy, we all stand at risk for losing, with a climate that will have changed dramatically.

Friends of the Earth Norway have spoken for a broad climate agreement in the Norwegian Parliament. The proposal has been well received by nearly all the parties of the Parliament, with the exception of the Progress Party (Fremskrittspartiet). We must start a discussion regarding what we can do, as well as an agreement on what measures to take. What we do accomplish the next 10-20 years is decisive for the extent of the climate change. The climate agreement must not be characterized by compromise alone. The Parliament (Storting) will not pass a resolution on a mediocre pension system when negotiating a pension arrangement that nobody is satisfied with.

A national climate agreement has to result in a national effort where the industry, the economic life, the central and the local authorities, the research environment and the big organisations contribute. A long term perspective is important, especially for the ones working to reduce emissions. They must know that this policy will be valid for a long time and not be at risk for a sudden change after the next elections. Then they will have a policy assurance to base their decisions and investments on. It is the rich countries that have to shoulder the historical responsibility for the global warming that we are experiencing today. If we are to have any expectations about involving the major developing countries, a few rich countries must assume the lead and exemplify that it is possible to reduce the emissions of greenhouse gases.

Stagnation is the best word to describe the situation of the international climate negotiations. Even though we recognize the problem, the willingness to take on new obligations regarding emission reductions is scarce. There is a desperate need for countries to assume responsibility and become an example to follow. Some countries have assumed responsibility and have become an example to follow. During the climate negotiations in Nairobi in 2006, Germany spoke for a 30% emission reduction within the European Union by 2020. The Germans were willing to cut their emissions by 40%. Such declarations create progress.

If we are to have any expectations about involving the major developing countries, a few rich countries must assume the lead and exemplify that it is possible to reduce the emissions of greenhouse gases. It is the rich countries that must assume the burden of the historical responsibility for the global warming that we are experiencing today.

The Norwegian Minister of the Environment, Helen Bjørnøy, has declared that Norway will not be any less ambitious than the European Union and that, together with the European Union, we will work for an international agreement obligating the rich countries to make substantial reductions in the years to come. In addition, she wants an agreement obligating the world to halve their emissions within 2050.

## **OUR HOPES TO A CLIMATE AGREEMENT:**

In a climate agreement the parties must dare to think grand and ambitious thoughts, both short term as well as long term. In order to reduce emissions of greenhouse gases to an acceptable level so as to avoid an average global temperature increase of more than 2 degrees and to have major developing countries participate in the work, the rich countries must commit themselves to at least 30% emissions reductions within 2020. Within 2050 the total emissions of the world must be halved, which means emissions from the rich countries must be reduced by 80-90% by that time. This must be the pronounced Norwegian position in the international negotiations.

We have gathered a series of essential points that we think should form the basis of a national climate agreement:

### **50% reduction in total emissions within 2020**

As one of the richest countries in the world, Norway holds a unique opportunity and special responsibility for leading the way in regards to the climate policy. Sweden has set the objective to become independent of fossil fuels within 2020, whereas the EU has decided on a minimum 20% reduction in emissions within 2020, and a 30% reduction within 2020 if a new, obligating international environment agreement preceding the Kyoto protocol comes into being. Norway should follow Germany's lead and declare that we go further than the EU. We should therefore have a 50% emissions reduction compared to the 1990 levels within 2020.

## **80% reduction in total emissions within 2050**

The EU says that the world's developed countries must cut their emissions by 60-80% within 2050. As one of the richest countries in the world, Norway must assume responsibility for emissions reductions corresponding to a reduction of at least 80% within 2050.

## **No increase in emissions until 2010**

Børge Brende of the Conservative Party of Norway has spoken for allowing the emissions in 2010 to become no higher than the 2000 level. This implies that in 2010 there will be emissions of no more than 54 tons of CO<sub>2</sub> equivalents in Norway. With the expected increase in emissions from the three gas power plants (Kårstø, Mongstad and Snøhvit), it means that powerful measures must be implemented in many sectors to keep the emission levels low.

## **Targets for each Parliament period**

Separate climate targets should be decided on for each Parliament period. The targets for each Parliament should be calculated based on the targets that are decided for 2020 and 2050.

## **A new, ambitious international climate agreement**

Norway must work for a more comprehensive and ambitious climate agreement to succeed the Kyoto protocol. The rich countries must have a 30% emission reduction within 2020, and the world's total emissions must be halved within 2050. Then the developed countries must reduce their emissions by 60-80%. This is in accordance with the targets of the European Union in the work with a new international climate agreement.

## **20% reduction in the total energy consumption within 2020**

Norway is among the countries with the highest energy consumption in the world. This energy consumption cannot continue to increase. Norway has a great potential for implementing cost-effective energy efficiency and releasing measures. The objective of the European Union is a 20% reduction in the total energy consumption within 2020. In Aftenposten, on January 17th, Børge Brende speaks for a similar objective for Norway. Norway must set this target. This will imply that the energy consumption in Norway will be reduced by 58 TWh compared with today's total energy consumption of 290 TWh.

## **No gas power without CO<sub>2</sub> cleansing**

All of the new gas power concessions must have a full scale CO<sub>2</sub> capture and storage from day one. Gas power plants under construction must as soon as possible make use of this technology and plans must be made for each plant in order to ensure a rapid implementation. According to the Norwegian Water Resources and Energy Directorate (NVE), it is possible for Kårstø to have a CO<sub>2</sub> cleansing processing in place within 2011/2012. At Mongstad there is an agreement in place for CO<sub>2</sub> cleansing within 2014 at the latest. There are no plans for the Snøhvit plant yet. Therefore, a work for implementing a plan for CO<sub>2</sub> cleansing must be carried out for Snøhvit as well.

## **5,75% bio-fuels**

Norway should adapt the objective of the EU that bio-fuels should account for at least 5,75% of the total fuel amount within 2010. Bio-fuels have the potential to reduce emissions of greenhouse gases considerably from the transport sector. In order to make the most of this potential, the bio-fuels used in Norway, should primarily be based on domestic waste and raw material production.

## **15TWh renewable energy within 2016/15**

At present, Norway has no energy crisis, however, first and foremost we have a heating crisis. A great share of our energy consumption is for household heating. This energy can be released and replaced by renewable heating sources. 15TWh new, renewable heat sources should be built within 2016. Norway spends approximately 1/3 of its total electricity production on the heating of buildings. A large portion of this could have been avoided or replaced by renewable heating energy.

The production of heating energy must be granted a production support per kWh, like the electricity power production will have. This will result in a far more stable and long term based system. According to the Norwegian Bio Energy Association, this would give 10TWh new bio-energy within 2016. In addition, new constructions should be upgraded for a better usage of solar energy. According to the Norwegian District Heating Association (Fjernvarmeforeningen), 30% of the energy for heating needs in Norwegian households could be supplied by solar energy. If solar energy had been made use of in all existing households, it would account for more than 10TWh energy per year.

## **More renewable energy within 2020**

Norway primarily uses renewable electricity from waterpower on shore. However, in the energy sector at the continental shelf, nearly all energy consumed is based on fossil fuels. As previously noted, emissions from the energy sector at the continental shelf have seen a big increase. By having a long term perspective on the investments made in renewable energy production for the off-shore energy supply to the continental shelf, there will be a big reduction in Norway's CO<sub>2</sub> emissions.

The government should continue to give support for upgrading existing water power plants. The upgrades can contribute to an increased energy production of 1-2TWh per year, without any added strain on the environment.

## **A maximum emission from new cars: 80 g CO<sub>2</sub>/km within 2012**

In 1996, the EU set the target that the average CO<sub>2</sub> emissions from new cars should be no more than 120 grams of CO<sub>2</sub>/km. Norwegian authorities should have as a target that this emissions requirement must be complied with in Norway within 2012, and that a requirement to not emit more than 80 grams of CO<sub>2</sub>/km must be complied with by 2020.

## **The outphasing of fossil energy for heating purposes within 2012**

There should be an objective for the ban of the use of fossil energy for heating purposes after 2012. Presently, annual emissions of approximately

3 million tons of CO<sub>2</sub> equivalents are released in the combustion of fossil energy for heating purposes. This represents about 6% of the total Norwegian greenhouse gas emissions. An outphasing of the use of oil and fossil fuels for heating purposes within 2012 by replacing it with renewable energy and energy efficiency measures, will thereby contribute to a considerable reduction of the Norwegian CO<sub>2</sub> emissions.

### **Increase the energy efficiency in the transport sector by 30% within 2015**

There are many macro-economic measures that can reduce emissions from the transport sector:

- Increase the energy efficiency by 30%, including conservation through energy saving driving techniques – eco-driving. Those obtaining a driver's licence should undergo training in eco-driving, like they do in Sweden.
- Increase the share of transport on foot or by bicycle by 40%
- Increase the market share of the municipal transport system by 50%
- Increase the market share of goods transported by sea by 10%

### **Bio-energy**

Bio-energy is a renewable energy source that does not contribute to climate change. Through history, bio-energy has been mankind's most important energy source. Today, polluting, non-renewable energy sources have taken over this role. With the dramatic increase in energy consumption and the resulting climate change, time has come for taking a renewed interest in bio-energy. With its scattered settlements and substantial forest industry, Norway has a great potential for such an undertaking.

Bio-energy is a collective term for energy originating from biological material or bio-mass. This encompasses everything from wood products, methane gas from landfills, household waste to more processed products such as bio-pellets and bio-diesel.

Throughout history, bio-energy has been the primary heating source and bio-energy represents 15% of the energy consumption in the world. In Norway, the use of bio-energy represents 5% of the energy consumption. We produce 15/16 TWh bio-energy annually. The increased forest growth indicates that we can produce significant more energy. In comparison, Sweden produces 110TWh. They have nearly doubled their bio-energy production since the mid 1990s.

Bio-energy can be put to use in many ways. It is possible to replace oil heaters and electrical heating in buildings by environment-friendly bio-energy. And it is possible to drive cars and trucks run on bio-ethanol or bio-diesel.

