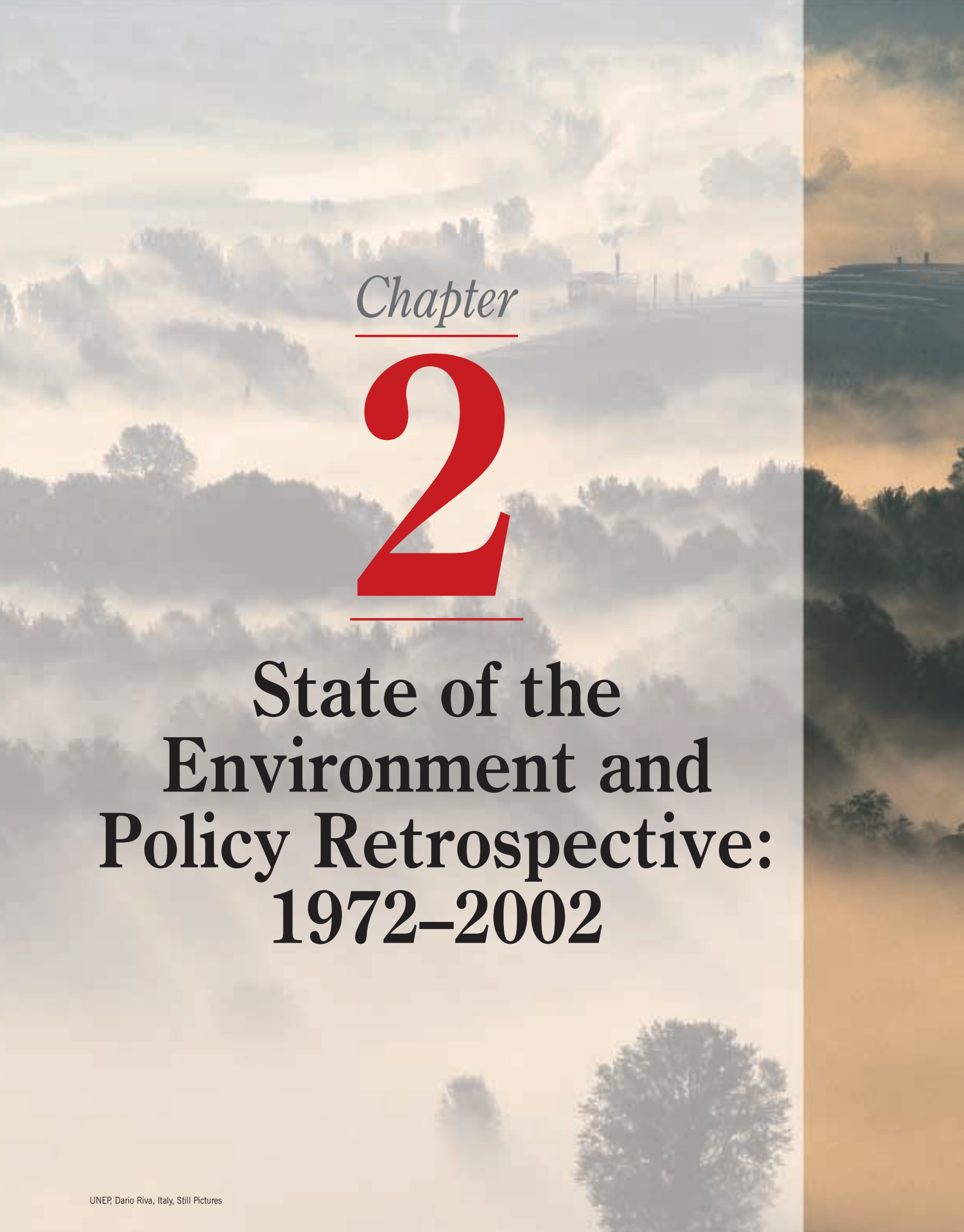


Chapter

2

State of the Environment and Policy Retrospective: 1972–2002

UNEP, Dario Riva, Italy, Still Pictures

State of the environment (SOE) reporting was introduced in the United States with the enactment of the 1969 National Environmental Policy Act (NEPA); it was made a global activity in the declaration adopted at the Stockholm Conference on the Human Environment in 1972. In the early years, the focus was on the state of the biophysical environment — land, freshwater, forests and wildlife, for example. People were generally reported as a threat to the environment. But SOE reporting has over the years become more integrated and now takes into account the complex human–environment interactions in assessing and reporting on the changing state of the environment.

Subsequently, SOE reporting has been established at virtually every level — local, national, sub-regional, regional and global. Many approaches have been used: some focused on media such as land and water, some on sectoral themes such as agriculture and forestry, some on issues such as land degradation and pollution (and some combined these approaches). Other frameworks have included the pressure-state-response (PSR) and later the driving force-pressure-state-impact-response (DPSIR). These different approaches have served their purpose but their inherent weakness is a linear approach to complex ecological processes and human–environment interactions. The reports often down played the fact that people not only have an impact on the environment but also that the environment has an impact on people.

Over time, therefore, a more integrated environmental assessment and reporting framework has emerged; one that aims to show the cause-and-effect of human–nature linkages. It seeks to connect causes (drivers and pressures) to environmental outcomes (state) to activities (policies and decisions) that have shaped the environment over the past three decades, and the impacts such changes now have on people.

The analysis is first by theme — socio-economic trends, land, forests, biodiversity, freshwater, coastal and marine areas, atmosphere, urban areas and disasters — but the holistic nature of the environment is emphasized where necessary. These thematic issues are analysed from first the global level then at GEO regional level: Africa, Asia and the Pacific, Europe, Latin America and the Caribbean, North America, West Asia and the Polar Regions. The global sections highlight many of the major issues under each sector, showing trends over the past three decades. The analysis uses the 1972 Stockholm Conference as the baseline, discussing the evolution of the issue and how the international community has tried to address the problems.

At the regional level, each region identified for analysis — through various consultation processes — two or three key regional issues under each sector or theme. These issues are discussed in the following pages and are listed in the table opposite. The table highlights common issues across the different regions, showing the global nature of the environmental issues facing the world today. In addition, the table identifies some unique regional differences, which have called for unique regional responses. Throughout the report, region-specific sections and graphics are colour-coded for easy identification (see table for regional colours).

Sub-regional differentiation analyses are also provided where appropriate. National level examples are presented to stress certain developments. The ultimate purpose of policy evaluation under integrated assessment is to identify successes and failures in environmental policy development and implementation as guidance for future policy initiatives.

The analyses are supported with graphics and other illustrations developed using data specially compiled for the GEO-3 30-year assessment period. The data were compiled from many different sources and then, wherever possible, aggregated from national to sub-regional, regional and global levels, making comparisons possible at these different levels. The GEO-3 Data Portal, some of the contents of which are available on a CD-ROM available with this report, addressed some of the data issues first identified in *GEO-1* in 1997: the harmonization of national datasets and acquisition of global datasets.

This chapter emphasizes integration across regions, between the state of the environment and policy, between the past and future, between thematic areas, and among sectors, for example, environmental, economic, social and cultural. It also tries to analyse policy (social responses) in relation to specific environmental issues, showing positive and negative policy impacts on the environment and how the environment can drive policy, both retrospectively and proactively. It covers the impacts of public and private sector policies, and regional and global policies, including multilateral environmental agreements. The

Key environmental issues by GEO region

	Land	*Forests*	*Biodiversity*	*Freshwater*	*Coastal and marine*	*Atmosphere*	*Urban areas*	*Disasters*
Africa	• Degradation and desertification • Inappropriate and inequitable land tenure	• Deforestation • Loss of forest quality	• Habitat degradation and loss • Bushmeat trade	• Variability of water resources • Water stress and scarcity • Access to safe water and sanitation • Deteriorating water quality • Wetlands loss	• Coastal area erosion and degradation • Pollution • Climate change and sea-level rise	• Air quality • Climate variability and vulnerability to climate change • Floods and drought	• Rapid urbanization • Solid waste • Water supply and sanitation • Air pollution	• Drought • Floods • Armed conflict
Asia and the Pacific	• Land degradation • Desertification • Land use change	• Forest degradation • Deforestation	• Habitat loss • Forest loss and degradation • Alien species	• Water scarcity • Pollution	• Degradation of coastal and marine resources • Pollution due to mining and coastal development	• Air quality • Ozone depletion • Greenhouse gas emissions and climate change	• Air pollution • Waste management • Water supply and sanitation	• Floods • Drought • Volcanoes • Earthquakes
Europe	• Land use • Soil degradation, sealing and contamination • Soil erosion	• Loss of natural forests • Forest degradation • Sustainable forest management	• Agricultural intensification • Genetically modified organisms	• Water quantity and quality • Policy and legislative framework	• Coastal erosion • Pollution	• Air pollution • Stratospheric ozone depletion • Greenhouse gas emissions	• Air quality • Noise pollution • Solid waste	• Storms and floods • Earthquakes • Human-caused disasters
Latin America and the Caribbean	• Land degradation • Land tenure	• Deforestation • Forest degradation	• Habitat loss and degradation • Overexploitation of resources and illegal trade	• Decreasing water available per capita • Water quality	• Habitat conversion and destruction • Pollution • Overexploitation of fisheries	• Air pollution • Ozone depletion • Air quality	• Solid waste • Water supply and sanitation • Air quality	• Drought • Hurricanes • Floods • Earthquakes • Spills of hazardous substances
North America	• Land degradation • Pesticides	• Forest health • Old growth forests	• Habitat destruction and degradation • Bio-invasion	• Groundwater • Great Lakes water quality	• Conversion of fragile ecosystems • Overexploitation of marine resources • Pollution	• Stratospheric ozone depletion • Greenhouse gases and climate change	• Urban sprawl • Ecological footprint	• Floods and climate change • Forest fires
West Asia	• Land degradation • Rangeland deterioration	• Degradation • Overexploitation • Sustainable forest management	• Habitat degradation and loss • Overexploitation of species	• Increasing water demand • Overexploitation of groundwater • Water quality	• Coastal development and urbanization • Overexploitation of resources • Marine pollution	• Air pollution • Ozone-depleting substances • Climate change	• Land conversion • Solid waste	• Drought • Oil discharges • Armed conflict
Polar Regions	• Degradation • Erosion • Climate change	• Boreal forest issues • Threats to forest tundra	• Climate change • Ozone depletion • Overexploitation	• Alien species • Pollution	• Overexploitation of fisheries • Pollution • Climate change	• Stratospheric ozone depletion • Long-range air pollution • Climate change	• Sanitation and waste	• Floods • Oil discharges • Pest invasion

Note:
This table represents the two or three key thematic issues by region which are covered in this chapter. Due to the DPSIR framework used for the analysis, one issue may be covered under two or more themes. For example, forest degradation may be a major driver of biodiversity loss in one region while in another it may be the key issue of concern

analysis takes into consideration not only environmental policy but also the impacts of general policies on environmental issues, such as broader social and economic policy trends with environmental repercussions.

Another important component of this chapter is the use of satellite images to illustrate environmental change over the past 30 years. The images were generated by Landsat, which coincidentally was launched in 1972 — the same year the Stockholm Conference was held. The Landsat images, which are placed in one or sometimes two pages at the end of each section, under the rubric 'Our changing environment', highlight environmental changes at different locations in different regions.

UNEP S. Yoh, Topham Picturepoint

Socio-economic background

Global overview

Over the past 30 years, the world has undergone unprecedented social, economic, political and technological change. These interlinked components provide the backdrop against which to view changes in the state of the environment over the same period because they serve a dual purpose as some of the most forceful drivers of that environmental change.

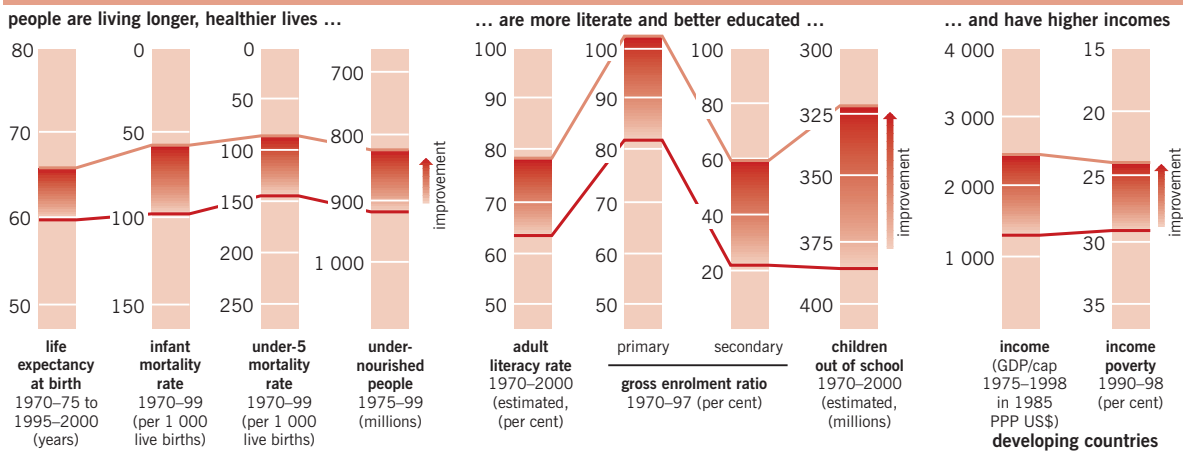
Human development

There have been some impressive gains in human development, particularly in the developing world: incomes and income poverty have improved, people are living longer, are healthier, more literate and better educated than ever before. Average annual incomes in developing countries have mostly risen: in real terms (constant US$1995) they rose during 1972-99 by 13 per cent in Africa, by 72 per cent in Asia and the Pacific and by 35 per cent in Latin America and the Caribbean; in West Asia they fell by 6 per cent (compiled from World Bank 2001). Nevertheless, the challenges remain daunting in the 21st century, with high levels of deprivation persisting across the world. Approximately 1.2 billion people, or one-fifth of the world's population, still live in extreme poverty on less than US$1 a day, and 2.8 billion people, or almost half the world's population, on less than US$2 a day (UNDP 2001). Three-quarters of those in extreme poverty live in rural areas (IFAD 2001), and the majority are women. Poverty is not limited to developing countries: more than 130 million people in the developed countries of the Organization for Economic Cooperation and Development (OECD) are considered income-poor (UNDP 2001).

