

ANNEXURE 1: NATIONAL, PROVINCIAL, MUNICIPAL AND SECTORAL STATE OF ENVIRONMENT REPORTS

State of Environment Reports Published

Title of the published output	Year of publication	URL link to full text
Summary State of the Environment Report for the Cape Metropolitan Area, Year 1 (1998)	1998	http://www.cmc.gov.za/soe
Summary State of the Environment Report for the Cape Metropolitan Area, Year 2 (1999)	1999	http://www.capetown.gov.za/soe
Summary State of the Environment Report for the City of Cape Town, Year 3 (2000) (Summary)	2000	http://www.capetown.gov.za/soe http://www.deat.gov.za/soer/
North West Province State of the Environment Report Overview (2002)	2002	http://www.nwpg.org.za http://www.deat.gov.za/soer/
State of the Environment Report (2002), North West Province, South Africa (Comprehensive)	2002	http://www.nwpg.org.za http://www.environment.gov.za/soer/
State of the Environment Report for the City of Cape Town, Year 5 (2002)	2002	http://www.cmc.gov.za/soe http://www.environment.gov.za
State of the Environment Report for the City of Cape Town Year 4 (2002)	2002	http://www.cmc.gov.za/soe
Ekurhuleni Metro State of the Environment Report (Comprehensive)	2003	http://www.deat.gov.za/soer/ http://www.ekurhuleni.com
Joburg State of the Environment Report (Comprehensive)	2003	http://www.joburg.org.za http://www.deat.gov.za/soer/
Limpopo State of the Environment Overview (2003)	2003	http://www.deat.gov.za/soer/reports/limpopo/Limpopo.pdf
Mangaung State of the Environment Report (Overview)	2003	http://www.deat.gov.za/soer/ http://www.mangaung.co.za
Mbombela State of the Environment Report (Comprehensive)	2003	http://www.deat.gov.za/soer/reports/mbombela/Mbombela5oER.pdf
Mogale City State of the Environment Report (Comprehensive)	2003	http://www.deat.gov.za/soer/reports/mogale/main.html
Mpumalanga State of the Environment Report (2003) (Comprehensive and Overview)	2003	http://www.deat.gov.za/soer/reports/mpumalanga/main.html http://eia.csir.co.za/mpumalanga/documents%5CMPU_SOE_2003_TOC.pdf
State of the Environment Report Gap Analysis for the City of Tshwane (2001—2002) (Gap Analysis)	2003	http://www.cmc.gov.za/soe
Eastern Cape State of the Environment Report (2004) (Comprehensive)	2004	http://www.deat.gov.za/soer/
Ekurhuleni State of the Environment Report (2004) (Comprehensive and Overview)	2004	http://www.ekurhuleni.com http://www.deat.gov.za/soer/
Gauteng State of the Environment Report (2004) (Comprehensive)	2004	http://www.deat.gov.za/soer/ http://www.dacel.gpg.gov.za
Northern Cape State of the Environment Report	2005	http://www.northern-cape.gov.za/
Western Cape State of the Environment Overview Report (2005) (Comprehensive)	2005	http://www.capegateway.gov.za/eng/publications/reports_research/W/120813

Municipal State of Environment Reports

Municipality	Expected Date of Publication
Drakenstein Local Municipality	2006
Nkangala District Municipality	2006
Sedibeng District Municipality	2006
The City of Tshwane	2006
West Rand District Municipality	2006
Eden District Municipality	2007

Provincial State of Environment Reports

Province	Expected Date of Publication
Free State (Comprehensive)	2007
KwaZulu-Natal (Comprehensive)	2006
Limpopo (Comprehensive)	2006
North West (second five yearly SoE report)	2007

Sectoral Reports

State of Rivers Reports		
Title of the published output	Year of Publication	URL link to full text
Crocodile, Sabie-Sand & Olifants River Systems	2001	http://www.csir.co.za/rhp/ http://www.deat.gov.za/soer/
Letaba and Luvuvhu River Systems	2001	
uMngeni River and neighboring rivers and streams	2002	
Diep, Hout Bay, Lourens and Palmiet River Systems	2003	
Free State Region River Systems	2003	
The Hartenbos and Klein Brak River Systems	2003	
Berg River System	2004	
Buffalo River System	2004	
Crocodile (West) Marico Water Management Area	2005	
Greater Cape Town's Rivers	2005	
Olifants / Doring and Sandveld Rivers	2006	
State of Estuaries		
State of South African Estuaries: geomorphology, Ichthyofauna, water quality and aesthetics	2000	http://www.deat.gov.za/soer/
Catchment Land cover	2001	
State of Vegetation		
Vegetation of South Africa, Lesotho and Swaziland	1999	http://www.deat.gov.za/soer/
Other Reports Underway		
State of Air		http://www.deat.gov.za/soer/
State of Coasts		
State of the Forest Report		

ANNEXURE 2: MILLENNIUM DEVELOPMENT GOALS (MDG), TARGETS, AND INDICATORS FOR SOUTH AFRICA

Note: Targets refer to either specific MDG targets or targets set by South Africa, where these are available. For some indicators explicit targets have not been set.

GOAL 1: Eradicate extreme poverty and hunger

Target 1: Halve, between 1990 and 2015, the proportion of people whose income is less than US\$1 a day

South Africa's approach to poverty eradication is premised on the need for an integrated approach that includes social security grants, free access to basic services, free basic education, local economic development, and sustainable job creation. Evidence suggests rising poverty and inequalities, but the positive impact of social grants may be starting to reverse this trend.

INDICATORS	1995	2001	Target by 2015
Proportion of population living below international poverty line of US\$1/day (or R87/month)*	7.6	11.3	5.7
Proportion of population living below international poverty line of US\$2/day (or R174/month)*	30.9	34.4	-

Source: Statistics South Africa. Based on 'A poverty profile of South Africa' Statistics South Africa (2005) (using the 1995 and 2000 Income and Expenditure Surveys, the 1995 October Household Survey, and the September 2000 Labour Force Survey).

*For those readers who require information on the 1995 Income and Expenditure Survey, the measures are as follows: proportion of population living below international poverty line of US\$1/day or R87/month, 7.6%; proportion of population living below international poverty line of US\$2/day or R174/month, 30.9%; poverty gap at US\$1/day, 0.018; poverty gap at US\$2/day, 0.106; Gini-coefficient, 0.59; Share of the poorest 20% in national consumption, 3.4%; 0.59 is Gini-coefficient excluding social transfers. If transfers are taken into account, the Gini-coefficient is 0.35.

Target 2: Halve, between 1990 and 2015, the proportion of people who suffer from hunger

Interventions have included school feeding schemes, community gardens, and food parcels for the destitute. Using malnutrition amongst children as an indicator, evidence suggests that hunger for the poor remains a persistent problem and there is no evidence of significant improvements.

INDICATORS	1994 (6-71 months)	1999 (12-71 months)	Target by 2015
Prevalence of underweight children under five years of age (%)	9.3	11.1	5.6
Percent of children showing wasting (%)	2.6	3.6	1.3
Percent of children showing stunting (%)	22.9	23.8	11.9

Sources: South African Vitamin A Consultative Group (1995); Department of Health (2000).

Notes:

'Underweight' refers to the proportion of children with a weight for age that is under 2 standard deviations from the norm (reference population median).

'Stunting' is defined as the proportion of children with height for age under 2 standard deviations from the norm (reference population median).

'Wasting' refers to the proportion of children with weight for height that is under 2 standard deviations from the norm (reference population median).

Goal 2: Achieve universal primary education

Target 3: Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling

Apart from basic access, the government has committed to a programme to improve all the physical conditions of primary schools, including elimination of open veld schools. There are positive enrolment trends, but many schools require improved infrastructure.

INDICATORS	Database 1	Database 2	Database 3	2015 MDG target
Primary net enrolment ratio (%)	88 (Census 1996)	94 (Census 2001)	96 (LFS 2004)	100
People aged 17 years who have successfully completed a minimum of primary education (%)	81 (Census 1996)	84 (Census 2001)	-	100
Literacy rate of 15 to 24 year olds (%)	95 (OHS 1996)	96 (GHS 2003)	98 (LFS 2004)	100

Sources: Statistics South Africa, Census 1996 and Census 2001; October Household Surveys 1996; General Household Survey 2003; and Labour Force survey March 2004.

Notes:

Primary education net enrolment ratio (NER) is the number of primary school students aged 7-13, divided by the total number of children in the population aged 7-13.

Literacy rates: the proportion of people who say they can read and/or write in at least one language.

Primary school in South Africa includes Grades 1 through 7, or seven years of education.

Goal 3: Promote gender equality and empower women

Target 4: Eliminate gender disparity in primary and secondary education preferably by 2005 and in all levels of education no later than 2015

Trends in this regard are very positive, with the number of female learners at higher levels exceeding the number of male learners. There are programmes aimed at targeting skills development for women in ABET sector, higher education sectors, and through learnerships and specific programmes for women in science and technology.

INDICATORS	1994	1996	2001	2003	2004
Ratio of girls to boys in:					
- primary education (girls per 100 boys)	98:100	96:100	-	-	-
- secondary education (girls per 100 boys)	118:100	-	112:100	-	-
- tertiary education (girls per 100 boys)	-	92:100	-	116:100	-
Ratio of literate females to males (15-24 years)	-	111:100	-	109:100	-
Share of women in wage employment in the non-agricultural sector (%)	-	41	43	-	-
Proportion of seats held by women in national parliament (%)	25	-	-	-	33

Source: Education Foundation of South Africa; Statistics South Africa; Census 1996 and 2001.

Sources: This assessment is based on the contents of the 2005 Millennium Development Goals (MDG) Country Report that was the South African Government's official submission to the MDG Summit in 2005, updated from various independent sources.

Goal 4: Reduce child mortality

Target 5: Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate

This remains a persistent problem at unacceptably high levels despite improved immunisation.

INDICATORS	1998	2002 Preliminary %	2003 (estimates)	Target by 2015
Neonatal mortality rate (per 1000 live births)	20	-	-	-
Infant mortality rate (per 1000 live births)	45	44	-	15
Under-five mortality rate (per 1000 live births)	59	60	-	20
Proportion of 1 year-old children immunized against measles (%)	72	-	78	90

Sources: South African Demographic and Health Survey (DOH - SADHS), 1998; Department of Health, 2001, Statistics South Africa, Causes of death 1997-2003, 2004.

Note: Neonatal mortality is the probability of dying within the first month of life, infant mortality is the probability of dying in the first year of life, and under-five mortality is the probability of dying between birth and age five.

Goal 5: Improve maternal health

Target 6: Reduce by three-quarters, between 1990 and 2015, the maternal mortality rate

Positive trends over the last ten years are set to continue.