### **1% of GNP to climate measures**

In the autumn of 2006, the report on climate, made by the former Chief Economist and Senior Vice President of the World Bank, Sir Nicholas Stern, on the authority of the British government, was presented. The report states that the climate change will have disastrous consequences for the environment and mankind. Furthermore the effects on the world economy will be so dramatic

that they can be compared with the depression in the 1930ies or the recession that came as a consequence of the two world wars.

Stronger hurricanes and rising sea levels will force people to evacuate. Up to 200 million people can be displaced as a direct consequence of climate change in Bangladesh, Vietnam, the Caribbean islands and big harbour cities such as Tokyo, London, New York and Cairo. The melting of glaciers in Himalaya, in the Andes mountains and in China will, after a short period of floods, result in a severe water shortage affecting 1 out of 6 people in the world. Close to 40% of the world's species can become extinct.

The report estimates that if we continue at the present rate, the climate change will have an annual cost of 5 to 20% of the world's total GNP. The good news and the most important conclusion of the report is that it is far less expensive to do something about the problem than not to.

According to Stern, emissions reductions towards an acceptable level will have an annual cost equal to 1% of the world's total GNP. For every one of us, that implies that all we purchase will become 1% more expensive.

The Prime Minister of Great Britain, Tony Blair, put it this way: "For every pound we invest now, we will save 5 pounds in the future." Taking mere economic considerations into account, it would be idiotic to continue on the path of increasing emissions and devastating climate change.

So let us take Stern seriously. Let us allocate 1% of the GNP for climate measures. In the case of Norway, this represents NOK 20 billion per year. It will not only represent an expenditure, however, it will to a great extent be investments for providing us with new industry and new jobs. In other words: An investment that will generate new income.

Many Norwegian parties have as a target that 1% of our Gross National Income (GNI) should be allocated for development assistance. And we are nearly there. We need a similar objective for climate measures. Norway, the richest country in the world, can definitely afford this.

For the allocated funds we can establish a national CO<sub>2</sub> fund that is to ensure a 50% emissions reduction in Norway within 2020 and at least an 80% reduction within 2050. Within 2013, such a CO<sub>2</sub> fund should ensure investments of 1% of the GNP in climate projects in several sectors that reduce emissions and promote low emission technologies. This could be measures like CO<sub>2</sub> management, CO<sub>2</sub> free energy production, electrification of the continental shelf, deposits for the disposal of oil heaters, investments in environment-friendly fuels etc.

## WHAT CAN YOU DO?

The main responsibility for cutting emissions lies with the politicians. They can impose significant emission reductions on the polluting industry. They also hold the authority to facilitate change for making it easier for each and everyone of us to reduce our emissions output. It must become more expensive to pollute and less expensive to choose an environment-friendly alternative.

There are a series of specific measures that every single one of us can do in our everyday life.

### **Travel less by car**

50% of all travels less than one kilometre are made by car. The potential for reducing the number of short trips by car is significant. In this way you save both gasoline expenses and the environment.

### **The buddy system**

Two cars put out twice the emission as one. Agree on sharing a ride with someone else if possible and you cut the fuel consumption to half.

### **Buy an eco-car**

With a flexi-fuel car you can fill bio-ethanol when possible, and gasoline when you have no access to bio-ethanol. When driving a car run on ethanol you reduce the CO<sub>2</sub> emissions output of the car by 70-80%.

### **Avoid travelling by plane – take the bus or the train**

An airline flight pollutes more than a train journey. Therefore, avoid travelling by plane if possible. Travelling by night train saves you valuable working time. In addition, when travelling by plane, bear in mind that you must add the travel time to and from the airport, the time spent in the check-in queue and the time waiting for your luggage into account.

### **Install a low flow shower head**

Normally, this will cut the hot water consumed showering to half.

### **Install time delay switches**

Electrical equipment does not have to be switched on at all times. Time delay switches regulates the current input of the electrical article. For instance you can program the household heating units to be switched off between midnight and 6 am. Or you can make provisions for the water heater to be on standby during the night and then switched back on in time for your morning shower.

### **Turn down the indoor temperature**

For each degree you turn down the indoor temperature you save approximately 5% of your heating costs. The indoor temperature should be at 19-22°C.

### **Use energy-saving light bulbs**

By replacing 60 Watt light bulb with an 11 Watt energy-saving light bulb you can save more than 100kWh per year. If all Norwegian households replaced 5 ordinary light bulbs with energy saving light bulbs, we would have conserved more electricity than two Alta water power plants could provide.

### **Switch heating solutions**

If you have your house heated by oil, paraffin or electricity, you can conserve energy by switching to bio-energy or installing a heat pump. You also save money, and will have covered the investment cost within a few years.

# SWEDISH CLIMATE CHANGE POLICY

By Lars Friberg\*



Sweden as all industrialised countries is still far away from a sustainable low carbon society.

Illustration Photo:  
Lisebet Skarpaas

In November 2006 the Swedish climate change performance was ranked as currently the best in the world by an index developed by Germanwatch, an NGO, followed by the United Kingdom and Denmark. Norway was ranked as the 20th best<sup>1</sup>. That said, Sweden as all industrialised countries is still far away from a sustainable low carbon society. The following article will give a brief overview of the development and most significant features of the Swedish climate policy, ending with a look towards the future.

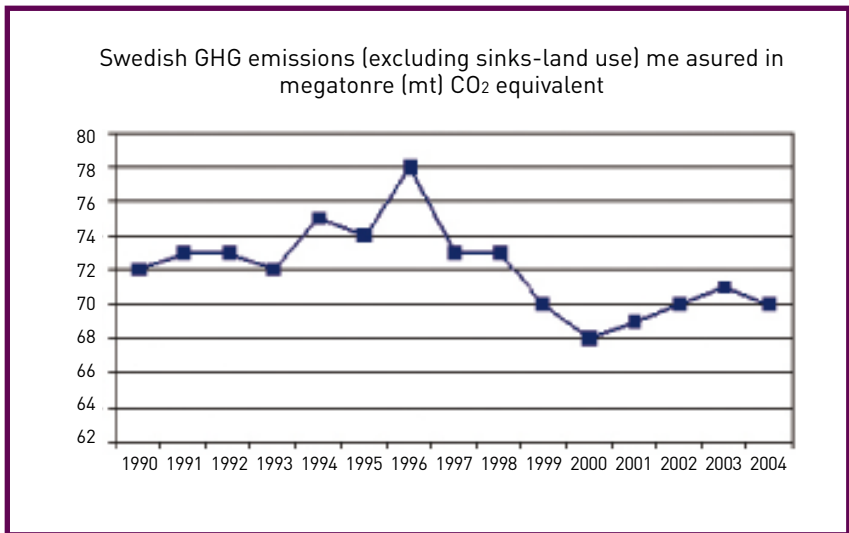
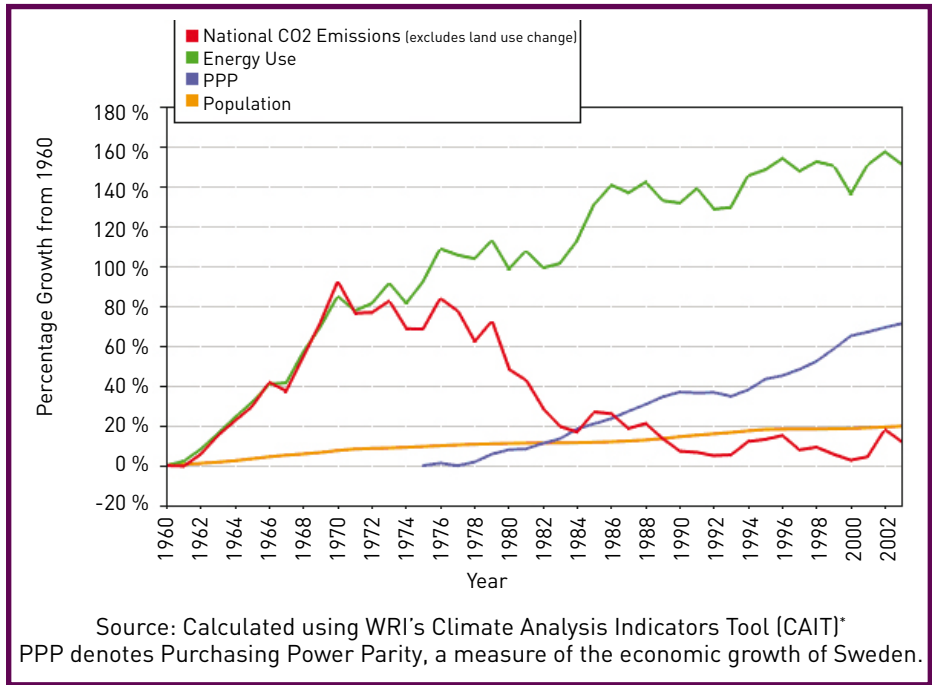
## SWEDISH GREENHOUSE GAS EMISSIONS

Energy consumption is high in Sweden but due to substantial emission reductions achieved since the early 1970s following the expansion of the hydro and nuclear power production as well as a shift away from space heating with fossil fuel Sweden's greenhouse gas emissions per capita compared to other OECD countries are low. Thanks to these early efforts, not driven by climate concerns but a wish to reduce oil dependency, Sweden's scope for reducing its greenhouse emissions differs from that in many other countries. Given the relatively low carbon content in the Swedish power generation it is more expensive to make further greenhouse gas reductions in Sweden than elsewhere.