Ill health is related to environmental factors (WHO 1997, Murray and Lopez 1996) and poverty. Medical innovation, progress in basic health care and enabling social policies have resulted in dramatic increases in life expectancy and declines in infant mortality (UN 2000). Overall, a child born today can expect to live eight years longer than one born 30 years ago (UNDP 2001). However, poverty rates in both urban and rural areas, as well as major infectious diseases such as HIV/AIDS, tuberculosis and malaria are a threat to health successes over the past few decades.

Tremendous progress has also been made in terms of education in the past 30 years, and adult literacy

Progress in human development over the past 30 years



Bar charts left show that progress in human development has been made on several fronts. Poverty data refer to the share of the population living on less than US$1 a day

Sources: FAO 2000, UNDP 2001, UNESCO 2000

rates have increased from an estimated 63 per cent in 1970 to 79 per cent in 1998 (UNESCO 2000). Nevertheless, in 2000 there were still 854 million illiterate adults, of whom 543 million (63.6 per cent) were women, and 325 million children not attending school of whom 56 per cent were girls (UNDP 2001). Improved education (especially among women) together with capacity building is considered to have been critical in slowing down world population growth from an annual peak of 2.1 per cent in the early 1970s to 1.3 per cent in 2000 (UN 1997, UNFPA 2001).

The Human Development Index (HDI)

The HDI combines indicators of the basic dimensions of human development (longevity, knowledge and a decent standard of living) to measure a country's overall achievements, categorized as high, medium or low human development. Between 1975 and 1999, there was overall progress in human development (see table), demonstrating the potential for poverty eradication and progressive human development in the coming decades. Nevertheless, 8 countries in economic transition and 12 in sub-Saharan Africa have suffered setbacks in the same period (see 'Africa' and 'Europe' in this section).

Changing structure of human development (millions of people)

	1975	*1999*
High human development	650	900
Medium human development	1 600	3 500
Low human development	1 100	500

Note: numbers of people refer only to countries for which 1975 and 1999 data are available and therefore do not equal total population
Source: UNDP 2001

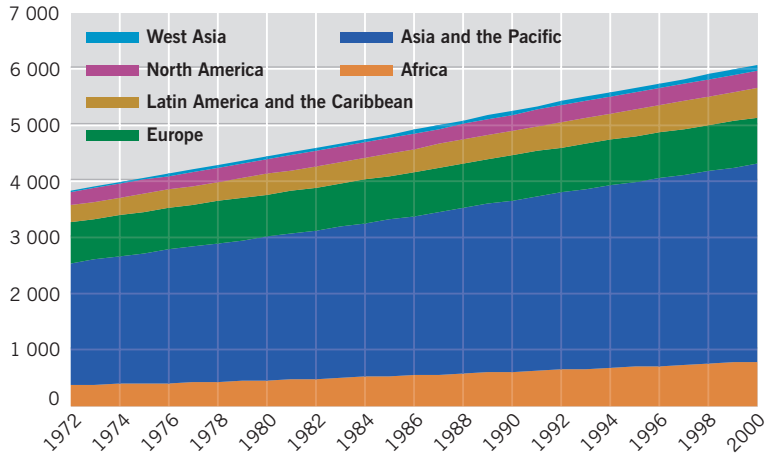
The changing population

World population increased from about 3.85 billion people in 1972 to 6.1 billion in mid-2000 (see figure on page 34), and is currently growing by 77 million people a year (UNFPA 2001). Most of the growth is concentrated in developing regions, with nearly two-thirds in Asia and the Pacific. Six countries accounted for 50 per cent of the annual growth: India (21.1 per cent), China (13.6 per cent), Pakistan (4.8 per cent), Nigeria (3.9 per cent), Bangladesh (3.7 per cent) and Indonesia (3.6 per cent) (United Nations Population Division 2001).

The population of industrialized regions, currently 1.2 billion, is expected to change little in the next 50 years while that of the developing regions is projected to increase from 4.9 billion in 2000 to 8.1 billion by 2050 (United Nations Population Division 2001). This difference is mainly due to levels of fertility. Less developed countries recorded fertility at 3.1 children per woman over the period 1995–2000, while developed countries recorded fertility at 1.57 children per woman over the same period — well below the replacement level of 2.1 children per woman (UNFPA 2001).

The gap in life expectancy between the developing and the more developed regions narrowed from 22 years in 1960 to less than 12 in 2000. Between 1995 and 2000, life expectancy in the industrialized regions was estimated to be 75 years, compared to about 63 years in developing regions (United Nations Population Division 2001). As world fertility continues to decline and life expectancy rises, the population of the world will age faster in the next 50 years than during the past half-century (United Nations

World population (millions) by region, 1972–2000



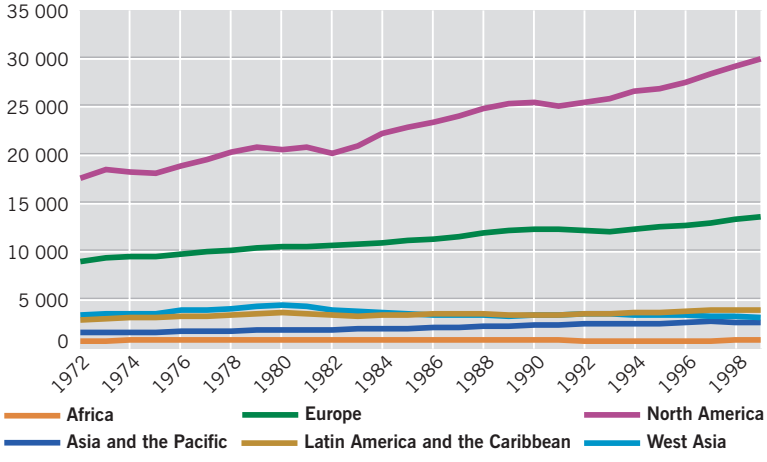
World population is currently growing at 77 million a year, with two-thirds of the growth in Asia and the Pacific

Source: compiled from United Nations Population Division 2001

Population Division 2001). Nevertheless, the emergence of HIV/AIDS in the 1970s has depressed life expectancy in the most affected countries, and the disease is now the fourth most common cause of death worldwide. More than 60 million people have been infected with HIV since the 1970s, and 20 million have died. Of the 40 million living with HIV/AIDS worldwide, 70 per cent are in sub-Saharan Africa where it is the leading cause of death (UNAIDS 2001). Compared to Africa, the relative impact of the HIV/AIDS epidemic in most other regions of the world is still low.

There have been notable population movements over the past 30 years due to rapid urbanization, international migration and the movement of refugees and displaced persons. The number of people living outside their own countries rose from 84 million in 1975 to an estimated 150 million people at the end of the 20th century (UNDP 1999, UNHCR 2000). The number of refugees rose from 2.7 million in 1972 to a peak of 18.3 million in 1992, and stood at 11.7 million at the end of 1999 (UNHCR 2000). By 2001, an estimated 22 million people 'of concern' were numbered among the world's refugees, returnees and persons displaced within their own countries (UNHCR 2001). The more developed regions are expected to continue being net receivers of international migrants, with an average gain of about two million a year over the next 50 years. Because of low fertility in recipient countries, this migration will have a significant impact on population growth in the developed regions (United Nations Population Division 2001).

Gross domestic product per capita (US$1995/year), 1972–99



Despite global economic growth, the gap between rich and poor has widened between developed and developing countries; per capita incomes have risen only marginally except in Europe and North America

Source: compiled from World Bank 2001

Economic development

The world economy has, on aggregate, expanded considerably over the past three decades, despite significant fluctuations. World gross national product (GNP) more than doubled from approximately US$14 300 billion in 1970 to an estimated US$29 995 billion in 1999 (Costanza and others 1997, World Bank 2001). However, these figures do not include the value of environmental goods and services which are critical to the Earth's life-support systems, and contribute to human welfare but are outside the market. An estimate of the economic value of these ecosystem services is between US$16 000 billion and US$54 000 billion a year, with an average of US$33 000 billion a year. This estimate should be considered a minimum because of the nature of the uncertainties (Costanza and others 1997).

The world economy grew by 3.1 per cent annually in real gross domestic product (GDP) between 1980 and 1990, and 2.5 per cent annually between 1990 and 1998, with annual per capita growth rates of 1.4 and 1.1 per cent respectively (UNCTAD 2000). There has, however, been significant regional variability over this period, with by far the highest growth rates in Asia and the Pacific, which contains more than half the world population. Per capita GDP (in constant

US$1995) almost doubled in Northwest Pacific and East Asia during 1972-99, growing by an annual average of 2.4 per cent a year (compiled from World Bank 2001); by contrast, it fell in sub-Saharan Africa.

Despite global economic growth, the gap between rich and poor has widened both between developed and developing countries and within countries, particularly in Latin America and sub-Saharan Africa (UNDP 2001). Per capita incomes have risen only marginally in most regions, with the exceptions of Europe and North America (see figure on page 34). Currently 3.5 billion people in low-income countries earn less than 20 per cent of the world's income, while the 1 billion people living in developed countries earn 60 per cent (UN 2000). The ratio between income earned in countries with the richest 20 per cent of the population, compared to the world's poorest 20 per cent, has also widened — from 30:1 in 1960, to 60:1 in 1990, to 74:1 in 1997 (UNDP 1999).

Growth in use of energy (see box) and transport are both indicators of economic development, and both have severe impacts on the environment. Private vehicular transportation has become an entrenched lifestyle choice among those who can afford it. Since the 1970s, about 16 million new vehicles have come onto the world's roads annually (UNDP, UNEP, World Bank and WRI 1998) and passenger cars account for 15 per cent of total global energy consumption (Jepma and others 1995).

Inequalities in income are also reflected in similar disparities in material consumption (see 'The Ecological Footprint', page 36). It has been estimated that the richest 20 per cent of the world's population accounts for 86 per cent of total private consumption expenditure, consumes 58 per cent of the world's energy, 45 per cent of all meat and fish, 84 per cent of paper, and owns 87 per cent of cars and 74 per cent of telephones. Conversely, the poorest 20 per cent of the world's population consumes 5 per cent or less of each of these goods and services (UNDP 1998).

For many developing countries poverty, unemployment and low productivity are major concerns. In developing countries as a whole, the informal sector provides 37 per cent of employment, and as much as 45 per cent in Africa (UNCHS 2001). In the 1980s, structural adjustment programmes (SAPs) were introduced by the World Bank to correct underlying economic imbalances and improve economic efficiency through reforms. SAPs have had

Trends in global energy production and consumption

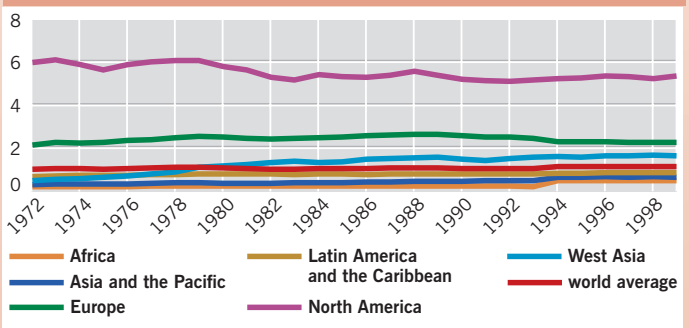
Energy is a key to socio-economic development. It is also central to achieving the economic, social and environmental goals of sustainable development. Harnessing energy has dramatically expanded people's choices, allowing those with access to enjoy unprecedented productivity, mobility and comfort. But the per capita use of electricity illustrates a major energy divide. The OECD annual average of 8 053 kilowatt-hours (kWh) per capita is nearly 100 times greater than in the least developed countries where it is only 83 kWh per capita (UNDP/UNDESA/WEC 2000).

The annual growth rate in total energy use between 1972 and 1999 averaged 2 per cent a year but this decreased from 2.8 per cent in the 1970s to 1.5 per cent in the 1980s and 2.1 per cent in the 1990s (IEA 1999). This decrease was due to weak economic performance in the transition economies in Europe in the 1990s, compounded by the global financial crisis of 1997-98 (UNDP/UNDESA/WEC 2000).

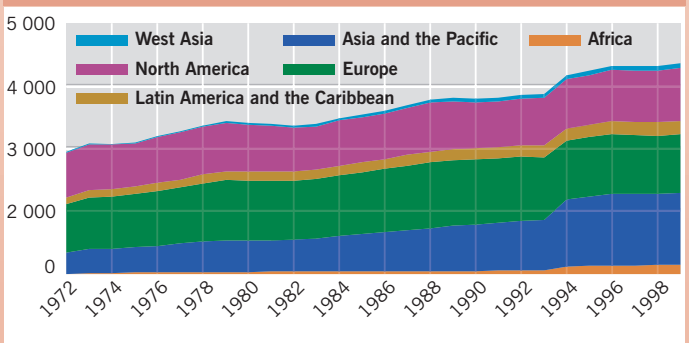
The human benefits of energy production and consumption frequently have an environmental downside, which may in turn threaten human health and quality of life. Impacts on atmospheric composition, deforestation leading to soil erosion and siltation of water bodies, the disposal of nuclear fuel waste, and occasional catastrophic accidents such as Chernobyl are some of the widely recognized problems.

Globally, per capita consumption has changed relatively little over the past 30 years although total consumption grew by some 70 per cent during 1972–99. At the regional level, per capita consumption has fallen in North America, the greatest consumer, and risen most sharply in West Asia. Reducing fossil fuel energy consumption in areas of high consumption, and achieving more balanced per capita consumption within and between countries, are environmental imperatives for the 21st century.

Per capita energy consumption (tonnes oil equivalent/year)



Total energy consumption (million tonnes oil equivalent/year)



Source: compiled from IEA 1999 and United Nations Population Division 2001

economic, social and environmental impacts, including negative impacts on social stability and environmental sustainability (Reed 1996). Poverty, unemployment and falling standards of living also emerged as significant problems for countries in economic transition in the 1990s.

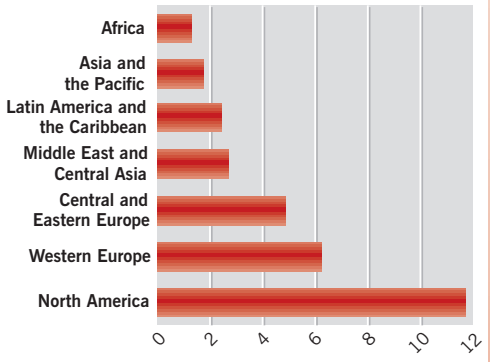
One critical issue is that of external debt which stood at US$2 572 614 million in 1999 (World Bank 2001). The Heavily Indebted Poor Countries (HIPCs) initiative was launched in 1996 and by November 2001 debt-reduction packages totalling US$36 000 million had been committed to 24 countries (mainly in Africa) (IMF 2001). However, there has been some disappointment with the initiative, and many of the countries receiving HIPC debt relief still spend more on debt servicing than on basic education or health (Oxfam 2001).