INDICATORS	1992- 1998	1998 SADHS (NDoH)	Revision	2004 NDoH / Stats SA	2005 National Target	Target by 2015
Maternal mortality ratio (per 100 000 live births)	-	150	84	124	100	38
Proportion of deliveries that are supervised by trained birth attendants (%)	84	-	-	-	90	-

Sources: South African Demographic and Health Survey (SADHS), 1998; National Department of Health / Statistics South Africa.

Note: Maternal mortality ratio (MMR) refers to the number of maternal deaths (women who die as a result of childbearing, during the pregnancy or within 42 days of delivery or termination of pregnancy in one year) per 100 000 live births during that year.

Goal 6: Combat HIV and AIDS, malaria and other diseases

Target 7: Have halted by 2015, and begin to reverse the spread of HIV and AIDS

The disease continues to spread at high rates despite commencement of various education and treatment campaigns.

INDICATORS	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
HIV prevalence among 15 – to 29-year-old pregnant women	7.6	10.4	14.2	17	22.8	22.4	24.5	24.8	26.5	27.9
Contraceptive prevalence rate	-	-	-	-	-	-	-	-	-	-
Number of children orphaned by HIV and AIDS	-	-	-	-	-	-	-	-	-	-

Sources: Department of Health, 2004. National HIV and Syphilis Antenatal Sero-Prevalence Survey in South Africa 2003.

Target 8: Have halted by 2015, and begin to reverse the incidence of malaria and other major diseases

Both diseases are on the increase, especially in poor areas. South Africa is however one of the few sub-Saharan countries that will meet the target. Challenges include treatment completion for TB and Malaria vector control, particularly given that climate change is expected to lead to an increased spread of malaria.

INDICATORS	1997	1998	1999	2000	2001	2002	Target
Prevalence and death rates associated with malaria (per 100 000)	1.2	1.3	2.6	2.4	1.9	1.8	-
Proportion of the population in malaria-risk areas using effective malaria prevention and treatment measures	-	-	-	-	-	-	-
Prevalence and death rates associated with tuberculosis (per 100 000)	53.4	67.6	79.4	96.4	113	131.7	-
Proportion of tuberculosis cases detected and cured under directly observed treatment, short-course (DOTS) (%)	-	-	-	53.8	53.7	53.9	85

Sources: Statistics South Africa, 2005 (mortality and causes of death), 1998, 1999, 2000, 2004 (mid year estimates); Department of Health Annual Report 2003/2004.

Note: To be classified as 'cured', patients must be smear-negative at the end of the treatment.

Goal 7: Ensure environmental sustainability

Target 9: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources

Per capita carbon emissions remain high and is likely to increase by 4% per annum. There is a slight improvement in energy efficiency. The 2010 Biodiversity target will in all likelihood not be met.

INDICATORS	1994/1995	2000	2003	MDG Target
Proportion of land area covered by forest (%)	7.6	7.6	7.6	-
Ratio of area protected to maintain biological diversity to surface area (%)	5.9	6.1	6.2	10.0
Energy use (kg oil equivalent) per US\$ 1 000 GDP	296.0	-	283.0	-
Carbon dioxide emissions (tons per capita per annum)	7.6	7.2	7.8	-

Sources: Department of Water Affairs and Forestry, Department of Environmental Affairs and Tourism; Statistics South Africa, Environmental Accounts; Earth Trends 2003; CSIR National Land Cover.

Target 10: Halve, by 2015, the proportion of people without sustainable access to safe drinking water

Access to safe water has improved to about 80%, but access to safe sanitation is still around 65%, although improving each year. Strategies and programmes are being developed to integrate sanitation provision into new human settlement and rural development strategies.

INDICATORS	1994	2004	Target to 2015
Proportion of total population with access to improved water source (%)	60.1	78.7	80.1
Proportion of rural population with access to an improved water source (%)	44.4	63.6	72.2
Proportion of urban population with access to an improved water source (%)	70.3	87.7	85.2
Proportion of total population with access to basic sanitation (%)	48.7	63.7	74.4
Proportion of rural population with access to basic sanitation (%)	32.5	44.5	66.3
Proportion of urban population with access to basic sanitation (%)	58.8	76.9	79.4

Source: Department of Water Affairs and Forestry.

Note: In South Africa, basic service levels for water are defined as a minimum quantity of 25 liters of potable water per person per day within 200 metres of a household not interrupted for more than 7 days in any year and a minimum flow of 10 litres per minute for communal water points. This is a substantially higher standard than the basic services defined by the Millennium Development Goals as 20 litres of potable water per person per day within 1 000 metres of a household.

Target 11: Have achieved, by 2020, a significant improvement in the lives of at least 100 million slum dwellers

Shrinking household sizes has resulted in an increase in the number of people living in slums despite the construction of 1.7 million homes.

INDICATORS	1996	2001	Target to 2015
Percentage of urban households with an adequate water supply	98.5	97.5	-
Percentage of urban population with an adequate water supply	98.7	97.7	-
Percentage of urban households with adequate sanitation disposal systems	78.5	79.4	-
Percentage of urban population with adequate sanitation disposal systems	78.8	80.4	-
Percentage of slum households	32.0	28.0	-
Percentage of population living in slums	27.0	25.0	-
Number of slum households (millions)	1.7	2.1	-
Number of people living in slums (millions)	6.0	6.4	-

Note 1: Indicators related to the issue of slum conditions tend to differ, depending on whether population or household data are used for analysis. The table gives both sets of data. From 1996 to 2001, the annual average growth rate of urban households was 6.2%, compared to a 2.9% growth rate for the urban population. This disparity would suggest that, in addition to the migration of single young adults into urban areas, existing households might be breaking up into smaller units.

Note 2: Sanitation in 2001 includes ventilated pit latrines, but this distinction cannot be made for 1996.

Goal 8: Develop a global partnership for development

Target 16: In cooperation with developing countries, develop and implement strategies for decent and productive work for youth

There are few signs of improvement despite numerous programmes. South Africa has released its first draft of the Youth Enterprise Strategy and the Joint Initiative on Priority Skills (JIPSA), that identifies youth employment creation as an area needing intervention.

INDICATORS	2000	2001	2002	2003	2004
Youth unemployment rate, aged 15–24, total	47.7	54.2	56.6	56.8	51.8
Youth unemployment rate, aged 15–24, males	44.1	50.1	51.8	54.2	44.8
Youth unemployment rate, aged 15–24, females	51.2	58.7	61.9	59.7	58.4
Ratio of youth unemployment 15–24; adult 25–65, unemployment, total	44.0	44.0	45.0	50.0	50.0
Ratio of youth unemployment 15–24; adult 25–65, unemployment, males	47.0	45.0	48.0	53.0	48.0
Ratio of youth unemployment 15–24; adult 25–65, unemployment, females	42.0	42.0	43.0	48.0	52.0
Share of youth unemployed to total unemployed, total	30.8	30.3	31.2	33.5	33.4
Share of youth unemployed to total unemployed, male	32.1	32.0	32.6	34.8	32.6
Share of youth unemployed to total unemployed, female	29.6	29.7	30.0	32.3	34.1
Share of youth unemployed to youth population, total	14.3	15.4	16.8	15.6	14.2
Share of youth unemployed to youth population, male	14.4	15.0	16.3	15.8	13.6
Share of youth unemployed to youth population, female	14.3	15.9	17.2	15.4	14.7

Target 18: In cooperation with the private sector, make available the benefits of new technologies, especially information and communications

Increase in mobile telephone subscribers is mainly attributed to the new evolution towards second-generation wireless system and introduction of prepaid cards targeting people on the lower bracket of the economy. The mobile telephone networks have grown their subscribers at a faster rate as compared to the fixed line networks whose subscribers have been declining. Although there are some 120 Internet service providers in South Africa, access to the Internet is still restricted to some geographic locations and segments of the society.

INDICATORS	1995	2000	2001	2002	2003	2004
Telephone lines and cellular subscribers – fixed lines (thousand)	-	5 493	4 962	4 924	4 844	4 821
Telephone lines and cellular subscribers – mobile phones	-	5 284	8 322	10 934	13 797	18 295
Telephone lines and cellular subscribers – total density (thousand)	-	10 767	13 284	15 858	18 641	23 116
Personal computers (per 1 000 people)	27.9	66.4	69.6	72.6	75.8	82.7
Internet users	1 820 000	2 400 000	2 890 000	3 100 000	3 325 000	3 566 000

Sources: Operators Annual reports for 2004; SA Census 1996 and 2001, ITU, United Nations Development Programme

ANNEXURE 3: SUGGESTED ACTIONS FOR ADDRESSING PRIORITY ENVIRONMENTAL ISSUES

Actors responsible for implementing actions are indicated in brackets in bold next to the suggested action. The following codes apply: GN = national government; GP = provincial government; GL = local government; R = research; B = business and industry; C = civil society.

Issues	Nature of action				Technological (T)
	Social and behavioural (S)	Knowledge and cognitive (K)	Institutional and legal (I)	Economic and incentives (E)	
CROSS-CUTTING THEMES					
1. Strengthening implementation and enforcement	a. Train the judiciary in principles of environmental management and sustainable development and build legal capacity within the national and provincial environmental departments (GN, GP)		b. Improve capacity within regulatory authorities to effectively manage, implement and review the various Integrated Environmental Management procedures and tools, notably the new EIA Regulations (GN, GP) c. Ensure appropriate, adequate, and continuous training for Environmental Management Inspectors (GN, GP) d. Renew focus on the implementation of multi- and bilateral agreements to improve regional and international governance (GN)		
2. Mainstreaming the environment	a. Develop processes that continue to mainstream the environment and sustainability considerations into all aspects of human behaviour (ALL) Refer to action 3(i)d d. Create a shift in mindset from weak to strong sustainability within government, business, and society in general (ALL) e. Increase focus on the value of natural capital to human well-being by extending the concept of ecosystem services in relation to human well-being to all sectors of society (ALL)		b. Ensure that the roll-out and revision of the National Strategy for Sustainable Development (N5SD) incorporates environmental considerations sufficiently (GN) f. Integrate sustainability criteria, in all levels of integrated and spatial planning (i.e. NSDP, PDDs, IDPs, SDFs), as well as into project formulation and selection checklists by public and private funders (i.e. government, major infrastructure funders such as the Municipal Infrastructure Grant, Transnet, the IDC, ESKOM, the Development Bank of Southern Africa, state-owned enterprises and private sector funders) (GN, GP, GL, B)	c. Continue the discussion proposed by the environmental fiscal reform policy paper, and promote the use of economic instruments such as charges, taxes and incentives to encourage natural resource management and pollution reduction (GN, B)	
3. Building capacity	a. Target and develop civil society education and awareness campaigns around the value of natural capital for human well-being (ALL)	c. Increase investment into sustainability-focused research and development particularly in land rejuvenation and conservation farming, energy efficiency in building techniques and industrial manufacturing processes (GN, R, B)	d. Mainstream sustainable development principles into the National Skills Development Programme (GN)		f. Increase investment in and extend the application of information and communication technology to support capacity building in integrated planning, particularly at local government level (GN, GL, R, B)