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<sup>1</sup>Climate Change Performance Index, Germanwatch <http://www.germanwatch.org/ccpi.htm>

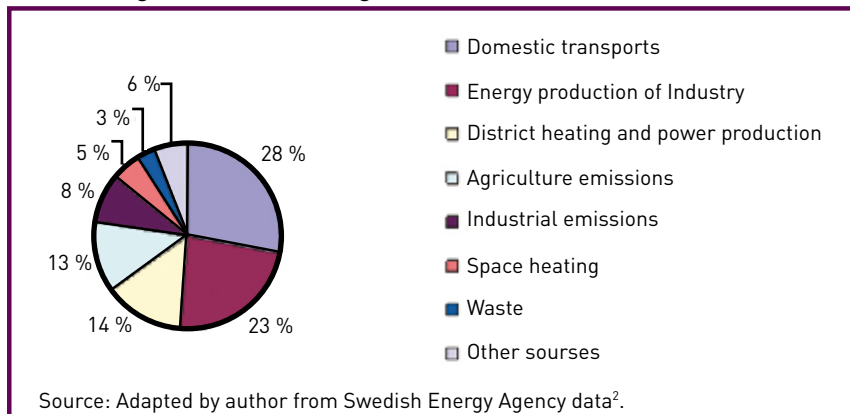
Chart 1: Sweden 1960-2002



\* World Resources Institute Climate Analysis Indicators Tool (CAIT) version 4.0. Available at <http://cait.wri.org>

Swedish emissions of greenhouse gases vary from year to year, principally due to annual differences in temperature and precipitation. If there is ample precipitation, hydropower may prove sufficient, but otherwise imports of electrical energy are required from energy sources that result in carbon dioxide emissions (the alternative is electricity production within Sweden based on fossil fuels). How fast the economy is growing also has a significant impact on annual emissions.

Chart 2: Swedish Greenhouse Gas Emissions 2004 (excluding land use change)



A factor not included in the two charts are the greenhouse gas emissions absorbed or emitted by changes in land use such as forest plantations or clear cuts. In 2006 Sweden decided to include Land Use, Land Use Change and Forestry (LULUCF) data in its national reporting mandated under the Kyoto Protocol. A decision that could potentially make it harder for Sweden to meet its Kyoto target as the carbon 'sink' of Swedish forests have decreased while drained peats have been found to be significant 'sources' of nitrous oxide and methane, potent greenhouse gases<sup>3</sup>.

Greenhouse gas emissions from the energy sector amounted to just over 32 million ton of carbon dioxide equivalents in 2004, which is equivalent to 46 per cent of Sweden's total emissions. In the last 15 years the use of coal has decreased whereas the use of biomass, including peat and waste, have more than tripled, in 2003 it accounted for 35.6 TWh. The positive trend is principally due to energy and carbon dioxide taxes but also to the municipal investment grant program for connection to the district heating network. As the expansion has principally taken place through increased use of biomass fuels, GHG emissions have not increased significantly.

<sup>2</sup> EEA Technical report No 6/2006, Annual European Community greenhouse gas inventory 1990–2004 and inventory report 2006.

<sup>3</sup> LAND USE STRATEGIES FOR REDUCING NET GREENHOUSE GAS EMISSIONS, A MISTRA supported research programme. LUSTRA Annual report 2006. <http://www-lustra.slu.se/>

Transport accounts for roughly 40 per cent of Sweden's emissions of carbon dioxide. Two thirds of those emissions derive from passenger transport. On average, Swedish citizens travel 44 km per individual per day by various modes of transport. Road traffic is the dominating mode for both transport of goods and persons. Road traffic accounts for the largest increase in CO<sub>2</sub> emissions since 1990, whereas emissions from civil aviation and railways have decreased. The car is the most common mode of transport in Sweden, regardless of purpose, and is used for almost 60 per cent of all journeys, Sweden has now over four million cars in use – the highest figure ever. A further explanation for emissions not decreasing is that the Swedish car fleet has become increasingly heavy with larger engines, which has counteracted the better fuel economy achieved<sup>4</sup>.

Swedish emissions of the basket of six greenhouse gases (GHGs) are projected to be one per cent below the 1990 base year levels in 2010. Land use changes and forestry are not included in this projection. Compared to Sweden's target of 4 per cent above 1990 levels under the EU burden sharing agreement, Sweden is comfortably on track to meet this target. This represents a total of approximately 3.6 MtCO<sub>2</sub>e more than its Kyoto commitment.

Sweden's investments in the flexible mechanisms of the Kyoto protocol, Joint Implementation and the Clean Development Mechanism are estimated to amount to 1Mt/year in emission credits. These reductions will be in addition to the 3.6 MtCO<sub>2</sub>e achieved through domestic policies. It is not clear what the Swedish government will do with these carbon credits, the civil servant in charge is arguing for selling them to the highest bidder among the European member states who is not on track to meet their Kyoto commitments.

## ORIGINS OF THE SWEDISH CLIMATE POLICY

The Riksdag, the Swedish Parliament for the first time discussed climate change in 1988. It subsequently decided that the government should ascertain the impact of energy consumption on carbon dioxide concentrations in the atmosphere and develop a programme for the emissions that nature is capable of withstanding. A subsidiary national objective was that "carbon dioxide emissions should not increase above their present level"<sup>5</sup>. It is worth noting that 1988 is the same year the Intergovernmental Panel on Climate Change (IPCC) was founded and that its first chair who stayed in that role for a decade was the distinguished Swedish meteorology professor Bert Bolin from Stockholm University<sup>6</sup>.

4 TRANSPORT AND COMMUNICATIONS, YEARBOOK 2005 SWEDISH INSTITUTE FOR TRANSPORT AND COMMUNICATIONS ANALYSIS, [www.sika-institute.se](http://www.sika-institute.se)

5 Gov. Bill 1992/93:179; and Gov. Bill 1996/97:84.

6 The Intergovernmental Panel on Climate Change (IPCC) was established in 1998 by two UN bodies, the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) to assess the "risk of human-induced climate change". <http://www.ipcc.ch/index.html>

Following the release of the first IPCC assessment report 1990 that serve as the scientific basis for the United Nations Framework Convention on Climate Change (UNFCCC) the Swedish Parliament amended the 1988 climate policy objective in 1991. The new objective was that emissions of all greenhouse gases should be limited in all sectors of society, not just carbon dioxide. The 1991 objective involved an action-oriented coherent strategy for reducing impact on climate, based on administrative and economic instruments. It was also stated that national efforts in this area should enable Sweden, together with other Western European countries, to assume a pro-active role in the international arena leading up to the UN Conference on Environment and Development in Rio 1992 where the UNFCCC was agreed upon.

## DEVELOPING AND IMPLEMENTING THE SWEDISH CLIMATE POLICY

The present Swedish climate strategy is largely based on the climate policy decision of 1993 and the energy policy guidelines drawn up in 1997<sup>7</sup>. The 1993 climate policy decision was adopted as a national strategy for complying with the UNFCCC. The goal was to stabilise emissions of carbon dioxide from the burning of fossil fuels in 2000 at their level in 1990 and then reduce them. A cost-effective Swedish climate policy was also advocated. In this way, economic instruments such as energy and carbon dioxide taxes have come to play an important part in national climate policy.

A new Environmental Code came into force on 1 January 1999, bringing together 15 existing central environmental laws. The aim of the Environmental Code is to promote sustainable development based on the understanding that nature is worthy of protection in its own right, and that man's right to exploit nature carries with it a responsibility. The Environmental Quality Objective for climate was defined as Reduced Climate Impact. This was translated into a long term and a short term target. For the period 2008–12, Swedish emissions of the six greenhouse gases listed in the Kyoto Protocol should be at least four per cent lower than in 1990. The long-term Swedish climate target is based on emissions in the longer term being evenly distributed among the world's population. In the long term, the goal of Swedish greenhouse gas emissions should therefore be reduced to a level below 4.5 tonnes carbon dioxide equivalents per capita per year. The national average for emissions in 2003 was around 7.9 tonnes per person. This can be compared to the average in the US that is 19.9 tonnes and 3.5 tonnes in China<sup>8</sup>. According to recent scientific research it is questionable though if the Swedish target of 4.5 tonnes that was based on a greenhouse gas concentration in the global atmosphere of 550 ppm CO<sub>2</sub> equivalent is compatible with EU's and Sweden's goal of limiting the global average temperature rise to

<sup>7</sup> Gov. Bill 1992/93:179; and Gov. Bill 1996/97:84.

<sup>8</sup> Source: CAIT <http://cait.wri.org>. Measured in tonnes carbon dioxide equivalents per capita per year, not including emissions from land use change.

no more than 2°C above pre-industrial levels<sup>9</sup>.

The Swedish short term target is more ambitious than what Sweden agreed to within the EU Kyoto burden sharing agreement level of plus 4 percent GHGs, compared to the base year 1990. While not officially acknowledged, it is likely that the planned decommissioning of the Swedish nuclear power plants was a factor taken into consideration when the EU burden sharing target of plus 4 per cent was agreed upon. Sweden is today one of few EU-15 countries on track to meet its obligation under the burden sharing agreement according to the European Environment Agency<sup>10</sup>.

In order to achieve these reductions a number of programmes, initiatives, new laws and changes of regulations have been implemented over the last 15 years. According to the third national communication to the UNFCCC Sweden's most significant climate policies are focusing on the areas of: taxation, regulation, fiscal incentives, information efforts and voluntary agreements.

## Taxation

Increased taxes on energy and carbon dioxide have for many years played an important role in Sweden, both as a fiscal tax source and as a policy instrument. The Swedish energy tax system was reformed in 1991. During the 1980s much focus had been on oil substitution and the tax system was therefore designed to discourage oil use. The reformed taxation system was based on a carbon tax and an energy tax on fuels, the latter not directly connected to the carbon content of the fuel. Simultaneously as the carbon tax was introduced general energy taxes was reduced by 50 per cent. The tax level was set to 365 Swedish Crowns (SEK)/kg of CO<sub>2</sub> released, much higher than the cost of carbon emission credits in the EU Emission trading system. Since then the system and the tax level has changed several times but a common feature is lower taxes for industry and electricity production than for consumers. The most obvious effect of the reformed taxation system has been the expansion of biomass use in the district heating system.

## Regulation

From January 2005, Swedish industrial installations included in the EU Emission Trading System's (EU ETS) trading scheme must have a special permit to emit carbon dioxide and nobody is allocated emission allowances without such a permit. The EU ETS regulations have been applied in Sweden through the Emissions Trading Act and the Emissions Trading Ordinance<sup>11</sup>. One of the important impacts of the law was that all the covered industries became fully

<sup>9</sup> Meinhausen, Malte (2006) What Does a 2°C Target Mean for Greenhouse Gas Concentrations? A Brief Analysis Based on Multi-Gas Emission Pathways and Several Climate Sensitivity Uncertainty Estimates In: Avoiding Dangerous Climate Change (ed. Schellnhuber, H J), pp 265-280. Cambridge University Press, New York.