The Ecological Footprint

The Ecological Footprint is an estimate of human pressure on global ecosystems, expressed in 'area units'. Each unit corresponds to the number of hectares of biologically productive land required to produce the food and wood people consume, the infrastructure people use, and to absorb the CO_2 produced from burning fossil fuels; thus the footprint takes into account the total impact people have on the environment.

The world's Ecological Footprint is a function of population size, average per capita consumption of resources, and the resource intensity of the technology used. During 1970–96, the world's Ecological Footprint rose from about 11 000 million area units to more than 16 000 million area units. The world average footprint remained fairly constant during 1985–96 at 2.85 area units per capita.

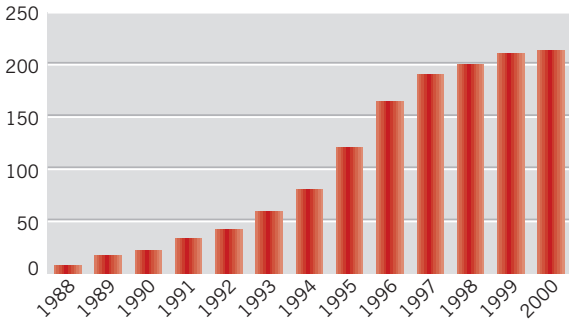
Regional Ecological Footprints (1996, area units per capita)



Note: not all regions correspond exactly to GEO regions

Source: WWF and others 2000

Number of countries connected to the Internet



Science and technology

The wonders of science and technology have brought to man higher standards of health, longer life, better jobs and education and a more comfortable existence than his forebears knew 100 years ago.

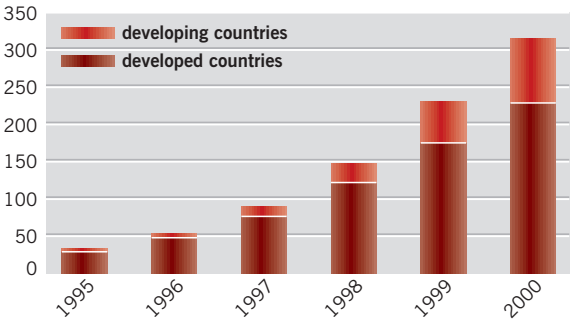
Commission to Study the Organization of Peace 1972

This perception from the 1970s still holds true today. Science and technology have brought about major breakthroughs over the past 30 years in, for example, the fields of information and communications, medicine, nutrition, agriculture, economic development and biotechnology. Forty-six global hubs of technological innovation have been identified around the world, principally in Europe and North America (Hillner 2000).

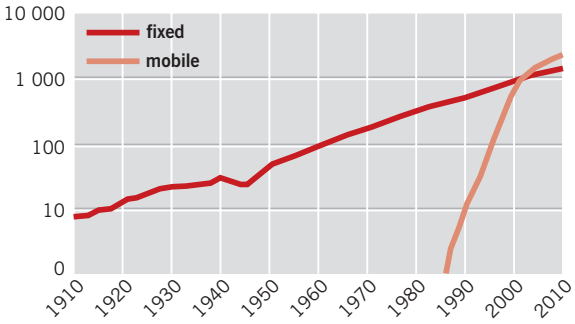
Information and communications technology (ICT) particularly has revolutionized the way people live, learn, work and interact (Okinawa Charter 2000). The Internet, mobile phones and satellite networks have shrunk time and space. Satellite communications technology from the mid-1980s gave rise to a powerful new medium with a global reach. Bringing together computers and communications in the early 1990s unleashed an explosion of ways to communicate, process and store, and distribute enormous amounts of information. In 2001, more information could be sent over a single cable in a second than was sent over the entire Internet for a month in 1997 (UNDP 2001).

ICT is advancing rapidly, presenting tremendous opportunities for human development by making it easier for more people to access available information from remote locations, quickly and cheaply. However,

Number of Internet users (millions)



Fixed and mobile telephone subscribers (millions)



Figures on the left demonstrate the explosive growth of the use of the Internet and mobile telephones — but even in 2000 only one-quarter of Internet users were from developing countries

Source: ITU 2001

the uneven diffusion of ICT means that access to related technological developments may be an advantage for the minority only. Today, Internet users are predominantly urban and 79 per cent of users live in OECD countries, which contain only 14 per cent of the world's population. Nevertheless, even in developing countries the increase in Internet use has been dramatic — for example, from 3.9 million to 33 million people in China between 1998 and 2002 (UNDP 2001, CNNIC 2002).

Mobile telephones have overcome the infrastructure constraints of fixed lines and the number of subscribers has increased from slightly more than 10 million around the world at the start of the 1990s to more than 725 million at the beginning of 2001, or one mobile phone for every eight inhabitants (ITU 2001).

Additionally, new technologies are helping people to better understand the environment. In July 1972, the US government launched the first LANDSAT satellite. By 2002, the LANDSAT programme has acquired 30 years of records which constitute the longest continuous record of data on the Earth's continental surfaces (USGS 2001). This has added a new dimension to environmental monitoring and assessment, enabling changes to be tracked, trends monitored and early warning improved (see image below). Images from this facility are included in the pages at the end of sections in Chapter 2.

However, for some developing countries, technology can be a source of exclusion instead of a tool for progress. 'Technology is created in response to market pressures, not the needs of poor people who have little purchasing power. As a result research neglects opportunities to develop technology for poor people' (UNDP 2001). For example, of the 1 223 new drugs marketed worldwide between 1975 and 1996, only 13 were developed to treat tropical diseases

Image below is the most detailed true-colour image of the entire Earth available in March 2002. Many months of satellite-based observations of the land surface, oceans, sea ice, and clouds were pieced together into a seamless, mosaic of every square kilometre the Earth (Antarctica not shown)

Source: NASA Goddard Space Flight Center Image

'It is only through the deep concern, information and knowledge, commitment and action of the people of the world that environmental problems can be answered. Laws and institutions are not enough. The will of the people must be powerful enough, insistent enough, to bring about the truly good life for all mankind.' — *Commission to Study the Organization of Peace 1972*

(UNDP 2001). New technologies also come with unforeseen risks to human health and the environment: for example, ozone-layer depletion from the use of CFCs, the side effects of drugs, unintended use of new technologies as weapons, pollution, concerns over the impacts of genetically modified organisms, and technological disasters such as Chernobyl and Bhopal.

Governance

Governance is an overriding issue which applies at all levels and sectors of society — from local to global, from the private to the public sector — and has impacts on law and human rights, political, parliamentary, democratic and electoral systems, civil society, peace and security, public administration, public information, the media and the corporate world. Awareness of and attention to governance issues have consequently grown in every aspect of modern life, not least in relation to the environment. 'Good' governance is recognized as a prerequisite for sound policy development and as being even more important for ensuring that policies are effectively implemented.

The 30 years between the Stockholm Conference and the 2002 World Summit on Sustainable Development have witnessed a major overhaul of political systems, including the decolonization of Africa, the end of apartheid in South Africa, the raising of the Iron Curtain, the reunification of Germany and the disintegration of the former Soviet Union. There has been a rapid increase in economic and trade alliances, and in membership of the United Nations, which stood at 190 in March 2002. Perhaps the greatest change has been at the national level where democracy and transparency have become major issues, particularly since the 1990s, and governments have been replaced as a result of popular demand. In the past 10 years, more than 100 developing and transition countries ended military or one-party rule (UNDP 2001). The internationalization of the environment since 1972 has had a bearing on national politics in many of the developed countries, with green parties making their mark, particularly during the 1980s (Long 2000). The past three decades have also seen the massive growth of civil society movements in all the regions of the world, with many

A hand through the Berlin Wall symbolizes the raising of the Iron Curtain in Europe in 1989 — one of the major political events of the past three decades

Source: UNEP, Joachim Kuhnke, Topham Picturepoint

organizations taking a more proactive role. Non-governmental organizations are increasingly influencing and sometimes participating in government and private sector decisions.

The power of the people in influencing policy has been recognized since at least the 1970s: 'It is only through the deep concern, information and knowledge, commitment and action of the people of the world that environmental problems can be answered. Laws and institutions are not enough. The will of the people must be powerful enough, insistent enough, to bring about the truly good life for all mankind.' (Commission to Study the Organization of Peace 1972).

The growing integration of finance, economies, culture, technologies and governance through globalization is having profound impacts, both positive and negative, on all aspects of people's life and the environment. With market forces beginning to dominate the social and political as well as economic spheres, there is a danger that power and wealth become concentrated in a minority while the majority become increasingly marginalized and dependent. In the 21st century, the challenge is to institute stronger governance to ensure that globalization operates for the benefit of most people and not just for profits.

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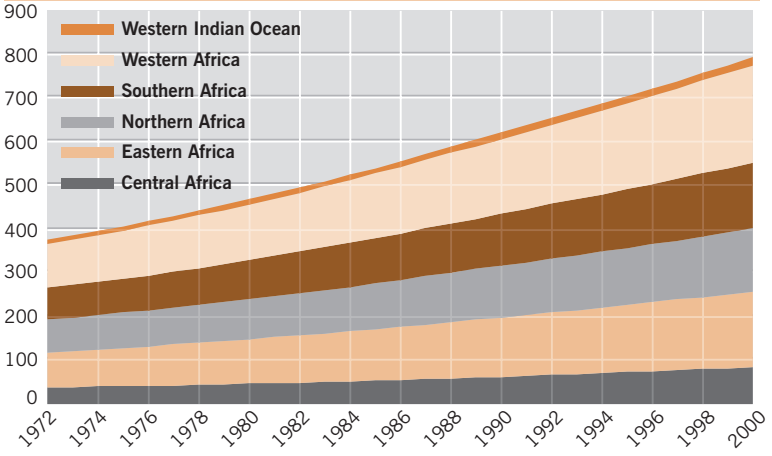
Socio-economic background: Africa

The African region has a wealth of natural resources, offering myriad opportunities for human, social and economic development. Its diversity of cultures and valuable indigenous knowledge provides the necessary human capital to realize these opportunities. Nevertheless, Africa entered the 21st century facing enormous challenges.

Population (millions) by sub-region: Africa



Rates of population growth in Africa are still high — 2.4 per cent a year compared to a world average of 1.3 per cent

Source: United Nations Population Division 2001

Human development

Of the 49 countries in Africa for which data are available, 20 are classified as having medium human development and 29 low human development (UNDP 2001). Generally, this translates to:

- a low life expectancy — 52.5 years compared to a world average of 66.3 years (United Nations Population Division 2001);
- low levels of education and literacy — about 60 per cent adult literacy in 1999, compared to an estimated world average of 75 per cent (compiled from UNDP, UNEP, World Bank and WRI 2000); and
- widespread poverty — per capita GDP (in US$1995) of US$749 in 1999 compared to a global average of US$5 403 (World Bank 2001a).

Sub-regional differences are most marked between Northern Africa, where rapid progress has been made over the past 30 years, and sub-Saharan Africa. In the former, life expectancy increased by 14 years in the period from 1970–75 to 1995–2000. However, in sub-Saharan Africa progress has been slow and 12 countries suffered setbacks in human development between 1975 and 1999 (UNDP 2001).

Close to 350 million people, 44 per cent of the total population, live on US$1 or less a day (as high as 70 per cent in Nigeria) and up to 150 million children live below the poverty line (ADB 2000, UNDP 2001). Income distribution is also highly skewed with the poorest 10 per cent of Africans earning less than 5 per cent of the income and the richest 10 per cent earning 25–45 per cent of the income, depending on the country (ADB 2001).

There are also large discrepancies between the status of men and women in Africa, with women prohibited from owning property or land in many societies. Women also generally earn less and do not hold a representative proportion of high-ranking jobs.

Access to health services varies but generally lags behind the international average. Poor economic growth and increasing population pressures on existing facilities have contributed to low investment in the health sector. In 1998, government expenditure on health care per capita (at purchasing power parity) ranged from a high of US$623 in South Africa to only US$15 in Madagascar (UNDP 2001).

The changing population

Africa has had one of the highest population growth rates in the world over the past 30 years; at the current 2.4 per cent a year, it is much higher than the global average of 1.3 per cent. The population more than doubled from 375 million in 1972 to 794 million in 2000, or approximately 13 per cent of the world's population. Fertility rates in Africa are also among the highest in the world, although they are declining — from 6.8 children per woman in the period 1965–70 to 5.4 children per woman in 1995–2000) (United Nations Population Division 2001).

The HIV/AIDS pandemic, which killed 2.3 million people in Africa in 2001, is having an impact on all aspects of human, social and economic development. The continent has the highest new infection rate and the largest proportion of the population living with HIV/AIDS (8.4 per cent of adults) in the world. In 2001, there were 28.1 million people with HIV/AIDS in sub-Saharan Africa — 70 per cent of the global total. Over the past 20 years, the disease has had a severe impact on life expectancy in the region, and in

countries such as Botswana and Malawi average life expectancy is already below 40 years (UNAIDS 2001). Northern African countries are less severely affected. Despite commendable action by many countries, the impact of AIDS on social development, economic growth and on health systems is projected to run to billions of dollars. For example, in South Africa the impact is anticipated to be equal to 0.4 per cent of GDP over the next decade (UNAIDS 2000). The impact on families, communities and societies is incalculable.

Economic development

The economies of African countries have been largely based on primary products or extraction of natural resources, both exported unprocessed. As a result, economic growth has been below potential, because revenues from the value that is added by processing accrue outside the continent, making African economies extremely vulnerable to external price fluctuations and trade regulations. The first oil crisis, in 1973–74, sparked a series of setbacks and economic recessions that have lasted for more than a quarter of a century. Falling prices for coffee, cocoa and other cash crops during the 1980s had catastrophic impacts on the economies of the region. Between 1970 and 1995, Africa lost half its markets, representing a loss of income of about US$70 billion a year (Madavo 2000).