	<p>b. Roll out a national environmental capacity-building programme for local government at an appropriately senior level to embed environmental considerations in municipal strategies and plans (GN, GP, GL)</p> <p>g. Make the capacity building of officials a mandatory component of outsourced projects, through 'on the job' training by including officials as part of the project team and through guideline documents or tool kits that can be used for similar projects in future (GN, GP, GL)</p>	<p>h. Establish partnerships to develop the access to information and the skills that non-governmental and community-based organizations, including women, youth and vulnerable groups, need to participate in technical debates (GN, GP, GL, C)</p>	<p>e. Improve the planning and implementation of environmental sustainability principles within existing education policy and improve the effectiveness of environmental education campaigns, particularly among the youth (GN)</p>	
4. Environmental Information	<p>a. Integrate the collection, management, and sharing of information and reports on environmental and other related matters across all government departments and research institutions, particularly in the case of important cross-cutting data sets (R, GN, B)</p> <p>d. Develop data collection and monitoring initiatives that target priority environmental issues (e.g. air and water emissions, land degradation and desertification, water quality and availability, cultural heritage, human vulnerability, and effectiveness of governance) (R, GN)</p> <p>g. Continue the development of appropriate environmental indicators and indices that feed into policy development and decision-making (GN, GP, GL, R)</p>	<p>b. Develop mechanisms to promote the appropriate translation of environmental science and research into practical policy and into usable and understandable information for the public, as much closer collaboration is needed between scientists and policy-makers and between scientists and civil society (R, GN)</p> <p>e. Improve access to environmental information in accordance with pertinent legislation, such as the Promotion of Access to Information Act (ALL)</p> <p>f. Conduct regular integrated environmental assessments, surveys and inventories (R, GN, GP, GL, B)</p>	<p>b. Apply the precautionary principle with respect to genetically modified organisms, including regulations to ensure public access to all relevant information (GN, B)</p>	<p>c. Use appropriate technologies, such as remote sensing, GIS and the internet, to provide access to information and to build accessible and integrated environmental information systems (GN, GP, GL)</p>
Sustainable land management				
5. Land use	<p>a. Institute a land-resources monitoring and assessment programme to give timely, accurate, and periodic information needed on the condition and trends in the land resource, which should feed into the National Action Programme on Land Degradation (GN, R)</p>		<p>c. Improve access to and support from financial institutions for emerging farmers (B, GN)</p>	<p>Refer to action 71e</p>

6. Access to land				<p>a. Increase extension support to beneficiaries of the land reform programme and improve institutional capacity for implementing the programme and developing in beneficiaries the skills they need for successful and sustainable land management (GH, B)</p> <p>b. Formulate and implement a plan to deal with the issue of land administration in communal areas (GH, GP, GL)</p>		
7. Land degradation and desertification	<p>a. Support capacity building initiatives for sustainable land management (GH, B)</p> <p>b. Develop targeted education and awareness initiatives on the benefits of using alternative sources of energy to lessen the dependence on biomass (GH, GP)</p>	<p>c. Develop rigorous desertification indicators and mapping methodologies (R)</p> <p>Refer to action 5Ih</p>	<p>d. Fast track the roll-out of the National Action Programme to Combat Land Degradation (GH)</p>		<p>e. Develop and institute a large-scale land rejuvenation programme that prioritizes and supports conservation farming methods (GH)</p>	
Sustaining our biodiversity and ecosystems						
8. Overexploitation, habitat degradation and loss	<p>a. Develop targeted awareness campaigns at sectors having the largest impact on biodiversity, e.g. agriculture, forestry and mining (GH, B, C)</p> <p>e. Make the case for the value of biodiversity, including the links between biodiversity and socio-economic development, and disseminate it among decision-makers and the public (ALL)</p>	<p>b. Update land-cover data on a properly comparable basis (R, GH)</p> <p>Refer to actions 7Kc, 4Kd and 13Kf</p>	<p>c. Work with production sectors that are major land users (such as agriculture, infrastructure, property development, forestry and mining), to develop and implement sector-specific wise-practice guidelines (GH, B, C)</p> <p>f. Ensure that land-use planning and decision making adequately incorporate biodiversity considerations, particularly in the case of SDFs and IDPs at local level, and EIAs (GL, GP, GH)</p>	<p>d. Increase the use of co-management agreements with communities and business to improve sustainable management of ecosystems (B, C, GH, GP, GL)</p>		
9. Protected areas		<p>a. Develop and implement a register of protected areas (GH, GP, GL)</p>	<p>b. Expand the protected area network to incorporate a representative sample of South Africa's biodiversity as well as key ecological processes (GH, GP, GL)</p>			
10. Invasive alien species	<p>a. Assist local government to develop appropriate alien plant management plans (R)</p>		<p>b. Prevent and control the impact of invasive alien species. This requires co-ordination and alignment of resource allocation and implementation strategies between the multiple institutions involved in preventing invasive alien species from entering the country and in controlling invasive alien species already present (GH, B, R, GL)</p>			
Improving aquatic ecosystems, water availability and water quality						
11. Water scarcity and service delivery	<p>a. Extend capacity to fully implement the Water Services Strategic Framework in consultation with all key partners (GH)</p>	<p>b. Review water management in the agricultural sector, taking into account irrigation systems, use of aquifers and rivers, and develop a strategy for more efficient and sustainable use of water in the sector (GH, B)</p>	<p>c. Strengthen co-operation with the Department of Provincial and Local Government and the South African Local Government Association to ensure the effective adoption of water services responsibilities by local government (GH, GP, GL)</p>	<p>d. Fast track implementation of tariff structures to reward water demand management (GH, GL)</p> <p>e. Encourage municipalities through financial incentives to maintain water supply infrastructure (GH, GL)</p>		

12. Water quality	a. Scale up public awareness campaigns to reduce littering and uncontrolled waste disposal (GL, C)	b. Standardize and consolidate monitoring results nationally for both surface and groundwater (GN, F)	c. Fast-track the implementation of DWAF's Discharge Charge System and implement incentives for reducing consumption, including amendments to by-laws, building regulations and regulations governing the re-use of grey water and treated sewage (GN, GL)	d. Promote and extend the use of cleaner production in industries producing solid, liquid and airborne wastes (GN, B, C)
13. Degradation of aquatic ecosystems	a. Increase the focus on conserving and raising awareness of freshwater biodiversity (GN)	b. Strengthen links between the monitoring and assessment of water resources and planning and policy, including extending the Rivers Health Programme assessments to cover all catchments and incorporating the results of this and the National Spatial Biodiversity Assessment into water resources planning (GN, F)	c. Improve land management throughout catchments so that it does not compromise the integrity of river and wetland systems (B, C, GN, GP, GL)	e. Continue the discussion proposed by the environmental fiscal reform policy paper, and promote the use of economic instruments such as charges, taxes and incentives to encourage natural resource management and pollution reduction (GN, B, C)
Using our marine and coastal resources wisely				
14. Overexploitation of stocks			a. Promote the non-consumptive use of marine and coastal resources by growing the tourism potential of SCUBA diving, whale watching, and marine safaris (GN, B, C)	
15. Habitat degradation	Refer to action 18kb		a. Improve the planning and monitoring of development in coastal areas, as a concerted effort is urgently required to improve the sustainability of developments, including golfing estates (GL, GP, GN, B, C)	
16. Protection and management			a. Management efforts should give attention to the west coast and KwaZulu-Natal coastlines, in addition to the current efforts being placed on the Western and Eastern Cape coasts (GN)	
Atmosphere				
17. Improving air quality	a. Institute a public awareness campaign about the health and safety risks of using coal and wood for heating and cooking (GN, C)	b. Ensure adequate funding for the establishment of the national air quality monitoring system, and air quality management plans at local level (GN, GL) Refer to action 4hd	c. Adopt revised air quality limits (GN)	f. Roll out the Implementation Strategy for the Control of Exhaust Emissions and integrate policing with vehicle roadworthiness, adopt Euro technologies for new vehicles and reduce the sulphur, benzene and aromatics content of fuels (GN, B)
			d. Develop and implement a transport policy that supports efforts to reduce vehicle emissions (GN)	g. Extend and implement the use of cleaner technology (B)

<p>18. Climate change</p>	<p>a. Implement a communication strategy alerting the general public to the potential outcomes of climate change (C, GH)</p>	<p>b. Ensure adequate funding and capacity for research on climate change and its impacts on society and the environment in order to guarantee appropriate strategies and policies are developed, including funding increases for renewable energy and energy efficiency interventions (GH, R, B)</p> <p>Refer to action 17b</p>	<p>c. Establish appropriate adaptation strategies for the socio-economic and biophysical environments, linked to national development initiatives such as ASQISA, the Integrated Sustainable Rural Development Programme and the Urban Renewal Programme, the Extended Public Works Programme. These adaptation strategies should be integrated into Provincial Growth and Development Strategies, Integrated Development Plans, and conservation management plans (GH, GP, GL, B, C)</p>	<p>d. Put in place a new regulatory framework that stimulates market incentives and disincentives to create markets for renewable energy generation, cleaner technology and energy efficiency, with a commitment by major cities to employment growth in an expanding alternative energy sector (GH)</p>	<p>e. Reduce the dependence on fossil fuels through a focused drive to develop cost effective alternative sources of energy, including solar, wind, wave, hydrogen, nuclear and biomass. Particular attention should be paid to developing and implementing incentives to promote energy efficiency, renewable energy and solar water heaters (B, GH, GL, R)</p> <p>f. Invest in clean coal production technologies capable of sequestering and/or reusing CO2 (B, GH, R)</p>
<p>Creating sustainable human settlements</p>					
<p>19. Integrated planning and service provision</p>	<p>a. Ensure that local governments have the capacity to handle the wide range of responsibilities that have been allocated to them (GH, GP, GL)</p>		<p>b. Implement sustainable human settlement strategies that promote diverse communities via densification; mixed land-use regulations; shortening the distance between home and work; linking home and work via public transport, pedestrian and cycling routes; enhancing the quality of the natural environment; and improving the safety and accessibility of settlements (GH, GP, GL, B)</p> <p>c. Improve coordination of urban development strategies, including housing delivery, infrastructure construction, social services, safety, health and transportation (GL)</p> <p>d. Include sustainability criteria into all spatial and integrated planning, e.g. IDPs and PGDSs, and project formulation and selection of public and private funding of infrastructure projects (GH, GP, GL)</p>		
<p>20. Infrastructure: buildings, transport, energy</p>	<p>a. Increase investment into sustainability science and technologies that link directly to the infrastructure programme (GH, B, R)</p>	<p>b. Develop design guidelines and information resources to support the built environment and design professions to incorporate sustainability criteria into the design of infrastructures and buildings (GH, B)</p> <p>e. Ensure there is a balance between private sector investments in the energy sector, with a rapid escalation in public sector investments in new generation and transmission capacity, including renewable energy and coal-based generation (GH)</p>	<p>b. Develop design guidelines and information resources to support the built environment and design professions to incorporate sustainability criteria into the design of infrastructures and buildings (GH, B)</p> <p>e. Ensure there is a balance between private sector investments in the energy sector, with a rapid escalation in public sector investments in new generation and transmission capacity, including renewable energy and coal-based generation (GH)</p>	<p>c. Ensure that ASQISA realizes the potential for long-term economic and ecological sustainability by promoting investment incentives that favour investments in fixed assets that reinforce the overall vision, mission and principles of the NSSD (GH, B, C)</p> <p>f. Significantly increase investments into public transportation, including freight by rail and passenger transport via rail, bus and mini-bus. The provision of new services, the upgrading of existing services and the gradual conversion to biofuels should be top priorities (GH, GP, GL, B)</p>	<p>d. Build durable and appropriate housing adhering to building standards and supervise builders carefully (B, GL)</p>