<sup>10</sup> <http://www.eea.europa.eu/pressroom/newsreleases/ghgtrends2006-en>

<sup>11</sup> EU ETS Directive 2003/87/EC; Emissions Trading Act, 2004:1199, Lag om handel med utsläppsrätter; and the Emissions Trading Ordinance 2004:1205, Förordning om handel med utsläppsrätter.

exempt from the Swedish carbon dioxide tax. Given that the EU ETS is an environmental/energy legislation of unprecedented width and complexity covering more than 12.000 installations in all of EU representing about half of the EU CO<sub>2</sub> emissions, it is still too early to evaluate if the trading system will be successful in curbing industry's carbon dioxide emissions. Other significant regulatory measures are the Electricity Certificate System aimed at increasing the proportion of renewable electricity generation and energy efficiency regulations.

### **Fiscal incentives**

Fiscal incentives are one of the hallmarks of the Swedish climate policy, supporting wanted action and making it costlier to carry on unwanted behaviour. One of the most successful examples of this approach was the 1996 initiated Local Investment Programmes (LIP) that in 2003 was replaced by the Climate Investment Programmes (Klimpin). These programmes have so far awarded 1,127 million SEK leveraging total investments of more than 30 billion SEK by local authorities, administrative regions and companies. 258 investment programmes in more than half of Sweden's municipalities, more than 2,200 projects in total. Applications are granted for the sectors that have the largest impact on reducing greenhouse gases. Such as expansions of district heating systems, anaerobic digestion of waste to produce biogas, support for transition to biofuels, energy efficiency measures and local information about the climate issue.

### **Information efforts**

As in many other countries climate change information campaign to raise awareness and profile of climate change, has also been a part of the Swedish climate policy. Including supporting such efforts by civil society such as Klimatkampen; a competition among high schools<sup>12</sup>.

### **Voluntary agreements**

The most significant voluntary agreement in the climate area is the European car manufacturers' 1998 agreement with the EU Commission. In order to avoid legislations the European Automobile Manufacturers Association (ACEA) agreed with the European Commission an average emissions target of 140g of CO<sub>2</sub> per kilometre for new cars by 2008, a pledge that the car industry with all likelihood is failing to meet<sup>13</sup>.

### **Transport policies**

In September 2001 the Swedish government decided to put a transport investment bill before parliament infrastructure for a sustainable transport

<sup>12</sup> <http://www.klimatkampen.se/>

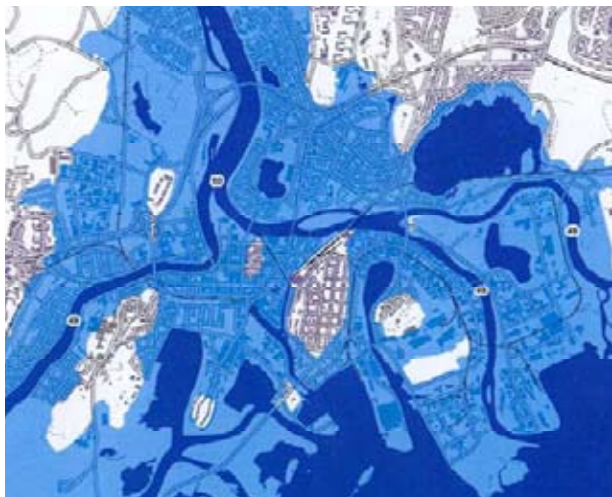
<sup>13</sup> Car makers 'failing' on climate, BBC News 20 April 2006, <http://news.bbc.co.uk/2/hi/science/nature/4922614.stm>

system<sup>14</sup>. This bill represents the largest investment in Swedish infrastructure in modern times. 364 billion SEK will be allocated for this purpose between 2004 and 2015 to develop and modernise transport systems and to take the necessary steps to maintain and safeguard the existing rail network and the 137,000 km of public highways. The package includes some important improvements on the rail capacity that expand the high-speed rail traffic.

Following the example of London, Stockholm is in the process of introducing congestion charging combined with extended public transport for the capital. The system was introduced on trial basis between 22 August 2005 and 31 July 2006, followed by a local referendum on its continuation. The referendum was somewhat inconclusive as the city voted for its continuation whereas the surrounding municipalities who staged their own referendums mainly where against the system. The trial was closely evaluated from a number of different perspectives and most of them came to the conclusion that the congestion charges had been successful and the system is set to be reintroduced.

### Adaptation policies

In Sweden adverse impacts of climate change was for a long time seen as mainly being a concern for developing countries, this all changed after Gudrun came to visit. During the weekend of 8-9 January 2005 a storm with close to unprecedented hurricane-force winds hit Sweden. The storm was named Gudrun. In one night some 75 million cubic metres of forest was blown down, destroyed or damaged, several times the national annual logging rate. Infrastructure sustained damage from fallen trees and directly from the hurricane-force winds. Electricity supplies were knocked out for up to 730,000 customers. Telephone lines were cut. People were isolated and several people were killed, both during the storm and during the forest clearing and power line reconstruction. Many experts regard Gudrun as the worst natural disaster ever to hit Sweden.



Flooding Scenario for Karlstad city centre  
Source: Adaptation and Vulnerability Inquiry Presentation

<sup>14</sup> Gov Bill 2001/ 02:20 Infrastruktur för ett långsiktigt hållbart transportsystem.

According to climate scenarios build on some of the scenarios used by the IPCC Sweden's annual mean temperature will increase by between 2.5 and 4.5°C. The length of the vegetation period is estimated to increase by between one and two months and in the far south by up to three months. Precipitation is expected to increase by between 5 and 25% over the next century, with the greatest increase occurring in northern Sweden during the winter. It is anticipated that the ecological impacts will be substantial. In June 2005 a climate and vulnerability inquiry committee was established to identify how Swedish society can prepare for future climate change. It will focus on infrastructure, estimating cost of potential damage and what can be done to adapt. The inquiry will give its recommendations in October 2007<sup>15</sup>.

### Sweden's International climate policy

In addition to the climate policies that Sweden are implementing as part of the EU, such as the system for emission trading, Sweden is also significantly engaged as a donor to a number of international activities and initiatives. The overall aim of Sweden's development assistance policy is to combat poverty. Mitigation and adapting to adverse impacts from climate change is therefore seen as an integral part of this overall aim. Swedish development assistance as it relates to climate change is intended to contribute to measures that prevent or minimise greenhouse gas emissions, reduce the vulnerability of poor countries and people to climate change and put them in a better position to adapt to a changed climate. Around a third of Sweden's climate-related development assistance is channelled via multilateral organisations, primarily the Global Environment Facility (GEF) where Sweden contributed a total of 764.67 million SEK for the period 2002-2006<sup>16</sup>. Sweden also contributed to the funds created by the Kyoto Protocol such as the 'Fund for least developed countries' (3 million SEK) and to the 'Special Climate Change Fund' (10 million SEK). Sweden also provides financial support to the World Bank's consultancy funds, regional development banks and the UN Environmental Programme<sup>17</sup>.

<sup>15</sup> Climate and vulnerability inquiry committee <http://www.sou.gov.se/klimatsarbarhet/index.htm>

<sup>16</sup> REPORT ON THE FUNDING STATUS OF THE GEF TRUST FUND AS OF SEPTEMBER 30, 2005, [www.gefweb.org](http://www.gefweb.org) It should be noted that the GEF does not focus only on climate change but also work on Biodiversity, International Waters, Land Degradation, The Ozone Layer and Persistent Organic Pollutants (POPs).

<sup>17</sup> The 4th Swedish National communication to the UNFCCC; <http://www.sweden.gov.se/content/1/c6/05/47/61/fbc570e8.pdf>

## FUTURE OF SWEDISH CLIMATE POLICY

In 2006 the Swedish Parliament adopted a new climate policy bill<sup>18</sup>. In this bill, the government stated the aim that Sweden's emissions in 2020 should be 25 per cent lower than 1990 emissions. In the national election in September 2006 Sweden for the first time in over a decade had a change of power, a four party Centre-Right coalition won, replacing the social democratic party that has shaped most of the Swedish climate policy. In an opinion piece published in Dagens Nyheter the 'new' Prime Minister Fredrik Reinfeldt (Conservative Party) and Environment Minister Andreas Carlgren (Centre Party) outlined that the main features of the climate policy would continue and they gave their support for a future ambitious EU climate policy. They also stated support for the proposal for an EU 30 per cent GHG reduction target for 2020 that UK, Germany and France have suggested, restating the Swedish ambition of a 25 per cent greenhouse gas reduction by 2020 compared to 1990<sup>19</sup>. Exactly how Sweden (and the EU) will reach these higher reduction targets is yet unclear.

A closely related initiative trying to answer some of these questions that received a lot of international attention was the creation of the Swedish 'oil commission' in December 2005. Made up by eight leading representatives from academia, government and industry chaired by the then Prime minister Göran Persson and using many external experts it tried to find ways how to decrease Sweden's oil dependency by 2020. Its recommendations were that through a combination of increased use of renewable energy, especially biofuels, and energy efficiency combined with a stronger role for the EU Emission Trading system Sweden could substantially reduce its use of oil and at the same time decrease its greenhouse gas emissions<sup>20</sup>.

Sweden will chair the EU presidency in the second half of 2009. Given that this presidency role will probably coincide with critical negotiations on the post-2012 negotiations in the UNFCCC, Sweden will have a very important role to play. One of the preparatory efforts that Sweden is already involved in has been the engagement and funding of a series of informal meetings of climate negotiators and environment ministers. The first such meeting took place on Greenland in 2005, followed in 2006 by a meeting in South Africa. A third one hosted by Sweden is scheduled for the summer of 2007 in Lapland.