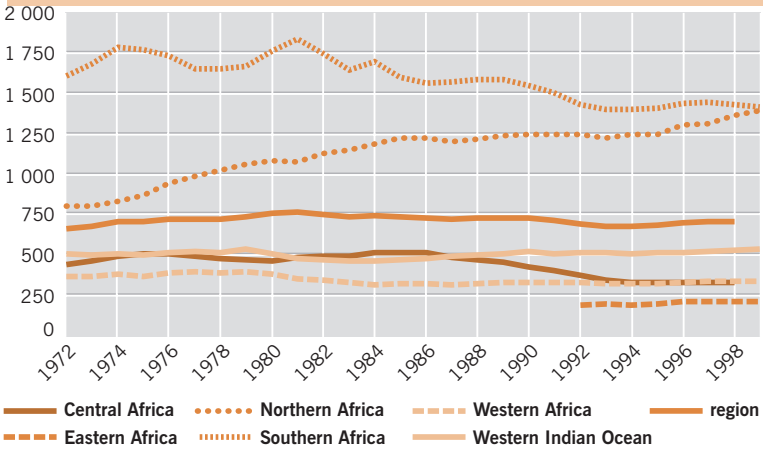
Africa's dependence on rain-fed agriculture means that production is vulnerable to climatic variability, which can severely affect food and human security, and exports. The focus on mineral extraction, cash crops and timber harvesting has also had detrimental impacts on the environment.

With the additional constraints of a growing population, Africa's economic performance has been poor over the past 25 years. Annual growth of per capita GDP for sub-Saharan Africa was -1 per cent between 1975 and 1999, and incomes have fallen (UNDP 2001). Nevertheless, 34 African countries recorded increases in per capita incomes between 1994 and 1997, and 18 grew at aggregate rates above the 5 per cent a year threshold for reducing poverty (Madavo and Sarbib 1998). There is some speculation that this may signal a sustained economic recovery, partly reflecting the positive results of implementing growth-oriented macroeconomic and structural reforms (Madavo 2000, Madavo and Sarbib 1998).

Since the mid-1990s price controls have largely been lifted, marketing boards abolished, trade taxes rationalized, financial markets liberalized and the process of privatization accelerated (ADB 2000).

National external debt is still a significant barrier to economic growth and poverty reduction in Africa.

GDP per capita (US$1995) by sub-region: Africa



While GDP per capita has climbed steadily since 1972 in Northern Africa, it has stagnated or declined in sub-Saharan Africa

Note: data for Eastern Africa are unreliable pre-1992

Source: estimated from World Bank 2001a

For the region as a whole, it increased almost 22-fold from US$16 960 million in 1971 to US$370 727 million by 1999 (World Bank 2001a). In 1970, the debt burden of sub-Saharan Africa was just US$6 000 million, or 11 per cent of GNP; this grew to US$330 000 million or 61 per cent of GNP by 1999 (ADB 2000). Since then there has been a small decline (World Bank 2001b). In Northern Africa, growth of external debt has followed a similar pattern. Recently, more emphasis has been placed on debt relief and increasing foreign direct investment (FDI). Although 20 African countries have had debt-reduction packages approved under the enhanced Heavily-Indebted Poor Countries Initiative (IMF 2001), indebtedness remains an issue of major concern.

Science and technology

In terms of technological achievement, diffusion of, access to and adoption of science and technology is generally poor in Africa. The region has a number of marginalized countries (such as Ghana, Kenya, Mozambique, Senegal, Sudan and Tanzania) where large parts of the population have not even benefited from the use of old technology such as fixed-line telephones. Nevertheless, Africa has a number of 'dynamic adopters' in the use of new technology,

including Algeria, Egypt, South Africa, Tunisia and Zimbabwe, although the diffusion of old technology is still slow and incomplete even in these countries. The region has two recognized global hubs of technological innovation: in El Ghazala, Tunisia, and Gauteng, South Africa. However, most African countries are not included on the Technology Achievement Index (TAI), and even South Africa, which has the highest score of any African country, has a TAI of 0.340 which is less than half the highest TAI value of 0.744 for Finland (UNDP 2001).

Lack of access to affordable appropriate technologies seriously constrains sustainable development options. In the agricultural sector, for example, many African countries depend on irrigation but the more efficient drip irrigation systems are too costly for most farmers, resulting in wastage of water. Africa also remains marginalized with respect to access to biotechnology for agricultural productivity, pharmaceutical products and disease prevention. Foreign companies may be able to exploit biological species commercially whereas local companies do not have the technology, capital or know-how to do so.

All countries in the region have Internet connections with a total of around 4 million users (2.5 million in South Africa), or one user for every 200 people, compared to a world average of about one user for every 30 people (Jensen 2001). Mobile communications technology has enabled Africa to leapfrog the infrastructure constraints of land-based communications. In 1990, African countries had no or low access to cellular communications; by 1999 the technology had spread dramatically to most countries — for example, availability has risen from 0.1 per 1 000 population to 132 per 1 000 in South Africa (UNDP 2001).

Governance

Despite significant institutional and political changes over the past 30 years, 'good' governance in Africa is still a partial and fragile feature. Most notable changes have been the end of colonialism, as well as military and one-party rule in most countries, and the rise in participation by non-governmental, community-based and civil society organizations. Nevertheless, corruption is endemic in many countries. For example, 14 African countries scored less than five out of a clean score of ten on a corruption perception index, and four of those scored less than two (TI 2001).

A further barrier to stability, economic growth and social development in the region over the past 30 years has been the escalating incidence of civil conflict. Conflicts, typically arising from ethnic or religious differences or competition for natural resources, have resulted in massive displacement of people and diversion of financial resources away from vital sectors such as health and education. About one in every five Africans still lives in circumstances of civil conflict (Madavo 2000).

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Socio-economic background: Asia and the Pacific

The Asia and the Pacific region occupies 23 per cent of the Earth's land area and is home to more than 58 per cent of its people. The region includes several of the world's largest emerging economies, such as China and those of Southeast Asia. Over the past 30 years, the region has gradually moved from a subsistence lifestyle towards a consumer society, with rapid rates of urbanization and westernization as well as population increase. This transition has not been without adverse social and economic, as well as environmental, impacts.

Human development

Of the 53 countries in the region, 7 are classified as having a high level of human development, 21 as a medium level, and 5 as a low level (the other countries, mainly small islands in the South Pacific, have not been classified). The Northwest Pacific and East Asia sub-region has made sustained and rapid progress in most areas of human development, while South Asia lags behind with human and income poverty still high. Per capita GDP (in US$1995) ranges from US$506 in South Asia to US$4 794 in Northwest Pacific and East Asia. Life expectancy at birth has improved throughout the region, rising in South Asia from 50 years in 1970–75 to more than 60 years by 1995-2000, and in Northwest Pacific and East Asia from about 61 to nearly 70 years over the same period. Adult literacy rates also show similar improvements increasing from 33 to 55 per cent in South Asia during 1972–99, and from 55 to 84 per cent in Northwest Pacific and East Asia (World Bank 2001).

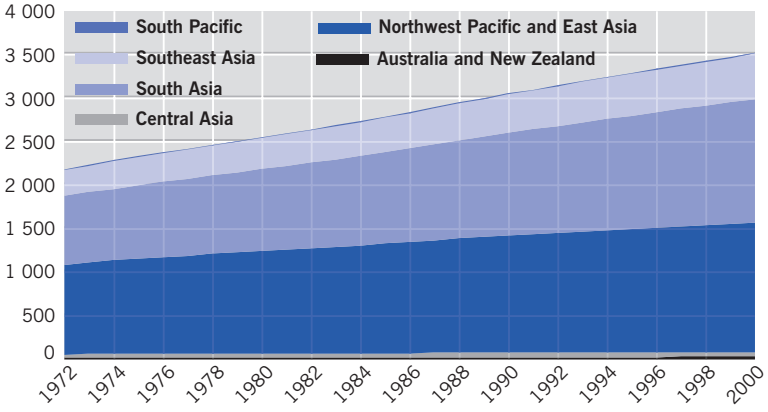
An estimated three-quarters of the world's poor live in Asia, and poverty is particularly significant in Afghanistan, Bangladesh, Cambodia, India, Lao People's Democratic Republic, Nepal and Pakistan. In South Asia, 40 per cent of the population lives on less than US$1 a day (UNDP 2001). Poverty is not just determined by economics, however. Conventional indicators suggest that many Pacific Island populations are at poverty level (UNESCAP 1999) — however, many communities still enjoy a high degree of subsistence affluence from traditional, non-monetary resource management systems (UNEP 1999).

Poverty for many countries of the region is the result of gross inequalities and institutional failures which allow the benefits of economic growth to be captured by a decreasing number of elites. In addition, urbanization, the shift to a monetary economy and high population growth without commensurate growth in employment opportunities compound the problem. So does the overexploitation of natural resources which threatens viable agricultural or subsistence lifestyles (UNESCAP 1999).

The changing population

The region's population grew from 2 173 million in 1972 to 3 514 million in 2000 (United Nations Population Division 2001). Population growth rates had declined from 2.3 per cent in 1972 to 1.3 per cent (the same as the world average) by 2000 — although there are significant sub-regional variations. This can be partly attributed to declining fertility levels which have fallen from 5.1 to 2.1 children per woman over the past three decades (United Nations Population Division 2001).

Population (millions) by sub-region: Asia and the Pacific



Asia and the Pacific's huge population is dominated by just three sub-regions. Overall, growth has now slowed to the world average of 1.3 per cent a year

Source: compiled from United Nations Population Division 2001

Nevertheless, the region includes some of the most populous countries in the world, with China and India accounting for 38 per cent of the world population. It also contains five of the six countries which account for one-half of global annual population growth — Bangladesh, China, India, Indonesia and Pakistan (United Nations Population Division 2001).

High population growth is reflected in the region's population structures. Most countries have youthful populations, with 30 per cent of Asia's population less than 15 years old (United Nations Population Division 2001). While this could be seen as a positive characteristic in terms of the large number of young

Asia and the Pacific's traditional agricultural economy is losing ground to service industries: during the period 1972–99, agriculture's contribution to GDP fell from 23 to 16 per cent while the contribution of the service industries grew from 43 to 50 per cent

Source: UNEP, Topham Picturepoint

workers available, in some sub-regions, especially the Pacific Islands, it also has significant negative socio-economic implications, particularly in terms of high unemployment. In addition, large numbers of young people entering their reproductive years compound the pressures of population growth.

Despite gains in life expectancy, an estimated 7.1 million people live with HIV/AIDS (almost 18 per cent of the world total) in Asia and the Pacific. There were about 435 000 deaths and more than 1 million new cases in 2001 (UNAIDS 2001).

Economic development

During the past 30 years, countries in the region have striven for economic development and higher standards of living. However, annual GDP growth rates decreased from a high of 9.76 per cent in 1970 to 2.54 per cent in 1999, with a negative growth of –1.04 per cent in 1998 due to the Asian economic crisis (World Bank 2001). Overall, however, between 1972 and 1999 per capita real incomes (measured in US$1995) nearly doubled in Northwest Pacific and East Asia, growing by an average of 2.4 per cent annually (see graph on page 45). In South Asia, the growth rate also exceeded 2 per cent (compiled from World Bank 2001). However, growth was very low in the Pacific Islands, and this is consistent with recent studies that indicate a general decline in the standard of living in Pacific island countries (UNESCAP 1999).

Asia and the Pacific accounted for 41.7 per cent of global external debt at US$1 073 977 million in 1999 — a significant burden which has increased more than five-fold from US$189 968 million in 1981 (World Bank 2001).

The economic structure of the region has changed remarkably over the past 30 years, with the importance of agriculture diminishing and the service sector growing. Even in South Asia, the contribution of agriculture to GDP fell from 39 per cent in 1980 to 30 per cent in 1995 while the contribution of the service sector increased from 35 to 41 per cent. (World Bank 1997). These structural changes are also reflected in employment. In 1960, 75 per cent of Asians were employed in agriculture. By 1990 this had fallen to nearer 60 per cent while the share of people working in industry grew from around 15 to 21 per cent (ADB 1997).

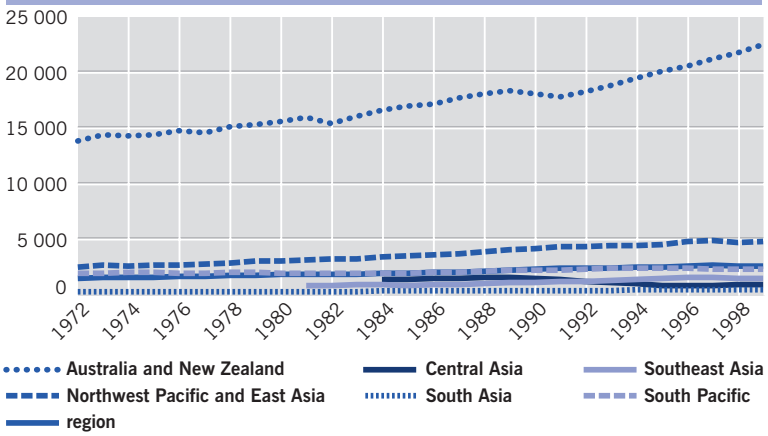
In the Pacific, lifestyles have changed from subsistence to cash-driven societies reliant on budgetary assistance. The standard of living for the sub-region's urban dwellers is relatively high when compared with those in other developing countries. However, there are some worrying trends, with indications of rising unemployment, particularly among young people; high drop-out rates from primary schools; low household cash incomes; and a growing incidence of drug abuse and crime (SPC 1998). Many of the small and remote islands of the Pacific have essentially no industry at all, while other countries in the sub-region have small industries related to food or beverage processing, clothing and minor machinery assembly or repair (UNEP 1999).

Science and technology

The region has at least ten global hubs of technological innovation in Australia, China, India, Japan, Malaysia, Republic of Korea, Singapore and Taiwan (Hillner 2000). Asia accounts for about 30 per cent of global expenditure on research and development, with Japan alone accounting for half of that (UNESCO 2000).

In line with developments in other parts of the world, the spread of new technologies such as the Internet and mobile communications has been unprecedented and is having significant impacts on people's lives and selected national economies. For example, rural information centres have been set up in Pondicherry in India allowing Internet access using solar as well as electric power and wireless as well as wired communications. As a result, farmers and fishermen can access everything from market information to satellite images. Nevertheless, only 0.4 per cent of Indians were using the Internet in 2001 (UNDP 2001). In China, use of the Internet has grown almost ten-fold from 3.9 million users in 1998 to more than 33 million by January 2002 (UNDP 2001, CCNIC 2002); this is still only 2.75 per cent of the entire population, although more than half the population of Hong Kong has access to the Internet (UNDP 2001). The information and communications industry in India generated an estimated US$7 700 million in 1999 — 15 times more than in 1990, with almost US$4 000 million in exports (UNDP 2001). The associated employment and economic development opportunities offer significant potential for addressing poverty in the region.

