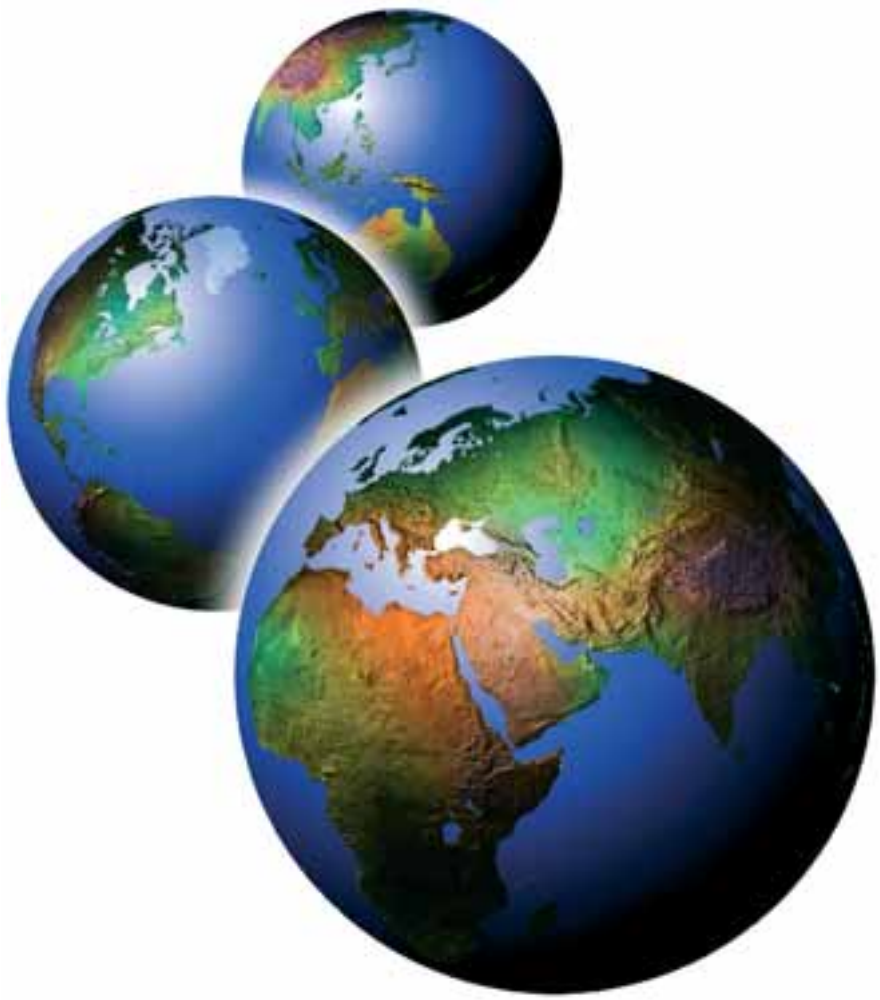
GEO YEAR BOOK 2007

An Overview of Our Changing Environment

UNEP United Nations Environment Programme

GEO YEAR BOOK

An Overview of
Our Changing Environment 2007



UNEP

ISBN: 978-92-807-2768-9

UNEP/GC/24/INF/2

DEW/0907/NA

Disclaimers

The content and views expressed in this publication do not necessarily reflect the views or policies of the contributory experts, organizations or the United Nations Environment Programme (UNEP) and neither do they imply any endorsement.

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of UNEP concerning the legal status of any country, territory, or city or its authorities, or concerning the delimitation of its frontiers and boundaries.

Mention of a commercial company or product in this publication does not imply the endorsement of UNEP.

