Africa Environment Tracking: Issues and Developments

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Foreword

More than four years ago, the African Ministerial Conference on the Environment (AMCEN) requested UNEP to help launch an Africa Environment Outlook process to facilitate the monitoring and reporting on the state of the regional environment.

UNEP, through its Division of Early Warning and Assessment (DEWA) and the Regional Office for Africa, accepted the challenge and the AEO process is now fully integrated in our programme of work. The first AEO report was presented to AMCEN in 2002 and there is no doubt that it has become a substantive tool for African policymakers to use in the assessment of the pressing environmental issues facing the region.

Two of the policy options highlighted in the first AEO report were the need for the African Union and AMCEN to persuade the international community to adopt the New Partnership for Africa's Development (NEPAD); and to improve environmental information systems as a basis for sound decision-making. Both policy recommendations have since been implemented. NEPAD has been endorsed by the United Nations General Assembly and UNEP. The issue of environmental information systems is being addressed through the Africa Environment Information Network (AEIN), which AMCEN endorsed at its 9th Session. All six sub-regions in Africa and 13 countries are directly involved in the AEIN pilot phase. The rest of the countries are involved indirectly through capacity building activities such as training in integrated environmental assessment and reporting. The AEIN process is critical to keeping the state of the regional and national environment under review.

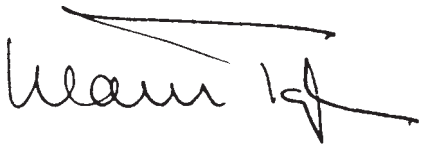
The first AEO report also urged African governments to support the production of sub-regional environmental reports. It is pleasing to note that two sub-regions will during the course of 2004 produce sub-regional environment outlook reports. In the Southern African Development Community, the preparation of such reports on a regular basis is now a policy decision as highlighted in the Regional Indicative Strategic Development Plan (RISDP). The RISDP, which was adopted by SADC countries during 2003, sets among others, a target to produce environmental assessment reports every five years.

It is important to note that the AEO process has facilitated these and other developments in a very short period. The process has informed policy discussions and facilitated action. Through this process, to which UNEP is fully committed, it has been possible to track environmental developments on a regular basis and to try and establish trends. It is through such tracking and determining trends that reliable information can be provided to policymakers for strategic decision-making. Reliable and

up-to-date environmental information is critical for sustainable development.

This targeted booklet on environmental issues and developments in two years since the launch of the first AEO report is yet another example of the premium we at UNEP place on keeping the Africa regional policymakers informed. Such information is critical to effective strategizing at the regional and even more important for action at the national and local levels. It is at these lower levels of decision-making that information is most needed and UNEP will continue to support the region in disseminating relevant information to different stakeholders and facilitate action.

It is our wish that this booklet – *Africa Environment Tracking: Issues and Developments* – will be a key resource for policymakerss in the region.



Klaus Töpfer
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Introduction

The African continent is rich in natural resources, many of high international value in terms of both monetary and global significance. The continent currently has six of the world's 25 biodiversity hot spots. Its resources are also of global importance for the world's climate and for the development of agriculture or industrial activities. The region has more than 50 000 known plant species, 1 500 species of birds and 1 000 mammals (NEPAD 2003).

Despite the richness of its biological, mineral and human resources, the continent remains poor. Food insecurity threatens millions each year, especially in the Horn and Southern African sub-regions, and Africa is home to more malnourished people than any other continent. Chronic food insecurity affects more than a quarter of the population at any one time, and interacts with the HIV/AIDS pandemic and structural economic problems to form a multi-dimensional emergency in many areas (Clover 2003). Various processes of environmental degradation threaten agricultural and pastoral lands, watersheds, surface and groundwater sources, and the rich forests and savannahs of the continent. There are 2 018 threatened animal species across the region.

In response to such challenges, the African Ministerial Conference on the Environment (AMCEN) was established in 1985 to strengthen cooperation between African governments in policy responses and on technical and scientific activities to halt the degradation of Africa's environment and satisfy the food and energy needs of the continent's people.

AMCEN provides continent-wide leadership by promoting awareness and consensus on global and regional environmental issues, especially those relating to international conventions on biodiversity, desertification and climate change, and developing common positions to guide African representatives in negotiations for legally binding international environmental agreements.

At its 8th Session in Abuja in April 2000, the Ministers decided that an Africa Environment Outlook (AEO) report should be prepared with the assistance of UNEP, to provide a comprehensive scientific assessment of the environment, policies, and environmental management programmes in Africa.

The report was launched at the Ninth AMCEN Session held in Kampala, Uganda between 4–7 July 2002.

The report revealed that environmental degradation remains a major challenge to sustainable development on the continent. A significant portion of the Gross Domestic Product (GDP) of many African countries is eroded through environmental degradation.

Social and economic inequality is increasing and human vulnerability due to environmental change is also increasing and manifesting itself into disasters in many parts of the continent.

The 9th session consequently adopted the AEO report as a tool for monitoring sustainable environmental management in Africa and also to act as the environmental reporting framework at national levels. It would also be used as a tool for monitoring the implementation of AMCEN programme and NEPAD's Environment Programme.

UNEP was requested to continue assisting AMCEN in producing the AEO on regular basis and also to establish an Africa Environment Information Network (AEIN) to support the production process.

This publication has been prepared as a complementary product of the AEO and it summarizes major environmental events and trends from July 2002 – November 2004, focusing on poverty and environment, freshwater, land, biodiversity, environmental emergencies and security, small island developing states, climate change and the major regional institutional developments in the area of environment. The objective is to keep these rapidly evolving issues in the focus of the decisionmakers in the region and stimulate timely action to address them.

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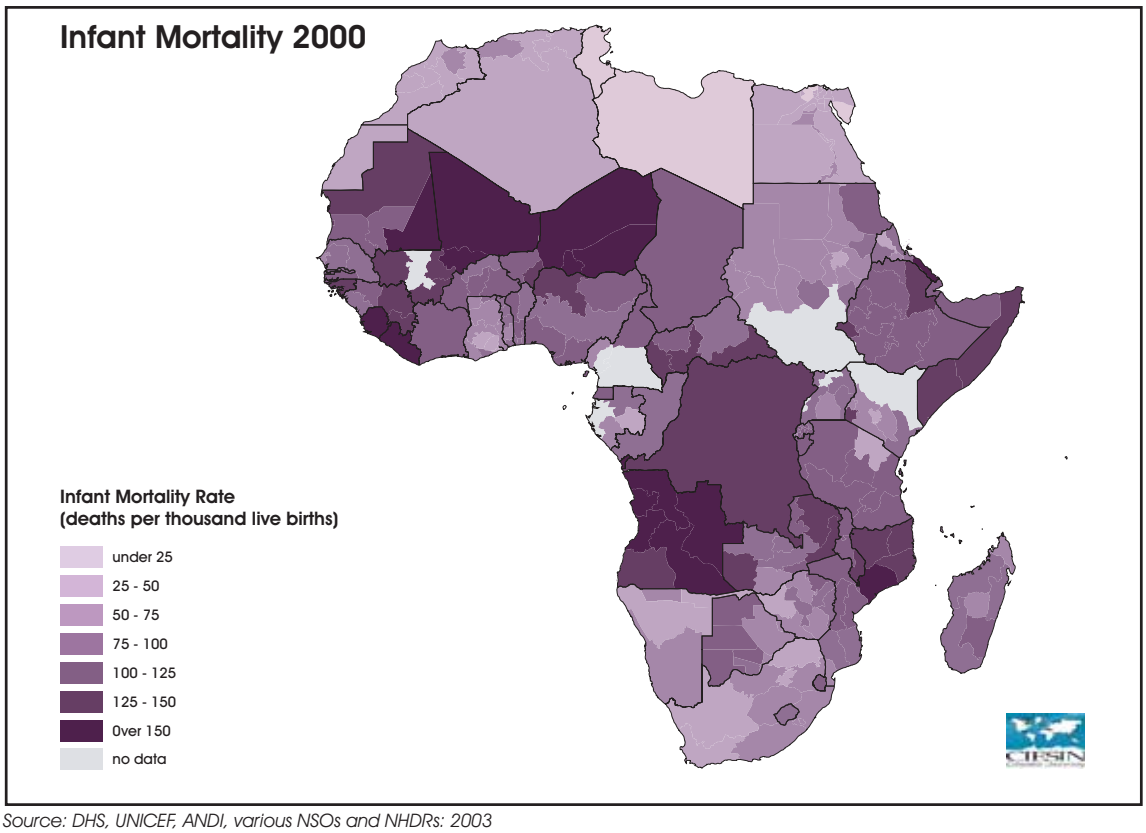
Christian Lambrechts

Poverty and the Environment

While at a global level the proportion of people living below the poverty line has fallen by almost half since 1981, the proportion has actually increased in Sub-Saharan Africa, and was estimated at 41.6 per cent of the total population in 2001 (World Bank 2004), which constitutes a huge challenge to achieving the Millennium Development Goals (MDGs).

Africa is the poorest region of the world, and the only region of the world where poverty is projected to rise during the twenty-first century if adequate measures are not taken urgently (NEPAD 2003). The number of people living in absolute poverty is expected to rise from 315 million to 404 million over the next 15 years (UNEP 2004).



Source: DHS, UNICEF, ANDI, various NSOs and NHDRs: 2003

The UNDP Human Development Report, 2003, identifies a total of 31 countries worldwide which are experiencing high levels of poverty, as measured by specific Millennium Development Goals, and are making slow or negative progress towards achieving the particular Goal. Of these 31 'top priority' countries, 25 are in Africa (UNDP 2004). Of the 35 countries at the bottom of the Human Development Index, in the 'low human development' category, 31 are African States. 32 of the 48 countries included in the list of least developed countries (LDCs) are in Africa (NEPAD 2003).

As noted by the WSSD Plan of Implementation, poverty in Africa has been exacerbated by conflicts, insufficient investment, limited market access opportunities and supply side constraints, unsustainable debt burdens, a general trend of declining levels of official development assistance, and the impact of the HIV/AIDS pandemic.

Strong global growth, buoyant commodity prices and better economic policies should, however, lead to a sharp upturn in Sub-Saharan growth in 2004–2005 (IMF 2004).

Poverty and access to environmental goods and services

Poor people are often blamed for environmental degradation, as areas which are experiencing the loss of the most globally significant and biodiverse ecosystems are also amongst the poorest in the world (Koziell and McNeill 2004). However, where poor communities are degrading the environment through unsustainable practices, it is often the case that they have been denied the opportunity to access goods and services in more sustainable ways because of economic, legal, ethnic, or other barriers.

The poor are the most affected by environmental degradation, because they have fewer livelihoods and habitation options. However, they are also environmental managers in their own right and are able to pro-actively respond to environmental change, as well as the challenges of poverty, the impacts of conflict, and other constraints.

African society remains overwhelmingly rural, despite being the most rapidly urbanizing continent. Overall, 63 per cent of Africans live in rural areas. The rate is much higher in some countries; in Rwanda for example, approximately 90 per cent of the population live in rural areas, and 81 per cent of households identify subsistence farming as the main household economic activity (Republic of Rwanda 2002). In neighbouring Burundi, urban areas cover less than one per cent of the total land area.

Africa: Fastest growth in decades

African incomes per head are set to rise by nearly six per cent in 2004-05, decisively reversing the long-term downward trend seen between 1970 and 2000. According to a Sub-Saharan outlook released in October 2004 by the International Monetary Fund (IMF), almost all economic indicators are positive over the next 18 months. As well as predicting real GDP growth of 5.7 per cent in 2005 almost double the three per cent annual average between 1997 and 2001 the Fund expects inflation to slow to 9.9 per cent from an average of 14.7 per cent a year between 1997 and 2001, while the Sub-Saharan current-account deficit will fall to two per cent of GDP in 2004, half the average for the previous five years.

Source: IMF 2004

Munyaradzi Chenje

Air pollution is a significant problem in urban areas. Use of unleaded fuel compounds the problem, and seriously impacts human health.

Livelihoods are overwhelmingly reliant on smallholder agriculture, livestock production, fishing, and other forms of subsistence production. Access to land is a vital underpinning of these livelihoods.

In addition to farmland and pasture, resources such as forests, hillsides and wetlands are important for the poor, especially in remote areas and in times of hardship. They fulfil many day-to-day needs, for example by providing fuelwood; in sub-Saharan Africa countries (with the exception of South Africa), fuel wood accounts for between 60 per cent and more than 90 per cent of primary energy consumption. The continental average figure is the highest in the world (World Energy Council 2003). Medicinal products; raw materials for construction and crafts; bushmeat; and wood for fuel contribute up to 50 per cent of household food requirements and up to 40 per cent of household incomes. There are clear linkages between environmental access, environmental quality, and human health: the environmental portion of the general burden of disease is estimated to be higher in Sub-Saharan Africa than in any other part of the world (McGranahan and Kjellen 2004).

In urban areas, land tenure issues are also important for the livelihoods and well-being of the poor. Millions of people live in slums: 71.9 per cent of the total urban population, the highest proportion of any continent (UN-Habitat 2003). Lack of land tenure prevents effective development of infrastructure, including water provision. Urban or peri-urban agriculture is also a crucial survival mechanism for many, who lack certainty that they will be able to harvest what they plant in marginal areas such as roadsides or undeveloped plots.

Text Box 1: Poverty, public health and the environment: Unleaded fuel

One example of environment-public health links is the public health aspect of the use of leaded fuel. Lead from fuel consumed in vehicles represents a grave health risk. Human exposure to environmental lead has been found to significantly lower children's intelligence quotient (IQ), delay puberty in girls, cause permanent brain damage and stunted growth in children, while causing hypertension, heart diseases and premature deaths in adults (NEMA 2003). Intake of lead into the human occurs through inhalation of polluted air or ingestion through vegetables grown along highways and other urban farms. People who spend long amounts of time by the roadside – as many poor people do, either due to homelessness or the use of the roadside as a place to engage in petty trade – are particularly vulnerable. There has been some improvement in this area in recent years: the Partnership for Clean Fuels and Vehicles has encouraged and facilitated moves by a number of countries to switch to unleaded fuel. Cape Verde, Egypt, Ghana, Libya, Mauritius, Mauritania and Malawi have already phased out leaded petrol, for example; while other countries have made steps to phase out use of leaded fuel by 2005, as laid out in the Dakar Declaration and, according to a UNEP survey, most are on course to do so, http://www.unep.org/pcfv/regact/Africa/Africa.htm and UNEP (2004).

Munyaradzi Chenje

Some countries, such as Egypt have completely phased out leaded petrol. Such a move has considerably reduced the health risk resulting from lead poisoning.