GDP per capita (US$1995) by sub-region: Asia and the Pacific



Although incomes in Australia and New Zealand dwarf those elsewhere, there has been steady growth in the other sub-regions, except in Central Asia and the South Pacific Islands

Note: data unavailable pre-1984 for Central Asia and pre-1981 for South Asia

Source: estimated from World Bank 2001

Governance

The glowing picture of Asia's future in the early to mid-1990s has been overshadowed by more recent events in Southeast Asia and Korea. There has been a loss of confidence in the region which has ensured that the region's leaders are now more attentive to the need for adaptive governance and fiscal management to guard against future downturns. For countries to prosper again, governments and institutions must encourage new or burgeoning markets and pursue social policies that will simultaneously benefit the economy, the environment and the people.

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Socio-economic background: Europe

The most important developments in Europe over the past three decades are the political, economic, social and institutional processes resulting from the strengthening and expansion of the European Union (EU) and the transition from centrally planned regimes to more open, market economy based societies (see box below). These changes have had profound effects on developments in all the countries concerned, on sub-regions and on the region as a whole. Although the three sub-regions of Europe (Western, Central and Eastern) do have similarities, there also are distinct differences due to recent and historical events resulting in political, economic and social heterogeneity in the region.

Following the collapse of communism at the end of the 1980s, a new era of pan-European cooperation on environmental issues began within the framework of the 'Environment for Europe' (EfE) process. Included in the broader political agenda of this process was the goal of supporting and strengthening democratization, which gradually replaced state socialism in post-communist countries (see box right). During preparations for the Århus Convention in the 1990s, it became clear that public rights and participation remained an elusive goal, in many of the established Western democracies as well as in Central and Eastern Europe (REC 1998).

Human development

Europe is predominantly a region of high to medium levels of human development (UNDP 2001). However, while the overall level continues to improve gradually throughout Western and parts of Central Europe, many countries of Eastern Europe have suffered severe setbacks, including a rise in income poverty, since the beginning of the transition process.

The region traditionally has high rates of adult literacy, estimated at 95 per cent or more for Europe as a whole, although rates tend to be slightly lower in southern parts of Western Europe (UNESCO 1998).

In several of the CEE countries (Moldova, Romania, the Russian Federation and Ukraine) half or more of the population had incomes below the official poverty line in the period 1989–95 (UNDP 1999a). This impoverishment is reflected in a drastic fall in real wages and per capita GDP, high rates of inflation and a rise in income inequalities — including between men and women, the latter often being the first to lose their jobs. Relative prices have also changed, with prices of goods and services needed by the poor often rising much faster than others (UN 2000a). While income poverty is clearly more pervasive and severe in Eastern Europe, it is not unknown in Western Europe, with an estimated 17 per cent of the EU population (excluding Finland and Sweden) still experiencing poverty. Vulnerability to income poverty is more widespread: 32 per cent of Europeans experience at least one annual spell of low income over a period of three years, while 7 per cent experience persistent poverty during this period (EC 2001).

The human costs of the transition process have reached beyond income poverty alone. In Europe as a

The enlargement of the European Union

For the ten Central and Eastern European (CEE) countries that have applied to join the EU (the Accession Countries), membership is seen as a means to stabilize the changes resulting from transition, as well as a means to accelerate economic development. For all 13 Accession Countries, EU membership poses tremendous political and economic challenges, including harmonization of laws and institutions to EU requirements. Both the EU and Accession Countries are in transition to more sustainable development but with different starting points.

Note: in early 2002, the Accession Countries were Bulgaria, Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia and Turkey

Availability of and access to environmental information

Information, participation and access to justice are essential elements of a true participatory democracy. These themes therefore became central elements in the EfE process, resulting in the endorsement of the Sofia Guidelines in 1995 and the adoption of the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (the Århus Convention) at the Environment for Europe Ministerial Conference held in Århus, Denmark, in 1998.

The Århus Convention is based on the notion that the involvement of the public in decision-making, notably by public authorities, tends to improve the quality and implementation of final decisions. It guarantees the right to information, participation and justice in the context of protecting the rights of present and future generations to live in an environment adequate to health and well-being.

whole, life expectancy has increased in the period 1995–2000 compared to 1975–1980 from 70.3 to 73.1 years (both sexes, compiled from United Nations Population Division 2001). However, in some Eastern European countries life expectancy has decreased over the same period, especially for men — for example from 62 to 58 in the Russian Federation and from 65 to 64 in Ukraine (UNDP 1999b). In addition, in many CEE countries (Belarus, Estonia, Latvia, the Russian Federation and Ukraine), the ratio of men to women is far below the standard ratio. The causes of this 'missing men issue' are multiple and complex but stem mainly from human insecurity: military conflict, poor health, unemployment, loss of pensions and corruption, all of which result in social breakdown and a poor quality of life (UNDP 1999b).

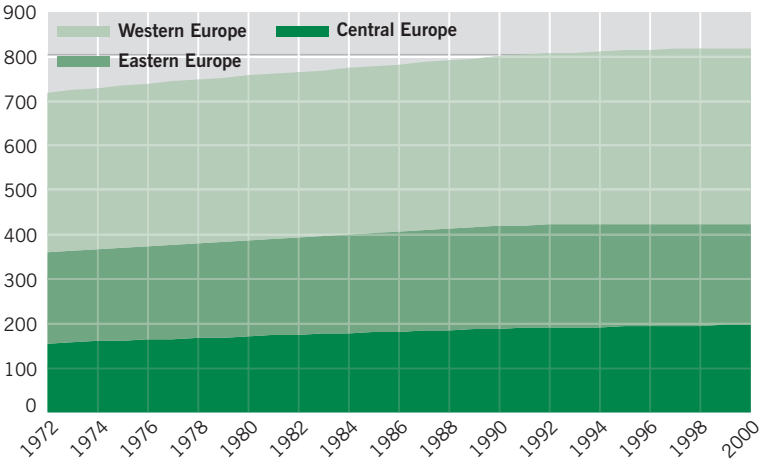
Dismantling of the communist era welfare system also led to social disintegration and inequality in social services in CEE. This decline was associated with a proliferation of fraud, illegal businesses and organized crime (UNDP 1999b). In sharp contrast to conditions before transition, people now find themselves deprived of personal safety and security — often at the mercy of organized criminal forces that have arisen on the basis of collusion with corrupt government officials. The increase in crime reveals a weakness in state authority and in public law enforcement.

The changing population

Europe's population has increased by 100 million since 1972 to a total of 818 million in 2000, or 13.5 per cent of the global population (see graphic). The most significant demographic change currently taking place in much of the region is the ageing of the population as a result of low fertility rates and increased life expectancy. Fertility rates have declined from 2.3 to 1.4 children per woman over the past 30 years and are as low as 1.1 in Armenia, Bulgaria and Latvia — well below the 2.1 children per woman required to keep population levels stable (United Nations Population Division 2001).

Another trend which is likely to continue, and which is an enormous challenge for the region, is that of population movements throughout Europe. These are related both to conflicts (asylum-seekers, displaced persons and refugees, including transit migration from developing countries) and to the search for more remunerative lifestyles (UNECE and others 1999, UNDP 1999b).

Population (millions) by sub-region: Europe



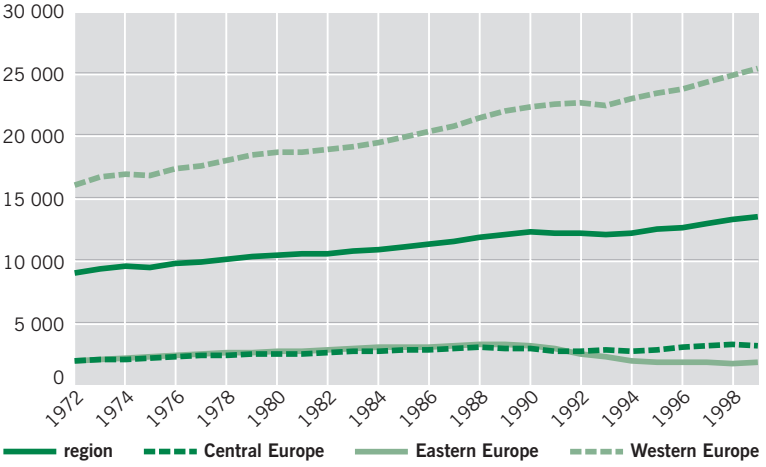
Europe's population increased by 100 million since 1972 but fertility rates have now fallen to below replacement levels in many countries

Source: compiled from United Nations Population Division 2001

Economic development

The economies of Western Europe have recovered from the recession of the early 1990s and were growing at around 2.5 per cent a year by the end of 2000 (UN 2000a). An important factor has been the realization of the single market. Starting with the creation of the European Monetary System in 1979, the completion of the European Single Market became a fact in 1993, and the European Monetary Union became a reality for 300 million people in 12 EU countries with the debut of the Euro on 1 January

GDP per capita (US$1995) by sub-region: Europe



Although GDP per capita has climbed steadily in Western Europe and thus in the region as a whole, there are marked contrasts with GDP per capita levels in Central and Eastern Europe

Note: data for CEE are unreliable pre-1989. Source: estimated from World Bank 2001

Energy consumption in Europe

Although the per capita consumption of fossil fuels in Europe as a whole has hardly changed over 30 years, this is partly the result of negative growth in energy consumption in CEE countries due to economic restructuring. In Western Europe, however, the link between economic growth and energy use has not been broken (EEA 2001). Per capita energy consumption varies considerably throughout Western Europe but is increasing in most countries with the exception of Germany, where it decreased by 5 per cent between 1987 and 1997. While per capita energy consumption in CEE is often lower than the Western European average, energy intensity is three or more times higher (OECD 1999). This is due to the high share of heavy industries, obsolete technologies and low efficiency of energy use. Current and future changes in industrial activity will have major implications for the link between energy use and economic growth. Replacing obsolete technologies with modern cleaner technology provides a potential for a more sustainable development.

2002. The currency is likely to be an instrument of economic stability and growth throughout Europe, which will strengthen economic and political cooperation in the region.

Per capita GDP (measured in constant US$1995) has grown steadily for the region as a whole from about US$9 000 in 1972 to an average of US$13 500 in 1999 (see graph on page 47). Nevertheless, there are major sub-regional differences, ranging from US$25 441 in Western Europe in 1999 to US$3 139 in Central Europe and US$1 771 in Eastern Europe (compiled from World Bank 2001). Between 1980 and 1999, real GDP declined in 14 CEE countries and by more than 50 per cent in four of them — Georgia, Moldova, Ukraine and Yugoslavia (UN 2000a).

Average per capita consumption has increased steadily by an average 2.3 per cent a year in Western Europe over the past 25 years (UN 2000b). Consumption in some CEE countries has started to increase in recent years, as some of the population has achieved increased purchasing power, particularly in Poland (which has experienced a 65 per cent increase since 1991), Hungary and Slovenia (UN 2000b).

Science and technology

Europe is a leader in the development and use of science and technology. The region has at least 19 hubs of technological innovation, led by Finland and Sweden, with many countries at the cutting-edge of technological innovation. Europe accounts for about 30 per cent of global expenditure on research and development, second after North America and equal to Asia and the Pacific (UNESCO 2001). The growth of information and communications technology, particularly the growth of the Internet linking millions of European homes and workplaces, is probably the single most stunning technological advance in the past 30 years. Internet users increased by 250 per cent between 1998 and 2000, from 539 per 10 000 inhabitants to 1 366 per 10 000 (ITU 2002), although these figures mask distinct sub-regional differences.

The European Space Agency and Canada launched the Envisat environmental satellite in early 2002 to monitor the health of the planet by collecting data on changes to the Earth's land, oceans, ice caps and atmosphere.

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Socio-economic background: Latin America and the Caribbean

Latin America and the Caribbean has experienced financial and political turmoil over the past three decades. While some aspects of human development have improved significantly, poverty — especially in rural populations — and inequity persist as major problems, hindering regional efforts to move towards sustainable development.

Human development

Six of the region's 46 countries (Argentina, Bahamas, Barbados, Chile, Costa Rica and Uruguay) are ranked as having a high level of human development; most of the others are in the medium human development group and only Haiti ranks in the low human development group (UNDP 2001).

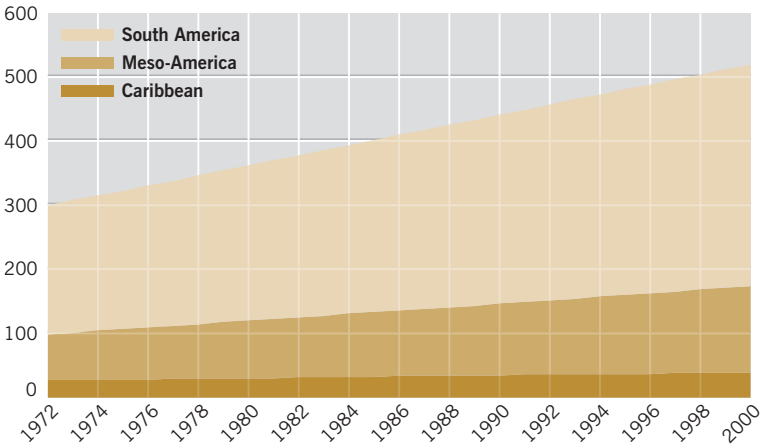
Poverty is widespread. It is estimated that about 200 million people, or 40 per cent of the region's population, live in poverty (IADB 2000, ECLAC 2000). The incidence of poverty is higher in rural areas but there are more poor people in urban areas than in rural ones, and almost one-half of the poor are children or youth.

Life expectancy increased from 65.8 to 72.5 years between 1970 and 2000, with important national and sub-national differences that are related to per capita income levels (PAHO 1998). The highest life expectancies are in the Caribbean (74 years) and in South America (73.5 years), although there are variations with sub-regions — life expectancy is 20 years longer in Cuba and Puerto Rico than in Haiti and 10 years longer in Venezuela and Colombia than in Bolivia. Despite this, all countries except Haiti now exceed the life expectancy goal of 60 years proposed for the region in 1977 as part of the World Strategy on Health for All by the Year 2000 (PAHO 1998). More efficient health programmes have also lowered the child mortality rate significantly, from 81.6 per 1 000 births in 1970 to 35.5 per 1 000 in 1995 (World Bank 1999).

Education has also improved in the past two decades. Adult literacy rates are generally high at about 88 per cent in 1999 (UNDP 2001), a leap from 77 per cent in 1980 (PNUMA/OD 2001). However, the highly unequal distribution of income, which is pervasive throughout the region, is mirrored by inequalities in access to schooling, attendance and performance (UIS 2001).