					<p>g. Give consideration to the introduction of a 'feed-in tariff' that will create a market for localized electricity generation that can be sold into the grid at an agreed tariff (GH)</p> <p>h. Promote changes in taxation, investment incentives, and other fiscal interventions, plus 'licence-to-operate' mechanisms, which reinforce market trends towards more sustainable production and consumption (GH, B, C)</p>	
21. Integrated waste management				<p>b. Focus on the collection of waste generation data, for general and hazardous waste (GH, GF, GL)</p>	<p>c. Apply incentives for improving resource use efficiency and waste recycling programmes (GH)</p>	<p>e. Increase the number of hazardous waste sites (GH)</p>
22. HIV and AIDS and the environment	<p>a. Hold competitions to reward waste recycling programmes (GL, C, B)</p> <p>a. Promote public and private sector campaigns that raise awareness about HIV/AIDS, and how to reduce the social stigma attached to the disease (GH, GL, C, B)</p>			<p>c. Implement Integrated Waste Management Plans to reduce wastes (GF, GL)</p> <p>b. Incorporate HIV/AIDS considerations into all strategies, policies, and plans that affect the environment and the use of natural resources (GH, GF, GL, B)</p> <p>c. Improve the capacity for administering and managing the roll-out of anti-retroviral drugs (GH)</p>		
23. Human vulnerability	<p>a. Build the coping capacity of communities at risk, by: developing social capital by building informal networks and extending participation in public affairs and decision-making; instituting prevention and preparedness initiatives in communities and institutions responsible for disaster management; and improving the rigour of vulnerability assessments and early warning systems (GH, GF, GL)</p>		<p>b. Improve the understanding of the effects of environmental change on vulnerable groups (R, GH)</p>	<p>c. Implement a programme to rectify the effects of past poor land-use planning processes, as many settlements are located dangerously close to hazardous areas such as rivers, mines, and industrial sites (GH, C)</p> <p>d. Entrench environmental and human vulnerability considerations further into development and land-use planning (GH, GF, GL)</p>		
24. Cultural heritage	<p>a. Public awareness campaigns to make people aware of the importance and value of the built environment (GL, C)</p>		<p>b. Conduct an audit of state of cultural urban heritage in a sample of cities and towns (GH, R)</p>		<p>c. Allocate tax rebates for activities supporting conservation of cultural heritage and the Arts (GH)</p>	



ACRONYMS AND ABBREVIATIONS

ACEP	African Coelacanth Ecosystem Programme	CFC-11	Trichlorofluoromethane
AEC	Atomic Energy Corporation	CFC-12	Dichlorodifluoromethane
AEO	Africa Environment Outlook	CH₃CCl₃	Methyl chloroform
AICC	African Institute of Corporate Citizenship	CH₄	Methane
AIDS	Acquired Immune Deficiency Syndrome	CITIES	Convention on International Trade in Endangered Species
AMCEN	African Ministerial Conference on Environment	Cl	Chloride
APPA	Atmospheric Pollution Prevention Act	cm	Centimetre
AQA	Air Quality Act	CMA	Catchment Management Agency
AQMP	Air Quality Management Plan	CO	Carbon monoxide
ARC-ISCW	Agricultural Research Council – Institute for Soil, Climate and Water	CO₂	Carbon dioxide
AsgiSA	Accelerated and Shared Growth Initiative – South Africa	CONNEPP	Consultative National Environmental Policy Process
ASP	African Stockpiles Programme	CPI/CPIX	Consumer Price Index
ATCM	Antarctic Treaty Consultative Meeting	CR	Critically Endangered
		CRLR	Commission on Restitution of Land Rights
		CSD	United Nations Commission on Sustainable Development
		CSIR	Council for Scientific and Industrial Research
		CSR	Corporate social responsibility
BCSD SA	Business Council for Sustainable Development South Africa		
BII	Biodiversity Intactness Index	DANCED	Danish Cooperation for Environment and Development
BCLME	Benguela Current Large Marine Ecosystems	DANIDA	Danish International Development Assistance
Br	Bromine	DDT	Dichlorodiphenyltrichloroethane
		DEAT	Department of Environmental Affairs and Tourism
CAPE	Cape Action for People and the Environment	DJSI	Dow Jones Sustainability Index
C₆H₆	Benzene	DLA	Department of Land Affairs
CAIA	Chemical and Allied Industries' Association	DME	Department of Minerals and Energy
CASP	Comprehensive Agricultural Support Programme	DNA	Designated National Authority
CBD	Convention on Biological Diversity	DOTS	Directly Observed Treatment Short-Course
CBO	Community Based Organisation	DPSIR	Driver-Pressure-State-Impact-Reponse
CCl₄	Carbon tetrachloride	DST	Department of Science and Technology
CDM	Cleaner Development Mechanism	DWAF	Department of Water Affairs and Forestry
CEC	Committee for Environmental Coordination		
CFC	Chlorofluorocarbon		



E. coli	<i>Escherichei coli</i>	GL	Local Government
Eds	Editors	GMO	Genetically Modified Organism
EEZ	Exclusive Economic Zone	GN	National Government
EF	Ecological Footprint	GNI	Gross National Income
EHS	Environment, Health and Safety	GNP	Gross National Product
EIA	Environmental Impact Assessment	GP	Provincial Government
EIP	Environmental Implementation Plan	GRI	Global Reporting Initiative
EMI	Environmental Management Inspector	GWh	Gigawatt hour
EMP	Environmental Management Plan	GWP	Global Warming Potential
EN	Endangered		
ENSO	El Niño Southern Oscillation		
EQ&P	Environmental Quality and Protection	H₂S	Hydrogen sulfide
ESI	Environmental Sustainability Index	ha	Hectares
EU	European Union	HC	Hydrocarbon
Euro I, II, III	European Emission Standards	HCFC-124	Tetrafluoroethane
EWT	Endangered Wildlife Trust	HDI	Human Development Index
		HDI	Historically Disadvantaged Individual (chapter 7)
FAII	Fish Assemblage Integrity Index	HFC	Hydrofluorocarbon
FAO	Food and Agriculture Organization of the United Nations	HGI	Human Gender-related Development Index
FIVIMS	Food Insecurity and Vulnerability Information and Mapping System	HIV	Human Immunodeficiency Virus
FTE	Full-time Equivalent	hPA	Hectopascal
FTSE	Financial Times Stock Exchange	HPI	Human Poverty Index
		HSRC	Human Sciences Research Council
GAW	Global Atmosphere Watch	ICLEI	International Council for Local Environmental Initiatives
GDI	Gross Domestic Income	ICOMOS	International Council on Monuments and Sites
GDP	Gross Domestic Product	ID	Identity document
GEF	Global Environment Facility	IDC	Industrial Development Corporation
GEM	Gender Empowerment Measure	IDP	Integrated Development Plan/Planning
GEO	Global Environment Outlook	IEG	International Environmental Governance
Gg	Gigagrams	IGFR	Intergovernmental Fiscal Reform
GHG	Greenhouse gas	IPCC	Intergovernmental Panel on Climate Change
gha	Global hectares	ISO	International Standards Organisation
Gini	Gini-coefficient	ISRDP	Integrated Sustainable Rural Development Programme
GIS	Geographic Information System		

ISCW	Institute for Soil, Climate and Water	MODIS	Moderate Resolution Imagery Spectro Radiometer
IUCN	World Conservation Union	MPA	Marine Protected Area
IWMP	Integrated Waste Management Plan	MTEF	Medium Term Expenditure Framework
		MVA	Manufacturing Value-Added
JPOI	Johannesburg Plan of Implementation	MW	Megawatt
JSE	Johannesburg Securities Exchange	MWe	Megawatt Electrical
		MWh	Megawatt Hours
Kj	Kilojoule	N₂O	Nitrous oxide
km²	Square kilometre	NAP	National Action Programme for Combating Land Degradation to Alleviate Poverty
KWh	Kilowatt hour	NASA	National Aeronautics and Space Administration
KZN	KwaZulu-Natal	NBI	National Business Initiative
LA21	Local Agenda 21	NBSAP	National Biodiversity Strategy and Action Plan
LMP	Linefish Management Protocol	NCCC	National Committee on Climate Change
LPG	Liquified petroleum gas	NDA	National Department of Agriculture
LRAD	Land Redistribution for Agricultural Development	NEAF	National Environmental Advisory Forum
LT	Least Threatened	NEDLAC	National Economic Development and Labour Council
m	Metre	NEMA	National Environmental Management Act
m³	Cubic metres	NEMAQA	National Environmental Management: Air Quality Act
MAR	Mean annual runoff	NEMBA	National Environmental Management: Biodiversity Act
MARPOL	International Convention for the Prevention of Pollution from Ships	NEMPA	National Environmental Management: Protected Areas Act
MCM	Marine and Coastal Management	NEPAD	New Partnership for Africa's Development
MDG	Millennium Development Goal	NGO	Non Governmental Organisation
MDR	Multi-drug resistance	NHP	National Heritage Programme
MEA	Multilateral Environmental Agreement	NLC	National Land Cover
mg/l	Milligrams per litre	NO_x	Nitrogen oxide (generic term)
MINTEC	Ministerial Technical Committee	NO	Nitrogen oxide
MJ	Megajoules	NO₂	Nitrogen dioxide
MLRA	Marine Living Resources Act	NORAD	Norwegian Agency for Development Cooperation
mm	Millimetres	NPO	Non-profit organisation
MPP	Multi Point Plan	NRF	National Research Foundation

