

World Council of Churches and Climate Change

This column continues the topical theme of climate change by exploring the latest groundbreaking reports by the United Nations primary advisory body on climate change: the Intergovernmental Panel on Climate Change. Although it paints a grim picture of further inaction, and says that some climate change is inevitable, the reports provide strong evidence that significant emission reductions are achievable and affordable. What follows is a modified extract from the World Council of Churches recent article on this issue.

New Scientific Evidence on Causes, Impacts and Mitigation of Climate Change

The Intergovernmental Panel on Climate Change (IPCC) has recently released three significant new studies as part of its Fourth Assessment Report (AR4). The IPCC, consisting of thousands of scientists from around the world, analyses the most-recent peer-reviewed research on climate change and prepares reports that summarise the consensus of the vast majority of scientists working in the field. All of the IPCC material can be accessed through: <http://www.ipcc.ch/>

The Four Assessment Report which has taken about four year to complete is made up of three discrete studies: the scientific basis (Working Group I); impacts, adaptation and vulnerabilities (Working Group II); and mitigation of climate change (Working Group III).

The Scientific Basis

The report of IPCC Working Group I released 2 February 2007, looked primarily at climate change science and concluded: "*Global atmospheric concentrations of [greenhouse gases] have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values determined from ice cores spanning many thousands of years. The global increases in [greenhouse gases] are due primarily to fossil fuel use, land use change...and agriculture.*"

The report says that the "warming of the climate sytem is unequivocal" and that it is "very likely" that emissions from fossil fuel use and other human activities are the main causes of climate change. In IPCC terminology, "very likely" indicates more than 90 percent probability, and is the strongest link to human activities made by the panel since it was set up in 1988.

The report finds that before the end of this century global temperature is likely to increase by of 1.1 to 6.4°C. As a result the report concludes that sea levels will rise, and the world will experience extreme weather events such as more frequent and severe droughts, floods, tropical cyclones and heatwaves.

Impacts, Adaptation and Vulnerabilities

The IPCC Working Group II report analysed research on impacts, adaptation and vulnerabilities and was released on 6 April 2007.

The IPCC Working Group II report raises serious concern about the impact of climate change on poor vulnerable peoples, communities and eco-systems: "*Poor*

communities can be especially vulnerable. They tend to have more limited adaptive capacities, and are more dependent on climate-sensitive resources such as local water and food supplies. Where extreme weather events become more intense and/or more frequent, the economic and social costs of those events will increase, and these increases will be substantial in the areas most directly affected.

Projected climate change-related exposures are likely to affect the health status of millions of people through:

- *increases in malnutrition and consequent disorders, with implications for child growth and development; and*
- *increased deaths, disease and injury due to heat waves, floods, storms, fires and droughts.*

In Africa alone, by 2020, between 75 and 250 million people are projected to be exposed to an increase of water stress due to climate change. Water security problems are also projected to intensify by 2030 in southern and eastern Australia.

Agricultural production, including access to food, in many African countries and regions is projected to be severely compromised by climate variability and change. The area suitable for agriculture, the length of growing seasons and yield potential, particularly along the margins of semi-arid and arid areas, are expected to decrease. Local food supplies are projected to be negatively affected by decreasing fisheries resources in large lakes due to rising water temperatures, which may be exacerbated by continued over-fishing.

Small islands, whether located in the tropics or higher latitudes, have characteristics which make them especially vulnerable to the effects of climate change, sea level rise and extreme events. Deterioration in coastal conditions, for example through erosion of beaches and coral bleaching, is expected to affect local resources, e.g., fisheries, and reduce the value of these destinations for tourism.

Sea-level rise is expected to exacerbate inundation, storm surge, erosion and other coastal hazards, thus threatening vital infrastructure, settlements and facilities that support the livelihood of island communities. Climate change is projected by the mid-century to reduce water resources in many small islands, e.g., in the Caribbean and Pacific, to the point where they become insufficient to meet demand during low rainfall periods."

The report goes on to say that many million more people are projected to be flooded every year due to sea-level rise by the 2080s. The numbers affected will be largest in the megadeltas of Asia and Africa while small islands are especially vulnerable.

Mitigation of Climate Change

The IPCC Working Group III report, released on 4 May 2007, focused the means of mitigating or reducing greenhouse gas emissions. The report provides strong evidence that significant emission reductions are achievable and affordable, with many ancillary benefits. The report finds that together with lifestyle and behaviour changes, known technologies and policies can reduce greenhouse gas emissions at reasonable costs. It also found that effective policies, including an effective carbon-price signal would be required: "*There is substantial economic potential for the mitigation of global*

greenhouse gas emissions over the coming decades that could offset the projected growth of global emissions or reduce emissions below current levels.

While studies use different methodologies, in all analyzed world regions near-term health co-benefits from reduced air pollution as a result of actions to reduce greenhouse gas emissions can be substantial and may offset a substantial fraction of mitigation costs."

In order to stabilise the long term temperature increase between 1.5 and 2.3°C the report concludes that global greenhouse emissions need to peak before 2015, so early action is essential. The good news is that the reduction of average annual GDP growth rate is less than 0.12 percentage points in 2050.