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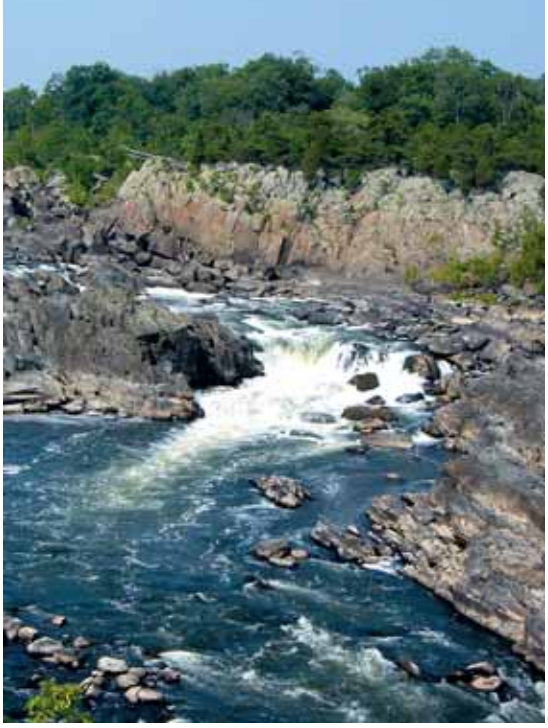

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Freshwater

Freshwater is necessary for economic growth and development and survival of ecosystems, as well as human communities. The Millennium Development Goals aim to reduce by half the number of people without access to safe water and sanitation by the year 2015 – a huge challenge. The Pan-African Implementation and Partnership Conference on Water, held in December 2003 in Addis Ababa, identified some of the pressing issues facing Africa, which include:

- Tripling access to water and quadrupling improved sanitation in order to achieve MDGs
- Closing the sanitation gap of the urban poor
- Reducing high water related diseases and deaths
- Preventing water pollution from cities
- Rising food insecurity
- Expanding irrigation for agriculture
- Doubling hydropower generation services
- Rising costs of water related disasters
- Sharing water among sectors and countries. (UNEP 2004).

Lack of access to safe water: Scale and impacts of the problem

Globally, more than 1 billion people lack access to safe water (World Bank 2004) with Africa accounting for 27 per cent or over 300 million people lacking reasonable access to safe water and sanitation (UNEP 2003a). Access to safe and adequate amount of water significantly contributes to improved health and food production and reduces the disproportionate burden on women and children who are normally responsible for collecting water for domestic use. Only 64 per cent of the African population has access to improved water supply with 50 per cent found in rural and 86 per cent in urban areas (UNEP 2003a). The majority of poor urban and rural people therefore travel long distances, with women spending three hours a day, or more in some areas, collecting water (UNEP 2002c).

Some of these problems are related to absolute water availability per capita. By 2025, 14 African countries (representing a total of 230 million people) will be affected by water scarcity, while another 14 (460 million people) will be suffering from water stress (UNEP 2002b).

However, much of the problem can be attributed to inadequate investment in water supply systems, especially in remote areas, and poor water management. In most countries, relatively little of the total freshwater supply is being utilized (with Northern Africa and South Africa representing notable exceptions). Pro-poor water policies will be necessary, in addition to basin-level management activities (McGranahan and Satterthwaite 2004).

Table 1: Access to safe water in some African countries (per cent of total population)

Northern Africa		Western Africa and Central Africa		Southern Africa	
Algeria	79	Benin	50	South Africa	70
Egypt	80	Burkina Faso	78	Mozambique	32
Morocco	55	Cote d'Ivoire	72	Namibia	57
Sudan	60	Ghana	56	Zambia	50
		Guinea	49	Zimbabwe	84
Eastern Africa		Guinea-Bissau	53	Malawi	47
Kenya	53	Cameroun	50	Lesotho	52
Uganda	34	Liberia	30	Botswana	93
Tanzania	50	Mali	37	Angola	32
Eritrea	16	Niger	53		
Ethiopia	25	Nigeria	39	**Indian Ocean**	
Rwanda*	66	Senegal	52	Mauritius	99
Burundi	70	Sierra Leone	3	Madagascar	29
		Togo	63		
		Chad	24		
		Democratic Republic of Congo (DRC)	27		
		Mauritania	81		
		Central African Rep	18		

* Figures predate the tragic events of 1994
Source: WHO and UNICEF joint monitoring programme 2003; League table-access to water

Rates of diarrhoeal disease, which are associated with inadequate water supply and poor sanitation are 240 times higher in Africa compared to high income countries (UNEP 2003a). Good water management may contribute immensely towards controlling water related diseases and vector-borne diseases, including malaria. Countries south of the Sahara account for 85.7 per cent of the annual global malarial deaths of 1.1 million, especially among children under five years (UNEP 2003a). Reducing the health impacts of poor water management will remove the burden on women and children, especially girls.

Financing increased provision of safe water and sanitation for the poor

There is widespread acknowledgement that the targets set out in the Millennium Development Goals are, if current trends continue, not going to be met. In order for the Goals to be met, financing to the water sector globally will have to double, according to many estimates (UNDESA 2004). However, the trend is rather that overseas development aid is falling, rather than rising. Of 22 major donor countries, only seven have reached the internationally-agreed target of 0.7 per cent of national income to be committed to overseas aid (CARE and others 2004). In general, despite commitments made at WSSD and other events, there has been a decline in aid to the water sector (UNDESA 2004).

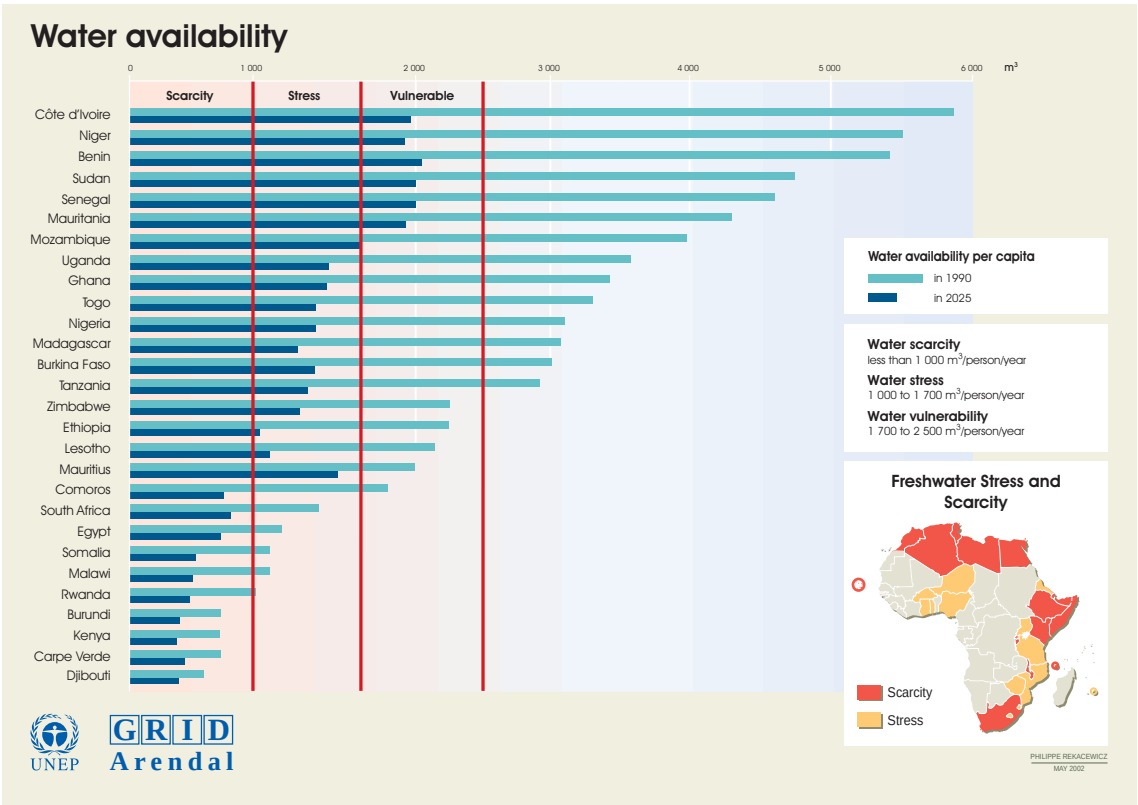
Also, in some cases, investment in the water sector is not going to the poorest countries. For example, the US spends only 4 per cent of its aid on water and only 8 per cent of that goes to the 30 countries which are most in need (WaterAid 2004). It seems that a lot of aid is being targeted according to political criteria, rather than according to levels of need, and an overall strategy and coordinated approach amongst donors is lacking.

African countries have also failed to prioritize water and sanitation in their own budgets, or in their Poverty Reduction Strategy Papers (Freshwater Action Network and others 2004). In some African countries, the share of the national budgetary allocated to water is actually declining. Of 15 African countries most affected by poor access to safe water, only two (Uganda and Tanzania) have the issue prioritized in their PRSPs. Four of these countries have scant mention of the issue in their PRSPs at all. (CARE and others 2004) Also, few of these countries – only four, according to one estimate – have made substantial progress towards establishing adequate Integrated Water Resource Management (IWRM) strategies in order to ensure increased water provision and rational water allocation between different sectors, including base flows for environmental sustainability (CARE and others 2004). According to WSSD targets, these IWRM plans should be in place by 2005.

Of additional concern is the fact that available human resources are not being fully involved in efforts to improve safe water provision, especially in terms of community level input to planning and management. There is evidence that where civil society is involved in formulation of strategies – for example, PRSPs – water is given a higher priority (Terry and Calaguas 2003). Also, increased involvement of communities in planning as well as management can result in greater sustainability and the development of innovative domestic funding mechanisms.

Water management issues

Poor waste and sewage management in many African cities results in the contamination of freshwater sources including rivers, nearby lakes, estuaries and seas. Common sources of pollution include industrial effluent, pollution of groundwater and surface water due to inappropriate siting of pit latrines, and agricultural chemical run-off.



Source: UNEP 2000b

In West Africa, and some parts of North Africa, dracunculiasis (guinea worm) and schistosomiasis (bilharzia) are among the most prevalent waterborne diseases, while diarrhoeal diseases are prevalent across the continent. Both Lake Victoria and Lake Chad face numerous problems affecting water quality, quantity and economic activities (see text box 2).

Environmental degradation, in conjunction with global climate change, is contributing to increasing severity of floods and drought intensifying the levels of poverty in Africa. Southern Africa, which is one of the world's most drought prone regions, is likely to suffer increased rainfall variability, increased frequency in flood and drought events from climate change compounding the problem of water and food insecurity (Beekman and others 2004).

A large portion of North Africa region depends on groundwater as the main source of fresh water. Libya, Tunisia, and Egypt, are currently using more than 40 per cent of the total water available. In the case of Libya, more than 100 per cent of the annually replenished water is being used. This may irreversibly deplete the aquifers being accessed (UNEP 2003c). In many areas, ground water resources in coastal regions are already suffering from salinization problems due to seawater or saline water intrusion (Beekam and others 2004). Depletion of groundwater resources may also be attributed to land use changes that alter surface runoff and reduce the replenishment of groundwater supplies (UNEP 2003c).

Because rainfed agriculture is highly vulnerable to climatic variation, irrigated agriculture will continue to play an important role in increasing crop production and contributing to better food security. A sizeable part of irrigation potential is already used in North Africa but not in sub-Saharan Africa where huge parts lie unused (UNEP 2003a). As a whole, only 7 per cent of Africa's potential for irrigated agriculture is being tapped

Text Box 2: Case studies of African river basins

In Eastern Africa, Lake Victoria is becoming increasingly polluted, especially on the Eastern side of the lake. Partly due to this pollution, the spread of water hyacinth has reduced or eliminated native species, disrupting ecological system and functions (Swallow and others 2003) and also the economic activities of the local population. Key issues include:

- Accelerated soil erosion and nutrient runoff
- Urban and industrial pollution and atmospheric deposition
- Prolific growth of aquatic weeds dominated by the water hyacinth

The area of Lake Chad has diminished by 90 per cent in the last four decades, and river discharges in the basin have been reduced by as much as 55 per cent, due to diversion of flows and unsustainable use of freshwater. Freshwater shortage in the Basin has led to conflicts between upstream/downstream users and has impacted heavily on the basin's economic activities, including fisheries, agriculture, animal husbandry and economic utilisation of wetland environmental goods and services. Key issues include:

- Freshwater shortage
- Climate change
- Habitat modification
- Unsustainable exploitation of fish and other living resources
- Pollution

Source: UNEP 2004c

Topfoto/UNEP

Most rural people in Sub-Saharan-Africa still access water in a raw form from rivers and lakes for domestic use. The quality of water from these sources is however compromized by pollution from agricultural run-off and wastes from settlements.

currently. Use of small scale irrigation schemes which require relatively minimal capital investment may help to boost food production in many parts of Africa. However, improved water management in irrigation schemes is necessary to ensure water availability for other sectors, and to avoid intersectoral conflicts. Integrated rural water development, within the framework of Integrated Water Resources Management (IWRM) to improve performance of both rainfed and irrigated agriculture is therefore necessary (FAO 2003).

Watershed degradation

Degradation of watersheds, through a variety of processes, is a key problem in many countries, and has received considerable attention in recent years.

Deforestation is a major cause of the phenomenon: as tree cover is reduced, there is more rainwater runoff from the ground and less permeates the soil. The general status of Africa's forest resources is one of overall decline. The net change of forest area in Africa is the highest among the regions of the world, with an annual net loss, based on country reports, estimated at 5.3 million hectares annually, corresponding to around 0.78 per cent annually (NEPAD 2003).

Illegal logging is significant in many countries, and represents up to 90 per cent of all logging in some countries. This results not only in uncontrolled deforestation, but also in a loss of revenue which, could be invested in the forest sector for proper management (Barrow and others 2004).

The problem is often worst in unregulated environments such as those experiencing conflict. Somalia's international trade in charcoal, for example, emerged during the past decade of civil war. Some 60 000 tonnes are reportedly being exported every month, mostly to the Gulf

states and Saudi Arabia (Masciarelli 2002). Charcoal for export is officially banned but domestic use is allowed, making overall control very difficult.

Watershed degradation results in changes to surface water flows and groundwater recharge rates. Many communities have seen their local rivers dwindle over time as forests upstream have been harvested. Others experience flash-floods, which destroy crops and food stocks. Such watershed degradation also involves increased soil erosion, which increases nutrient build-up in lakes and rivers, affecting flora and fauna. Such impacts can be international, with sediment from highlands upstream congesting irrigation infrastructure in countries thousands of kilometres away.

A recent development in the forest sector management is the interest in decentralizing responsibility for forest and other natural resources to the communities themselves. In many countries, communities are increasingly being enabled to manage local forest resources, and to benefit from revenue accruing from timber or non-timber products. This has been supported by international initiatives such as the Shiga Declaration, which recommends that policy makers, "put in place appropriate incentives to support the sustainable management of forest and water services to ensure that those who use resources pay the full cost of their exploitation and those who bear the costs of conservation are equitably compensated" (International Expert Meeting on Forests and Water 2002). The World Summit on Sustainable Development (WSSD) does commit governments [in article 45 (h)] to carry out "actions at all levels" to "Recognize and support indigenous and community-based forest management systems to ensure their full and effective participation in sustainable forest management." (World Rainforest Movement 2004). In 2003, an African Ministerial Conference on Forest Law Enforcement and Governance produced a Ministerial statement that acknowledged the importance of including a wide range of actors in forest management (Barrow and others 2004).