In many ways 2006 was a tipping point for the climate change issue in Sweden. The issue received massive amounts of media coverage, helped by the fact that the last six months of 2006 were the warmest on meteorological record.

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18 Gov Bill 2005/06:172, National climate policy in global cooperation.

19 Fredrik Reinfeldt & Andreas Carlgren, Utsläppen av växthusgaser ska minska med 30 procent. Dagens Nyheter, December 18, 2006.

20 På väg mot ett OLJEFRITT Sverige, Kommisjonen mot oljeberoende, juni 2006, <http://77www.regeringen.se/content/1/c6/06/62/80/bf5c673c.pdf>

While Swedes in general might not mind a bit warmer summers, the lack of winter and 'unnaturally' high temperatures on Christmas Eve to many brought home the message that something is seriously wrong with our climate and that it is urgent to do something about it. Thanks to a combination of good conditions and successful policies Sweden has shown that it is possible to reduce ones greenhouse gas emissions while maintaining economic growth. The reductions achieved so far not demanded any significant changes of behaviour. It is clear that if Sweden is to achieve its part of the drastic reductions needed to keep global climate change in check, this will have to include some mayor changes to the way we live, travel, consume and produce. Is the Swedish consensus model able to deliver these necessary changes?

# THE ENVIRONMENTAL INVOLVEMENT OF THE CHURCH OF NORWAY

By Harald Gundersen and Hans-Jürgen Schorre

## The starting point

“And God said; «See, I have given you every plant producing seed, on the face of all the earth, and every tree which has fruit producing seed: they will be for your food. And to every beast of the earth and to every bird of the air and every living thing moving on the face of the earth I have given every green plant for food: and it was so. And God saw everything which he had made and it was very good. And there was evening and there was morning, the sixth day. “

Genesis 1, 29 - 31

Climate changes have led to deforestation and desertification in many places. In Machakos in Kenya (pictured) trees are being planted to bind the soil and hold the rain water.

Photo: Norwegian Church Aid/Jostein Havik Eriksen



The administrative responsibility - the responsibility of managing the Creation of God as a source of life – has always been a central part of Christian understanding. The view upon nature as a God-given gift from the Creator, to give joy and life to the humans, and something to be managed and not consumed – and thereafter to be passed on to new generations, is a point of view that has been characteristic for the Christian teachings. The involvement of the Church in environment issues has therefore a somewhat different anchorage than traditional environmental protection. As a central part of theology, it is the basis of both Christian teachings and ethics. It is also important to add that in regards to this point there has been a big discrepancy between the life of the Church and the teachings of the Church.

## HISTORY AND STATEMENTS

In many ways the awareness in society in regards to environment and distribution issues is reflected in the awareness of the Church. However, the Church has often addressed these kinds of issues at an early stage. In 1969, the Bishops' Conference passed a statement titled "Pollution of Nature and Everyday Life". Here, specific environmental problems were mentioned, that "appeals to the conscience of the individual. But at the same time, it is about a social problem of an alarming magnitude. It can be solved only through considerable efforts by society. If this challenge is to be met effectively, this will imply a slowing-down in the growth of our wealth. However, this is a sacrifice that we as a people – and as a civilisation – will have to make. Our belief in God as creator, gives human beings a holy obligation to take care of his creation. And the fundamental commandment "You shall not steal" prohibits us to exhaust the resources that rightfully belong to our children and grandchildren." (Minutes, Bishops' Conference 1969.)

20 years later, and in the light of the Brundtland Commission, the 1989 General Synod followed up with the declaration "Protection of Life". "As a society, we must act on the assumption that the experts' gloomiest prediction for the moment of the ecological breakdown may prove to be correct. If we choose less radical solutions, we run a life threatening risk."

In 1992 the report "The Consumer Society as an Ethical Challenge" was presented at the Bishops' Conference. The Bishops' Conference passed an extensive statement on the subject, and both the report and the statement attracted attention from the Church as well as from the political environment and from the industry.

Simultaneous to the declarations made by the Church of Norway, the ecumenical organisations were planning a more specific work within this area. As early as 1983, the World Council of Churches (WCC - Kirkenes Verdensråd, KV) adopted a specific focus on the work with "Justice, Peace and Integrity of Creation" (JPIC) at the General Assembly in Vancouver, which was four years prior to the Brundtland Commission's presentation of Our Common Future to the United Nations. Researcher Oluf Langelle at the International Research Institute of Stavanger AS (Rogalandsforskning), who holds a doctorate in "sustainable development", is of the opinion that the term sustainable development was used for the first time in this ecclesiastical work.

Already before the JPIC got started, the World Council of Churches had been through a period of consolidation with the programme Just, Participatory and Sustainable Society (JPSS). Between the sixth (1983) and the seventh (1991) General Assembly the WCC challenged its member churches to give statements and carry out common actions in order to oppose the threat to all life – human beings and nature, as part of the essence of what being a Church entails. After 1991, as a follow-up of the JPIC, the WCC has carried out 22 studies from all over the world in relation to the programme "Theology of Life" (TOL).



Climate changes have led to unpredictable weather in Kenya. Everybody in the local community in Utooni takes part in the voluntary construction of dams. The sand dams work as water reservoirs, providing safety for people and animals when there is no rain.

Photo: Norwegian Church Aid/Hege Opseth



Water is a condition for life. The people in Utooni get clean water from the sand dams they have constructed. This very old method for water conservation has been put to use.

Photo: Norwegian Church Aid/Hege Opseth

All these programmes have been carried out in such a way that sought to challenge the member churches to assume more responsibility in regards to justice, peace and Creation. Even though the distance between the WCC and the Norwegian congregations is big, the national councils of the Church of Norway have contributed to the anchoring and nourishing of this involvement in Norway.

## CONSUMPTION AND JUSTICE

The 1996 General Synod addressed the issue “Consumption and Justice” and formulated the resolution as a liturgical greeting in the form of a letter:

The General Synod greets all congregations and councils in the Church of Norway and everyone of good will!

The resolution was sent to all the congregations of the Church of Norway and the last point of its resolution the General Synod called upon all levels of the Church:

The General Synod encourages the staff and boards at all levels in the Church of Norway, national, diocesan and local, to implement the challenges as described in the letter. Concrete objectives should be formulated for all aspects of the work in the Church, related to the nine mentioned challenges, and there should be regular reporting to evaluate the progress.

The resolution of 1996 rings the bells three by three times for change, action and hope and lists up nine issues for specific action in the years to come: the use of church funds, a labelling system for fair trade, resource awareness, the use of time and money, the human dimension within the consumption culture, issues related to indigenous people, debt cancellation for the poorest countries, climate issues and green tax.

In many ways this resolution was the start of an extensive work at the central level, at the diocese level and in many congregations. It is sensational that this involvement has been unanimously confirmed and further developed by three General Synods, each synod composed of a new group of people. Thus, the Church of Norway presented a most welcome unanimity cross cutting all other potential division lines within the Church.

Five years later, in 2001, the General Synod after a comprehensive evaluation of the work so far renewed their discussion of the issue. In the 2001 General Synod resolution, the following statement was made: "The vision must be to make the Church the world's largest environmental movement" and that the thematic issue "Consumption and Justice" concerns the entire congregation. After this General Synod the first resource groups at the diocese level were established. It was noticed that the environmental involvement was very pronounced in the accomplished work.

The 2003 General Synod also had consumption and justice on the agenda; this time as item 12/03 Protecting the Sea, a project rooted in the work of the Church for the environment and for "consumption and justice". The background for this work and for a resolution concerning the management of one of our northernmost sea areas especially with a particular emphasis on the management of fisheries, the fish farming business and the oil exploration was a North Sea Sailing Seminar carried out in collaboration with the ecumenical patriarch of Constantinople in connection with the General Assembly of the Conference of European Churches in the summer of that year. The fact that the General Synod at that time adopted a resolution for the introduction of a celebration of the "Creation Day" as an integral part of the ecclesiastical year, may in the future become one of the most important contributions of the Church for a frequent reminder of our God-given administrative responsibility. Symbolically speaking, the issue was also important since it demonstrated that the work for the environment had become the most prominent issue within the area of "consumption and justice".

Prior to the General Synod in Bodø in 2004 a strategy gathering for all the resource groups at the diocese level was carried out at Kjerringøy outside Bodø. Many of the church leaders and representatives from the Christian Council of Norway were also present. This strategy gathering adopted a common platform for the work, and in addition a national resource group was to be established to coordinate the work centrally. This gathering has been followed up with annual inspiration gatherings in addition to functioning as a useful arena for the regional resource groups.

The single issue within the area of consumption and justice that has had the most work done during the years that this work has existed, is undoubtedly "green congregations" – efforts to motivate the local level of the Church, the congregations, in addition to developing tools for their environmental involvement. This issue has partly been present from the start as an important part of the involvement of key persons, and partly it has escalated as a result of project support from the department of the environment.

This support has made it possible to employ a national coordinator in a 50% job position, to develop and update the internet websites in addition to sending out regular newsletters.

This job position has also made it possible to make an even greater effort to provide environmental certification for different institutions and congregations within the Church. Separate criteria for congregations, common parish councils, and cemeteries have been developed in collaboration with The Foundation Eco-Lighthouse Program and Green Living. This certification system imposes stricter requirements to the activities than the “green congregation” does, imply a certification by an independent third party and in addition it has economic costs. As a starting point, it may be most realistic to recommend it to major establishments.

A new version for the guideline “Our green congregation” containing concrete choices of action in regards to service, diaconal work, education, information, purchase, energy, transports and waste management makes it possible for the congregation to start a similar process with less costs and less obligations. The Norwegian Church Aid makes use of such a guideline in connection with the Lenten Campaign 2007, with the challenge to the congregation; become a green congregation.

The emphasis on the environment issue has influenced the consumption and justice work in the Church of Norway over the past few years, in spite of a very broad platform which includes everything from economic injustice and debt relief to issues concerning indigenous peoples and integration of refugees and asylum seekers.