Violence, including homicide, is on the increase in the entire region, particularly in Colombia and Brazil. Furthermore, violence within the family has increased, particularly towards women and children; it is estimated that about half the women in Latin America face at least one episode of family violence in their life (ECLAC 2000). In recent years, the region as a whole has edged towards peace except for a few conflicts such as those between Peru and Ecuador in the 1990s.

Population (millions) by sub-region: Latin America and the Caribbean



Although the region's population grew by 74 per cent during 1972–2000, the growth rate dropped from 2.48 to 1.52 per cent a year over the same period

Source: compiled from United Nations Population Division 2001

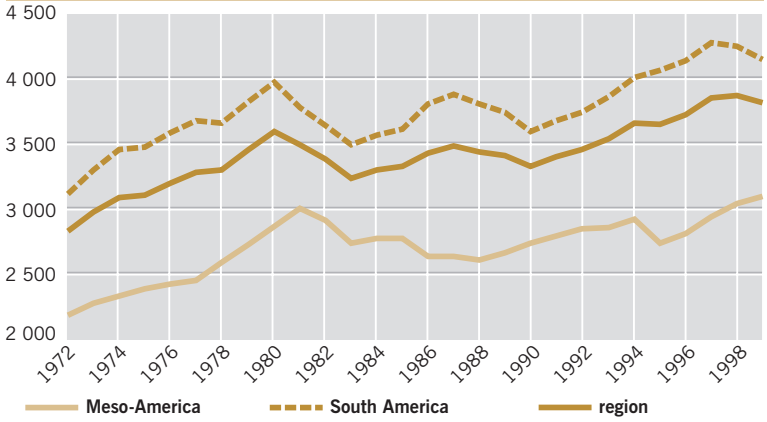
The changing population

The region's population has increased by about 74 per cent from 299 million in 1972 to an estimated 519 million in 2000. However, the annual population growth rate dropped from 2.48 to 1.52 per cent over the same period, largely as a result of changes in birth patterns — fertility rates halved from 5.6 children per woman in 1970 to 2.7 children per woman by 1999. Population growth rates are now highest in Meso-America, 1.78 per cent, and lowest in the Caribbean, 1.04 per cent (compiled from United Nations Population Division 2001).

Economic development

Economic growth has fluctuated in the region over the past three decades from a high of 8.4 per cent a year in 1973 to a low of –2.2 per cent a year in 1983 (World Bank 2001). As a result, per capita GDP has grown by an average of only about 1.0 per cent a year, from US$2 827 in 1972 to US$3 819 in 1999 (compiled from World Bank 2001), although some countries have performed better than others. In Chile, for example, per capita GDP more than doubled from US$2 360 to

GDP per capita (US$1995/year): Latin America and the Caribbean



For the region as a whole, growth of per capita GDP averaged only about 1.0 per cent a year during 1972–99

Note: reliable data for the Caribbean sub-region are unavailable

Source: estimated from World Bank 2001

US$5 121 while in Nicaragua it almost halved from US$917 to US$472 (World Bank 2001).

Growth in the 1990s was made possible through major economic reforms, particularly trade and investment liberalization. Integration processes, including free trade agreements and customs unions — such as the North American Free Trade Agreement (NAFTA), the Andean Pact, the Southern Common Market of Latin America (MERCOSUR), the Caribbean Community (CARICOM), and the Central American Common Market — have begun to pay dividends. For example, Andean Community exports increased by 37 per cent in value terms in 2000 and intra-regional exports by 29 per cent. Similarly, intra-regional trade in the MERCOSUR countries increased by 21 per cent and under NAFTA by 20 per cent (IADB 2000).

Inequities in social development

The level of distributive inequity in the region is the highest in the world, and is still increasing in all sub-regions. In the region as a whole, the minimum wage was on average 28 per cent lower in 1998 than in 1980. The limited job creation capacity of the region's economies and the fact that those with university education benefit most from rising demand for labour are among the suspected reasons for the continuing concentration of income but debate continues on the root causes.

The situation with regard to the distribution of land reflects a similar trend, with land ownership highly concentrated in Chile, Mexico and Paraguay, for example. Inequality in access to this basic asset by the rural population is a source of social tension. Numerous conflicts arose during the 1990s due to land access problems and high levels of rural poverty. To address this problem, Costa Rica's government has redistributed almost 2 million hectares (roughly one-third of the country's total land area) through large-scale land title allocation, acquisition and settlement programmes. El Salvador's 'Peace Agreement' has brought agrarian reform and a land-transfer programme (currently, 75.1 per cent of land is owner-occupied in El Salvador).

Source: ECLAC and UNEP (2001)

Nevertheless, except for a few countries such as Chile, the majority have been unable to regain their pre-1980s economic strength and, overall, the region has achieved only modest economic growth over the past 30 years. Exports remain largely based on commodities and primary goods, particularly oil and its derivatives, minerals, agriculture, forestry and related products. In this respect, the region's traditional vulnerability and external dependence have increased further due to the unsustainable nature of these activities in terms of both market access and long-term availability of natural resources (UNEP 2000). In many countries imports continue to grow more rapidly than exports (ECLAC and UNEP 2001).

Per capita energy consumption increased from about 0.7 to 0.9 tonnes of oil equivalent during 1972–99, compared with the global average of 1.1 tonnes of oil equivalent (compiled from IEA 1999 and United Nations Population Division 2001).

The region's external debt burden increased dramatically (21-fold) from US$46 251 million in 1971 to US$982 032 million by 1999, accounting for 38 per cent of global debt (World Bank 2001). Governments started to take on unsustainably high levels of debt in the 1970s with devastating consequences for regional economies during the decades that followed. In the 1980s, rising interest rates in the United States and Western Europe increased debt service payments while efforts to reduce the inflation caused by recession reduced the income from which to service the debt. Hyperinflation occurred in many countries, notably in Argentina and Brazil, as governments resorted to printing money. The 1990s saw an accumulation of large macroeconomic imbalances that led to severe crises in Mexico in 1995, Brazil in 1998 (ECLAC and UNEP 2001) and most recently Argentina in 2001-2002. Argentina alone has a national debt of US$147 880 million, or about 18 per cent of the region's total. Some countries, such as Bolivia and Guyana, have now qualified for debt relief under the Heavily Indebted Poor Countries (HIPC) initiative (World Bank 2001).

In 1999, the unemployment rate in the region reached 8.8 per cent, the highest in the 1990s (ECLAC and UNEP 2001), similar to the rate at the height of the debt crisis in the 1980s. With the exception of Chile and Panama, the number of people working in the informal sector rose in most countries as unemployment rates increased. In the 1990s, seven out of every ten jobs generated in the region's cities

were in the informal sector, characterized as non-permanent, with little regulation and no social security (ECLAC and UNEP 2001). The only positive development in terms of labour force trends is the growth in female participation in the labour market. In 1980, little more than one-quarter of the labour force was female in Meso- and South America; by 1997, women made up one-third of the labour force in Meso-America and nearly two-fifths in South America. In the Caribbean, where female participation in the work force has been higher than the rest of the region, the figure reached 43 per cent in 1997 (ECLAC and UNEP 2001). The increase over the past two decades has been larger than in any other region in the world.

Science and technology

Traditional information and communication technologies continue to spread throughout the region, with a large increase in the distribution of telephones and radios in all sub-regions over the past two decades (see table). There has also been increased usage of mobile phones and computers, with Internet usage growing at more than 30 per cent a year in Latin America (UNDP 2001). Brazil is one of the top ten users of mobile phones, with more than 23 million subscribers in 2000; mobile phones have overtaken fixed lines in a number of countries including Mexico, Paraguay and Venezuela (ITU 2001).

The region, with 8.6 per cent of the world population, has 2.7 per cent of the international scientific community and produced about 2.5 per cent of the scientific publications in 1998. Brazil is considered to be the most successful country in science and technology, investing about 1 per cent of GDP for scientific research and development, compared to a regional average of 0.53 per cent (Massarani 2001).

The spread of communications 1980–98 (numbers/1 000 people)

	Telephone lines		*Daily newspapers*		*Radios*	
	1980	*1998*	*1980*	*1998*	*1980*	*1998*
Meso-America	23.0	86.2	54.8	54.7	181.4	298.7
South America	35.8	120.6	48.9	46.9	305.1	457.8
Caribbean	52.9	227.4	37.9	23.7	361.4	520.3
Region	**36.7**	**139.1**	**45.7**	**37.3**	**293.1**	**442.7**

Source: World Bank 2000

Governance

Two important political developments have marked the past three decades in the region. The first is the transition from military dictatorships towards democratic governments. All countries now either have a democratically elected government or are in the course of establishing one. The democratization process has made more rapid progress in recent years due to strengthening of local governments and municipalities, reform of the judiciary system and privatization of large state-owned enterprises.

The second important development relates to the participation of civil society and creation of civil society institutions such as non-governmental organizations. The increase in freedom has brought with it greater public concern for the environment and sustainable development but these issues have yet to be fully integrated into political decision-making.

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Socio-economic background: North America

The past three decades of the 20th century have brought increasing affluence and power to North America. North Americans not only live long lives in increasingly diverse societies but their production of material wealth and consumption of goods are also among the highest in the world. American capital, technology and goods are fuelling globalization, a defining trend of the new millennium that carries unprecedented opportunities and risks.

Human development

Based on the Human Development Index (HDI), the region probably has the highest level of human development in the world. With Canada ranked third and the United States sixth, the region has an average HDI value of 0.935, compared to 0.928 for the high-income OECD countries (UNDP 2001).

Despite this, poverty is not unknown in North America. Over the past decade, poverty rates have declined in the United States but increased in Canada. Although debates about the definition, measurement and thus extent of poverty continue, data clearly show that some social groups are more vulnerable than others. Poverty is more likely to affect aboriginal people, some minorities, single parents and children. (Ross, Scott and Smith 2000, Dalaker 2001).

The changing population

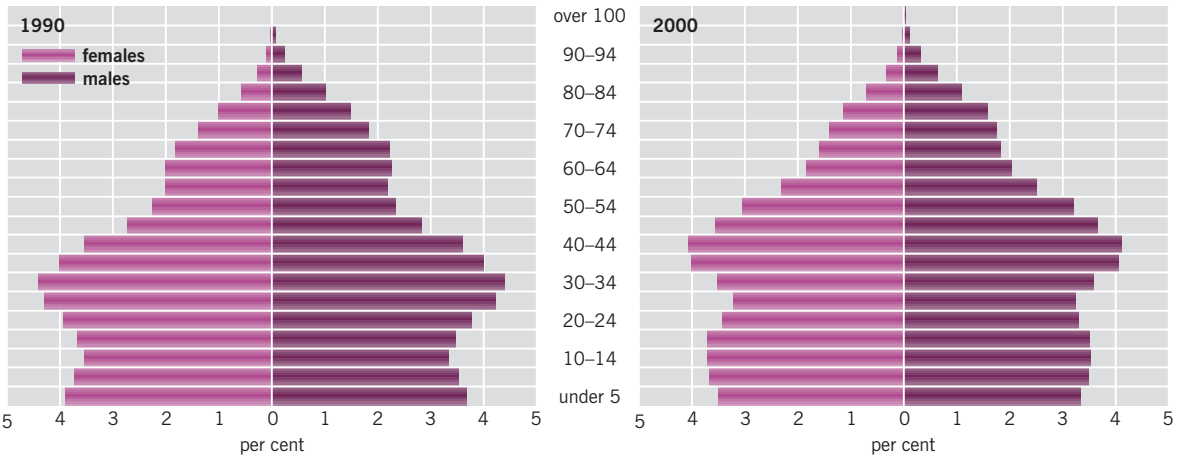
In contrast to other industrialized countries, particularly in Europe, population growth in North America continues, although growth rates have stayed constant at about 1 per cent over the past three decades and the region's share of global population has declined slightly from 6.2 per cent in 1972 to 5.2 per cent (about 314 million) in 2000 (United Nations Population Division 2001). Although birth rates are low, there is continuous immigration mostly from Latin America, the Caribbean, and Asia and the Pacific. This has also resulted in a more diverse population in the region (Blank 2001).

The population is growing older (see charts below). People aged 60 and more accounted for 14 per cent of the population in 1970 and 16 per cent in 2000. By 2025, this is projected to increase to 25 per cent (United Nations Population Division 1998). The gradual 'greying' of the population is a result of declining birth rates and increasing life expectancy as well as the ageing of the post World War II generation. This trend has implications for social security systems and also for global financial flows. As the number of retirees increases, they stop saving and start drawing down their accumulated assets instead.

Economic development

Since 1972, North America has experienced greater regional integration, increased economic activity and a gradual shift towards the service sector. Some North American companies have become truly transnational and have invested heavily in emerging economies, significantly influencing development patterns elsewhere. Despite periodic setbacks over the past 30 years, North America has strengthened its role as an engine of global economic change (Blank 2001).

Population pyramids 1990 and 2000: United States



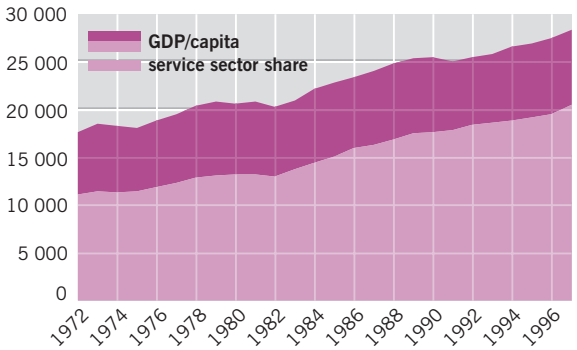
Population pyramids for the United States show a clearly discernible ageing trend, even over the single decade 1990–2000

Source: US Census Bureau 2002

Concerns about the vulnerability of the energy sector largely vanished as the 1973 and 1979 oil crises were followed by economic restructuring and the growth of the service sector (see graph). With the conclusion of a free trade agreement and the emergence of information and biotechnologies, many regional North American economies soared through most of the 1990s and then collapsed in 2000, shaking the stock markets.

In 2001, it was estimated that the 285 million people (including 135 million workers) of the United States produced about US$10 000 billion in GDP; the 31 million people (including 15 million workers) of Canada about US$670 billion in GDP (US Department of Commerce 2002, US Census Bureau 2002, US Department of Labor 2002, Statistics Canada 2002).

GDP per capita (US$1995/year), with service sector share: North America



GDP per capita grew strongly in North America over the past three decades, with the service sector share of the economy growing from 63 to 72 per cent during the period 1972–1997

Source: World Bank 2000

North America not only leads the world in economic output but also consumes the most. Private consumption per capita in the region is about five times the global average, and grew from US$11 461 in 1972 to US$18 167 in 1997, compared to a global average of US$2 315 in 1972 and US$3 257 in 1997 (World Bank 2001, all figures expressed in constant US$1995).