However, this positive trend is in some cases undermined when responsibilities for forest management are not supported by full ownership of forests by communities themselves; or when communities are not given adequate institutional or legal backing. In addition, there is still widespread reluctance to empower communities to manage areas which are particularly significant in terms of financial returns (e.g. from timber) or biodiversity (Wily 2002). Increased commitment to community-based natural resource management for watershed protection will to a large degree depend on the extent to which respect for customary resource rights is institutionalized in laws, policies, and programmes (Wily and Mbaya 2001).

Christian Lambrechts

Water catchments protection and management is key to conserving freshwater resources.

Text Box 3: Watershed degradation in Kenya

Mount Kenya with its glaciers, moors and rainforest belt fulfils the important function of a "water tower" for the surrounding lowlands (Gichuki 2002). It provides the population of neighbouring plains with goods and services such as drinking water, water for irrigation and energy production, natural landscapes for tourism and sacred sites. It also supports a range of ecological services such as watershed/catchment benefits, microclimate amelioration and regulation, carbon sequestration, and habitat for biodiversity, and soil stabilization. Continued benefits from these natural endowments have increasingly become elusive over the past four decades. This is attributed to human encroachment mainly in the upper catchment, for settlement and food and drug (*miraa* and cannabis) cultivation. Increasingly, a significant area of Mt Kenya forest is being cleared for charcoal production to provide incomes for the families.

As a result of loss of indigenous tree cover, serious soil erosion has been occurring, leading to declining food production. Soil erosion has also contributed to the heavy siltation of the reservoirs at the country's five hydroelectric power stations, significantly reducing their power generation potential. Secondly, the volume of water flowing from the upper catchments of the Ewaso Ng'iro and Tana River basins has significantly dwindled over the years, after many rivulets dried up. The waning access to water by lowland communities has also led to conflicts in many areas, not all of which have been expressed directly – hence the urgent need to restore and sustain social equity between highland and lowland communities. It is expected that rising temperatures – as a result of climate variability and change and its impacts – will increase the rates of water loss from soils in the basins, while possible flooding could lead to massive soil losses mainly from farmlands in the upper catchment. Several areas in Meru district already suffer fatal mudslides during heavy rains and could worsen in the event of floods. The recent severe droughts of 1998–2000 and the *El Nino* flooding in Kenya have served to expose the vulnerability of the ecosystems and communities to climatic variability and change. A reduction in the rate of loss of vegetation in the upper catchment of the rivers *Tana* and *Ewaso Ng'iro*, and a gradual increase in vegetation in the entire watershed should, hence, be urgently pursued.

Source: Kituyi and Eriksen 2003

Changing institutional roles

Across Africa, water demand is expected to increase significantly in coming decades, and in some countries, demand is expected to double over the next 30 years, posing a huge challenge. A number of African governments see this increasing demand for water (as well as sanitation services) as beyond the capacity of national government departments, and have invited greater involvement of the private sector and water users in the provision and management of water and sanitation services. Most of the water and sanitation infrastructure currently being used has been inadequately maintained, and current demand is much higher than the levels for which the infrastructure was originally designed.

Proponents of privatization argue that delegating some responsibility to the private sector in water supply and distribution for example may increase efficiency in service delivery and leave governments to concentrate on some other areas that may not be attractive to investors (e.g. expanding the infrastructure in urban slums and rural areas). Privatization of water services may involve leasing or selling the water supply infrastructure and/or services to a private entity and has taken place in number of countries including Ghana and South Africa. Other countries

may learn from their experiences and see how best to proceed. The issue of changing water prices must be addressed to ensure that access, particularly for the poor, is enhanced, and not further compromised. Evidence from countries such as Ghana, and other continents, especially Latin America, suggests that without adequate regulation, water prices can increase drastically with the onset of privatization. During 2001, for example, water prices in Ghana increased by 95 per cent. Some level of government presence will therefore be necessary to regulate players in this sector.

The need for better institutional co-ordination and better management of competing upstream-downstream demands for water has resulted in the paradigm of Integrated Water Resources Management (IWRM) become dominant in current thinking. The approach offers considerable potential for improving efficiency and reducing pollution, among other benefits. However, it is unlikely that better water management at the water-basin level can, by itself, ensure that household-level access is improved. Political, economic, and institutional factors often limit access to water, even where the overall water availability is plentiful (McGranahan and Satterthwaite 2004).

Most organizations involved in integrated management of land and water resources (such as the World Bank and many bilateral donors) have advocated creation of 'umbrella' organisations . Examples of this approach include the river water user associations (RWUAs) which are in existence in some areas. These are voluntary organizations composed of a range of water users which share a water resource.

In most developing countries, RWUAs are seen as the future for water management, due to a number of reasons, including:

- Minimal budgets, plus SAP-affected staff numbers, limit the Ministry of Water's abilities to monitor and enforce the water regulations.
- Increasing water demands, decreasing water flows in some areas, and multiplicity of water users, makes central monitoring and enforcement very difficult.
- The principle of subsidiarity included in the Dublin Principles on water management, accepted by almost all countries worldwide.

Topfoto/Imageworks

Innovative community management of water sources is still focusing on point sources such as boreholes, wells and springs. This should be extended to other water sources such as rivers, lakes and swamps which serve as water sources for most rural people.

4

Land

Christian Lambrechts

Land degradation is a serious problem in many parts of the continent, with some 500 million hectares affected by moderate or severe erosion (UNECA 2001). As much as 39 per cent of the entire land area of the continent is seriously affected, according to some estimates (NEPAD 2003).

Processes and impacts

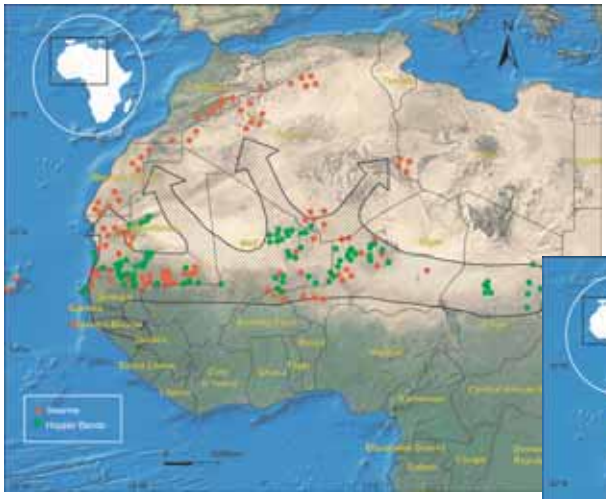
Some reports suggest that up to 80 per cent of pastures in Africa show signs of degradation, partly because of 'overgrazing' in some areas (Thrupp and Megateli 1999). Dryland degradation reduces livestock productivity, compromises livestock health, and can cause pastoralist migration patterns to alter, putting such communities into competition with those living along their new migration routes, and contributing to local disputes and conflicts.

In addition, as much as 65 per cent of agricultural land is affected by degradation. Farming households in many areas are forced to migrate because of soil erosion, creating potential problems through the expansion of 'frontier agriculture'. If the degradation of cultivated land continues at the present rate, it is predicted, crop yields could be reduced by half by 2043, having a serious negative impact on the food security of the continent and exacerbating poverty. The food security situation is already poor: about 200 million people in Africa are chronically hungry and nearly 30 million require emergency food and agricultural assistance in a typical year. Africa has become the largest single recipient of food aid; it has also reversed in recent decades from being a significant exporter of agricultural commodities to being a net importer (FAO 2002).

"In 2004, Western and Northern Africa was affected by a serious locust invasion which threatened food security of millions of people in 10 countries in the two sub-regions and caused severe economic constraints to the affected countries. Morocco for example spent US$ 30 millions fighting the invasion, which was threatening its agricultural sector worth 2 billions in 2002. The invasion was the worst in 15 years" (FAO 2004).

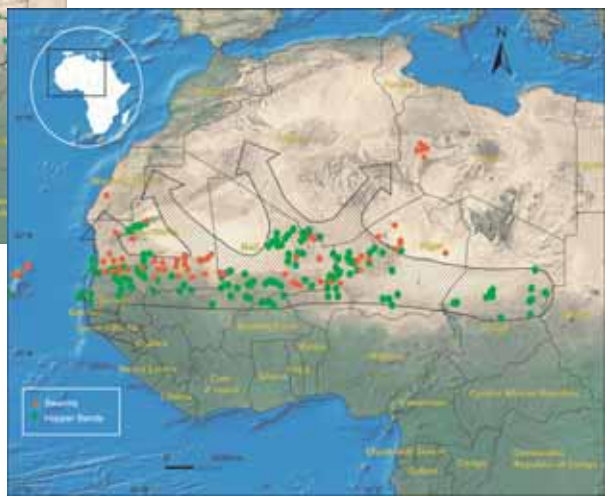
Desert Locust Invasion

October 2003



Source: FAO - Desert locust information service 2004
Map compiled by UNEP/DEWA, GRID-AFRICA

September 2004



Source: FAO - Desert locust information service 2004
Map compiled by UNEP/DEWA, GRID-AFRICA

Regional variations

UNEP have identified soil erosion as probably the most important factor in the decline in agriculture productivity in southern Africa, and they estimate that about 15 per cent of this sub-region's land is degraded. This trend is likely to continue over the next 30 years, due to population pressure, skewed land tenure systems, and increasing demand for land (UNEP 2002). Other causes identified include:

a) lack of knowledge of conservation measures;
b) use of unsustainable traditional production practices;
c) lack of inputs such as labour; and
d) breakdown in management policies, rules and regulation (UNECA 2003).

The situation is perhaps even worse in North Africa, largely because of its fragile ecology, where more than 57 per cent of the total land is threatened by desertification (NEPAD 2003). About 40 per cent of Africa's cultivated land under irrigation is found in this sub-region, and salinisation, waterlogging and other issues are significant problems in many irrigation schemes.

The drylands of the Eastern African sub-region have low rainfall, and are extremely vulnerable to drought and desertification, especially in the Horn of Africa. Rapid population growth and increasing demand for food, combined with high variability in rainfall and frequent drought, is putting pressure on farmers to clear more natural vegetation, and to cultivate more and more marginal land. Shortening of fallow periods and high intensity of rainfall contribute to creating conditions which are conducive to land degradation, soil erosion and desertification (UNEP 2002). In Central Africa, higher and more predictable rainfall facilitates relatively extensive cultivation but hilly areas (especially Rwanda and Burundi) are prone to erosion: soil erosion is moderate to severe on 50 per cent of the land surface of Rwanda (Clay and others 1998), and the country may be losing up to 12 251 tons of soil per year due to land erosion.

Text Box 4: Links between land scarcity and land degradation in Burundi

In Burundi, over 80 per cent of rural households have less than 1.5 hectares of land, and the average land holding in 1982 was reportedly 0.39 ha (Leisz 1996). Land scarcity has triggered internal population movements towards relatively less populated areas often generating suspicion on the part of communities into which newcomers integrate. In addition to these demographically-induced movements, multiple waves of displacement due to conflict have made land ownership issues very complex and politically sensitive. Population pressure has led to exploitation of marginal lands which makes livestock and agricultural productivity increasingly fragile. In addition, forests have been 'devastated' and soil productivity is on the decline, especially on small farms which are intensively cultivated (United Nations 1999). Lack of purchasing power means that fertilizers cannot be purchased, and there is little land available to put under fallow for regeneration of soil fertility. The environment has also been seriously affected by the declining forest cover (Huggins and Mugisha 2003).

Christian Lambrechts

Rural livelihoods in most parts of Africa are closely linked to the quality of land resources

Land degradation is identified as a major issue in many western African countries. Specifically issues include: the degradation of forest cover; intensive cultivation practices; and desertification (UNEP 2002). In the northern Sahelian zone, where the majority of the population practice pastoralism, the main agent of soil erosion is the wind, which is supported by dry climatic conditions. Overgrazing and trampling reduces the vegetative cover and causes compacting of the soil, which is then vulnerable to erosion. In Niger, for example, only 19 per cent of the country is non-desert, and most of this is highly or very highly vulnerable to desertification (Reich and others 2001). Mauritania is similarly affected, with 93 per cent of the country classified as hyper-arid, and the remaining 7 per cent at moderate to very high risk of desertification (Reich and others 2001). In Nigeria, up to 3 500 square kilometres of land are converted to desert each year, making desertification the country's leading environmental problem (Brown 2004). The IPCC predicts that due to global warming, this sub-region will experience declining rainfall and higher rates of evaporation, further contributing to desertification pressures in future (IPCC 2001).

In the wet forest zones of the sub-region, sheet and gully erosions are predominant, due to loss of vegetative cover, while the prohibitive price of fertilizer means that soil fertility is declining in many agricultural areas (UNEP 2002).

The action plan to address land degradation, desertification and drought under NEPAD is based on regional and sub-regional action programmes under the Convention to Combat Desertification for Africa. The implementation of this programme area will be undertaken in collaboration with the secretariat of the Convention, particularly the secretariat of the annex for Africa, located at the headquarters of the African Development Bank.

Access to land

Per capita land access is low and is falling across the continent, as populations continue to rise and unutilized areas dwindle. In 1961, the continental average was 0.6 ha per capita; by 1993 this had fallen to 0.27 ha (UNECA 2001). It is a particular problem in some small island developing states (SIDS). It is estimated that densities in the year 2015 will be as high as 645 people/sq km in Mauritius, 475 people/sq km in Comoros, and above 175 people/sq km in the other SIDS (IOC 2004). Reform in the legal and administrative manner in which land rights are recognised and regulated is occurring widely in sub-Saharan Africa. In recent years, important new land tenure laws or policies have been developed or drafted in Uganda, Tanzania, Zanzibar, Mozambique, Zambia, Eritrea, Namibia, South Africa, Rwanda, Malawi, Lesotho, Zimbabwe and Swaziland (Manji 2004; Huggins 2003). A number of West African countries reformed their land laws in the mid-late 1990s, and complemented legal reform with administrative decentralization, the development of rural land tenure plans, and innovative pilot projects particularly regarding common property resources and pastoral areas (GRAF/GRET/iied, 2002). In Benin, a process of local land rights registration is underway as part of a nation-wide Natural Resources Management programme; in other countries, such as Algeria, draft texts have been prepared for discussion (Tawfia 2003), while Kenya, with significant donor support, is currently planning ways in which to address land tenure problems (Alinon 2003).

Sub-regional issues

Key issues to be addressed are of course different in each country and region, reflecting variations in historical experiences, ecological realities, and political processes.

In Southern Africa, the land question, in so far as it regards access, should be understood within the framework of colonial land policies and legislation over the last two centuries at one level; and gender relations on another level. Currently, southern Africa's mixes of land tenure systems give women varying extents of access to land. Under the private freehold system, women have rights to access land but very few of them have the resources to purchase such land on the open market. On the other hand communal land held under the traditional or customary system allows women secondary access through marriage, but if the marriage ends, they lose the right to cultivate lineage land (SARDC-WIDSAA 2000).