It is worth mentioning that this work has also picked up impulses from parts of our own Church. Within the work of the Sámi Church Council (Samisk Kirkeråd) the approach to the climate and environment issue has been somewhat different from the traditional anthropocentrically one. In the Sami understanding of Christianity, Nature and Creation has a special value in itself. While in the classical Christianity it has been stated that man through the administrative responsibility is totally superior to nature, the Sámi tradition has to a greater extent had a deep respect for nature’s intrinsic value. These impulses to the environmental involvement of the Church are not reserved for the Sámi alone, but something that indigenous peoples all over the world are becoming spokespeople for. This perspective constitutes an important corrective to the classical point of view, where man alone is superior to the Creation as such.

## **THE INVOLVEMENT OF THE BISHOPS**

The ones who for many years, to a great extent, have sustained this involvement personally as well as on behalf of the Church of Norway, are undoubtedly several of the bishops. Not only have they been symbol bearers for an important cause in the capacity of their roles, but they have also managed to put several issues on the agenda.

The first one to become involved was perhaps the bishop of the diocese of Møre, Odd Bondevik. Not only has he, on several occasions, expressed his critical viewpoints in regards to gas power plants, but he has also been an advocate for the protection of the environment in general, within the Church as well as for the rest of the society in general.

The Bishop of the diocese of Bjørgvin, Ole D. Hagesæther, has also thrown himself into the environmental movement. Pushed forward by a very active resource group, he has managed to put high velocity trains on the agenda. Calculations show that it is possible to establish a high velocity railway across Haukelifjell mountain that can transport passengers from Oslo to Bergen or Stavanger in three hours. A high velocity railway would not defer a noticeable amount of travellers away from the Bergen railway since only 20 % of the passengers travel between Oslo and Bergen. However, it would compete effectively with the flights Oslo – Bergen and Oslo – Stavanger and thus prove to be an environment-friendly and competitive alternative.

Moreover, the Bishop of the diocese of Nidaros, Finn Wagle, has for a long time been eager to introduce a liturgy which includes the whole Creation. His Norwegian “Hustavle”; the precept “The cry from a wounded planet” is a good example of a hymnic language speaking to the heart and not only to the mind: The Norwegian “Hustavle” has also gained much sympathy and appreciation in non-ecclesiastical environments. His approach deals with the need of the Church to include protection of the environment into the “ecclesiastical language” and in the ongoing service reform taking place in the Church of Norway. Several bishops could be mentioned. There is hardly one of them that hasn’t distinguished themselves through initiatives or other engagements that concern protecting Creation and warning against the dangers of a greedy consumption culture.

To sum it up, this has an inestimable value when it comes to lifting the Church up towards the vision of “making the Church what it in being is – the world’s biggest organisation for the protection of the environment (Martin Lønnebo – former bishop of the Church of Sweden).

## THE BREAK-THROUGH

It is no exaggeration to say that the environmental involvement of the Church of Norway has mainly been carried on by the “consumption and justice environment” with its resource groups and key persons at the central and regional level. Even though there are several examples from the congregations where the environmental involvement has blossomed, there has been limited success with making the protection of Creation an integral part of the congregations’ self-understanding in regards to what it means to be a Church. To an even lesser extent one has succeeded in manifesting the fight to save the environment in the different activities of the congregations – except for little things such as the recycling of paper etc.

An objection made by some people concerning the work of the Church within this area – and that might be an explanation for the lack of break-through in the congregations – has been that the involvement is too focused on the alternatives for change in the life style and the life patterns of the individual. There is nothing wrong in appealing to the people to go by bicycle instead of by car, or to save energy by changing to energy-saving light bulbs and pellet stoves, but when the individual alternatives for action are over-communicated compared to the collective responsibility (the authorities) for facilitating choices for environment-friendly alternatives, then the main responsibility is placed on the individual, and not on the collective solutions. This may be one of the reasons why the environmental involvement is considered to be something unique and alternative – within the Church as well as within the environmental movement in general. Others will point out other reasons: a too heavy work load combined with an insufficient amount of dedicated employees result in strict priority lists within the congregations. They are not able to follow through on all of their ambitions within this area even though they may be excellent ambitions.

Another essential component is that change takes time. We are talking about big changes in attitudes. With this perspective much has happened in a relatively short period of time. Not the least, in connection with all the extensive reforms taking place within the Church has this perspective been taken care of:

- In the reform of religious education where children and young people become acquainted with the values of the Church. Several local projects have environment, consumption and justice as central elements in their work, and the steering committee for reform especially asks for this focus in the advertising of funds for new projects.
- A new guideline for diaconal work in the Church of Norway is currently under development. The draft of the new guideline has a revised formulation for the definition of diaconia to include the protection of Creation as an essential part of the diaconal responsibility of the Church.
- In the autumn of 2006 the General Synod, for the first time, adopted a communication platform for the Church of Norway. Transparency, presence and hope, in addition to forsaking, shall become core values in all ecclesiastical communication. This is an expression for the wish that an awareness for the necessity of a sustainable management must be reflected in all ecclesiastical communication.
- Finally, the strategic plan of the Church of Norway for 2005-2008 has this perspective included in the main objectives as well as in the underlying objectives.

Perhaps in the long run this integration of the perspective in the central steering documents will be one of the most important components in regards to establishing durable, sustainable organisational and societal structures.

There is reason to point out that – in regards to this issue, we at present most probably are witnessing a shift within the congregations of the Church of Norway. A series of incidents this past year with extensive media coverage has made the grassroots of

the Church aware of the existing climate threat. The Church of Norway has been given the opportunity to facilitate for, and show their extensive environmental involvement. Through the United Nations World Environment Day in Tromsø with a televised service and a liturgy that will be dispersed to all churches in the country, as well as to the Lenten Campaign of the Norwegian Church Aid in most congregations in the country, with a focus on the environmental challenges in the south, the members of the Church will to a greater extent obtain a natural arena where they can engage themselves in the environment movement and the climate issues.

It is also very pleasing to see that things are starting to happen in the Free Churches of Norway. The Christian Council of Norway (Norges Kristne Råd – NKR) will, at its meeting in March of this year addresses the challenges from the work with “consumption and justice” and focus on the environment. Our hope is that more church communities will throw themselves into the fight for the protection of Creation.

On February 6th of this year, the Church of Norway Council of Ecumenical and International Relations (Mellomkirkelig Råd for Den norske kirke – MKR) gave a statement in connection with the IPCC report (see appendix). In this statement MKR points out that while every one of us must forsake some things in our life for the sake of Creation, the politicians must to a much greater extent take action on behalf of the collective society. The challenge for the prophetic voice of the Church in regards to the climate issue from now onwards will be whether or not the Church will be able to manage these two components simultaneously. Then the Church – standing tall - will be the voice bringing a different and important contribution into the debate.

## APPENDIX

On the occasion of the United Nations Panel Climate publishing its report, the Church of Norway Council of Ecumenical and International Relations (Mellomkirkelig Råd for Den norske kirke – MKR) convened in Oslo on February 6th, 2007, gave the following declaration:

### THE GOVERNMENT MUST ASSUME RESPONSIBILITY ON OUR BEHALF – ALL OF US MUST FORSAKE SOMETHING

Sons and daughters of the Earth, you know good and evil:

Life is in danger! Show that you care!

Bishop Finn Wagle, "Hustavle – the cry from a wounded planet"

#### 1. We must show our responsibility worthy as fellow human beings.

We are all caretakers of God's Creation. This concerns humanity's greatness and responsibility. We know that God's Creation is threatened by climate change as a result of our emissions. The Bible speaks of God's covenant with all of humanity and all living creatures - "that is with you, for perpetual generations" (Genesis 9). In the good Norwegian farm tradition the land will be passed on to the next generation in such a condition that they also will be able to make a living of it. It is difficult to relate to generations that are as yet unborn. But, we must show our responsibility worthy as fellow human beings.

The climate change will hit the poor first and hardest. Already now, the climate change is responsible for the loss of human lives. Several animal and plant species are at risk for becoming extinct. Protection of the environment must be given the same priority as conflict resolution, poverty and the spread of deadly weapons - issues that are commonly found on the political agenda. The Church of Norway would like to emphasize that the protection of the environment deals with how we practice justice, charity and our love to the world that God loves. As part of the worldwide Christian community we would like to emphasize that this responsibility is a global responsibility. This implies that we in Norway must not only ask how we best can fend for ourselves, but show that we take our global responsibility seriously. This is about our common future on our common earth.

#### 2. We must forsake for life's sake.

We must forsake if we are to be able to do something about the climate change, we must forsake if this earth shall become a good place to live for those who are living in areas that are already devastated. We must forsake if we and our future descendants shall have a good life on this earth. The climate change will either way have a heavy cost. To counteract the climate change will also have a heavy cost on individuals and on the community. But it will

have an even higher cost if we do not act now. When we forsake, we forsake for the sake of life. And much of what we can do, can improve our quality of life.

### **3. The government must assume responsibility on our behalf and demand our responsibility.**

The Church asks the government to implement necessary actions in order to save an endangered earth, even if it is costly. The Norwegian government must be able to make demands in regards to the economic life and the citizens, the way it is done when it comes to securing the defence of the country and its inhabitants. It is no less valid when it comes to the defence of the earth and the future generations. The situation requires a will to find broad solutions cross cutting political parties and country borders. The politicians within all professions, at the local and national level, must now take big and important measures on behalf of all of us. Interests that in the short term may stand to lose something must not have the final word in this connection. Responsible politicians must obtain the support of the Church and the people in order to support demanding and unpopular actions. Every week the Church prays for all who hold responsibility in society. There is no less need now when faced with these demanding challenges.

### **4. Norway must assume responsibility for their own emissions - we can not just pay our way out of the environmental problems.**

The government must as soon as possible decide on how we in Norway intend to reduce our emissions substantially. This must apply for the economic life, the public life as well as for the individual. Although it is important to contribute to the reduction of emissions in other countries, it is not enough. We can not pay our way out of our own responsibility for reductions, neither as a nation nor as individuals.