NSBA	National Spatial Biodiversity Assessment	Ramsar	Signing place of the Convention on Wetlands
NSI	National System of Innovation	RDP	Reconstruction and Development Programme
NSoER	National State of the Environment Report	RHA	Respiratory hospital admissions
NSSD	National Strategy for Sustainable Development	RHP	River Health Programme
NWA	National Water Act	RISA	Research and Innovation Support and Advancement
NWMS	National Waste Management Strategy	RSA	Republic of South Africa
NWRS	National Water Resource Strategy		
O₃	Ozone	SAAMBR	South African Association for Marine Biological Research
ODA	Overseas Development Assistance	SABS	South African Bureau of Standards
ODS	Ozone-depleting substances	SACN	South African Cities Network
OECD	Organisation for Economic Cooperation and Development	SADC	Southern African Development Community
ORV	Off-road vehicle	SADCO	Southern African Data Centre for Oceanography
OSMS	Open Space Management System	SAEO	South Africa Environment Outlook
PADELIA	Partnership for Development of Environment Law in Africa	SAHRA	South African Heritage Resources Agency
PAFT	Programme for Alternative Fluorocarbon Toxicity Testing	SALGA	South African Local Government Association
PAs	Protected Areas	SANBI	South African National Biodiversity Institute
Pb	Lead	SANParks	South African National Parks
PBMR	Pebble Bed Modular Reactor	SANS	South African National Standard
PCBs	Polychlorinated Biphenyls	SAPIA	South African Petroleum Industry Association
PFC	Perfluorocarbons	SAPIA	Southern African Plant Invaders Atlas (chapter 5)
pH	Measure of relative acidity and alkalinity	SAPREF	South African Petroleum Refineries
PIC	Prior Informed Consent	SASS	South African Scoring System
PJ	Petajoule	SASSI	Southern African Sustainable Seafood Initiative
PM	Particulate Matter	Scuba	Self contained underwater breathing apparatus
PM₁₀	Particulate matter of less than 10 micrometres in diameter	SD	Sustainable development
PM_{2.5}	Particulate matter of less than 2.5 micrometres in diameter	SDI	Spatial Development Initiative
POPs	Persistent Organic Pollutants	SDCEA	South Durban Community Environmental Alliance
Ppm	Parts per million	SEA	Strategic Environmental Assessment
PRTR	Pollutant Release and Transfer Register	SETI	Government Science, Engineering and Technology Institution
R&D	Research and development		

SF₆	Sulphur hexafluoride	UNESCO	United Nations Educational, Scientific and Cultural Organisation
SFU	Sustainable Futures Unit	UNFCCC	United Nations Framework Convention on Climate Change
SKEP	Succulent Karoo Ecosystem Programme	US\$ PPP	Power-Purchasing Parity in US dollars
SLAG	Settlement/Land Acquisition Grant	USA/US	United States of America
SMME	Small, Medium and Micro Enterprises	UV	Ultraviolet
SO₂	Sulphur dioxide	UV-B	Ultraviolet-B
SoE	State of the Environment		
SoER	State of the Environment Report		
SPI	Standardised Precipitation Index		
SRAP	Sub-regional Action Programme to combat desertification	VBD	Vector-borne disease
SRI	Socially Responsible Index	VCR	Videocassette recorder
SRK	Steffen Robertson Kirsten	VOC	Volatile organic compound
Stats SA	Statistics South Africa	VOS	Voluntary Observing Ships
STEP	Subtropical Thicket Ecosystem Planning Programme	VU	Vulnerable
		WBCSD	World Business Council on Sustainable Development
TAC	Total Allowable Catch	WC	Water Conservation
TAI	The Access Initiative	WCNCB	Western Cape Nature Conservation Board
TB	Tuberculosis	WDM	Water Demand Management
TFCA	Trans Frontier Conservation Area	WESSA	Wildlife and Environment Society of South Africa
TI	Transparency International	WfC	Working for the Coast Programme
TJ	Terajoule	WHO	World Health Organisation
TRAFFIC	The Wildlife Trade Monitoring Network	WIS	Waste Information System
		Wits	University of the Witwatersrand
UK	United Kingdom	WMA	Water Management Area
UN	United Nations	WMC	Waste Management Club
UNCCD	United Nations Convention to Combat Desertification in Countries Experiencing Drought and/or Desertification, Particularly in Africa	WMO	World Meteorological Organisation
UNCED	United Nations Conference on Environment and Development	WMS	DWAF's Water Management System Database
UNCHE	United Nations Conference on the Human Environment	WPC	World Parks Congress
UNDP	United Nations Development Programme	WRC	Water Research Commission
UNEP	United Nations Environment Programme	WRI	World Resources Institute
		WSSD	World Summit on Sustainable Development
		WWF-SA	World Wide Fund for Nature South Africa



GLOSSARY

A

Abstraction: see **Water abstraction**.

Acid rain: rainfall that is acidic due to contact with various air pollutants such as carbon dioxide, sulphate, and nitrogen oxides. Acid rain contaminates soil, plants, and water, damages buildings, and can affect human health.

Afforestation: the establishment of forest by natural succession or by the planting of trees on land where they did not formerly grow, e.g. establishment of monocultures of pines, eucalypts, or wattles in primary grasslands in South Africa.

Agenda 21: a global plan of action for sustainable development agreed to by most of United Nations member states at the United Nations Conference on Environment and Development (also called the Earth Summit or UNCED) held in Rio de Janeiro, Brazil, in 2002. The Agenda 21 document contains 40 separate sections of concern and outlines a total of 2 500 recommendations. It focuses on partnerships involving the public and all relevant stakeholders to resolve developmental problems and to plan strategically for the future.

Agrarianization: the movement towards the economic activity of agriculture.

Agriculture: the cultivation of soil and rearing of animals to feed the human population. As more people move from rural areas to cities, more intensive farming methods and more extensive areas are used for farming to increase food production.

Algae: simple plants containing chlorophyll or other photosynthetic pigments, found widely in freshwater and marine environments, and ranging from single cells to plants many metres in length.

Air pollution: air containing gases, dust, fumes, or odour in potentially harmful amounts (that is, in amounts that could be harmful to the health or comfort of humans and animals, or that could damage plants and materials).

Ambient air: all air outside buildings, stacks, and exterior ducts.

Anopheles mosquito: the species of mosquito that is a carrier for the malaria parasite.

Anthropocentric: the idea that human beings are the central feature of the world; the interpretation of environmental and resource issues solely in terms of human values and standards.

Anthropogenic: human-induced or human-caused changes to the environment.

Aquatic: growing, living, or found in water.

Aquifer: a body of permeable rock that can store significant amounts of water.

Atmosphere: the thin layer of gases surrounding Earth that sustains life on the planet and composed mainly of nitrogen and oxygen. It consists of two main layers: the troposphere, which extends from sea level to about 17 kilometres up, and the stratosphere, which extends from 17 kilometres above sea level to about 48 kilometres above the Earth.

B

Basic sanitation: the prescribed minimum standard of services necessary for the safe, hygienic, and adequate collection, removal, disposal, and purification of human excreta, domestic wastewater, and sewage from households, including informal households.

Benthic: the lowermost region of a freshwater or marine profile in which organisms reside.

Biodiversity/biological diversity: the variability among living organisms from all sources, including terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part. The term also includes diversity within species, between species, and of ecosystems.

Biodiversity hotspot: an area that is identified as a conservation priority because it contains a high number of endemic species and faces extreme threats.

Biodiversity mainstreaming: the incorporation of biodiversity considerations into all human activities including programmes, plans, and policies.

Biodiversity target: A biodiversity objective expressed in a qualitative or quantitative manner, normally to be achieved by a specified date.

Biomass: the total mass of all living organisms present in an ecosystem, usually expressed as a dry weight.

Biome: one of the world's major environmental communities, classified according to the predominant vegetation and characterized by adaptations of organisms to that particular environment. Major biomes include: aquatic, desert, forest, grassland, and tundra.

Bioprospecting: research and development of indigenous biological resources for commercial exploitation.

Biosphere: the envelope around the Earth containing the planet's life-supporting systems (for example, the atmosphere, soil, inland water, and the sea).

Biosphere reserve: a locality that forms part of an international network of protected areas designated by the United Nations Educational, Scientific and Cultural Organization, located in areas of high biodiversity where research into and the monitoring of biodiversity is carried out with the participation of local people.



Biota: the combined flora and fauna of a particular region or period.

Birth rate: the number of childbirths per 1 000 persons per year.

Bush encroachment: the conversion of a grassland-dominated vegetation type to one that is dominated by woody species; an increasing woody plant density.

C

Carbon dioxide (CO₂): a gas that occurs naturally in the atmosphere. It is produced when animals breathe, when vegetation rots, and when material containing carbon is burnt or broken down.

Carbon sinks: carbon reservoirs and conditions that take in and store more carbon than they release (for example, forests and oceans).

Carbon tax: a tariff charged by governments on business, industry, and energy sources that emit greenhouse gases, particularly carbon dioxide, through the burning of fossil fuels (coal, oil, natural gas). The charge is typically levied per tonne of carbon dioxide.

Carcinogenic: a substance contributing to the development of cancer in animal tissues.

Carrying capacity: the maximum population of a given organism that a particular environment can sustain.

Catchment: the area of land drained by a particular stream or river.

Catchment management: a philosophy, process, and implementation strategy to achieve a balance between the utilization and the protection of environmental resources in a particular catchment area.

Child mortality: number of children dying before the age of 5 years, per 1 000 births per year.

Chlorofluorocarbons (CFCs): ozone-destroying chemicals released mainly by cooling systems such as air conditioners and refrigerators.

Clean development mechanism: a proposition according to which industrialized countries or their companies could earn emissions credits, while developing countries acquire technology and capital and earn emissions credits that can be banked or sold.

Cleaner production: improvements to an industrial production process in order to use less energy, water, or other inputs, or to reduce the generation of waste.

Climate change: the variation in the Earth's global climate or in regional climates over time. It includes changes in the variability or in the average state of the atmosphere – or average weather – over timescales ranging from decades to millions of years. Anthropogenic climate change refers to

climate change that is attributable directly or indirectly to human activities that alter the composition of the global atmosphere.

Coastal zone: the area of land and sea along a coast. It includes estuaries, onshore areas, and offshore areas, wherever they form an integral part of the coastal system.

Commodity market: market where raw/primary products are exchanged.

Communal areas: areas of land that are owned and managed communally, generally by traditional authorities.

Conservation: the maintenance of environmental quality and functioning.

Consumption: the purchase and/or use of goods and services.