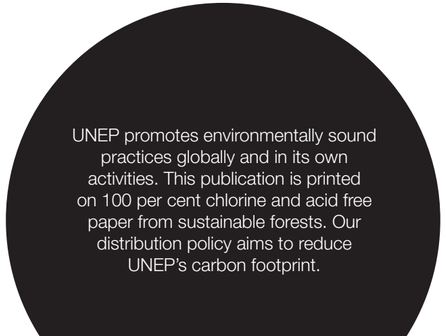
Reproduction

Produced by
Division of Early Warning and Assessment (DEWA)
United Nations Environment Programme
P.O. Box 30552
Nairobi 00100, Kenya

Tel: (+254) 20 7621234
Fax: (+254) 20 7623927
E-mail: uneppub@unep.org
Web: www.unep.org
GEO Year Book web site: http://www.unep.org/geo/yearbook

Editor: Paul Harrison
Graphics, layout, and printing: Phoenix Design Aid, Denmark
Coordination of production: United Nations Office for Project Services (UNOPS)
Distribution: SMI (Distribution Services) Ltd. UK

This publication is available from Earthprint.com http://www.earthprint.com



Contents

Preface

The 2007 Global Environment Outlook Year Book is focused on the interface between two powerful trends: concerns for environmental integrity and accelerating globalization. In the first years of the 21st century we became all too aware of how global events can affect local attitudes and actions. In 2006 we witnessed how local actions affect global outcomes: for instance, how local consumer demand can lead to certification schemes for sustainable production of goods and services on another continent or how local integration in development of biodiversity corridors can create a destination for the global tourism market.

Globalization is inescapable and its many advances seem self-perpetuating but its consequences should and must be shaped in ways that maximize benefits for people and for the planet. It presents both risks and opportunities. If globalization is managed to optimize the opportunities—to enhance the forces that bring food to the undernourished and clean water to millions and to avoid tendencies towards social or economic exclusion and homogenization of culture—it will become a major force for world-wide sustainable development.

This is why the topic of environment and globalization has been chosen as the key theme for the 24th Session of the Governing Council / Global Ministerial Environment Forum (GC-24/GMEF). The health and wealth of every economy and every region are dependent on the successful reconciliation of these two trends.

Many components of their interface are presented in the GEO Year Book's global and regional **Overview** chapter which details progress and problems at the global scale and within each region. It reports significant developments over the past year and describes recent policy decisions and innovative schemes aimed at resolving potential clashes of economic growth with environmental concerns, including initiatives to reconcile issues of conflict and the environment.

The importance of environment and globalization in the modern world is also why the Year Book's **Feature Focus** is dedicated to the issue. Action towards a more intelligent, socially responsible, and environmentally sensitive form of globalization is long overdue. In some ways, the need for such action has become even more critical as the production and consumption patterns of the developed world are being matched by those of rapidly developing economies such as Brazil, China, and India.

Innovative technologies and techniques are being developed to facilitate the integration of environment and justice concerns into the management of globalization. Paying for ecosystem services, financing environmentally sound technologies, harnessing consumer demand for certification of sustainable produced goods and services, and distributing access to environmental monitoring information for responsible decision-making—these are all mechanisms presented here with the goal of disseminating good ideas and building synergies that will produce more innovations.

The chapter on **Emerging Challenges** looks at one area of those opportunities: nanotechnology—materials and technologies at a scale of one billionth of a meter. Nanotechnology promises to transform sectors as diverse as medicine, manufacturing, energy, water supply, and transportation. Public and private sectors, particularly in developed countries and economies in transition, are investing heavily in research and applications.

By 2014, nanotechnology is projected to have 14 per cent or US$2.6 trillion of the global manufacturing market. But what are the potential impacts of nanotechnology on the environment and human health? Do current regulatory frameworks deal adequately with the special challenges posed by these 'smart' particles? Policy-makers need to develop and extend science-based risk frameworks and to look at how best to address transboundary issues on the development and deployment of nanomaterials and products.

The **Indicators** chapter depicts up-to-date data on key environmental trends and growing stresses on ecosystems. The latest trends from data tracking $C0_2$ emissions and forest harvest rates continue to head in the wrong direction. In comparison there are positive trends in areas like the consumption of ozone depleting substances and renewable energy.