Norway has a special responsibility in facing the climate change, for several reasons. Norway is one of the countries with the highest CO<sub>2</sub> emission per inhabitant in the world. A big part of our material prosperity is based on the sale of fossil fuels. Norway has both the economy and the opportunity for making big adjustments themselves and for contributing to the technological breakthroughs that others can make use of as well. The government must show how Norway – through technology transmission, projects and actions - will take an international responsibility for the contribution to the reduction of emissions in other countries. For a major difference to occur, it is not enough to focus on the responsibility of the individual - although very important. We must set ambitious, concrete and time specific targets in order to counteract the climate change and the consequences thereof. That is why the targets we set for ourselves for 2020 are so essential. The objectives must be set so far in to the future to obtain a satisfactory long term perspective and at the same time be

so near in time that they require immediate action. International agreements like the Kyoto protocol must be followed up, but even it is just a start.

## **5. What the Church expects.**

Church of Norway expects the government and the political environment to join forces now on the task of showing how Norway will face and counteract the climate change, both in this country as well as in the rest of the world. Now is not the time for quibbles and internal disagreements. The Church expects a thorough and objective oriented work towards an ambitious statement on our contribution to the CO2 emission reduction in our country as well as on a global basis. The Church expects the economic sector to assume their responsibility and adjust their activities and investments accordingly based on our current knowledge of climate change. We expect that a great amount of effort and creativity will be put into developing new technological solutions and new products that can contribute to a reduction in the total CO2 emissions. The Church expects the Norwegian people to come together and make a united effort for our earth, our fellow human beings and for our descendants - to great joy for us all.

# CLIMATE CHANGES THREATEN THE FIGHT AGAINST POVERTY

By Norwegian Church Aid



Rich countries must bear the main responsibility for reducing and dealing with greenhouse gas emissions. As one of the world's richest countries, Norway has a particular responsibility.

Photo: Otto Nodeland

Human-induced climate changes are threatening development for millions of the world's poorest. Emissions from fossil fuels (oil, gas and coal) in rich, industrialised countries are leading to global warming that is destroying the basis of life for poor people in the developing world. The consequences of climate changes are currently dramatic. More extreme weather conditions and the increased frequency of droughts, floods and other disasters contribute to reduced food and water security, the increased spread of diseases, more climate refugees, and a struggle for ever more scant resources. The fight against poverty and the reduction and handling of climate change are irrevocably intertwined.

Those who currently emit the least greenhouse gases are those who are most affected by climate changes. Poor countries have less resources and a weaker ability to adapt and are therefore more vulnerable. Rich countries must bear the main responsibility for reducing and dealing with greenhouse gas emissions. As one of the world's richest countries with high and increasing emission levels and a substantial oil and gas sector, Norway has a particular responsibility.

The recommendations of the UN panel on climate change (IPCC) are clear: In order to avoid irreversible climate changes we need to reduce the world's total emissions of greenhouse gases by approximately 80 per cent in the course of a few decades. This requires global solutions and immediate action. The Kyoto Protocol is the international framework for limiting the emissions of greenhouse gases in wealthy countries, but the agreement has number of weaknesses, inter alia that the permitted emission levels are high. In addition it is unclear as to how much of the emission reductions that are to be taken nationally. Also, the world's largest source of greenhouse gases, the United States, has not even ratified the agreement. Another challenge is supplying energy to poor people in order to promote development without this leading to further climate change that in turn worsens their living conditions. Increased consumption in poor countries must therefore be combined with reduced consumption in rich countries. Additionally, the rich countries must take responsibility for investing in renewable energy sources and for ensuring that developing countries also benefit from climate-friendly technology.

### **NORWEGIAN CHURCH AID IS OF THE OPINION THAT:**

- Norway must immediately reduce its own emissions of greenhouse gases. At least half of Norway's emission obligations in the Kyoto Protocol must be implemented nationally. Norway must further actively work towards a more comprehensive and ambitious international climate convention where global climate instruments for international air and sea transport are included in the agreement framework.
- Norway must work to provide the poor with access to energy because this is a prerequisite for development. The government should also to an increasing degree facilitate the development of climate-friendly technology that developing countries may benefit from. Norway should further contribute to the establishment of a global fund with the purpose of alleviating the consequences of high oil prices in developing countries and assist developing countries to become less dependent on carbon-intensive energy. At the same time Norway must not promote policies that deny poor countries the opportunity to use the same technology that is available to industrialised countries.
- Climate changes must become a priority of Norwegian aid and development policies, and climate adjustment must become an integrated part of aid policies. Norway must intensify efforts to strengthen natural resource management in developing countries. Securing the rights of the poor and their access to natural resources is central because this is a prerequisite for reducing their vulnerability to climate change.



**Both droughts and floods are a problem for the access to clean water.**

Photo: Otto Nodeland

- Developing countries also have an independent responsibility for ensuring that economic growth does not preclude sustainable development. In the work with a new international climate agreement, developing countries with rapidly growing economies should therefore commit themselves to reducing the growth of their greenhouse gas emissions. Norway and other rich countries must assist developing countries with expertise and capacity building that supports the participation in, ratification of and implementation of international climate agreements. Increased support for capacity building in civilian societies is essential.
- Active and targeted work must be carried out to ensure that individuals as well as organisations and businesses are provided with a better foundation and incentives to change consumption patterns. Focusing on technology will be important, but the climate threat also requires a switch to more sustainable consumption patterns.

# REDUCE EMISSIONS IN SWEDEN WITH 40 PER CENT BY 2020 – AND FINANCE THE SAME AMOUNT OF REDUCTIONS IN DEVELOPING COUNTRIES

Views by Church of Sweden

*This position paper focuses on goals and targets in the Swedish national climate policy. Church of Sweden will present a position paper on climate and development in 2008, which will discuss support to climate change mitigation and adaptation in developing countries.*

## Introduction

The position of Church of Sweden on climate policy has its starting point in a long-standing commitment to the climate issue within the framework of the World Council of Churches (WCC). The WCC has a consultative status to the United Nations (UN) and has participated as an NGO-representative in the negotiations within the UN Framework Convention on Climate Change (UNFCCC) since the Convention was signed in Rio de Janeiro in 1992. Church of Sweden has on several occasions participated in the WCC delegation at these meetings. The position is also based on the Guidelines for the international department's work on climate issues and on statements delivered by Church of Sweden to the Swedish government.<sup>1</sup>

As will be seen from these documents Church of Sweden believes that Sweden should act from a perspective of global justice in decisions and negotiations concerning climate change. Further, Church of Sweden stresses the urgency for Sweden to pursue a forceful climate policy nationally, as well as internationally, and that early action in the climate issues are of decisive importance.

Church of Sweden sees climate change as an issue of fundamental global importance for the future, from an environmental perspective as well as from a justice and development perspective. Climate change is an obvious example of how all people belong together. It embraces important issues of

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<sup>1</sup> Comments to reports related to the checkpoint for climate policy, Dnr Ks 2004:0684; Comments to the report "Sweden's environmental objectives – a shared responsibility" by the Environmental Objectives Council; Comments to Checkpoint 2008. The development of the Swedish strategy on climate change (all documents in Swedish).

equity between rich and poor countries, between those who are affected by the large emissions and those who cause them.

### **The development of the climate issue**

The reports that the Intergovernmental Panel on Climate Change (IPCC) of the UN published in the spring of 2007 showed that researchers now can predict with greater certainty that climate change is ongoing, that it happens faster than was earlier believed and that its effects may be much more dramatic than earlier expected. The recommendations made by IPCC on the pace by which greenhouse gases must be reduced have also been sharpened. In order to have a fair chance to reach the goal of maximum two degrees increase of the average temperature, IPCC considers that the global emissions have to reach their maximum in 2015 and thereafter be reduced with 50-85 percent by 2050.

The Swedish government's Scientific Council on Climate Issues presented its report in September 2007. The Council had the possibility to consider more recent research than IPCC and argued that the concentration of greenhouse gases in the atmosphere has to be stabilised at 400 ppm CO<sub>2</sub> equivalents in order for the world to have a fair chance to reach the two degrees goal. This suggestion can be compared with Sweden's long-term environmental goal for the climate, which in 2002 was settled at 550 ppm, as well as with the fact that IPCC in the spring of 2007 claimed the necessity of a stabilisation at 400-450 ppm.

The great attention to climate change in the media during the last year has, in combination with extreme weather conditions, contributed to an increased public awareness of the climate issue. Today there is a greater preparedness of politicians and the public, as well as in the business community, to meet the challenges that climate change present. Church of Sweden has in this context a special responsibility to draw attention to the global effects of climate change, but also to inspire and motivate people to change their life style.

### **A new global agreement after the Kyoto Protocol**

The Kyoto Protocol under United Nations Framework Convention on Climate Change (UNFCCC) was adopted in 1997 and entered into force in 2005. The treaty expires in 2012, and for a new treaty to come into effect before that, it is considered necessary that a new agreement is reached during 2009. Discussions in preparation for this take place annually at Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (COP/MOP) but also in a number of other contexts, such as the G8 and the UN Security Council.

EU hopes that a new agreement will be reached at COP15 that will be held in Copenhagen in the end of 2009. As the meeting takes place during Sweden's EU Presidency, Sweden may play a historical key-role in these negotiations.

## The climate policy of Sweden

The Swedish government intends to present a government bill on climate policy in 2008. The goals and strategies established there will serve as the basis for Sweden's actions within the climate negotiations in the EU and the UN. "Checkpoint 2008" – a follow-up of the Swedish climate strategy prepared by a number of government authorities – will serve as the basis for the government bill, together with the results of three special government initiatives: The Commission for Sustainable Development, the Scientific Council on Climate Issues, and the Parliamentary Drafting Committee on Climate.

### Climate policy goals and targets

The present climate strategy of Sweden was decided upon by the Parliament in 2002. The goals were then established that the concentration of greenhouse gases will not exceed 550 ppm in 2050, that the Swedish per capita emissions will not exceed 4,5 tons by 2050, and that the Swedish emissions will be four percent lower in 2008-2012 than in 1990.

In 2005 the Swedish emissions were seven percent lower than in 1990. This reduction had taken place at the same time as GDP increased with 36 percent since 1990.