Although representing only around 5 per cent of the global population, the United States and Canada consume nearly 25 per cent of total energy (IEA 2002). While there is evidence of a slight decoupling of energy use and economic growth, per capita energy use has remained consistently higher than in any other of the world's regions (Mathews and Hammond 1999). Use of private vehicles continues to increase, whereas use of public transportation has generally remained constant (see 'Urban areas').

Science and technology

Over the past three decades, the region has led the world in scientific and technological innovation. North America has 14 global hubs of technological innovation, 13 in the United States and 1 in Canada, and 38 per cent of global expenditure on research and development comes from North America, with a large share of this spending taking place in the United States (UNESCO 2001). An increasing proportion of this investment comes from the private sector, accounting for 67 per cent in the United States and 45 per cent in Canada. Venture capital continues to be a particularly important source of funding for new technology-based firms, particularly in the information, communication and biotechnology sectors. Spending on higher education is among the highest in the world at more than US$19 000/student/year in the United States and more than US$14 500/student/year in Canada in 1998. The region also attracts the largest number of foreign-born scientists (OECD 2001a).

The United States was responsible for 34.8 per cent of all patents filed in 1995, and like Canada publishes a high number of scientific papers per capita. North America is a keen diffuser of information and communication technologies, key assets for a knowledge-based economy. Access to computers and the Internet are among the highest in the world, and access rates continue to grow. The United States is the world's largest Internet market, with almost 100 million regular users at the beginning of 2001. It was also the world's leading mobile market with about 110 million users in 2000, a lead likely to be soon overtaken by China (ITU 2001).

Multi-factor productivity, or the efficiency of the use of capital and labour in the production process, increased rapidly both in Canada and in the United States during the second half of the 1990s (OECD 2001b).

Governance

As the world moves towards global integration, political, fiscal and administrative power is increasingly devolving to states and provinces in North America. This has led to a 'flatter' corporate structure and decentralized decision-making. At the same time, non-governmental organizations have emerged as important new social actors, many with little formal authority structure.

But growing interconnectedness has also exposed the region to new risks associated with events half way

across the world. The events of 11 September 2001 demonstrated not only interconnectedness but also exposure, vulnerability and a need to improve understanding of the major driving forces at global level. The protection of American economic interests and investments has become integrated into the concept of national security (IIP 2001). Protests over liberalized trade in Seattle in 1999 and Quebec City in 2001 were evidence of growing public anxiety about globalization, environmental values, trade and labour rights. At the same time, a trend towards greater corporate accountability and transparency has potentially important implications for regulation and civil society's engagement in influencing the private sector.

The past 30 years also brought an increasingly conscious struggle to balance continued economic growth with environmental and social objectives. Concern about the state of the natural environment has come to the forefront as environmentalism became a recognized social movement. Prodded by the grassroots in the 1970s, environmental laws and policies were quickly enacted. North America was an early adopter of environmental legislation, public participation and, at least in the case of Canada, the concept of sustainable development (Barr 1993). Impressive gains were made in controlling many conventional pollutants and in continuing a trend in setting aside protected areas.

Environmental concern was increased during the mid-1980s by a new awareness of the global nature of some environmental problems, and membership in environmental NGOs soared. By the 1990s, 'common sense' approaches were advocated as concerns over deficit reduction led to budget cuts to environmental departments and to reliance on market incentives and voluntary programmes (Dowie 1995, Vig and Kraft 1997). After the UN Conference on Environment and Development in 1992, both countries became committed to sustainable development as reflected in stated federal goals in Canada and the efforts by many US states and localities in moving forward on *Agenda 21*.

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Socio-economic background: West Asia

The West Asia region has undergone major demographic development and socio-economic transformation, including substantial agricultural and industrial development, since oil was discovered at the beginning of the 20th century. These trends have intensified during the past 30 years.

Although the West Asian economy is statistically dominated by the petroleum industry, economic reality for many West Asians is still based on traditional lifestyles

Source: UNEP, Topham Picturepoint

Human development

Most West Asian countries fall into the high (Bahrain, Kuwait, Qatar and the United Arab Emirates) or medium (Jordan, Lebanon, Oman, Saudi Arabia and Syria) category of human development. Yemen is the only country classified as having a low level of human development, and information is not available for Iraq and the Occupied Palestinian Territories (UNDP 2001). Human development rankings were higher for most countries in the 1990s than the early 1980s although many have experienced set-backs over this period, particularly in the 1990s (UNDP 2000).

In some countries, there has been a significant improvement in certain components of human development over the past three decades. For instance, in Oman life expectancy increased from 54.9 years in the early 1970s to more than 70 in 2000 although in Iraq it declined from 66 to 58 years over the same period (WHO 2000). Access to improved water and adequate sanitation is generally high (80–100 per cent) with the exception of Yemen, where the figures are 69 per cent for improved water and 45 per cent for adequate sanitation (UNDP 2000, 2001). Access to safe water also dropped in Iraq during the second half of the 1990s (UNDP 2000).

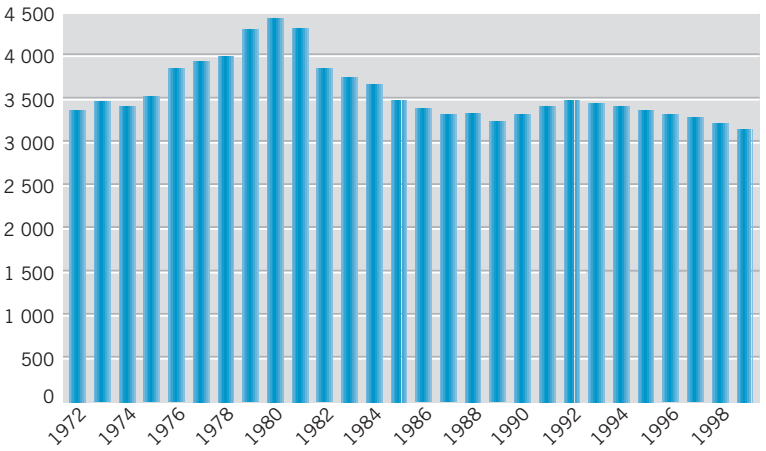
There is considerable variation in per capita GDP between the countries of West Asia. The highest are on the Arabian Peninsula, ranging from US$6 384 in Saudi Arabia to US$16 483 in Kuwait in 1998. However, in countries such as Kuwait, Qatar and United Arab Emirates, per capita GDP has declined over the past 30 years — for example, from US$36 413 in 1975 to US$12 950 by 1998 in Qatar. These changes are attributed to fluctuations in oil prices. Mashriq countries have much lower levels of per capita GDP, ranging from US$1 095 in Syria to US$2 288 in Lebanon in 1998 (data are not available for Iraq and the Palestinian territories). Yemen is by far the poorest country — average per capita GDP increased from only US$169 in 1975 to US$471 in 1998 (UNESCWA 1999).

Despite the relatively high per capita GDP in many countries, human and income poverty still exist. Seven West Asian countries (Iraq, Jordan, Lebanon, Oman, Saudi Arabia, Syria and Yemen) score poorly on one or more of the key components used to assess levels of human development. For most of these countries, adult literacy and low life expectancy are the key factors, rather than income poverty which is mainly an issue in Jordan, Oman and Yemen (UNDP 2001). Overall, literacy rates have increased in West Asia over the past two decades — for example to 92 per cent in Lebanon. Female literacy has increased steadily in most countries but it remains below the male literacy rate (UNESCO 2000).

The changing population

The total population of West Asia (excluding the Occupied Palestinian Territories) has almost tripled from an estimated 37.3 million in 1972 to 97.7 million in 2000, increasing less in the Mashriq than the Arabian Peninsula (see graph on page 56). The

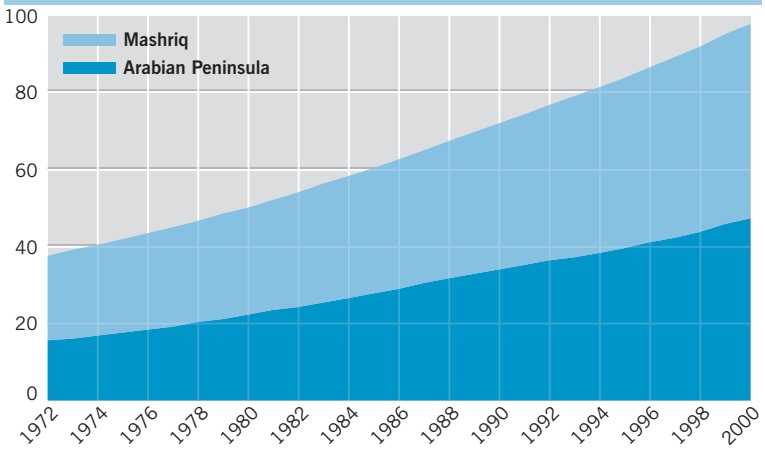
GDP per capita (US$1995/year): West Asia



West Asian GDP per capita has shown little overall change since 1972. Variations are mainly due to changes in the price of petroleum

Source: estimated from World Bank 2001

Population (millions) by sub-region: West Asia



The West Asian population is still increasing at more than 3 per a year — by about 3.6 per cent a year in the Arabian Peninsular sub-region and by about 2.7 per cent a year in the Mashriq sub-region

Source: compiled from United Nations Population Division 2001

population of the Occupied Palestinian Territories was 1.13 million in 1972 and 3.19 million in 2000 (United Nations Population Division 2001).

The regional population growth rate was still above 3 per cent in 2000, well above the global average of 1.3 per cent (United Nations Population Division 2001). There are, however, significant variations within the region — the population of the United Arab Emirates has increased more than eightfold since 1970 whereas in other countries the rate has been much lower or even negative. The highest growth rates are currently in the Yemen — 4.1 per cent a year at the end of the 20th century (United Nations Population Division 2001).

The high population growth rates can be partly attributed to national policies. For example, health improvements have brought about a decline in death rates of 50 per cent or more, increased life expectancy from 60.7 to 69.7 years, and more than halved the infant mortality rate from 75 to less than 30 per 1 000 live births. Despite a decrease in fertility rates in both sub-regions from more than 7 to 6.3 and 4.6 children per woman in the Arabian Peninsula and Mashriq respectively, present fertility rates are still much higher than the world average of 2.8 (United Nations Population Division 2001).

In most countries, the population is very young. In the Gulf Cooperation Council countries (GCC, all countries in the Arabian Peninsula except Yemen), 43 per cent of the population is younger than 15 years (Al-Qudsi 1996) and in the Mashriq sub-region the figure ranges from 30 per cent in Lebanon to 48 per cent in Iraq (UNESCWA 1997). Almost 50 per cent of the Palestinian population is under the age of 15 years, increasing the dependency ratio (those under 15 and more than 64 years, who depend on the working population) to more than 100 per cent, very high by world standards (PCBS 1997).

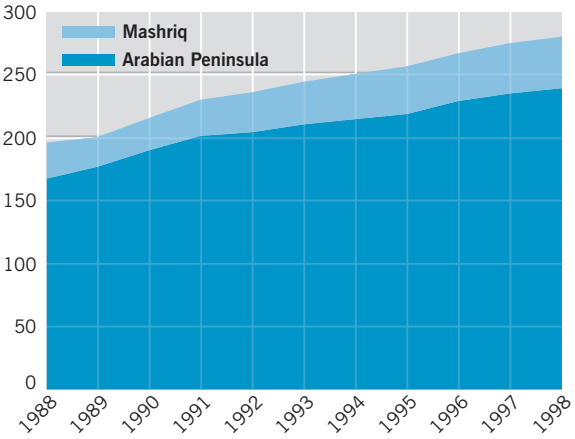
Despite rapid population growth during the past three decades, GCC countries still suffer from a low population base (Al-Qudsi 1996). While the increase in population has been partly due to high population growth rates, a large influx of foreign workers due to increasing demand for labour by the expanding industrial and service sectors has also been a significant factor. The total workforce in the GCC countries increased from 2 million in 1975 to 8 million by 1995. Foreign workers formed 70 per cent of this total workforce and up to 90 per cent in the United Arab Emirates and Qatar, 83 per cent in Kuwait, 60 per cent in Bahrain and Oman, and 59 per cent in Saudi Arabia (Al-Qudsi 1996).

Economic development

Economic performance has been greatly affected by fluctuations in oil prices on international markets, internal economic policies and other non-economic factors, including regional wars and internal conflicts (UNESCWA 1999). The economies of the GCC countries depend on oil revenues and related industries while those of the Mashriq countries and Yemen are more diversified.

Total GDP for the region has increased more than

Total GDP (US$1995 billion) by sub-region: West Asia



In real terms, total GDP increased by 43 per cent in the region as a whole over the decade to 1998 (measured in constant US$1995)

Source: estimated from World Bank 2001

threefold from US$85.8 billion in 1975 to US$256.67 billion in 1980 and reached US$307.71 billion by 1998 (UNESCWA 1999). The graph on page 56 shows the growth of total GDP in constant US$1995 for the period 1988–98.

The GCC countries (excluding Iraq) accounted for 85.47 per cent of aggregate nominal GDP for the region in 1997, of which Saudi Arabia had the largest share (US$146.2 billion) followed by the United Arab Emirates (US$49.54 billion) and Kuwait (US$30.37 billion). The Gulf War in 1990 severely damaged the economies of many countries in the region, directly or indirectly.

Economic growth rates have varied considerably within the region. While the real annual GDP growth rate averaged 3.04 per cent in the GCC countries between 1976 and 1998, it was slightly higher in some Mashriq countries — 4.46 per cent in Syria, 5.51 per cent in Jordan and 6.39 in Lebanon (UNESCWA 1999).

The structural composition of GDP in the region has changed markedly in the past three decades due to economic diversification (UNESCWA 1999). GCC countries started restructuring their economies to reduce their dependency on oil by diversifying into agriculture, industry and the service sector, including tourism. The combined share of the industrial sector (including oil) fell from 80 per cent in 1975 to 51 per cent by 1998, while the service sector's contribution increased from 19 per cent in 1975 to 44.5 per cent by 1998. The overall contribution of agriculture increased from 0.89 per cent in 1975 to 4.22 per cent in 1998 (UNESCWA 1999). Although the share of oil in the GDP of the GCC countries has fallen from 62.4 per cent in 1980, it was still high at 33.81 per cent in 1998.