In West Africa, the issues tend to revolve around the relationship between customary tenure systems, which are still influential, and statutory laws. From a post-colonial view that customary systems were largely irrational and anti-development, thinking has now evolved into recognition that legal frameworks should be pluralistic, through models which include subsidiarity, codification, and registration (Alinon 2003). In savannah zones of West Africa, land has historically been relatively abundant and customary land tenure systems are particularly strong. These customary systems are not necessarily static - they dynamically adapt to changing social and economic circumstances. For example, as arable land becomes more scarce, informal land markets are emerging, even though this is against 'tradition'. Pastoralists are increasingly moving into agricultural zones,

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Commercial farming in Kenya contributes more than 60 per cent of the export earnings from agriculture.

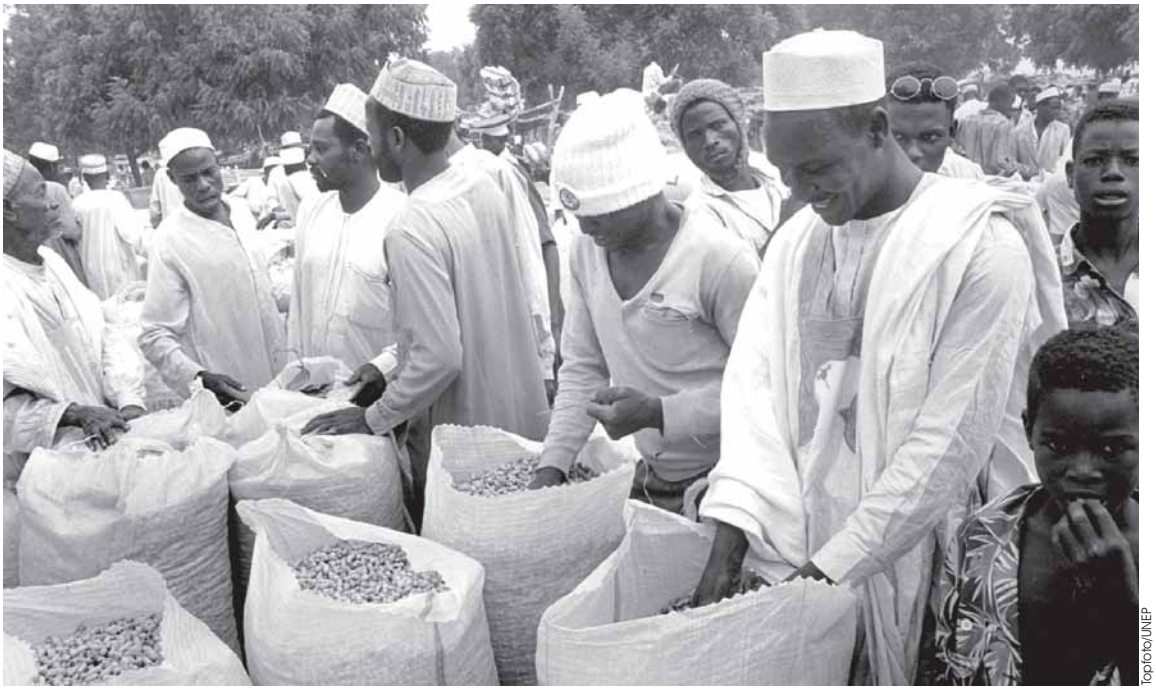
and becoming involved in economic relationships with cattle-keeping farmers, which can be mutually beneficial but also, at times, conflictual. Modern legal systems are attempting to provide support to evolving customary land tenure regimes. Customary systems provide flexible, well-adapted solutions to local land tenure needs. However, due to population increase, expansion and commercialization of agriculture, and other 'modernisation' processes, customary land tenure systems are coming under increasing stress from actors with differing interests and perspectives. Policy-makers often discuss land tenure in terms of 'customary' or 'modern'. In fact, an evolutionary process is underway, through which some communal lands are being 'individualised' but in locally-specific ways, which differ from typical understandings of privatisation and modernisation (CISDL/ACTS 2003).

In Central Africa, a number of issues are significant, including demographic pressures and plot fragmentation in some areas (suggesting the need for addressing problems of plot miniaturization through sub-division), while in other areas, it is important to address the role of customary leaders. Conflict-related issues, especially related to internal and international migration, are also significant (Huggins 2004) In Rwanda, for example, population density has increased from 101 people per sq km in the early 1960s, to 303 people per sq km today, with some districts having densities of up to 820 people per square km (Liversage 2003) As a result of population pressure and the sub-division of farmland for inheritance purposes, as well as some outright sale of land, the average size of a family farm holding has reduced from 2 hectares in 1960, to less than 0.5 ha currently. Landlessness is a significant issue, resulting from population pressure and distress sales of land due to extreme poverty (Huggins 2003). Due to the return of about a million long-term refugees since 1994; and almost 1.2 million shorter-term refugees between November 1996 and January 1997, 'land sharing' has been practised. While generally successful, it has posed some localized challenges (Gasarasi and others, unpublished).

In North Africa, agricultural and pastoral activities contribute significantly to national economies and traditional lifestyles, with between 40 per cent - 60 per cent of the population of the North African countries relying directly on land for subsistence (Tawfic 2003). This is despite severe constraints including low annual rainfall and limited availability of arable land. In Algeria, for example, only 3 per cent of the land area is arable (Terranti 2003). Egypt's agricultural production is almost totally dependent on the floodwaters of the Nile. Land cultivation in the sub-region is becoming increasingly dualistic in nature, with a high technology agribusiness sector developing alongside traditional smallholder agriculture. In almost all countries, some farmers still harvest their crops by hand, while commercial agriculture is heavily mechanized, employing highly efficient irrigation systems, tractors, multi-furrow ploughs and combine-harvesters. There is a pressing need to integrate the two sectors, and to combine the wisdom from each (UNEP 2002). In terms of land policy, most Northern African countries implemented far-reaching land redistribution programmes in the 1970s or 1980s, with the intention of ending sharecropping and landholder-tenant relationships, and providing landless labourers with their own plots. But during the late 1980s and 1990s, influenced by the policies of international financial institutions, most countries reversed those reforms and provided landlords with greater freedom to evict tenants, or encouraged private-sector management of agricultural assets that were previously managed by the state (Tawfic 2003).

Text Box 5: The HIV/AIDS pandemic and access to land

In recent years, there has been greater awareness that the effects of HIV/AIDS, including illness and premature death of breadwinners, has impacts on land use and land ownership patterns. These land use changes include a decrease in the area cultivated due to illness, and a shift to less labour-intensive land uses (Mullins, D., Drimie, S. undated). Access to land is also altered, as households caring for people with AIDS are more likely to rent their land, enter into sharecropping agreements, or lend land to others. Such households are also more likely to lose land, either through formal or informal sale, abandonment of land, or having land forcibly taken from them. (FAO Population and Development Service 2003). It is also important to note that access to land affects people's vulnerability to HIV infection. Limited access to land forces individuals to seek off-farm income, which often involves migration and may separate spouses for long periods. In many areas, widows without children as well as divorced women are denied access to land.



Topfoto/UNEP

Traditional institutions and culture influence the gender disparities in land access and benefit sharing.

Regional and global issues

In many developing countries in particular, property rights with regard to land are ill-defined. When rights to resources are not well-defined, the poorest and most marginalized segments of society, especially women and children, suffer the most exacerbating their daily struggle to meet basic needs. In such situations, more powerful members of society can use their access to information, political influence, and money to access land resources at the expense of the poor. In some countries, communities face the sporadic nationalization of land holding by the state, undermining the incentive to invest in the land. In fact, even where land tenure systems do function, they often have unequal effects on the society.

Simply providing title to land, however, does not in itself guard against this process. The very act of deciding who owns land is frequently manipulated by powerful groups, with the result that the state ends up legitimizing and enforcing inequalities.

In many African countries, significantly more than 90 percent of the total land area is under customary tenure systems. Customary systems can provide tenure security and important 'safety nets' for vulnerable members of society, but are coming under increasing pressure from a variety of processes, including demographic changes, and loss of legitimacy of customary authorities.

Next to tenure security, the most important requirement for investment in land is generally described as low transaction costs, to enable profitable transformation from land into various goods and services, and hence income (UNEP 2002). Institutions need to be accessible (which involves financial aspects as well as geographical accessibility), and services need to be provided effectively. However, in Africa, transaction costs can be high, especially in terms of the time involved. Land registration in most countries takes 15–18 months (assuming that no dispute occurs over ownership), and durations of 2–7 years are not unknown (Land Equity International 2003). The capacity for formal surveying is often limited, with some African countries having less than 30 registered professional surveyors (Land Equity International 2003). One of the other limitations to effective land administration is the difficulties of coordinating different sections of government, particularly as access to ICT is generally minimal,

outside of the most central offices. The transfer of information vertically within organizations and horizontally between them, and the management of that data en route, can be problematic. An important component of international debate on land and property rights in the last three years has been the World Bank's process of consultation on key principles of Land Policy (Quan 2003). This process led a significant shift in the Bank's thinking, as articulated in a major Policy Research Report (Deininger 2003). The Bank's new approach focuses on land and property rights primarily from an economic point of view, emphasizing the importance of secure rights to economic growth. But it recognizes that rights do not necessarily have to be secured by formal land tilting processes, and acknowledges the relevance of more accessible processes, based in local institutions. In addition, it recognizes the social values of land rights, the complex nature of land access particularly in rural developing world contexts, which often involves collective or community rights rather than individual ownership as is common in Western and urban settings, and the fact the poor and vulnerable have often been disenfranchised as a result of land tenure policies in the past (Deininger 2003 and Quan 2003).

One important problem is the urban bias in much policy-making and the lack of effective consultation with peasant farmers and pastoralists, and awareness-raising on land-related problems. An imaginative land campaign in Mozambique has sought to overcome this problem, as documented by Oxfam GB (Palmer 2004). The campaign, in which over 200 civil society organisations took part, involved the translation of key aspects of a potentially progressive new land law into local languages, and used imaginative media such as comics, audio cassettes, theatre, music and posters to overcome the challenge of illiteracy and to help raise people's awareness of their new rights. According to one source, the campaign was so successful that many members of the general public became just as knowledgeable about the land law as the state administrators (Negrao 2002).

5

Christian Lambrechts

Biodiversity

Africa is home to more than 50 000 known plant species, 1 000 mammal species and 1 500 bird species. East Africa has the highest numbers of endemic species of mammals (55 per cent), birds (63 per cent), reptiles (49 per cent) and amphibians (40 per cent). Madagascar is the most endemic-rich country in Africa, and the Cape Floral Kingdom is one of the six most significant concentrations of plants in the world. Seventy per cent of the wild species in North Africa are known to be of potential value as sources of traditional food, medicine and pharmaceuticals and half of these have more than one potential use (UNEP 2002).

Threats to biodiversity

Africa's biodiversity is facing numerous threats from habitat loss (through conversion of natural habitats to urban, industrial or agricultural uses), over-harvesting (due to increasing population and rising consumption levels), pollution (from farming, urban household and industrial sources), and the introduction of alien invasive species (which dominate or alter habitat conditions) (UNEP 2002). Pressure from these sources is likely to intensify because of the increasing population, widespread poverty and dependence on natural resources.

The IUCN Red List helps focus attention on those taxa at the highest risk of extinction (see table below). Thirteen countries in Africa each have more than 100 species at risk (Cameroun, Democratic Republic of Congo, Cote d'Ivoire, Gabon, Ghana, Kenya, Madagascar, Mauritius, Mozambique, Nigeria, South Africa, Tanzania and Uganda).

Biodiversity and Agriculture

The loss of agricultural biodiversity has meant that agriculture in many countries has become heavily dependent on genetic resources from other parts of the world. Sub-Saharan Africa is estimated to be 87 per cent dependent on other parts of the world for the plant genetic resources it needs. Over two thirds of developing countries, including Africa, acquire more than half of their crop production from crops domesticated in other regions. Given the importance of a relatively small number of crops for global food security, it is important that the diversity within major crops is conserved effectively and managed wisely (FAO 2004 b).

Threatened Species: Country Totals by Taxonomic Group (2003 Red List)

AFRICA

Northern Africa	Mammals	Birds	Reptiles	Amphibia	Fishes	Molluscs	Other Inverts	Plants	Total
Algeria	13	6	2	0	9	0	12	2	44
Egypt	13	7	6	0	13	0	1	2	42
Libya	8	1	3	0	8	0	0	1	21
Morocco	16	9	2	0	10	0	8	2	47
Sudan	22	6	2	0	7	0	1	17	55
Tunisia	11	5	3	0	8	0	5	0	32
W. Sahara	4	0	0	0	10	0	1	0	15
Southern Africa	**Mammals**	**Birds**	**Reptiles**	**Amphibia**	**Fishes**	**Molluscs**	**Other Inverts**	**Plants**	**Total**
Angola	19	15	4	0	8	5	1	19	71
Botswana	7	7	0	0	0	0	0	0	14
Lesotho	6	7	0	0	1	0	1	1	1
Malawi	8	11	0	0	0	8	0	14	41
Mozambique	15	16	5	0	19	6	1	46	108
Namibia	14	11	3	1	11	1	0	5	46
South Africa	36	28	19	9	47	10	103	75	327
Saint Helena	1	14	1	0	10	0	2	23	51
Tanzania	41	33	5	0	26	41	6	238	390
Zambia	11	11	0	0	0	4	2	8	36
Zimbabwe	11	10	0	0	0	0	2	17	40
Western Africa	**Mammals**	**Birds**	**Reptiles**	**Amphibia**	**Fishes**	**Molluscs**	**Other Inverts**	**Plants**	**Total**
Benin	9	2	1	0	7	0	0	12	31
Burkina Faso	7	2	1	0	0	0	0	2	12
Cape Verde	3	2	0	0	13	0	0	2	20
Côte d'Ivoire	19	12	2	1	10	1	0	101	146
Gambia	3	2	1	0	10	0	0	3	19
Ghana	14	8	2	0	7	0	0	116	147
Guinea	12	10	1	1	7	0	3	21	55
Guinea-Bissau	3	0	1	0	9	0	1	4	18
Liberia	16	11	2	0	7	1	1	46	84
Mali	13	4	1	0	1	0	0	6	25
Mauritania	10	2	2	0	10	0	1	0	25
Niger	11	3	0	0	0	0	1	2	17
Nigeria	27	9	2	0	11	0	1	121	171
Senegal	12	4	6	0	17	0	0	7	46
Sierra Leone	12	10	3	0	7	0	4	43	79
Togo	9	0	2	0	7	0	0	10	28
Eastern Africa	**Mammals**	**Birds**	**Reptiles**	**Amphibia**	**Fishes**	**Molluscs**	**Other Inverts**	**Plants**	**Total**
Burundi	6	7	0	0	0	0	3	2	18
Djibouti	5	5	0	0	9	0	0	2	21
Eritrea	12	7	6	0	8	0	0	3	36
Ethiopia	35	16	1	0	0	3	1	22	78
Kenya	50	24	5	0	27	12	3	99	220
Rwanda	8	9	0	0	0	0	2	3	22
Somalia	19	10	2	0	16	1	0	17	65
Uganda	20	13	0	0	27	7	3	36	106
Central Africa	**Mammals**	**Birds**	**Reptiles**	**Amphibia**	**Fishes**	**Molluscs**	**Other Inverts**	**Plants**	**Total**
Cameroon	38	15	1	1	34	1	3	164	257
Central African Republic	14	3	1	0	0	0	0	10	28
Chad	15	5	1	0	0	1	0	2	24
Congo	15	3	1	0	9	1	0	33	62
Democratic Republic of Congo	40	28	2	0	9	41	4	55	179
Equatorial Guinea	16	5	2	1	7	0	2	24	57
Gabon	14	5	1	0	11	0	1	71	103
Sao Tome and Principe	3	9	1	0	6	1	1	27	48
Western Indian Ocean Islands	**Mammals**	**Birds**	**Reptiles**	**Amphibia**	**Fishes**	**Molluscs**	**Other Inverts**	**Plants**	**Total**
Comoros	2	9	2	0	3	0	4	5	25
Madagascar	50	27	18	2	25	24	8	161	315
Mauritius	3	9	4	0	7	27	5	87	142
Mayotte	0	3	2	0	0	0	1	0	6
Réunion	3	5	2	0	5	14	2	14	45
Seychelles	4	10	3	4	10	2	2	45	80

Source: Adopted from the IUCN Red List 2003

Topfoto/UNEP

Overharvesting of forest resources is threatening biodiversity in many parts of Africa and jeopardizing livelihood of forest communities.