Contractual parks: protected areas established as a result of contracts between government agencies and local communities, where the local communities retain their title to the land in the park.

Convention: an agreement drafted by an international, independent panel, which various governments then sign, to support specific action.

Cooperative governance: In South Africa, government is constituted as national, provincial and local spheres of government which are distinctive, interdependent and interrelated. All spheres of government must observe and adhere to the principles in Section 41 of the Constitution and must conduct their activities within the parameters that the Chapter provides.

D

Deforestation: the permanent clearing of an area of forest or woodland.

Degradation: the reduction or loss of the biological or ecological productivity of an area. (See **Desertification**.)

Demersal fish: fish that live on, or adjacent to, the bottom of the sea.

Demography: the study of the structure of populations.

Dependency ratio: a measure of the portion of a population that is composed of dependents (that is, people who are too young or too old to support themselves).

Desalination: the process of removing dissolved salts from salt water or brackish (slightly salt) water, making it fit for consumption by humans or for use for agricultural and other activities.

Desertification: the degradation of land in arid, semi-arid, and dry sub-humid areas, resulting from various factors including climatic variations and human activities.

Development: a process of change that represents planned

progress of some kind. For example, developing the economy of a region or country can take place through the expansion of economic activities, the improvement of people's skills, or job creation.

E

Eco-efficiency: the ecological efficiency of goods and services, assessed by measuring their economic price and checking it against its production or manufacturing success in reducing environmental impact, improving quality of life, and lessening the overall adverse environmental impact on nature. Being more eco-efficient means creating more goods and services while using fewer resources and creating less waste and pollution.

Ecological Footprint: a measure of the 'load' imposed by a given population on nature. It represents the land area of average quality needed to sustain current levels of resource consumption and waste discharge by that population. The bigger the footprint the greater is the impact that it represents.

Economic growth: the increase in a nation's capacity to produce goods and services, usually expressed as a rate of change in output from one year to the next.

Ecosystem: the dynamic complex of animal, plant, and microorganism communities and their non-living environment (soil, water, climate, and atmosphere) interacting as a functional unit.

Ecosystem services: the beneficial functions provided by ecosystems, such as water quality regulation, nutrient cycling, soil fertility maintenance, regulation of the concentration of atmospheric gases, and cultural and recreational opportunities.

Ecotourism: tourism in which the natural environment is the main tourist interest, and the exercise of which does not potentially harm the environment.

Effluent: water (usually wastewater) that flows out of a man-made system into a river or the sea.

El Niño: (meaning "the Christ Child" in Spanish) is the name of a warm ocean current appearing periodically along the coast of Ecuador and Peru. In contrast to the normal, cold, north-flowing current, El Niño (when it flows) causes warming in the Pacific region, which influences world weather patterns by affecting air and ocean temperatures. A serious El Niño event can cause changes in climate over southern Africa. (See **La Niña**.)

Emission: a noise or a liquid or gaseous effluent that is discharged into the environment.

Emissions inventory: a listing, by source, of the amounts of air pollutants discharged into the atmosphere. It is used to establish emission standards.

Emissions trading regime: a free market solution to

problems caused by the adverse impacts of pollution, in which a country is allocated a 'pollution quota' and the freedom to sell the portion of the quota that it does not use. (See **Kyoto Protocol**.)

Endangered species: a plant or animal species whose number of individuals or whose population has been reduced to a critical level or whose habitats have been reduced so drastically as to cause an imminent risk of extinction.

Endemic: a plant or animal species that occurs and is restricted to a particular geographical region is said to be 'endemic' to that region, owing to factors such as isolation or response to soil or climatic conditions.

Energy: the capacity of matter or radiation to do work.

Environment: the surroundings within which humans exist.

Environmental degradation: the reduction of the capacity of the environment to meet social and ecological objectives and needs.

Environmental governance: the processes of decision-making involved in the control and management of the environment and natural resources.

Environmental health: well-being based on the health of the environment, both natural and built.

Environmental Impact Assessment (EIA): the process of identifying, predicting, evaluating, and mitigating the biophysical, social, and other relevant effects of development proposals before major decisions are taken or commitments made. The EIA Regulations require that specific procedures be followed, and reports (scoping and/or EIA reports) prepared for those activities listed as potentially having a substantial detrimental effect on the environment.

Environmental Implementation Plan (EIP): a statutory instrument for promoting cooperative governance for environmental management among different spheres of government.

Environmental indicator: Physical, chemical, biological, or socio-economic measures that can be used to objectively assess the quality and quantity of natural resources and of the environment.

Environmental justice: a term used in the social sciences to describe injustices in the way in which natural resources are used. It is often also used in the context of attempts to right the wrongs of past practices that discriminated against the poor and the disadvantaged.

Environmental management: the deliberate and multidisciplinary process of managing environmental resources, which requires the careful preparation, planning, and administration of environmental policies and standards. It aims to ensure that environmental concerns are included in all stages of development, so that development is

sustainable and does not exceed the carrying capacity of the environment. (See **ISO 14000 series**.)

Environmental Management System (EMS): documented procedures drawn up in terms of a South African Bureau of Standards (SABS) code of practice to implement the requirements of ISO 14000. The code is an international standard and provides the basis for uniform EMS, which will conform to wider international standards and requirements.

Environmental Sustainability Index (ESI): an index constructed by Yale University that ranks countries according to their performance based on a range of aspects of environmental sustainability.

Estuary: the coastal body of water that has a free connection with the open sea and where fresh water, derived from land drainage, is mixed with sea water.

Eutrophication: a process of nutrient enrichment of aquatic ecosystems, mainly by nitrates and phosphates from agricultural pollution, which stimulates excessive plant growth (algal blooms). This growth in turn reduces dissolved oxygen in the water when dead plant material decomposes and can cause other organisms to die.

Evapotranspiration: a combined term for water lost as vapour from a soil or open water surface (evaporation) and water lost from the surface of a plant, mainly via the stomata (transpiration).

Exclusive Economic Zone (EEZ): a zone in the sea under a country's national control, up to 200 nautical miles wide. The coastal country has the right to explore and exploit and the responsibility to conserve and manage all living and non-living resources in its area.

Externality: economic activities that cause uncompensated environmental loss or damage to others.

Extractive Industry Transparency Initiative (EITI): an international initiative that aims to ensure that the revenues from extractive industries contribute to sustainable development and poverty reduction.

F

Fauna: all the animal life of a habitat or a region at a given time.

Fertility rate: the number of children born alive to a woman during her lifetime.

Floodplain: an area beside a river that is seasonally flooded when water levels rise because of high rainfall.

Flora: all the plant species that make up the vegetation of a given habitat or area at a given time.

Forestry: the practice of growing and managing forest trees for commercial timber production. It includes the management of specifically planted forests and of native or

exotic tree species, as well as the commercial use of existing indigenous forests.

Food security: the assured availability and access (physical and economic) to adequate food (in terms of quality and quantity) by all people at all times, as required for a healthy, active, and productive life.

Fossil fuels: mined energy sources, such as coal, gas, and petroleum, that are derived from the remains of prehistoric animals and plants.

FTSE4Good: an international Index Series designed to measure the performance of companies that meet globally recognized corporate responsibility standards and to facilitate investment in those companies.

Full cost accounting: a method of accounting that aims to identify, quantify, and allocate all costs associated with a product or process, including environmental and social costs.

Fynbos: Afrikaans word for fine-leaved bush, a biome in South Africa's southern Cape area, comprising shrubs and shrubby woodland with patches of hardwood.

G

Genetically modified organism (GMO): a type of genetically engineered organism through which a gene from one organism is isolated and transferred to cells of another organism, where it is incorporated into the recipient's chromosomes and expressed. During the 1990s, there was dramatic growth in the commercial applications of this new technology, including the development of generically modified (GM) crops.

Gini-coefficient: a measure of inequality. It is normally used to measure income inequality, but can be used to measure any form of uneven distribution. The Gini-coefficient is a number between 0 and 1, where 0 corresponds with perfect equality (where everyone has the same income, for example) and 1 corresponds with perfect inequality (where one person has all the income, and everyone else has zero income).

Global Environmental Facility (GEF): established in 1991 by World Bank resolution, GEF helps developing countries to fund projects and programmes that protect the global environment.

Global Stewardship Corruption Perception Index: an annual measure compiled by a German group (called Transparency International), designed to measure the performance of governments against set criteria of bribery and corruption.

Global warming: a gradual warming of the air temperature in the Earth's lower atmosphere as a result of the build-up of greenhouse gases (for example, carbon dioxide, nitrous oxides, methane, and ozone). (See **Greenhouse effect**.)

Globalization: the process by which the world's nations and communities are becoming more closely connected by modern telecommunications and more strongly interdependent economically, socially, and politically. The process carries with it the pressure to conform to global standards and economic approaches.

Governance: the systems of values, policies, and institutions by which society manages its economic, political, and social affairs through interactions within and among the state, civil society, and the private sector.

Grassland: a habitat/ecosystem/biome that has vegetation dominated by grasses.

Green Scorpions: the popular name of a South African enforcement unit empowered by the National Environmental Management Act to ensure statutory compliance with environmental legislation.

Greenfields site: a site on which no development has yet taken place.

Greenhouse effect: a warming effect of the Earth's lower atmosphere resulting when greenhouse gases trap heat from the sun and prevent that heat from escaping back into space. (See **Global warming**.)

Greenhouse gas: any gas that absorbs infrared radiation in the atmosphere, thus allowing heat to enter the Earth's atmosphere but not to leave it.

Gross domestic product (GDP): the value of all goods and services produced by all factors of production in an economy by both residents and non-residents over a period of a year.

Groundwater: water that is stored within the air spaces of soil and in rock formations.

Groundwater recharge: replacement of water, normally through rainwater percolating into the ground to replenish water lost from the groundwater store by abstraction, evaporation, or transpiration.

H

Habitat: the place where an organism or community occurs. It is characterized by its physical properties and by the other life forms found there.

Habitat fragmentation: the break-up of natural habitat into small non-contiguous parts. This can cause problems because when the portions are too small they cannot function effectively on their own.

Habitat loss: a process of land use change in which one habitat-type is removed and replaced by some other habitat-type. In the process of land-use change, plants and animals that previously used the site are displaced or destroyed. This generally results in alteration or reduction in biodiversity. (See **Deforestation** and **Habitat fragmentation**.)

Hazardous waste: waste that poses substantial or potential threats to public health or the environment.

Heritage: the sum total of sites of geological, zoological, botanical, archaeological, and historical importance. Heritage is that which we inherit: wildlife and scenic parks; sites of scientific or historic importance; national monuments; historic buildings; works of art; literature and music; oral traditions; and museum collections, together with their documentation.