In its climate policy bill of 2006 the government estimated that the Swedish emissions ought to be reduced with 25 percent by 2020.

In their basic data for "Checkpoint 2008" the Swedish Energy Agency and the Swedish Environmental Protection Agency presuppose that Sweden's emissions will be reduced with 25-30 percent by 2020.

In the spring of 2007 the EU heads of states agreed to reduce EU's emissions with 30 percent within 2020 on the condition that other industrial countries make comparable commitments.

In August of 2007 the German government announced its intentions to reduce Germany's emissions with 40 percent until 2020.

During the climate talks within the UN framework in August 2007 it was recognised that avoiding the most catastrophic forecasts made by the IPCC would entail emission reductions in the range of 25-40 percent below 1990 levels by industrial countries.

*1990 is used as base year for the calculations of emission reductions.*

## VIEWS BY CHURCH OF SWEDEN

### Longer-term goals

Church of Sweden insists that the goal to limit the average increase in temperature to two degrees should remain. However, it should be stressed that even such an increase in temperature might have very serious consequences.

A longer-term climate goal is needed that comprises both Sweden's national emissions and the average per capita emissions. The national goal will be a target that describes the comprehensive mitigation that has to take place, while the per capita goal will be a pedagogic means to illustrate these changes on an individual level and to illustrate global justice.

The goal should be that Swedish emissions are reduced with 90 percent by 2050. This estimate is based on a) IPCC's calculations that the global CO<sub>2</sub> emissions have to be reduced with 50-85 percent compared to today's level (2000) by 2050, b) the forecast that the global population in 2050 is estimated to amount to 10 billion people and c) the assumption that the average per capita emissions, from a perspective of global justice, in the long run should be on the same level, irrespective of nationality. The remaining 10 percent should be covered by purchase of emission reduction units from projects in developing countries, similar to the direction of the Norwegian government.<sup>2</sup>

The Swedish per capita goal in 2050 should be one ton carbon dioxide equivalents, even if a reduction of 90 percent leads to a somewhat lower reduction of the emission of greenhouse gases. From a pedagogic point of view one ton per person is an important goal.

### Emission targets for 2020 – mitigation *both in Sweden and abroad*

The arguments for a reduction of emissions in Sweden are often that the rich countries, which so far have been causing most of the climate change, have to take the responsibility for their own emissions and at the same time show that it is possible to combine economic growth with reduced emissions. Other arguments are that Sweden, as well as other industrial countries, sooner or later will have to reduce their emissions radically. To postpone the transformation of society will in the long run be more expensive than to start immediately. The arguments for reducing emissions abroad are often that it is more cost efficient in the short run to implement measures in developing countries, and that is necessary to transfer technology in order to avoid large emission increases in the future.

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<sup>2</sup> Norway has indicated that it will take responsibility for a reduction of the world's emissions at a level corresponding to 100 percent of all Norwegian emissions.

This means that the starting point for the Swedish climate strategy should be that Sweden both takes the lead and reduces emission considerably within our own country and at the same time contributes to emission reductions abroad, especially in developing countries. This strategy should be highlighted through the formulation of separate emission targets that complement each other: on the one hand emission targets for reductions in Sweden, on the other hand targets for reductions that are reached through the flexible mechanisms as defined in the Kyoto Protocol.

### **Emission target for Sweden: minus 40 percent by 2020**

Sweden should raise its level of ambition in its climate policy and establish a target that emissions should be reduced with 40 percent by 2020, including the allowances to the so-called trading sector.<sup>3</sup> There are several reasons for this:

-> According to IPCC a higher speed is needed in the global actions on climate if we are to reach the long-term goal for 2050 by reducing emissions at a steady rate rather than pushing the problems ahead of us to the next generation. A reduction by 40 percent until 2020 gives a steady rate of about three percent emission reductions per year until 2050.<sup>4</sup>

-> Sweden's experiences from the climate policy that has been implemented so far show that it has been easier to reach established targets than expected. The present target of four percent lower emissions in 2010 than in 1990 was reached several years in advance, although the target had been sharpened during the implementation period. Therefore we should not be afraid of aiming high. It can also be noted that during last year's vivid public debate on climate change a number of business executives, in Sweden as well as internationally, said that the business community is ready to develop new energy technology and "climate friendly" products rapidly. However, without distinct directions from politicians in the form of targets and policy instruments the necessary investments may not be made.

-> A target of 40 percent is a clear but realistic increase of Sweden's earlier level of ambition. It can, for example, be noted that if the total number of cars

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<sup>3</sup> Big installations in industrial and energy production within the so-called trading sector are included in EU's system for emission trading. This means that the emission reductions to which these companies commit themselves can be accomplished either at their own plants or, if that is cheaper, by purchase of emission allowances. The emission reductions are then accomplished by other companies within the system, that is, somewhere within the EU.

The Scientific Council has proposed emission reductions in Sweden by 20-25 percent, which is a lower level than Sweden and the EU have expressed so far. A lowered level of ambition according to the proposal of the Council, however, implies that the rate of emission reductions will be very low within 2020, slightly more than one percent per year, and then dramatically rise to more than five percent per year between 2020 and 2050. This means that the costs are postponed to future generations.

in Sweden would reduce the emissions to an average of 120 g per kilometre, which is EU's goal for new cars, the carbon dioxide emissions would be reduced with about 5.5 million tons.<sup>5</sup>

-> The reduction of emissions will in practice be considerably lower than 40 percent. One of the reasons is that 1990 is used as base year, and already today the emissions are lower than at that time. Another reason is that the considerable increase of emissions from the use of bunker oil in Sweden for international shipping and air transport is not included, in accordance with the reporting rules in the Kyoto Protocol. Besides, the emission reductions only include the emissions in the country and not the emissions that are caused by import. If these emissions, after deduction for emissions from Sweden's export, would be included the emissions caused by Sweden might be double as much as stated.<sup>6</sup>

-> Sweden has a historically important role to play during its EU presidency in 2009 when the next major climate negotiations will be finalized. It is of utmost importance that Sweden can push for ambitious global emission targets in the international negotiations from a position where our national policy is ambitious, credible and equitable, and where Sweden can show that it is possible to combine reduced emissions with high welfare and economic growth.

### **Emission reductions in developing countries: corresponding to 40 percent**

Investments in emission reducing measures in developing countries through so-called flexible mechanisms – CDM-projects or, in transitional economies, through JI-projects<sup>7</sup> – lead to transfer of new technology to developing countries at the same time as the global emissions of greenhouse gases can be reduced in a more cost efficient way.

It is necessary to guarantee that these projects really result in sustainable development and transfer of technology. The flexible mechanisms should concentrate on projects that involve investments in renewable energy and increased energy efficiency, and they should lead to local environmental benefits and be a channel for transfer of technology in the climate field. It is important that Sweden in its engagement in CDM-projects makes high demands on the aim of the projects and their contribution to a sustainable development.

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<sup>5</sup> At present, Sweden's emissions are 67 million ton per year.

<sup>6</sup> Koldioxidutsläpp till följd av Sveriges import och konsumtion (Carbon dioxide emissions as a consequence of Sweden's import and consumption), Annika Carlsson Kanyama, KTH, May, 2007, [http://www.ima.kth.se/eng/respublic/CO2\\_utslaapp\\_import\\_konsumtion.pdf](http://www.ima.kth.se/eng/respublic/CO2_utslaapp_import_konsumtion.pdf)

<sup>7</sup> Clean Development Mechanism and Joint Implementation are the flexible mechanisms that are included in the Kyoto Protocol and that can be used by the OECD countries in order to fulfil some of their commitments

The support to CDM-projects should be raised considerably, so that Sweden achieves as big emission reductions in the developing countries as we do domestically. The support should amount to 20.3 million ton reduction units, corresponding to 40 percent of the Swedish emissions in 1990<sup>8</sup>. It should not be financed within the budget for development cooperation.

## **Conclusion**

The Church of Sweden considers it to be of great importance to co-operate within Sweden as well as between the countries and peoples in the world concerning the great challenge that the global warming constitutes. Through early and powerful measures Sweden can take a global responsibility to secure a sustainable future for present and future generations

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8 The total cost for this, starting from the price levels calculated with by the Swedish Environmental Protection Agency and the Swedish Energy Agency in the basic data for Checkpoint 2008, would amount to 3 billion SEK per year, corresponding to ca 0.1 percent of Swedish GDP.

Global warming and a dramatic reduction in the earth's biological richness and diversity have created an ecological imbalance, threatening the livelihoods of local communities. More extreme weather conditions and the increased frequency of droughts, floods and other disasters contribute to reduced food and water security, the increased spread of diseases, more climate refugees, and a struggle for ever more scant resources. Conflicts of interest over control of natural resources are aggravating relations between various parties and increasing the risk of armed conflict. Peaceful coexistence is threatened by a shortage of water and food. Climate change speaks directly to poverty. Few other single issues present such a danger to the future welfare of the world's poor.

Those who currently emit the least greenhouse gases are those who are most affected by climate changes. Poor countries have less resources and a weaker ability to adapt and are therefore more vulnerable. Norwegian Church Aid and Church of Sweden are now intensifying our advocacy work on the issue of climate change. We advocate that rich countries must bear the main responsibility for reducing greenhouse gas emissions and facilitate the development and transfer of climate-friendly technology that will benefit developing countries. It is no longer possible to ignore climate change adaptation as an element in development work. Increased support for developing countries that will enable them to adjust to climate change is urgently needed. We also add our voices to those that demand that governments across the globe, and in particular our own governments, demonstrate bold leadership in working for a responsible and ambitious post-Kyoto agreement.

We believe that human beings have a duty to manage our natural resources and the global environment in a sustainable manner so we do not jeopardize the lives of future generations. God has given the earth, nature and the environment to the whole of mankind. No one generation or group has the right to exploit these resources for their own greed or at the cost of future generations.


Norwegian Church Aid and Church of Sweden hope this publication will provide perspectives and insight for the readers and add another perspective to the debate on climate change and stimulate much needed action.



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