Overharvesting of resources especially timber is common in Central and Western Africa, and together with the bush meat trade, contributes significantly to the decline in populations of gorillas, chimpanzees, elephants, bush pigs and forest antelopes. In addition to timber, forest products are also valuable; for example, *Acacia senegal* is a highly sought after species because of the gum Arabic it produces, which is used in confectionery, the printing industry, and other sectors. When gum Arabic prices are reduced (through market changes or policy interventions) many acacias are cut down for fuelwood; when they are artificially high, short-term exploitation can lead to over-tapping and subsequent tree death (UNEP 2002). Activities such as logging and mining are also improving access to previously remote areas, making collection from the wild more profitable. The exotic pet trade and demand for animal products such as ivory, rhino horn, skin, furs and other trophies are contributing immensely to species reduction. Thriving black markets, nationally and internationally, create demand and the extreme levels of poverty in Africa often tempt local people to meet that demand (CITES 2002).

Aquatic and marine habitats have been affected by overharvesting of resources, physical alterations, urban and industrial developments, siltation, pollution, introduction of alien species. Introduction of alien species may be accidental or done intentionally. Because alien invasive species are often free from predators or other natural limitations to their population growth, they are able to dominate plant and animal communities either by out competing native species for space, light, or nutrients or through predation. Southern and Eastern Africa and Island nations have been affected by the introduction of alien species including Nile Perch in Lake Victoria (around 30 years ago) and more recently, the water hyacinth. Despite good progress in combating water hyacinth infestation, the weed has reappeared in 2004 (Nation Correspondent 2004). Islands are particularly vulnerable to invasions by predators, because many island species have evolved in isolation from predators such as cats and dogs (UNEP 2002).

Lack of recognition of indigenous knowledge and property rights has contributed to the problem of biodiversity loss especially where protected areas have been established without consulting the local people and getting their consent. This often leads to protected areas that are not only ineffective in their contribution to conservation but also fail to earn the respect of local communities. Communities often encroach into such protected areas or at times deliberately raid resources

(UNEP 2002). Weak legal and institutional structures, corruption, conflict; civil strife and market factors can also contribute to habitat degradation and loss. The introduction of genetically modified species is, according to sceptics of biotechnology, a possible threat that may result in lowered genetic diversity through hybridization, competition and predation. Several formal or informal organizational coalitions developed positions either pro or against biotechnology, in view of its possible impacts on biodiversity, at the World Summit on Sustainable Development, Johannesburg, 2002 (ITDG 2002).

Loss of biodiversity represents loss of medicines, useful genetic materials and income from ecotourism. The continent's forests are particularly diverse supporting millions of people with food, clothing, construction materials, medicinal products, cultural and recreational facilities. Of the 25 internationally recognized hotspots, six are in Africa (these being places where diversity and endemism is high with an extraordinary threat of loss of species or habitat). These include the Mediterranean Basin Forests, the Western Indian Ocean Islands, the Cape Floristic Region in South Africa, the Succulent Karoo shared between South Africa and Namibia, the Guinea Forest in west Africa and the Eastern Arc Mountain Forests of Eastern Africa (UNEP 2002) - all of which host a high number of endemic species. There are also several other areas of high species richness and degree of threat but low endemism. All these need to be conserved well to avoid further decline in biodiversity.

Strategies for biodiversity conservation

A number of governments committed themselves to increase the size of protected areas to 10 per cent of their land area during the 5th world park

Munyaradzi Chenje

Equitable distribution of benefits from biodiversity resources, including harvesting for medicinal purposes and income from eco-tourism can promote community involvement in Biodiversity conservation.

Deborah Nightingale

Community involvement in conservation has helped restore ecosystem integrity in some parts of Africa, for example Kenya and Zimbabwe.

congress in Durban. The specific recommendations of delegates including involving private sector, indigenous people, local communities and youths in protected areas to jointly safeguard the many benefits to society from these areas should be encouraged (DEAT/ IUCN 2003) as governments may not have the resources to do this by themselves as the current rates of species extinction across Africa shows. The congress recommendations summarised this as follows;

1. The importance of engaging with the broad array of people residing near and around protected areas to ensure that their interests and needs are understood and considered in the management of these areas.
2. The recognition that protected areas provide a number of very valuable ecosystem services in addition to protecting threatened species, such as clean water, maintenance of critical habitats and the important role in relation to mitigation and adaptation to climate change.
3. Importance of providing practical tools, guidelines, training and resources for protected area managers to achieve their objectives.

The NEPAD programme on *trans-boundary conservation or management of natural resources* is designed to complement and extend existing national initiatives and should build on these national level initiatives where the opportunity arises (NEPAD 2003). It includes sub-components on fresh water; biodiversity, biosafety and plant genetic resources; and forests. In terms of freshwater, the African Ministerial Meeting Conference on Water (AMCOW) adopted, at its first substantive session, held in February 2003, the African Regional Programme of Action on Freshwater, and AMCEN and AMCOW will coordinate on areas of mutual interest. In its activities on biodiversity, biosafety and plant genetic resources, there is need to develop biosafety institutions and structures in African countries for the operationalization of the Cartagena Protocol on Biosafety, and for transfer of experience, both technical and scientific. Activities on forests thus far have included a thematic workshop in Yaounde in February 2003, in collaboration with the World Wide Fund for Nature (WWF). In the margins of that workshop Nigeria and Cameroun signed an agreement on transboundary protected areas between the two countries, followed by an agreement to conserve endangered species under the UNEP/UNESCO

Great Apes Survival Project. Future activities will be implemented in conjunction with the Congo Basin Initiative, in addition to other organizations.

Control of invasive alien species is also an important aspect of biodiversity conservation. The NEPAD thematic workshop on prevention, control and management of invasive alien species was held in Pretoria on 23 and 24 January 2003. The participants identified 14 project proposals for the implementation of this programme area, which respond to the key issues defined and agreed by a technical working group convened as part of the development of the invasive alien species programme and fall under a group of interrelated sub-programmes. The sub-programme areas are as follows: prevention of invasive alien species; awareness raising and provision of information; training and capacity building; aquatic invasive alien species; terrestrial invasive alien species; ballast water; and African islands (NEPAD 2003). Sub-regional legislation includes components on control of invasive species. Examples include the Treaty for the Establishment of the East African Community, the Treaty of the Southern Africa Development Community and the treaty establishing the Common Market for Eastern and Southern Africa.

Also of great importance is the The Cartagena Protocol on Biosafety, which entered into force in September 2003. The Protocol sets out the first comprehensive regulatory system for ensuring the safe transfer, handling and use of genetically modified organisms (GMOs), with a specific focus on movements of these organisms across national borders (UNEP 2003b). Adopted in January 2000 by the member governments of the Convention on Biological Diversity, the Protocol features one set of procedures for GMOs that are to be intentionally introduced into the environment, and one for GMOs that are to be used directly as food or feed or for processing. Both are designed to ensure that recipient countries are provided with the information they need for making informed decisions about whether or not to accept GMO imports.

6

Christian Lambrechts

Extreme Events

Africa has continued to be affected by drought, flood, and other emergencies over the past two years. These disasters, often termed 'natural', may have their origin in extreme climatic events, but are in reality compounded by anthropogenic factors such as poor disaster preparedness, high population densities in disaster-prone areas, poor responses after disasters, and in some cases political or violent conflict which makes certain groups especially vulnerable (Dunne and Mhone 2003).

In addition to domestic actors, international attitudes and actions can also exacerbate the problems. Some areas are marginalized due to remoteness, lack of strategic importance, or the dangers associated with monitoring events in the area, resulting in a lack of data and late or inadequate responses to disaster (IFRC 2003). The crisis in Democratic Republic of Congo would seem to be a prime example of this pattern 3.3 million people died between 1998 and 2003, the vast majority of them from communicable diseases or malnutrition, and the international response - from Africa and the West - was minimal (Project Ploughshares 2004). In the Kosovo conflict, which had a high media profile, far fewer people were killed - though estimates vary, a total of 20 000 people may be a reasonable estimate; this is equivalent to the number of people killed in the Democratic Republic of Congo every two weeks between 1998 and 2003 (Ibid. Also Jones 2000).

People in countries of low human development are worst affected when disaster strikes, reflecting the lack of emergency measures in place to mitigate the impacts. During 2003, for every disaster that occurred in countries of high human development, an average of 18 people died. The comparable number of deaths in countries of low human development was 555 (IFRC 2003) Flooding affected a number of countries between mid-2002 and 2004. For example, in mid-2003, 12 000 people were affected by high water levels in Caprivi Region in Namibia, which was reported to be the worst flooding for 21 years. In September of the same year, 21 000 people were displaced as a result of flooding in Budalang'i Division of Western Kenya, an area regularly affected by flood damage and until recently poorly served by prevention measures. In July, heavy rains triggered a landslide in Cameroon that killed 20, injured many and left more than a hundred people homeless. In September 2003, Kassala State in Eastern Sudan suffered the worst flooding for 70 years, which affected 200 000 people. In Northern Nigeria a month later, flooding contributed to a cholera outbreak. In March of this year, flooding in Namibia left thousands homeless, and in April, 70 people were killed in Djibouti and many homes were destroyed by flash floods (www.reliefweb.int).

As noted in section 11 of this report, it is likely that Africa will be increasingly affected by extreme climate variability, and in particular, severe drought, due to the effects of long-term climate change.

Text Box 6: Drought and food insecurity in Southern Africa

The first evidence of a potential food insecurity emergency in Southern Africa could be seen as early as 2001. However, the situation was allowed to deteriorate until by early 2003, a total of 15 million people were estimated to be affected. Disaster relief agencies blamed donor governments, as well as national governments, for underestimating the threat and delaying the response. NGOs in the region have also documented the links between food insecurity and the high prevalence HIV/AIDS, which forces households to spend large amounts of money on healthcare at the expense of agricultural investments or food purchases, and which also reduces labour availability.

In Zimbabwe, drought in 2002 and a problematic land nationalization programme, in addition to a severe macro-economic crisis, all contributed to a massive food security problem. By early 2003, seven million people – almost half the population – required food aid (IFRC 2003).

Per-Anders Pettersson/UNEP/Still Pictures

Extreme weather events are affecting livelihoods in many parts of Africa with increasing frequency.

7

Environment and Security

Topfoto/UNEP

Over 50 countries in Africa are currently, or have recently, been affected by civil or cross-border conflicts. However, the last two years have seen some major progress in national-level peacemaking on the African continent. Significant moves towards peace and long-term stability have been made in countries such as Burundi, Sudan, the Democratic Republic of Congo, Cote d'Ivoire, and Liberia, among others. Nevertheless, Africa continues to be affected by civil conflicts in some areas as well as lower-profile local disputes and episodes of low-intensity insecurity. Many of these events are linked to environmental change and natural resource access, although they are clearly complex and multi-causal phenomena. In some cases, access to natural resources is one of the issues being openly contested. In others, armed groups utilize natural resources (such as timber, or animal products) in order to sustain themselves and buy weaponry. Over time, the profits from natural resource extraction may become even more significant than the political issues at stake, in which case the conflict may legitimately be termed 'resource war'.

Another important issue is population movement as a result of environmental degradation or scarcity. In countries such as Rwanda, for example, many people have migrated in order to access farmland due to land scarcity in their native areas (Huggins 2003a). In some cases, people cross international borders in order to gain improved access to environmental goods and services, in which case they may be legitimately termed 'environmental refugees' (Brown 2004).

A related issue is the effect of armed conflict on the environment. Conflict can have both positive and negative effects on biodiversity. At times, it can reduce human encroachment in areas of high diversity, through the creation of 'no-man's lands'. Of course, this has negative humanitarian consequences on those displaced from such areas.

On the other hand, conflict can exacerbate poverty and therefore increase the rate of unsustainable resource exploitation. Wildlife is also hunted by armed forces for food and/or illegal trade, as is the case for example in some of the National parks of North-Eastern Democratic Republic of Congo.

In Southern Sudan, which is a haven for rare and endangered wildlife (with 19 conservation areas, three gazetted National Parks, and a Biosphere Reserve), the conflict has prevented protection of rare species, many of which have been over-hunted or have migrated due to conflict-related disturbance. In Somalia, populations of elephant, leopards, and giraffes have been wiped out or have moved to safer areas (Masciarreli 2002).

Tragically, consumption of bushmeat by conflict-affected populations can also contribute to disease epidemics. The emergence of Ebola has been linked to the bushmeat trade in the Republic of Congo and Gabon; and the origins of HIV/AIDS have been linked with blood-to-blood contact during hunting and preparation of chimpanzee for the bushmeat trade. The human tragedy of disease is accompanied by a loss of primate species, as they are also affected by the same viruses (Bailey 2004).

Disease can also be cause by localized pollution; for example, when displaced populations are forced to gather in refugee camps, pollution of water sources can occur due to insufficient management of sanitation. Of course, refugee camp populations are vulnerable to disease due to population density; and refugees can unwittingly bring diseases to areas in which host populations have low immunity to these new infections (Shambaugh and others 2001).