Holism: the term comes from the Greek holos, meaning 'complete, integrated'. This is a philosophy based on the idea that the whole is greater than the sum of its parts, that is, that a system may have properties over and above those of the parts and the way in which they are organized.

Homelands: areas designated for black people according to their ethnic group, under the former apartheid government.

Human Development Index (HDI): a summary composite index that measures a country's average achievements in three aspects of human development: longevity, knowledge, and standard of living. It was created by the United Nations Development Programme and first presented in its Human Development Report in 1990.

Hydrocarbons: any chemical compound that consists only of the elements carbon (C) and hydrogen (H). All hydrocarbons contain a carbon backbone, called a carbon skeleton, and have hydrogen atoms attached to that backbone. Examples of hydrocarbons include petroleum, coal and gas, and the fossilised remains of plants.

Hydrological cycle: the flow of water through the terrestrial and atmospheric environments.

Hydropower: electricity generated by means of flowing water.

I

Immunosuppression: a state in which the ability of the body's immune system to respond to disease is decreased.

Indicator: a measure that helps to assess the extent of the success with which goals are being achieved. Based on complex information or data, indicators are often used in State of the Environment Reports to measure how resources are being managed.

Indicator species: a species whose presence, or relative well-being in a given environment is indicative of the health of its ecosystem as a whole.

Indigenous species: plants, animals, or microbes that are native to a particular area. (See **Fynbos**.)

Industrialization: a process of social and economic change, associated with technological innovation, through which a

human society is transformed from pre-industrial to an industrial state.

Inflation rate: the percentage increase in the price of goods and services, normally measured year on year.

Infrastructure: the framework of key facilities that supports communities and their industrial and commercial activities and services.

Integrated Environmental Management (IEM): a code of practice to ensure that environmental considerations are fully integrated into the management of all activities, so as to achieve a desirable balance between conservation and development.

Integrated Pollution and Waste Management: an integrated approach adopted by the South African government to deal with the current problems relating to waste management and pollution.

Integrated resource management: (see **Integrated Environmental Management (IEM)**.)

Inter-basin transfer: the transfer of water from one river system to another, in places where water would not naturally be transferred between the two systems.

Intergovernmental: this term refers to the relations among spheres of government and to relations among government agencies in the same sphere of government.

Intertidal zone: the area of the beach between the high and low tide watermarks.

Invasive alien species: species that are intentionally or unintentionally introduced to an area where they would not naturally occur, which then reproduce and invade areas beyond those into which they were originally introduced.

Invertebrate: a species of animal without a backbone, such as, for example, a butterfly or a lobster.

ISO 14000 series: an international standard for environmental management systems developed by the International Standards Organisation (ISO), which ensures that actions and processes are carried out in a uniform manner. ISO 14000 sets out guidelines on how to manage environmental matters in different companies in different countries, and is often used to certify organizations as environmentally sound. (See **Environmental Management System (EMS)**.)

J

Johannesburg Plan of Implementation: a key outcome of the 2002 World Summit on Sustainable Development, which constitutes a plan of action for more sustainable global development.

K

Karoo: shrubby, semi-desert landscape covering two-thirds of the area of South Africa.

Kyoto Protocol: the international protocol named for the city in Japan where it was adopted on 11 December 1997 at the Conference of Parties of the United Nations Framework Convention on Climate Change. It sets individual emissions limitations and reduction targets on six greenhouse gases through three flexible mechanisms: Joint Implementation, Emissions Trading, and Cleaner Development Mechanism (CDM).

L

La Niña: (from the Spanish for 'female child') unusually cold sea surface temperatures found in the eastern tropical Pacific ocean. La Niña occurs approximately half as often as El Niño.

Land administration: the act or process of authoritative control over land.

Land degradation: reduction or loss, in arid, semi-arid and dry sub-humid areas, of the biological or economic productivity and complexity of rainfed cropland, irrigated cropland, or range, pasture, forest and woodlands, as a result of land uses or from a process or combination of processes, including processes arising from human activities and habitation patterns such as:

- (i) soil erosion caused by wind and/or water
- (ii) deterioration of the physical, chemical and biological or economic properties of soil
- (iii) long-term loss of natural vegetation. (See **Soil degradation**.)

Land reform: redistribution of land to recognise the rights of all citizens.

Land rehabilitation: the process of returning land in a given area to some degree of its former self, after a process (such as may be conducted by business, industry, or a natural disaster) has damaged it.

Landfill: places, such as quarries, used for disposing household and industrial waste. Normally, land is excavated and sealed to prevent the contamination of adjacent land or underground water.

Landscape: the patterns and structure of a specific geographic area or place, including its natural, physical, built, and socio-economic environments.

Land tenure: a type of land ownership.

Land transformation: the conversion of land, normally from natural habitat to human uses such as agriculture or settlements.

Land-use change: changes in the purpose for which land is used, as, for example, where land that was previously used for pasture becomes a human settlement.

Legislation: is statutory law that is enacted (or 'promulgated') by a legislature or other governing body. The term may refer to a single law or to the collective body of



enacted law. Before legislation becomes law it may be known as a bill. In South Africa, legislation must be confirmed by the executive branch of government before it enters into force as law. Under the Westminster system, an item of legislation is known as an Act of Parliament.

M

Macroeconomics: a study of national economic aggregates.

Mariculture: the rearing of fish, shell-fish, and certain aquatic plants under controlled and managed conditions either in their natural environment in the sea or on land-based sea farms. Also called aquaculture or fish farming.

Marine: an umbrella term for things relating to the ocean, as in the terms 'marine biology' and 'marine geology'. In scientific contexts, the term almost always refers exclusively to saltwater environments.

Marine Protected Area (MPA): an area of marine or estuarine habitat where some types of fish or plants are protected or where an entire ecosystem is set aside as a park or reserve.

Medium Term Expenditure Framework (MTEF): a detailed three-year rolling expenditure and revenue plan for national and provincial departments in South Africa.

Millennium Development Goals: the set of development goals contained in the Millennium Declaration of 2000, which are intended to guide actions for development globally.

Methane: an odourless and colourless hydrocarbon gas produced either by natural or artificial decomposition of organic material. (See **Greenhouse gas** and **Hydrocarbon**.)

Microbial contamination: contamination with bacteria, fungi, or other microbes that can cause disease.

Migration: movement of all or part of a population to and from a geographical area.

Mitigation: measures taken to reduce adverse effects on the environment and humans.

Morbidity: the frequency of a sickness in a population.

Mortality: the frequency of death in a population or community.

Multilateral Environmental Agreements (MEA): international environmental treaties that contain measures to prevent the degradation of environmental resources, such as the Convention on Biological Diversity (CBD).

N

Natural environment: the physical environment comprising all living and non-living things that occur naturally on Earth.

Natural heritage: natural features consisting of physical and biological formations, or groups of such formations, which are of outstanding universal value from an aesthetic or scientific point of view.

Natural resources: the basic minerals and resources that are produced through the Earth's own inherent natural processes and systems.

National park: land set aside for the protection of plants, animals, and scenery, and for human enjoyment.

Non-governmental organization (NGO): an organization that is not part of a government and was not founded by a state. NGOs are typically independent of governments. Although the definition can technically include for-profit corporations, the term is normally restricted to social, cultural, legal, and environmental advocacy groups having goals that are primarily non-commercial.

Non-renewable resources: resources that do not renew themselves in a human time-scale and cannot be replenished once exhausted, such as fossil fuels and copper.

Nutrient loading: the release of excessive nutrients into a water body from the catchment area, often through the use of fertilizers or other pollutants. (See **Eutrophication**.)

Nuclear power: energy created by the process of fission from atomic nuclei, as generated by nuclear power stations. (See **Radioactive waste**.)

O

Overgrazing: grazing by livestock or wildlife to the point where grass cover is depleted, leaving bare, unprotected patches of soil, with a corresponding increase in erosion by water and wind.

Over-utilization: overuse of resources, thereby affecting their future use and the condition of the environment.

Ozone: a gas molecule composed of three oxygen molecules, which occurs naturally in the stratosphere where it protects Earth's surface from harmful ultraviolet radiation. In the troposphere it acts as a greenhouse gas.

Ozone depletion: the destruction or thinning of the stratospheric ozone layer that shields the Earth from harmful ultraviolet radiation.

P

Particulates: a term used to describe either particles of solid matter (for example, dust, soil, soot, and ash) or droplets of liquid (for example, sulphuric acid, salts, dioxins, and pesticides) that are small or light enough to remain suspended in the atmosphere for short periods of time. (See **PM₁₀**.)

Pelagic: relating to communities of marine organisms that



belong to the open sea, living free from direct dependence on the sea bottom or shore.

Persistent Organic Pollutants (POPs): chemical substances that are toxic, persist in the environment for long periods of time, and bioaccumulate as they move up through the food chain.

Perennial: (in reference to a water body) flowing or occurring throughout the year.

Pesticides: can be categorized as a diverse group of chemicals that kills insects or weeds, which can harm humans and the natural environment. Pesticides can migrate by wind or water to areas that they were not intended to reach, thus causing unintended damage to insect ecological systems that are essential for pollination.

Petrochemical industry: broadly defined as that industrial activity which uses petroleum or natural gas as a source of raw materials, and whose products are neither fuels nor fertilizer.

PM₁₀: any particulate matter with a diameter less than or equal to 10 micrometers.

Policy: a framework or basis of action to overcome identified problems or to achieve stated goals and objectives, which sets out guidelines for decision-making and action.

Pollution: the concentration of substances that are beyond the environment's capacity to handle. It refers to any substance released to air, water, or soil by any process, which is capable of causing harm to humans or other living organisms supported by the environment. Pollution comes in many forms, including liquid effluent, solid waste, air emissions, noise, and smells. (See **Air Pollution**, **Solid waste**, and **Wastewater**.)

Population density: the number of organisms, species, or humans found in a prescribed area.

Population dynamics: the study of the changes in the size, age, and gender composition of a population due to major biotic and abiotic factors.

Population growth: an increase in the number of organisms or species. In human demography, the population growth rate refers to the annual growth rate of the population calculated from mid-year.

Poverty: a certain level of material deprivation below which a person suffers physically, emotionally, and socially.

Poverty gap: the total income shortfall (expressed in proportion to the poverty line) of families with income below the poverty threshold, divided by the number of families.

Poverty line: a poverty threshold that takes into account household size and age composition and that is intended to indicate an income level below which subsistence needs are not met.

Precautionary principle: the principle included in policy

and laws requiring that where the environmental consequences of a particular project, proposal, or course of action are uncertain, then the project, proposal, or course of action should not be taken.

Precipitation: all the forms in which water falls to the ground such as rain, sleet, snow, hail, and drizzle. It also refers to the deposition of dust or other substances.

Productivity: the rate at which plants, animals, and humans produce or have the capacity to produce.