The Year Book also highlights how the Multilateral Environmental Agreements are evolving. For example, member governments of the Basel Convention on the Control of Transboundary Movements of Hazardous

Wastes agreed in 2006 to accelerate efforts to reduce the risks and maximize the benefits from the dramatic worldwide growth in electronic wastes—a globalization issue if ever there was one.

The UN Convention on Climate Change estimates that the its Clean Development Mechanism alone could generate some US$100 billion of funds for developing countries. The Kyoto Protocol is also helping to drive investment and trade in new and renewable technologies like wind, solar power, and biomass fuels.

The GEO Year Book series has many aims—not least to bring together science and policy-making. More than 80 experts worldwide were involved this Year Book's preparation. UNEP and the Year Book team also benefited from your comments and suggestions. I hope you find the GEO Year Book 2007 informative and stimulating for your discussions during the 24th Regular Session of the GC/GMEF. As always, your feedback is most welcome.

Achim Steiner
United Nations Under-Secretary General and
Executive Director,
United Nations Environment Programme

2006 OVERVIEW

Source: Thomas Reineke

- Global
- Africa
- Asia and the Pacific
- Europe
- Latin America and the Caribbean
- North America
- West Asia
- Polar

Global

Environmental threats in 2006 highlighted the need for national and international efforts to address global problems. Climate change commanded increased attention, including a number of business initiatives, but policy makers also addressed issues such as marine biodiversity and global chemicals and waste management.

CLIMATE CHANGE: A GLOBAL PROBLEM

Following an ongoing trend since the late 1980s, 2006 was the sixth warmest year since records began in 1880 (NOAA 2006a). There were other signs of increasing climate instability. Chinese officials attributed extreme droughts to climate change—droughts that left millions short of water (Reuters/MSNBC 2006). In East Africa, persistent drought was followed by heavy rainfall and flooding that displaced two million people and took hundreds of lives (Oxfam 2006, CNN 2006).

New research and climate modelling published in 2006 strengthened the case for action on global warming. A new US National Aeronautics and Space Administration (NASA) study found that the world's temperature had increased by about 0.2°C per decade in the past 30 years, reaching the warmest levels since the end of last ice age nearly 12,000 years ago. It is now within 1°C of the maximum temperature of the past million years, threatening dangerous climate change based on the likely effects of sea level rise and species loss (Hansen 2006) **(Figure 1)**.

New data showed an alarming increase in the human output of greenhouse gases. Figures published in 2006 showed that between 2000 and 2005 carbon dioxide (CO_2) emissions grew by 3.2 per cent—four times faster than in the preceding 10 years, according to researchers at the Global Carbon Project (Le Quéré 2006). Average concentrations of CO_2 in 2005 were measured at 380 parts per million (ppm), up from 377.5 ppm in 2004 (NOAA 2006b).

Among countries with commitments to cut emissions under the Kyoto Protocol only Denmark, France, Iceland, the UK, Germany, and Norway reported lower emissions in 2004 than in 1990, along with ten formerly communist countries where problems of transition depressed economic activity. These results exclude activities related to land use, land use change, and forestry (UNFCCC 2006a).

Given the complexity of reducing CO_2 emissions, interest has grown in sequestration. Amid some controversy regarding sequestered CO_2's potential contribution to ocean acidification, the London Convention on marine dumping was amended in November, making it legal from February 2007 to bury CO_2 in natural structures under the oceans (IMO 2006).

The story for methane has been more encouraging. Atmospheric methane concentrations have remained stable for the past seven years (Simpson and others, 2006). Among 41 Annex I parties to the Kyoto Protocol who reported data, overall methane emissions fell by 18 per cent between 1990 and 2004. In 24 of these countries methane emissions declined by more than 10 per cent and increased by more than 1 per cent in only 8 countries (UNFCCC 2006a).

Ocean surveys are illustrating that the pace of planetary change is variable and not linear. Over time global warming is expected to raise ocean temperatures, but a 2006 study found that the average temperature of the upper ocean fell by 0.03°C from 2003 to 2005

Figure 1: Mean Surface Temperature Anomaly 2001-2005