In Liberia, where 14 years of war were ended by the signing of a Comprehensive Peace Agreement in August 2003, the reconstruction process is faced with a number of major environmental challenges. For example, timber products were illegally exploited by the armed forces involved in the war, with the result that forest cover in the country was reduced from 38.1 per cent to 31.3 per cent during the 1990s (UNEP 2004). Timber exports were estimated to be worth $150 million in 2002. Though the war is now over, the deforestation trend is set to continue as the limited road network is extended into forested areas. Research indicates that most deforestation occurs within three kilometres of a road. Sanctions have been imposed on timber exports (as well as on countries importing timber from Liberia) by the UN Security Council, which recognized the links between exploitation of natural resources and the trafficking of illegal arms in the West Africa region. The ban on timber export went into force in July 2003, and has been successful in restricting exports to most developed countries, though the regional situation is less clear. The roads network also facilitates other activities which threaten the environment, such as hunting, mining, and agricultural encroachment.

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Access to natural resources such as grazing land during the dry season leads to localized conflicts, especially in the Horn of Africa.

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Improper disposal of urban waste can lead to disease outbreaks. The most vulnerable are the poor urban dwellers who live close toe dump sites.

Mineral exploitation, much of it informal, illegal and without any environmental impact assessment or mechanisms for mitigation of environmental impacts, has had severe consequences in some areas. For example, small-scale gold mining utilizes the mercury-based amalgamation process, which results in approximately 2 grammes of mercury being released into the environment for every gramme of gold recovered. In addition to environmental consequences, the fact that mineral exploitation was so directly linked to the dynamics of conflict led to the development of new vocabulary such as 'blood diamonds', and the implementation of the Kimberly Process to break the link between legitimate trade in diamonds and illegal trade in 'conflict diamonds'. It is conflicts such as that seen in Liberia that have led some analysts suggest that, rather than being grievance-based, most conflicts worldwide are in fact a means of illegitimately securing access to resources, and are therefore based on 'greed' (Collier 2000).

In some pastoral areas, such as the Horn of Africa, traditions of sporadic low-intensity conflict with neighbouring communities, which often take the form of cattle-raiding, have been transformed into more destructive and predatory conflicts due to small arms flows, political and commercial interference, and the erosion of customary checks on levels of violence. It is clear that many of the warring groups are also fighting for control over water and pasture, often seeking dry-season access rather than territorial control. Most pastoral and agro-pastoral communities have clearly defined territories, generally falling into three categories, namely home territories, areas of overlapping access and joint management between two or more communities, and buffer zones administered on a more-or-less ad hoc basis. It seems that customary management arrangements of some of these dryland zones are changing because of land-use changes, state administrative divisions, and a host of other reasons. In such an environment, it is possible that the frequency and nature of conflict will alter.

Text Box 7: Links between conflict and environmental change in Somalia

In Somalia, the charcoal trade is a lucrative source of finance for local warlords and factions. Although export is banned, the Transitional National Government (TNG) experiences difficulty in stopping the trade. The trade may fuel conflict because militias can spend the profits on arms, and because port towns such as Kismayu are fought over by rival groups keen to control the trade. Negative impacts of deforestation can be seen along coastal areas, which are now affected by creeping desertification, according to the TNG's Environmental Minister (Masciarreli 2002).

Text Box 8: Natural resources and conflict in Darfur

The current troubles in Darfur, Western Sudan, have some environmental roots. Ethno-political conflicts have been recorded in the area in the past, but have gained intensity since the 1980s. The northern part of the region has been affected by Sahelian drought cycles – drought has been almost continuously experienced since 1967, with only short interruptions – and is widely believed to be undergoing creeping desertification (Suliman 1997). Some pastoralists lost their herds during the worst episodes of drought, and have become impoverished, though little data are available on the extent of this problem. Environmental stress is increasing due to the combination of drought and high livestock numbers, which has been partly caused by drops in livestock prices abroad and temporary bans on Sudanese livestock exports. These external trends lead to a lack of marketing outlets and results in those households that have stock being unable to sell them for a profitable sum (UN 2001). Studies in the area in the 1980s found evidence of "serious degradation" and clearing of tree cover around water points; the situation has become worse since then. (Hunting Technical Services, 1986). The decline in the natural resource base makes control over water, pasture and fertile land ever more significant for impoverished rural communities.

One of the issues involved is the boundary between migration routes used by pastoralists on their annual move from North Darfur to the south, and the surrounding farms. There are frequent instances of camels and cattle eating crops, sometimes devastating farms, and this is enough to cause localised violence. These small beginnings often trigger larger confrontations between armed members of the respective tribes. About 20 per cent of informants also mentioned deforestation as an issue - nomads are perceived as cutting down palatable trees to allow goats to browse on higher branches. Settlement also has an impact on tree cover: one study in the Al Fasher area of Northern Darfur found that the construction and maintenance of a house requires the cutting down of 334 trees and bushes every four to six years (El Tayeb 1981). This will become more significant as the population continues to grow.

Pastoralists complain that farmers have expanded their farms in recent years, encroaching on their customary livestock routes. In response to allegations that they migrate at inappropriate times, they explain that the health of their camels suffer if they are exposed to rain, so they have to migrate in June, when crops are still standing. However, they concede that their migration patterns have also altered due to drought and desertification in North Darfur (Nyala and Jebbel 2002). Of course, other factors, either political or 'ethnic' in nature, have also been significant.

In the past, natural resource issues have largely been neglected in peace processes. However, there are now encouraging signs that they are being factored into discussions. In the Somalia peace talks facilitated by IGAD in Nairobi, Kenya in 2003, for example, a special technical committee was established in order to examine problems arising from conflicts over land access, which date back to colonial times (Huggins 2003b). Natural resource management issues were also highly significant in the Sudan Peace Process, and the ***Agreement on Wealth Sharing during the pre-interim and interim period*** has an entire section devoted to the ownership of land and natural resources (Government of Sudan/Sudanese People's Liberation Army 2004).

The stakeholders preparatory meeting on the International Conference on the Great Lakes Region

Countries of the Great Lakes Region have been directly or indirectly affected by various ethno-political conflicts especially during the past two decades. The organization of an international conference on the Great Lakes Region has been a recurrent idea particularly since the 1994 Rwandan genocide. This international conference as directed in Resolutions 1291 and 1304, constitutes a significant progress in the appreciation of the region's problems by the international community and a consolidated attempt to support the region to initiate a process for a peaceful resolution of the challenges it faces. In that context, UNEP organized in September 2004 in liaison with the office of the Special Representative of the Secretary General a meeting of stakeholders from the region on environmental issues in the Great Lakes region. The meeting agreed and stressed that an environmental dimension must be integrated into the four themes proposed for the international Great Lakes Conference namely:

i) Peace and Security,
ii) Democracy and Good Governance,
iii) Economic Development and Regional Integration and
iv) Humanitarian and Social Issues.

The meeting also agreed on the following::

i) the environment is a victim of conflicts occurring in the Great Lakes Region;
ii) access to environmental resources and mismanagement of natural resources may be a causal factor of conflicts in the Great Lakes Region;
iii) unless environment is well managed, it can act as a catalyst, fuel and/or may perpetuate conflicts and that
iv) environment is a key factor in promoting co-operation and conflict prevention in the Great Lakes.

Various environmental issues were identified in the context of the four themes. The meeting also identified principles and actions, which will form the basis for a comprehensive action plan, which would take into account conflict resolution and prevention, resettlement, rehabilitation,

Munyaradzi Chenje

Regional dialogue in the Great Lakes region has recognised environment as a key factor in the peace initiative in the region

reconstruction in the context of the environment in the Great Lakes Region. Post-conflict environmental assessment, integrated environmental assessment and reporting, environmental monitoring and early warning, capacity building, harmonisation of policies and strengthening of management institutions were some of the issues highlighted.

At the First Summit of the Heads of State and Governments held during the International Conference on Peace, Security, Democracy and Development in the Great Lakes Region in Dar-Es-Salam, 19 – 20 November 2004, the leaders expressed concern about the impact of armed conflicts on the environment, particularly the effect of refugees and internally displaced persons on the degradation of the ecosystem of the Congo River Basin region and acknowledged the link between peace, environment and development. They therefore committed their governments to support the establishment of a regional early warning and rapid response mechanism for natural and man made disasters and build capacities for environmental restoration in the areas degraded by settlements of refugees and displaced population.

UNEP and the African Ministerial Conference on the Environment (AMCEN) Secretariat shall facilitate the follow up on the environmental components of the four themes of the Conference and promote the development of an integrated action for environmental management as part of sustainable development in the Great Lakes Region. This would be consistent with the World Summit on Sustainable Development (WSSD) Plan of Implementation Chapter VIII, which promotes sustainable development.

8

Christian Lambrechts

Climate Change

The Intergovernmental Panel on Climate Change (IPCC) has stated that, "there is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities". It is expected that climate change will trigger more intense, frequent and unpredictable hazards, including storms, floods, and drought (IFRC 2003). Africa is considered to be more vulnerable to the impacts of climate change because of factors such as widespread poverty, recurrent droughts, inequitable land distribution, and over-dependence on rain-fed agriculture. According to the FAO, climate change will cause severe drought in Africa and an additional 30 million people could be affected by famine by 2050 (Clover 2003). While climatic factors are not the only cause of food insecurity, they have both short-term and long-term negative impacts. Over time, community and household assets are used up, as livestock are slaughtered, land is sold off, and other survival mechanisms are employed. With each successive episode of extreme climate variation, households and communities become less able to cope.

Climate change may already be having a negative impact on human wellbeing. For example, in parts of West Africa, cases of meningitis are associated with particular climatic conditions, which may become more common due to climate change. In Burkina Faso, thousands of people are killed each year due to meningitis (République du Burkina Faso 2002).

The past decade has witnessed a phenomenal increase in efforts to search for appropriate responses for adapting to climate variability and change-a key obligation for all Parties to the UNFCCC. In particular, Article 4 paragraph 1(e) of the Climate Convention calls for cooperation in preparing for adaptation to the impacts of climate change. Parties are committed to developing and elaborating appropriate and integrated plans for, among others, water resources and agriculture and the protection and rehabilitation of areas-particularly in Africa-affected by drought, desertification and floods.

Mitigation measures

Climate change country focal points, regional agencies and international agencies have all been engaged in the search for viable responses. Ongoing activities include: the development of climate change adaptation programmes by many development funding agencies (e.g. GTZ, USAID, OECD); the ongoing development of National Adaptation Plans of Action (NAPAs) by the LDCs, 38 of which are based in Africa; preparation of the Second National Communications (though some developing countries are yet to submit their initial national communication); and the USAID

funded FEWSNet project in Africa. Many responses at national and regional levels have included the promotion of drought-resistant crops, strengthening the participation of African delegations to global negotiations such as the COPs and SB fora and building capacity for weather prediction and response design.

Three key constraints to the reduction of vulnerability of socio-economic systems to climate change have emerged:

1) Past adaptation efforts have not sufficiently been able to integrate and strengthen local capacity and coping mechanisms regarding climatic and other shocks to livelihoods. The poorest and most vulnerable have often not been successfully 'reached' because many measures aimed at adaptation are unattainable to poor people; improved seeds and other inputs aimed at adapting to climatic conditions require financial investments which are often beyond many poor farmers, for example. Many of the early national adaptation strategies were also designed based on global scenarios. This lead to a tendency of *top-down* identification of responses and the disregarding of local complexities such as the social, cultural and other economic and political realities that drive systems (Kituyi and Eriksen 2002).

2) Adaptation has not been integrated in national development policies, but has often been considered a separate environmental policy, along with other climate related policies. Adaptation policies have therefore not effectively been integrated in any efforts to strengthen local livelihoods and reduce poverty.

3) The links between national adaptation efforts and international fora, as well as between national adaptation and research, have been weak. In order to make a greater impact on vulnerability, there is a need to identify responses that are less *top-down* in nature, integrate indigenous knowledge, form part of coordinated policy approaches rather than piecemeal or isolated efforts, and to make use of the current untapped potential in research to advise the national policymaking processes. (Kituyi and Eriksen 2003).

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Water for livestock increases the utilization of semi-arid areas which would otherwise be unsuitable for agriculture.

Vulnerability to Climate Change in Africa

Source: Anna Ballance

There is an increasing recognition within the climate change research community that the climate system is likely to undergo changes, regardless of the implementation of abatement policies under the Kyoto Protocol or other regimes. While the full range of impacts resulting from these changes is still uncertain, it is becoming clear that adaptation to climate change is necessary and inevitable. The Intergovernmental Panel on Climate Change (IPCC) scenarios suggest an increase in temperatures of 1.4 – 5.8 degrees over the next 100 years. While there may be both decreases and increases in average rainfall in different areas, surface runoff, which is a product both of rainfall and increased evaporation due to higher temperatures, is likely to decrease over most of southern and eastern Africa (Joubert and Hewitson 1997). Evidence suggests that variability and the intensity of extremes may be increasing in southern Africa and that the frequency and intensity of floods and droughts can be expected with global warming.

The Third Assessment Report of the IPCC highlighted that developing countries are highly vulnerable to climate change. Yet gaps exist in understanding the nature of this vulnerability and opportunities for adaptation. Furthermore, in many of these countries, there is a need for improved scientific and technical capacity to conduct the integrated, multi-disciplinary regional investigations necessary to fill these gaps.

It is imperative that holistic, bottom-up approaches for adaptation be sought for African

countries. Coping and adaptation takes place within complex local livelihood structures. Approaches most likely to lead to successful adaptation are those which will not only address vulnerability of systems but also those that simultaneously respond to other urgent livelihood challenges. There is a need to identify policy measures for win-win solutions that both reduce local vulnerability to climate change, strengthen local livelihoods and national development and contribute to sustainable natural resource management. The implementation of such approaches would achieve the dual benefits of adapting to climate change and reducing local environmental degradation and poverty. The identification of such approaches calls for a systematic research, capacity building and policy-research interaction, and information dissemination.

The NEPAD *African climate* change strategy revolves around the issue of vulnerability assessment and the development of adaptation strategies (NEPAD 2003). It was considered that the following three major steps needed to be taken to increase the resistance of African countries to climate change:

a) the ecosystems, regions and people most vulnerable to climate change need to be identified;
b) adaptation strategies need to be developed for the identified regions and sectors;
c) demonstration and pilot projects need to be implemented to show the way forward.

Simultaneously, capacity-building support will have to be provided to enable important institutions to function effectively. The NEPAD framework has established an energy initiative, led by Senegal, designed to achieve Africa's energy goals. All countries should undertake full social and environmental impact assessments of all energy projects The role of renewable energy and small-scale projects designed to meet rural electrification needs should be further explored. To this end, the following preliminary projects are proposed within the climate change section of NEPAD:

a) promotion of renewable energy initiatives and strategies;
b) establishment of a sustainable link and working module between climate-change experts and energy initiative capacity-building for sustainable development and the Clean Development Mechanism of the Kyoto Protocol;
c) evaluation of the synergistic effects of adaptation with mitigation activities through pilot projects in the areas of agroforestry, including soil stabilization, income generation, improved soil water retention and enhanced biodiversity.