Energy production and consumption: West Asia

West Asia is rich in conventional energy resources and 9 of the 12 countries are oil producers and exporters. Despite being a major producer, the Middle East uses only about 4.3 per cent of total global commercial primary energy. Energy consumption has grown faster in West Asia over the past three decades than anywhere else. Nevertheless, this growth slowed from 6.4 per cent annually in the 1970s to 4.7 per cent in the 1990s (UNDP, UNDESA and WEC 2000). Per capita total final energy consumption has also grown steadily over the past three decades, from 0.5 tonnes of oil equivalent in 1971 to 1.6 tonnes of oil equivalent by 1999 (compiled from IEA 2001).

Science and technology

Achievements in science and technology have been modest. Science and engineering students comprise about one-quarter of tertiary level students in Jordan, Kuwait, Lebanon, Syria and the United Arab Emirates, and as much as 41 per cent in Iraq (World Bank 2001). Nevertheless, lack of financial resources limit their contribution. Priority areas for research include water resources, biotechnology, renewable energy and the development of indigenous technologies.

The diffusion of communication technologies is variable. Distribution of personal computers ranges from almost twice the world average of 7.72 per 100 inhabitants in Bahrain, Kuwait, Qatar and the United Arab Emirates to only 0.19 per 100 inhabitants in Yemen (World Bank 2001). Use of mobile phones has grown rapidly, and is likely to have overtaken fixed lines in Bahrain and the United Arab Emirates, which have the greatest number of subscribers per 100 inhabitants — 54.8 and 30.0 respectively (ITU 2001, 2002).

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Socio-economic background: the Polar Regions

This section covers only the Arctic since the Antarctic has no permanent population. In the past 30 years, the Arctic has emerged as an important geopolitical region composed of eight nations surrounding the Arctic Ocean: Canada, Denmark (Greenland and the Faeroe Islands), Finland, Iceland, Norway, the Russian Federation, Sweden and the United States (Alaska). The Arctic encompasses about 13.4 million km^2 with a population of only 3.5 million people, a density of 0.26 people/km^2 (AMAP 1997).

Human development

Seven of the eight Arctic states rank high on the Human Development Index (HDI), including Norway (1st) and Greenland/Denmark (15th) while the Russian Federation at 55th is in the mid-range (UNDP 2001). The Russian Federation is the only Arctic nation with an HDI that has fallen over the past three decades (UNDP 2001). The rankings mask a subtle but critical difference between the Arctic region and the more temperate latitudes of each of the Arctic nations.

The Arctic region has lower life expectancy and higher mortality rates, including higher infant mortality rates, than the national averages of its constituent countries. Life expectancy in northern Norway is five years less than the national average for men and three years less than that for women (AMAP 1997). In Greenland, where more than 80 per cent of the population is Inuit, life expectancy is 69.5 years, almost ten years below that of Iceland (AMAP 1997, UNDP 2001). At the end of the 1980s, life expectancy for men (54 years) and women (65 years) in the Russian north was 10–20 years less than the national average (AMAP 1997). The rate of infant mortality for indigenous minorities of the Russian North is 30 per 1 000, and reached 47.6 per 1 000 among the Siberian Yup'ik, while infant mortality in Iceland is only 6 per 1 000 live births (AMAP 1997).

High rates of literacy characterize all Arctic areas but the quality of schooling in remote communities is below that of urban centres to the south. Concern for native language retention has led to renewed efforts to offer primary education in native languages as well as native language training in secondary schools and institutes of higher education.

All Arctic peoples share health risks from persistent organic pollutants (POPs), toxic metals, radionuclides, indoor and outdoor air pollutants, water contamination and ultraviolet radiation. Initial studies in Canada showed that levels of POPs in the blood of indigenous people who consume marine mammals were 3–10 times higher than levels in southern Canada. Fear of contaminants, however, may lead to changes in traditional diets that could lead to other health problems (Government of Canada 2000).

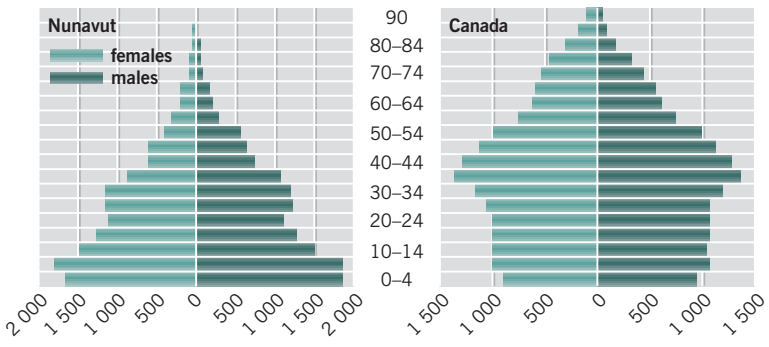
The changing population

The Arctic is home to numerous indigenous peoples. Inuit comprise more than 80 per cent of the population of Greenland and 85 per cent of the population of Nunavut, Canada. With these exceptions, indigenous peoples are minorities in their own homelands due to immigration.

The Arctic has a very youthful population; one-quarter of the population is younger than 15 in Greenland and Iceland, whereas 41 per cent are younger than 16 in Nunavut, Canada (Conference Board of Canada 2002, CIA 1998a and b). There was a dramatic 32 per cent increase in population in Nunavut between 1986 and 1996 due to high birth rates and increased life expectancy (see charts left).

Employment opportunities and housing construction have not kept pace with population growth, resulting in unemployment and serious housing crises in many communities (AMAP 1997). High rates of alcoholism, suicide, homicide and accidental deaths in Arctic populations may also be related to lack of opportunities and a resulting sense of powerlessness (Bjerregaard and Young 1998). By

Population pyramid for Nunavut and Canada



Arctic populations are young compared to those of the Arctic states themselves

Note: Nunavut in numbers of people, Canada in 1000s
Source: Conference Board of Canada 2002

the late 1990s, unemployment in the Russian North had reached 25–30 per cent (AMAP 1997), and half a million people had left the region (Weir 2001).

Economic development

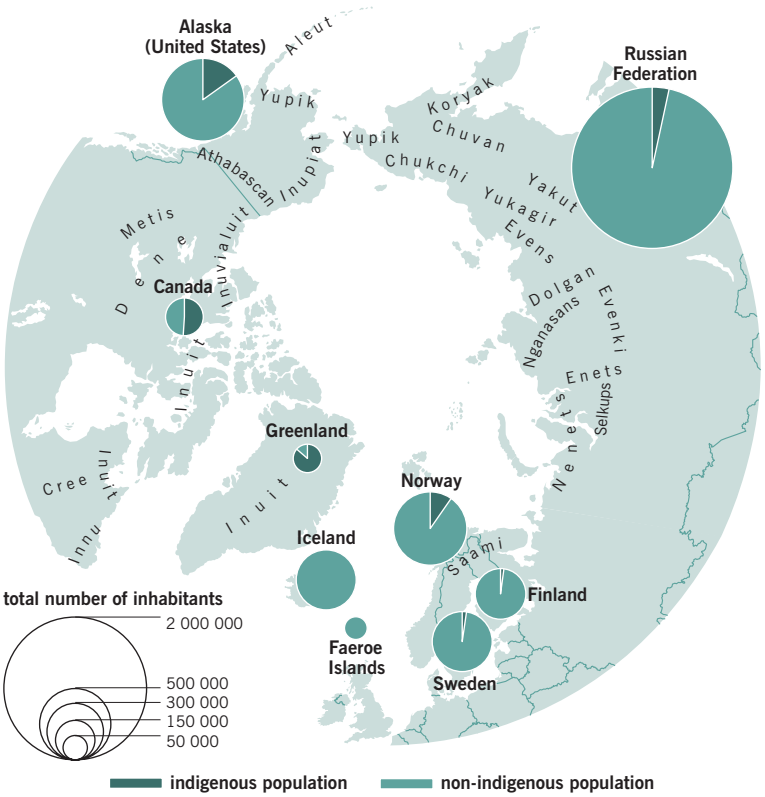
Fishing, tourism, the fur trade, arts and crafts are traditionally important commercial activities in the Arctic, and an estimated 26 per cent of the jobs in Alaska depend on a healthy environment (Colt 2001). The economies of Greenland, the Faeroe Islands, and Iceland are dependent on fishing and fish exports (AMAP 1997) which account for 75 per cent of Iceland's exports (CIA 1998b). The fur industry crashed in the 1970s due to animal rights protests, and European and US bans on marine mammal products (Lynge 1992).

Tourism is increasingly important to Arctic economies. Summer tourist visits to Alaska doubled in the 1990s, reaching almost 1.2 million in 1999 (ADT 2000) and accounted for 3 per cent of Alaska's gross state product in 1998 (Goldsmith 1999). By 1999, tourism brought annual revenues of US$30 million to Nunavut and almost US$1 000 million to Alaska (State of Alaska 2001).

Exploitation of petroleum resources has fuelled economic growth in the Arctic nations. Nearly 85 per cent of Alaska's budget comes from oil revenues (State of Alaska 2001), and further developments are planned. Oil development has expanded to offshore Alaska, and exploration is occurring on the shelf of the Faeroes as well as in the Norwegian sector (Bjorsvik 2000). Oil and gas resources are developed in several regions of the Russian North, of which West Siberia has been assessed as the world's largest petroleum province (Klett and others 1997). Exploration in Northern Canada, the site of half of the country's estimated petroleum potential, has been revitalized in recent years (DIAND 2001).

Mining is another important economic activity for some countries. Alaska's mining industry was valued at more than US$1 000 million/year during 1995–2000 (Knowles 2001a). Gold, lead, zinc and diamond production continue to be important to the Canadian Arctic (BHP Billioton 2002). Lead and zinc mining has ceased in Greenland (Taagholt and Hansen 2001) but a new gold mine has started test production. Russia's Norilsk mining complex was the world's largest nickel producer in 1997 (Norilsk 2002).

Indigenous populations in the Arctic



Map shows location of main indigenous peoples in the Arctic and the percentage of indigenous peoples in the Arctic areas of Arctic states

Source: CAFF 2001

Science and technology

Following the 1972 UN conference in Stockholm, indigenous participation in NGO forums and scientific meetings has led to an appreciation of different forms of traditional knowledge and the inclusion of traditional ecological knowledge in land and resource planning. Today, many scientists welcome the partnership of indigenous and local Arctic residents in research.

Internet access, while unevenly distributed, has revolutionized Arctic communication. However, while computers as well as television, film, video and broadcasting have spread across the Arctic, many of the settlements in the Russian Arctic still have inadequate or no telephone service.

The importance of subsistence foods

Communities throughout the Arctic depend on domestic reindeer, wild meat, birds, marine mammals, fish and local plants which account for up to 50 per cent of the indigenous diet and 25 per cent of the general population's diet in the Chukotka Autonomous Okrug region of the Russian Federation (AMAP 1997). This subsistence food is critical to indigenous people, and it is one reason why indigenous organizations promote the conservation of natural resources, rights to hunt, fish, trap and gather plants, and a reduction in the pollution transported to the Arctic from the mid-latitudes.

Alaskan Oil and the Arctic National Wildlife Refuge

The Arctic National Wildlife Refuge (ANWR) in northeastern Alaska is 'America's finest example of an intact naturally functioning community of arctic/subarctic ecosystems' (USFWS 2001). The Refuge is set aside for wilderness protection except for one disputed area that may be open to oil and gas exploration by an Act of the US Congress. This area is estimated to contain 2–12 billion barrels of economically recoverable oil. The US Fish and Wildlife Service (USFWS) reports a 50 per cent chance of finding an amount of oil equal to that consumed by the United States in nine months. Alaska's North Slope oilfields have already produced 13 billion barrels since 1973 and may have only 3 billion barrels remaining.

For the Gwich'in people straddling the Alaska/Canada border, the ANWR is sacred land because it includes calving grounds of the porcupine caribou herd, their chief source of food, clothing, tools, ornaments, and the centre of their culture (Gemmill 2002).

Governance

In 1972, the Arctic was a highly militarized zone preventing most international cooperation. Only with the establishment of the Arctic Environmental Protection Strategy (AEPS) in 1991 did all eight Arctic nations commit themselves to ongoing cooperation. In 1996, the AEPS developed into the Arctic Council to further environmental protection and sustainable development. The Council is unique among international organizations in granting indigenous organizations special status as 'permanent participants' of the Council (Arctic Council 2002).

Devolution of political authority from central governments to regional and even local governments and huge transfers of land and capital to indigenous peoples have occurred in the Arctic over the past three decades. Comprehensive Claims Agreements now cover all Arctic areas of Canada and include the transfer of millions of square kilometres of land and water, capital, revenues, harvesting exploitation and development rights. The Saami have gained considerable powers of self-determination through the creation of Saami Parliaments in each of the Nordic states. Greenland became semi-autonomous in 1979 with the establishment of the Home Rule Government, which was further strengthened in 1985 (Osherenko and Young 1989). Indigenous people of the Russian North have yet to achieve such a degree of control over their lands and lives despite protection of their rights in the 1993 Constitution and recent legislation (Osherenko 2001, Kryazhkov 1996).

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OUR CHANGING ENVIRONMENT: Mesopotamian marshlands

Comprising an integral part of the Tigris-Euphrates river system, the marshlands are located at the confluence of the rivers in southern Iraq and into Iran. The desiccation of these vast wetland resources is attributable to two main causes: upstream dams and drainage schemes. An aerial view of the marshlands in 1976 shows them still largely intact. Since then, there has been a 90 per cent decline in marshland area. By the year 2000, only a small section of the Al-Hawizah marsh straddling the Iran-Iraq border remains but even this is rapidly shrinking due to upstream water projects.

The marshlands are a key site for migratory birds. Marshland loss has put an estimated 40 species migrating between Siberia and South Africa at great risk. Several mammals and fish unique to the marshlands are now considered extinct. Coastal fisheries in the Northern Gulf, dependent on the marshlands for spawning grounds, have also been affected.

Many of the Marsh Arabs, who have lived on their fragile, near-floating homes in this rare water world for millennia, have now been forced to flee as a result of the collapse of their habitat. A culture has been destroyed and an indigenous people turned into refugees.

A typical marsh landscape, with villages built on artificial floating islands that enclose an area of swamp which is then filled with reeds and mud. For flood protection, more layers are added each year to strengthen the platform's foundation

In the image below, dense vegetation (mainly *Phragmites* reeds) appears as dark red patches, while red patches along river banks are date palms. By 2000 most of the Central Marshes appear as olive to greyish-brown patches indicating low vegetation on moist to dry ground

Compilation: Hassan Partow, UNEP Division of Early Warning and Assessment
Satellite images: USGS/EROS Data Center
Photograph: Nik Wheeler