Promulgation: the act of formally proclaiming new legislation to the public. This occurs when the law receives final formal approval. It is generally performed by the head of state who acts according to constitutional rules or convention.

Q

Quaternary catchment: a catchment on the fourth level of sub-division of catchments into sub-catchments; often used as a management unit.

R

Radioactive waste: substances from nuclear processes that are contaminated and not reusable. Radioactive waste covers a spectrum from low-level waste (clothing and materials that have been used by people when handling radioactive sources) to high level waste (spent fuel elements) arising from the fission process in nuclear power stations. (See **Nuclear power**.)

Rainfall variability: the term used to describe a pattern of rainfall in which the amount of rain differs over a period of time, such as from year to year.

Ratification: formal approval of an international agreement by a state's highest authority. In ratifying a Convention, a country agrees to be bound by the terms of the agreement and indicates to the international community a commitment to meet implementation goals.

Recycling: the process of collecting, cleaning and re-using waste materials that would otherwise be thrown away.

Recharge: water added to underground water – for instance, rainfall that seeps into the ground.

Red Data list/book: a catalogue of species in danger of extinction and those already extinct, published by the International Union for the Conservation of Nature (IUCN).

Red Data species: species that appear on a Red Data list.

Red tide: a proliferation of marine plankton that is toxic and often fatal to fish and other organisms, including humans.

Regulation: a set of rules of conduct, standards, or procedures, which must be followed in order to comply

with legislation, or a governmental or ministerial order that has the force of law.

Rehabilitation: see **Land rehabilitation**.

Renewable energy: energy obtained from sources that are essentially inexhaustible (for example, wind energy, solar energy, hydropower). (See **Renewable resource**.)

Renewable resource: a resource produced as part of the functioning of natural systems at rates comparable with its rate of consumption. Under normal conditions these resources are continuously renewing themselves.

Resilience: the capacity to recover from a disturbance, for example, the capacity of a degraded natural area to return to its original state.

Resource: a general term for whatever can be used to provide the means to satisfy human needs and wants.

Resource management: the control of resources in a planned and responsible way.

Resource base: all the resources on which human societies depend, including natural resources such as land, water, and minerals, for example.

Riparian vegetation: vegetation on or immediately adjacent to a river bank.

River catchment: all the land from mountain-top to seashore that is drained by a single river and its tributaries. Catchment areas vary in size. A big river may have a catchment area of several thousand square kilometres, whereas a smaller tributary could have a catchment area of only a few hectares.

Runoff: the flow of water over the ground surface.

S

Salinity: the measure of the total quantity of dissolved solids in water, in parts per thousand by weight.

Scenario: a story, told in words and numbers, about the manner in which future events could unfold, and offering lessons on how to direct the flow of events towards sustainable paths and away from unsustainable ones.

Sea level: the position of the air–sea-level interface to which all terrestrial elevations and sea depths are referred.

Sediment: finely divided solid matter suspended in or falling to the bottom of a liquid or gas. Materials such as rocks and sands deposited by glaciers, wind, or water.

Semi-arid: an area in which annual rainfall ranges from about 250–600 mm, rainfall is seasonal and variable, and evaporation is high.

Siltation: the deposition of soil or fine rock particles on the bottom of river beds or other water bodies, often as a result of soil erosion in the surrounding area.

Social capital: the collaboration and cooperation within a community or society (through such mechanisms as networks, shared trust, norms, and values) to achieve mutual benefits.

Socio-economic: linked to human activities, for example social, economic, cultural, and political activities. Themes that form part of the socio-economic environment are the economy, health, education, safety, and security as well as environmental governance.

Soil erosion: the loss or movement of soil by agents such as running water, wind, and gravity.

Soil conservation: an intervention to stop soil degradation and even reverse it, through physical structures such as contours and terraces, or through biological means such as intercropping and grass strips.

Soil degradation: the declining productivity of soils through physical, chemical, or biological deterioration resulting from a combination of physical factors such as drought, management factors such as cultivation of marginal land or overstocking, and historical and socio-economic factors such as inequitable distribution of land. (See **Land degradation**.)

Solid waste: any solid, semi-solid, liquid, or contained gaseous materials discarded from industrial, commercial, mining, or agricultural operations, and from community activities. Solid waste includes garbage, construction debris, commercial refuse, sludge from water supply or waste treatment plants or air pollution control facilities, and from other discarded materials.

Species: a population of plants or animals that is able to interbreed to produce fertile offspring.

Species diversity: the range of different species in an area or habitat, expressed as a combination of the number of species and the abundance of each species.

Species richness: the number of species in an area or habitat.

Stakeholders: people and/or organizations involved or interested in an area or an issue, for example, residents, councillors, business people, trade unions, government institutions.

Strategic Environmental Assessment (SEA): an environmental assessment that is carried out in connection with one or more strategic actions, policies, plans, or programmes. It is an important tool for helping planners and decision-makers to understand what will happen to an area if it were to accommodate different land uses.

Stratospheric ozone: the ozone in the layer of the Earth's atmosphere, which extends from 15 to 35 kilometres above the surface and protects life on the planet from harmful ultraviolet rays.

Subsistence: a situation in which people provide for all their

own needs from their immediate environment, rather than earning wages to pay for goods and services. Subsistence fishing, for example, refers to the level of fishing where the catch is enough to feed only the person fishing and his or her family.

Sulphur dioxide (SO₂): a colourless, acrid gas formed by the combustion of sulphur. It is an oxidizing and reducing agent and is used as a refrigerant, disinfectant, preservative, and bleach. It reacts with water to make sulphuric acid.

Surface water: water found on the surface of the land, for example in rivers and dams.

Sustainable agriculture: agriculture that does not degrade the soil or other resources on which it depends.

Sustainable development: development that meets the needs of the current generation without compromising the ability of future generations to meet their needs, in turn.

Sustainable harvesting: the harvesting of natural resources (for example, fish) in such a manner that there is no long-term decline in the population or its ability to reproduce.

Sustainability: the ability to meet the needs of present and future generations through the responsible use of resources.

T

Taxa: plural of taxon. (See **Taxon**.)

Taxon/taxonomic group: a group of living organisms with similar characteristics of any taxonomic rank (family, genus, or species), such as, for example, mammals, insects, and flowering plants.

Taxonomy: the science of discovering, identifying, naming, and documenting the life-forms making up the Earth's biological diversity.

Terrestrial: of or associated with land.

Thermal efficiencies: the efficiency with which a power source transforms the potential heat of its fuel into work or output, expressed as a ratio of the useful work done by the power source in a given time interval to the total heat energy contained in the fuel burned during the same time interval, both work and heat being expressed in the same units.

Threatened species: plants or animals that are likely to become endangered within the foreseeable future.

Total Allowable Catch (TAC): is a catch limit set for a particular fishery, generally for a year or a fishing season.

Tradable emissions: emissions that fall under a tradable emissions permit, which allows the holder to release a certain quantity of a specific emission. Should the permit-holder reduce his or her emissions, he or she can sell the quantity that remains on the permit.

Trade liberalization: the reduction of tariffs and other measures that restrict trade.

Tragedy of the commons: the idea that if there is no clear ownership of the rights to use a natural resource, this resource tends to be over-exploited.

Transboundary Protected Areas/Parks: areas that straddle international boundaries, but within which all human barriers are removed. Their primary purpose is wildlife conservation and they are managed as a unit under a single management plan.

Transfrontier Conservation Area (TFCA): area that straddles international boundaries and are composed of two or more conservation areas, which may have differing conservation status. These areas may also be separated by human barriers, which can prevent the free movement of animals.

Transparency International: an organization dedicated to fighting corruption.

Trickle Down Effect: an economic theory that an increase in wealth in society will eventually increase the standard of living of all the people in that society.

Triple bottom line: one of the theories of sustainable development conceptualized by John Elkington, which suggests that true sustainable development in business must consider not just the financial 'bottom line' of prosperity and profit, but also the bottom lines of environmental quality and social equity.

U

Ultraviolet (UV) radiation: the light between visible light and X-rays on the light spectrum, further divided by wavelength into A, B, and C bands. Most UV radiation is absorbed by the ozone layer before it reaches the lower reaches of the atmosphere. Excessive exposure to UV radiation results in skin cancer.

Unemployed: people who are unable to find a job but will accept work if given the opportunity.

Untransformed: when used in an environmental context, a term describing land or habitat in its natural state.

Urbanization: the main process driving the creation and ongoing remaking of towns and cities. An area is deemed urban if it has a population of more than 20 000 people. The term is often used with reference to the movement of people from rural to urban areas.

V

Vector-borne diseases: diseases that are commonly transmitted through vectors. 'Vector' is a term used broadly to refer to any animal that transmits human disease or plays an essential role in a parasite's life cycle (for

example, anopheles mosquitoes transmitting malaria, snail hosts of schistosomiasis, or rodent reservoirs of leishmaniasis).

Vegetation: the plant-life of an area or region.

Veld: South African term for natural vegetation, usually grassland or savanna, typically containing scattered shrubs or trees.

Volatile Organic Compounds (VOCs): primarily the lighter 'fractions' of oil or hydrocarbons, that is, the parts that evaporate easily because they have a low boiling point.

W

Waste: something which nobody wants at a particular time and which needs to be disposed of. (See **Solid waste**.)

Waste management: a control system to limit, collect, and dispose of waste, through policies and environmental standards.

Waste treatment: the treatment of industrial or municipal waste with chemicals or natural organisms to reduce the amount of nutrients and other contaminants in the water before it is released to the environment.

Wastewater: water left over after it has been used, for example in homes, gardens, and factories.

Water abstraction: the removal of water from a body of water.

Water balance: the balance between incoming water and the loss or use of water in a given area or system.

Water-borne diseases: diseases such as cholera, typhoid fever, dysentery, gastroenteritis, hepatitis, and schistosomiasis, which are commonly transmitted through contaminated water.

Water erosion: a process of soil erosion beginning when raindrops bombard bare soil, loosening and washing away soil particles and culminating eventually in gully formation.

Water table: a more or less horizontal layer in the soil below which all spaces between soil particles are saturated with water.

Wetland: land that is transitional between terrestrial and aquatic systems, where the water table is usually at or near the surface, or where the land is periodically covered with shallow water; in normal circumstances, such land supports or would support vegetation typically adapted to life in saturated soil.

Wind erosion: a process of soil erosion, most severe in dry flat areas where vegetative cover is poor and winds blow strongly.

World Heritage Site: architectural works, works of monumental sculpture and painting, elements or structures of natural or archaeological elements, structures or

landscapes, and combinations of features, which are of outstanding universal value from the point of view of history, art, or science. The protection of world heritage sites is the duty of the international community as a whole, and is governed by the United Nations World Heritage Convention.



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