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Good climate and ambient air quality is one of Africa's valuable resources that is being tapped by many countries in the region to enhance livelihoods through the promotion of tourism

9

Small Island Developing States

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Small Island Developing States (SIDS) have been recognized as a special category of countries, which are in need of differentiated and favourable treatment by their economic partners (United Nations Secretary General 2004). They were first given an international political identity with the establishment in 1991 of the Alliance of Small Island States (AOSIS). They have been acknowledged as a special category of country, with special development needs and environmental challenges by such international decision-making fora including WTO and WSSD. However, the committed level of international support has not yet been forthcoming (UNDESA 2003). SIDS are affected by a number of special challenges, including:

- Small populations and economies
- Weak institutional capacity in both private and public sectors
- Remoteness from international markets
- Susceptibility to natural disasters and climate change
- Fragility of land and marine ecosystems
- High costs of transportation
- Limited diversification in production and exports
- Dependence on international markets
- Export concentration,
- Income volatility and vulnerability to exogenous economic shocks (United Nations Secretary General 2004).

Of the Atlantic Africa and Indian Ocean SIDS, only Cape Verde, the Maldives and Mauritius have demonstrated sustained annual growth in real GDP per capita. The others – Comoros, Sao Tome and Principe and the Seychelles – recorded zero or negative rates of growth in recent years. In general, foreign direct investment in SIDS has declined since 1999.

Sustainable access to freshwater is a major issue for many SIDS. The Cape Verde islands, for example, have thus far relied heavily on underground water sources, which poses sustainability problems. The intrusion of seawater into freshwater aquifers is a problem on some islands, such as the island of Maio where it is damaging the local economy. The answer to these issues have been identified as a combination of re-use of water, desalinization of seawater, and use of surface waters (Government of Cape Verde 2004). In some areas of the Comoros islands, clearing of forests has changed local hydrology. On the island of Anjouan, for example, more than half the rivers have effectively dried up over the last century, while on the island of Moheli, many previously permanent rivers have become seasonal (Union des Comores 2002). Water availability is already insufficient to match demand, and will be increasingly outstripped by demand as population rises and industrial activities are intensified.

Topfoto/UNEP

Coastal erosion is one of the major environmental threats in the small island states.

The greatest threat to marine resources lies in pollution originating from SIDS themselves, including human wastes, industrial pollutants, and agricultural run-off. The Comoros islands, for example, face difficulties with waste management, which threatens fragile coral ecosystems (Union des Comores 2002). Pollution of land from agricultural inputs is also a major concern especially in Mauritius, which uses five times more fertilizer than the world average of 113 kg per hectare (UNEP 2002). This level of use of chemicals poses a serious threat to freshwater supplies. Due to the sheer length of their coastlines, most SIDS lack the capacity for effective monitoring of the situation.

In terms of availability and quality of land resources, the report of the Secretary General recognizes that the situation varies widely between SIDS, but identifies inappropriate land uses, deforestation and inadequate land-use planning as significant issues which pose a threat to agricultural production. In recent years, states including Madagascar and Cape Verde have faced significant food insecurity.

Also of significance is the heavy reliance of most SIDS on a small number of primary agricultural exports, such as raw cane sugar, coffee, or cocoa. For example, until a recent price crash, and the discovery of oil in offshore waters, Sao Tome derived 90 per cent of its agricultural earnings from cocoa alone (Monge-Roffarello and others 2002).

Sustainability of fisheries is an important issue in many small island states, including Cape Verde, where unsustainable practices such as use of explosives and the harvesting of young fish continue, despite the existence of legislation to ban the practices (Government of Cape Verde 2004). Marine biodiversity in the waters of the Comoros Islands, which includes many species of global significance, is threatened by poaching, eutrophication of coastal waters, and the degradation of beaches, especially through harvesting of sand for use in the construction industry. Water availability is already insufficient to match demand, and will be increasingly outstripped by demand as population rises and industrial activities are intensified.

Terrestrial biodiversity is also threatened. Many African SIDS are havens of biodiversity. For example, Madagascar has the highest number of endemic species of any country in Africa, and ranks sixth in the world. About 88 per cent of higher plants species and over half of all vertebrate species found on the island are known or thought to be endemic.

However, on all SIDS, species population numbers are small because of the islands' small landmass. This makes island biodiversity especially vulnerable (IOC 2004). Biodiversity is vital not only due to its inherent, and also universal values, but also because of its importance in the tourist industry. Most of the African SIDS rely heavily on tourism to generate foreign exchange. For instance, the Seychelles imports more than 90 per cent of its total primary and secondary production inputs from the revenue generated through tourism (IOC 2004).

A number of SIDS are challenged by reduced soil fertility and other threats to agricultural productivity. Climatic factors are also significant; the Cape Verde islands, for example, are affected by drought, which has been associated with climate change, and has contributed to food emergencies over the past two years (UNEP 2004).

Regarding energy sources, in many states there is limited awareness of energy efficiency and conservation measures, which limits the ongoing attempts to utilize alternatives to petroleum, which is imported at a very high cost (United Nations Secretary General 2004). In Cape Verde, for example, energy production has in the past been heavily reliant on the islands' forests, but these are now becoming increasingly depleted, necessitating the importation of petroleum products. There is also concern that some countries (such as the Seychelles and Mauritius) have fairly high rates of CO_2 emission (IOC 2004). Biomass fuels, wind energy, and small-scale solar photovoltaic systems are identified as possible alternatives.

Climate change is a major threat to many SIDS. In the case of the Maldives, for example, 80 per cent of land is less than one metre above sea level (IPCC 2001). Many Maldivian islands are already suffering inundation and shoreline erosion. Many African SIDS are susceptible to storms and can be expected to suffer from more frequent storm events due to global climate change. In September 2002, for example, marine and terrestrial biodiversity were compromised due to storm damage on the island of Praslin in the Seychelles (Republic of Seychelles 2004). Regarding vulnerability to natural disasters, much has been done in recent years. In Cape Verde, legal instruments have been ratified, and seismographic technology has been installed to monitor the activities of volcanoes found on the islands.

In terms of management of shoreline vulnerability, the islands shores have a fairly high population density, which means that the livelihoods and/or homes of many thousands of people are at risk from sea level rise and extreme weather events. Protection walls in areas specializing in tourism have been damaged, bays and ports that provide a buffering function are in danger, and important ecosystems, particularly in Boavista, are at risk. Expected impacts of climate change on the Comoros islands by 2050 include the intrusion of salt water into coastal aquifers, an increase in the occurrence of vector-borne diseases including malaria, a decrease in productivity of the agricultural and fisheries sectors, infrastructural damage to the value of $400 million; and the displacement of 10 per cent of the population who live in coastal areas (Union des Comores 2002).

International Responses to SIDS Issues

Regarding climate change, the need for increased financial support for SIDS was emphasized at the 9th Conference of the Parties to the United Nations Framework Convention on Climate Change (Milan 2003).

In terms of environmental challenges, a recent report by the Secretary General of the UN provided more details on the areas of concern which have been identified above (United Nations Secretary General, 2004). The report also notes that despite increasing cooperation between governments and community-based organizations in the area of disaster preparedness, as well as the establishment of disaster management agencies in some areas, contingency planning and response preparedness remains generally weak.

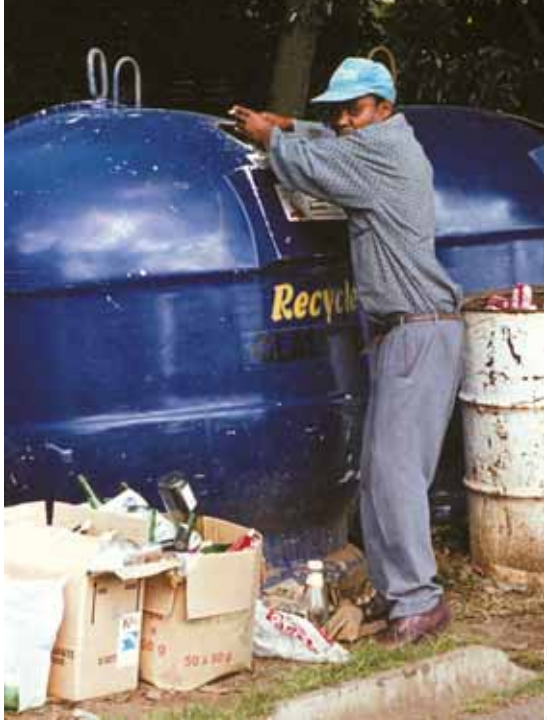
In response to these challenges, the Plan of Implementation of the WSSD included a component concentrating solely on the needs of SIDS, which identified the following areas for action:

- Implementation of sustainable fisheries management.
- Delineation and effective management of coastal areas and exclusive economic zones.
- Support for SIDS components within programmes on marine and coastal biological diversity.
- Support for programmes for freshwater provision and management.
- Reduction and control of waste and pollution through implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities in SIDS.
- Support for community-based sustainable tourism initiatives.
- Support local communities and national or regional bodies in order to enhance hazard and risk management; and disaster prevention, mitigation and preparedness.
- Support for the finalization and early operationalization of economic, social, and environmental vulnerability indices and related indicators as tools for sustainable development.
- Assistance for increased capacity to adapt to climate change.
- Support for efforts to build capacities to implement intellectual property regimes.
- Support the availability of adequate. affordable and environmental sound energy services through capacity-building and promotion of renewable, efficient and indigenous energy sources.

Also significant is the NEPAD conservation and sustainable use of coastal and marine resources programme area (NEPAD 2003). The objectives of this area are to support the implementation of the objectives of the Abidjan and Nairobi conventions, to contribute to the implementation of the decisions of the Super Preparatory Conference of the African Process regarding the management of Africa's coastal and marine resources in an integrated manner, and to support the development and implementation of the African Regional Programme of Action on Freshwater, which is being developed by the African Ministerial Conference on Water (AMCOW). Activities in the area of freshwater will be undertaken in the context of AMCOW pursuant to its mandate. The programme will also aim at assisting African countries to implement the relevant provisions of the Global Programme of Action and the activities contained in the Global Programme of Action work programme for the period 2002–2006, including the Strategic Action Plan on Municipal Wastewater.

10

Regional Institutional Developments



Topfoto/UNEP

In 2002, the Organization of African Unity transformed into the African Union (AU), shifting its development agenda from one that was a predominantly political mandate towards a more economic paradigm. The AU, which has brought with it a new impetus toward the African Economic Community as envisaged in the Abuja Treaty, adopted a multi–dimensional economic development framework, the New Partnership for Africa's Development (NEPAD). NEPAD recognizes the various dimensions of development, ranging from economic, political, security, social to cultural issues.

Action Plan of the Environment Initiative of NEPAD

The environmental activities to be implemented under NEPAD are laid out in the Action Plan of the Environment Initiative of NEPAD. The Action Plan was prepared in 2003, under the leadership of AMCEN and in close cooperation with the NEPAD secretariat and the African Union as well as with the support of the United Nations Environment Programme (UNEP) and the Global Environment Facility (GEF).

In addition to the programmes on trans-boundary conservation or management of natural resources; climate change; prevention, control and management of invasive alien species; conservation of Africa's wetlands; land degradation, desertification and drought; and conservation and sustainable use of coastal and marine resources outlined above, there is a programme to conserve Africa's wetlands and there are several cross-cutting issues.

Activities to conserve Africa's wetlands will be supported by the Conference of the Parties to the Ramsar Convention, following a decision taken at the eighth COP meeting. Promotion of the establishment of North African and West African wetlands networks followed by the establishment of similar networks for the other subregions. Links will be fostered with the Global Water Partnership, the International Water Management Institute and other organizations for the design and implementation of projects.

Cross cutting issues within the Action Plan of the Environment Initiative of NEPAD include health and environment, transfer of environmentally sound technologies, assessment of and early warning on natural disasters, and the environmental directory of NEPAD.

The implementation of the programme will be within the framework of sub-regional organizations in Africa.

Also of relevance is the Comprehensive Africa Agriculture Development Programme (CAADP) of

NEPAD, which has been developed in conjunction with the FAO.

There are three main pillars to the CAADP:

a) Extending the area under sustainable land management and reliable water control systems;
b) Improving rural infrastructure and trade-related capacities for market access.;
c) Increasing food supply and reducing hunger (which includes a subcomponent on responding to disasters and emergencies);

There is an additional long-term activity: Agricultural research, technology dissemination and adoption.

Text Box 9: Subregional Organizations

There are nine subregional organizations in Africa:

1. CEEAC (ECCAS) - Economic Community of Central African States (Angola, Burundi, Cameroon, Central African Republic, Chad, Congo Democratic Republic, Congo Republic, Equatorial Guinea, Gabon, Rwanda, Sao Tomé and Principe)
2. CEMAC: Central African Economic and Monetary Community; (Cameroon, Central African Republic, Republic of Congo, Gabon, Equatorial Guinea, Chad)
3. CEN-SAD - Community of Sahel-Sahara States (Burkina Faso, Central African Republic, Chad, Djibouti, Egypt, Eritrea, Ethiopia, the Gambia, Libya, Mali, Morocco, Niger, Nigeria, Tunisia, Senegal, Somalia, Sudan)
4. COMESA - Common Market for Eastern and Southern Africa (Burundi, Comoros, Democratic Republic of Congo, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Namibia, Rwanda, Seychelles, Swaziland, Sudan, Uganda, Zambia and Zimbabwe)
5. ECOWAS - Economic Community of West African States (Benin, Burkina Faso, Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo)
6. IGAD - Intergovernmental Authority for Development (Djibouti, Eritrea, Ethiopia, Kenya, Somalia, Sudan, Uganda)
7. SADC - Southern African Development Community (Angola, Botswana, DRC Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe)
8. UEMOA – West African Economic and Monetary Union (Benin, Burkina Faso, Cote d'Ivoire, Guinea-Bissau, Mali, Senegal, Togo, Niger)
9. UMA – The Union of the Arab Maghreb (Algeria, Libyan Arab Jamahiriya, Morocco, Mauritania, Tunisia)

References

Alinon, Koffi (2003) *Land Issues in the Core Development Agenda: The West African Situation, Paper Presented at fourth Pan-African Programme on Land and Resource Rights (PAPLRR) workshop,* Cape Town, South Africa, 5-7 May 2003

Barrow, E., Chege, F., Lahtela, V., Mkanda, F., Matindi, S., Ndikumagenge, C., Saint-Laurent, C., Young T. (2004) *Civil Society, Law Enforcement, and Forest Governance in Africa*. IUCN, Nairobi

Beekman H.E., Abu-Zeid K., Afouda A., Hughes S., Kane A., Kulindwa K.A., Odada E.O., Opere A., Oyebande L. and Saayman, I.C. (2004) *Vulnerability of Water Resources to Environmental Change in Africa – A Basin Approach. Early Warning and Assessment Report* Series, UNEP/DEWA/RS. United Nations Environment Programme, Nairobi, Kenya.

Brown, L.(2004) Troubling New Flows of Environmental Refugees. *Eco-Economy Update* No. 33. Earth Policy Institute, Washington

Bailey, N. (2004) 'Bushmeat, Health and Conservation Impacts'. In: Bushmeat Crisis Task Force, (2004). *Bushmeat Quarterly*. No. 11 Spring/Summer 2004

CARE, Freshwater Action Network, Green Cross, Oxfam, Tearfund, WaterAid, WWF (2004) *A Scorecard Assessment of Developing Country and Donor Progress.* Available online at http://www.wateraid.org.uk/documents/NGO%20Water%20Consortium%20CSD-12%20Case%20Scorecard%20Report.pdf

CISDL/ACTS (2003) *Land Tenure Reform and the Drylands*; UNDP Global Drylands Initiative.

CITES (2002). *Introduction to CITES*. Available on www.cites.org

Clay, D;Reardon and Kangasniemi(1998) *Sustainable intensification in the highland tropics; Rwanda's investment in land conservation and soil fertility*. Massachusetts State University

Clover, J. (2003) Food Security in Sub-Saharan Africa. *African Security Review*, Vol 12. No. 1. Institute for Security Studies, Pretoria

Daudelin, J. (2003) *Land Policies for Growth and Poverty Reduction*. World Bank, Washington DC

Dunne, P. and Mhone, G. (2003).*Africa's Crises: Recent analysis of armed conflicts and natural disasters in Africa. International Labour Organization*: Working Paper No. 5

Eriksen, S. and L.O.Næss. (2003). *Pro-poor adaptation: Norwegian Development Cooperation and Climate Change Adaptation*: An Assessment of Issues, Strategies and Potential Entry Points. NORAD, Oslo

Freshwater Action Network, Green Cross, Oxfam, Tearfund, WaterAid, WWF (2004) *"Promised but not Delivered"*

FAO (2002) *The Future of Regional Food Security and Agriculture in Africa: High Level Meeting in Abuja*. Press Release, FAO, Rome.

FAO (2003). *Unlocking the water potential of agriculture*. FAO, Rome

FAO Population and Development Service (2003). *HIV/AIDS, Food Security and Livelihoods*; FAO, Rome.

FAO (2004) "Hunger in their wake: Inside the battle against the desert locust". Food and Agriculture Organization, Rome. http://www.fao.org/newsroom/focus/2004/51040/

FAO (2004b) "Erosion of plant genetic diversity". Food and Agriculture Organization, Rome. http://www.fao.org/newsroom/en/focus/2004/51102/

Gasarasi (forthcoming) *Land Disputes in Kibungo Province, Rwanda*. University of Rwanda.

Gichuki, F. (2002) *Water, Environment and Development in Mountain Areas and Surrounding Lowlands*. Paper presented at Africa High Summit Conference, UNEP, Nairobi 6-10th May 2002

Government of Cape Verde (2004), *Barbados Programme of Action+10 Review: National Assessment Review of Cape Verde*, Praia

Government of Sudan/Sudanese People's Liberation Army, (2004) *Framework Agreement on Wealth Sharing During the Pre-Interim and Interim Period Between The Government of the Sudan (GOS) and The Sudan People's Liberation Movement/Sudan People's Liberation Army (SPLM/A)*. Naivasha

GRAF/GRET/iied, (2002) *Making Land Rights More Secure: International Workshop for Policy Makers and Researchers*. Report of a Workshop, Ouagadougou, March 19th to 21st, 2002

Huggins, C. (2003a) *The Challenges of Land Scarcity and Protracted Social Conflict in Rwanda: A Discussion Paper. Internal document for Preventing Conflict through Improved Policies on Land Tenure, Natural Resource Rights, and Migration in the Great Lakes Region*: An Applied Research, Networking and Advocacy Project

Huggins, C. (2003b) Ecological Sources of Conflict in Sub-Saharan Africa: Linking Theory to Practice. *Eco-Conflicts Policy Brief* Vol. 2 No. 3. ACTS Press, Nairobi

Huggins, C. with Mugisha, A. (2003c) Country Background Brief: *Burundi; Internal document for Preventing Conflict through Improved Policies on Land Tenure, Natural Resource Rights, and Migration in the Great Lakes Region*: An Applied Research, Networking and Advocacy Project

Huggins, C. (2003d) *Rural Water Tenure in Kenya and Tanzania: Changing Tenure Patterns, Legal Regimes and Community Responses*. OSSREA. Addis Ababa.

Huggins, C. (2004) *Preventing Conflict through Improved Policies on Land Tenure, Natural Resource Rights, and Migration in the Great Lakes Region*. *Eco-Conflicts Policy Brief* Vol. 3 No. 1.

IMF (2004) IMF Sub Saharan Africa: Regional Economic Outlook. Economist Intelligence Unit - Business Africa Number 304, 16 October 2004.

iisd (1999). Twenty-second special session of the general assembly for the review and appraisal of the implementation of the programme of action for the sustainable development of small island developing STATES; *Earth Negotiations Bulletin* Vol. 8 No. 31, October 1999

Indian Ocean Commission (IOC) (2004) *Atlantic Africa and Indian Ocean Environmental Outlook Report, 2004 (Draft)*

International Expert Meeting on Forests and Water, (2002) *Shiga Declaration on Forests and Water*. Shiga, Japan. November 2002

IPCC (2001). *Third Assessment Report: Climate Change Impacts, Adaptation and Vulnerability.* IPCC Working Group II, Geneva, online at http://www.grida.no/climate/ipcc_tar/wg2/index.htm

ITDG (2002) *Biotechnology and GMO Commission at the Peoples' Global Forum*. Available online at http://www.itdg.org/html/advocacy/wssd_biotech_gmo.htm

IUCN (2003). *IUCN Red List Categories and Criteria*. IUCN special survival commission. IUCN, Gland, Switzerland and Cambridge UK.

IUCN (2003).*Department of Environmental Affairs and Tourism/ Media Release/ Vth IUCN World Parks Congress sets Agenda for Next Decade, Spurs Conservation Initiatives for Africa*

Jaspars, S. and J. Shoham (2002). *A Critical Review of Approaches to Assessing and Monitoring Livelihoods in Situations of Chronic Conflict and Political Instability*: ODI, London

Jones, A. (2000) Kosovo: Orders of Magnitude.In: *Idea: A Journal of Social Issues*. Vol. 5, No. 1

Joubert, A.M. and B. Hewitson (1997). Simlulating present and future climates of southern Africa using general circulation models. *Progress in Physical Geography* 21: 51-78.

Kituyi, E. and S. E.riksen, (2002). *Adaptation to climate change in Eastern Africa: Which way out?. Inter-regional Conference on Adaptation to Climate Change* October 18-20 2002, Development Alternatives, the Government of India, UNFCCC, RING. Hotel Taj Mahal, Man Singh Road, New Delhi.

Kituyi, E. and Eriksen, S. (2003) *Harnessing the Potential in Integrated Watershed Management for Adaptation to Climate Variability and Change in Eastern & Southern Africa: A Policy Research, Capacity Building & Information Dissemination Project*. Project Proposal.

Koziell, I and McNeill, C. (2004) Poverty Reduction through Conservation and Sustainable Use of Biodiversity. In: Bigg, T. (ed) (2004) *Survival for a Small Planet: The Sustainable Development Agenda*. Earthscan

Leisz, S. (1996) Rwanda Country Profile; in Bruce, John W. (1996) *Country Profiles of Land Tenure: Africa, 1996;* Land Tenure Centre, University of Wisconsin-Madison; Research Paper No. 130.

Liversage, H. (2003) *Overview of Rwanda's Land Policy and Land Law and Key Challenges for Implementation*. DFID/MINITERE. Kigali

Manji, A. (2004) *Towards a Sociology of Land Reform in Africa*. Presentation for Birkbeck `Development as History Seminar Series', London, 2004

McGranahan, G and Kjellen, M. (2004) Environment and Human Health: Towards a Shared Agenda for Sustainable Development. In: Bigg, T. (ed) (2004) *Survival for a Small Planet: The Sustainable Development Agenda*. Earthscan

McGranahan and Satterthwaite, (2004) Improving Access to Water and Sanitation: Rethinking the Way Forward in Light of the Millenium Development Goals. In: Bigg, T. (ed) (2004) *Survival for a Small Planet: The Sustainable Development Agenda*. Earthscan

Monge-Roffarello, L., Swidinsky, M. and Vanzetti, D. (2002) *Sink or Swim? Assessing the Impact of Agricultural Trade Liberalization on Small Island Developing States*. UNCTAD, 2002

Mullins, D., Drimie, S. (undated), HIV/AIDS and Land: Kenya, Lesotho, Malawi & South Africa, Paper presented at Social Aspects of HIV/AIDS Research Alliance Conference, 1 - 4 September, Pretoria South Africa, available online at http://www.sarpn.org.za/documents/d0000158/index.php.

Nation Correspondent (2004) *EAC to aid war against the hyacinth*. Daily Nation, Nairobi, February 10, 2004

National Environmental Management Authority (NEMA)(2003) *Taskforce on the Phasing-Out of Leaded Gasoline in Kenya – Meeting Report: Sub-Committee Meeting on Data and Information*, September 2003. Nairobi

Negrao, J. (2002) *Land in Africa - an indispensable element towards increasing the wealth of the poor*. Paper Presented at the inaugural fourth Pan-African Programme on Land and Resource Rights (PAPLRR) workshop in Cairo, Egypt, 25 - 26 March 2002

NEPAD (2003) *Action Plan of the Environment Initiative of the New partnership for Africa's Development (NEPAD)*. Johannesburg

Palmer, R. (2004). *Land as a Global Issue - A Luta Continua*; paper Prepared for Oxfam-Zambia Copperbelt Livelihoods Improvement Programme Land Workshop

Pottier, J. (1996) *Agricultural Rehabilitation and Food Insecurity in Post-War Rwanda: Assessing Needs, Designing Solutions, IDS Bulletin*, Vol. 27 Number 3

Project Ploughshares, (2004) *Armed Conflicts Report, 2003. Project Ploughshares*. Ontario, Canada

Republic of Burkina Faso (2002). *Contribution nationale du Burkina Faso en vue de l'élaboration du rapport sur l'état de l'environnement en Afrique de l'Ouest*.

Republic of Seychelles (2004), *Barbados Programme of Action+10 Review; Republic of Seychelles National Assessment.*

Quan, J. (2003) *Reflections on the Development Policy Environment for Land and Property Rights*, 1997 – 2003; Background Paper for International Workshop on Fundamental Rights in the Balance: New Ideas on the Rights to Land, Housing & Property. Institute of Development Studies, University of Sussex. 16-18 October 2003

Sara J.Scherr,(1999) *Poverty-Environment Interactions in Agriculture: Key Factors and Policy Implications*. Paper prepared for the United Nations Development Programme (UNDP) and the European Commission (EC) expert workshop on Poverty and the Environment, Brussels, Belgium, January 20-21, 1999

Shambaugh, J., J. Oglethorpe, and R. Ham (with contributions from Sylvia Tognetti)(2001) *The Trampled Grass: Mitigating the Impacts of Armed Conflict on the Environment.* Biodirsity Support Program. Washington D.C.

Swallow, B; Okono, A; Ong, C and Place, F (2003). TransVic: *Improved Land management across the Lake Victoria Basin. CGIAR Research towards integrated Natural Resources Management.* ICRAF. Nairobi

Tawfic, Rawia (2003) *Land and Agriculture in NEPAD: Implications for North Africa. Paper Presented at fourth Pan-African Programme on Land and Resource Rights (PAPLRR) workshop, Cape Town, South Africa, 5-7 May 2003*

Terranti, S. (2003). *Privatisation of Agricultural Land in Algeria*; Paper Presented at fourth Pan-African Programme on Land and Resource Rights (PAPLRR) workshop, Cape Town, South Africa, 5-7 May 2003

(Terry, G., and Calaguas, B., 2003). *Financing the Millennium Development Goals for Domestic Water Supply and Sanitation*, WaterAid, London.

Tibaijuka, A. K. (1997) *AIDS and Economic Welfare in Peasant Agriculture*: Case Studies from Kagabiro Village, Kabera Region, Tanzania; in World Development, Vol. 25, No. 6.

UNDESA (2003). *Report of the AIMS Preparatory Meeting to Review Implementation of the Programme of Action for the Sustainable Development of Small Island States.* New York

UNDESA (2004). *OECD Global Forum on Sustainable Development: Financing Water and Environmental Infrastructure for All.* Background Paper No. 6. New York

UNDP (2004). *Human Development Report 2003*, Washington DC

UNECA (2001). *State of the Environment in Africa*. UNECA, Addis Ababa

UNECA (2003). *Report of the Ad Hoc Expert Group Meeting on Land Tenure Systems and Sustainable Development in Southern Africa*; October 2003, Lusaka Zambia

UNEP (2002). *Africa Environmental Outlook.* Past Present and future perspectives. UNEP, Nairobi

UNEP (2002b). *Vital Water Graphics*. Nairobi

UNEP (2002c). *Global Environmental Outlook 3.* UNEP, Nairobi

UNEP (2003a). *Water policy challenges and priorities in Africa: Pan-African Implementation and Partnership conference on water* December 8-12, 2003, Addis Ababa, Ethiopia. UNEP, Nairobi

UNEP (2003b). *Treaty on International Trade in GMOs to become Law*. Press Release. Nairobi

UNEP (2004). *Desk Study on the Environment in Liberia*. Nairobi

UNEP (2004b). *GEO Yearbook 2003*; Nairobi

UNEP (2004c). *Global International Water Assessment; Lake Chad Basin GIWA Regional Assessment* 43. UNEP.

UN-Habitat (2003) *Global Report on Human Settlements 2003: The Challenge of Slums*. UN, New York

Union des Comores (2002) *United Nations Framework Convention on Climate Change*: Initial national Communication

United Nations Development Programme, (1994), *Pastoral Natural Resource Management and Policy: Proceedings of the Subregional Workshop,* Arusha, Tanzania, UNDP/ UNSO

United Nations Framework Convention on Climate Change

United Nations Secretary General (2004). *Review of Progress in the Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States: Report of the Secretary General*; Washington DC

WaterAid (2004) *UN Commission for Sustainable Development 12 (CSD-12).* Available online at http://www.wateraid.org.uk/in_depth/news_and_events/2003.asp

Wily, L. and Mbaya, S. (2001) *Land, People and Forests in Eastern and Southern Africa at the Beginning of the 21st Century: the Impact of Land Relations on the Role of Communities in Forest Future*, IUCN World Conservation Union

World Bank (2004*). World Development Indicators 2004*, Washington, D.C.

World Bank (2004). *World Development Indicators*. 3 Environment. World Bank

World Energy Council (2003) *The Potential for Regionally Integrated Energy Development in Africa: A Discussion Document.* London.

World Rainforest Movement, (2004) 'Community Forests in International Processes'. *World Rainforest Movement Bulletin* No. 81, April 2004

WRI (2000). *World Resources 2000-2001. UNDP/UNEP/WB/WRI.*