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1. Definitions

Ecosystem (Source: Environment Canada – State of the Environment Report: wwww.ec.gc.ca)

A dynamic complex of organisms (biota), including humans, and their physical environment, interacting as a functional unit (adapted from Federal–Provincial–Territorial Biodiversity Working Group 1995). Ecosystems vary in size and composition and display functional relationships within and between systems. The term may be applied to a unit as large as the entire ecosphere or to smaller divisions like the Arctic or even small lakes. Ecosystems apply to the more natural through to heavily human-modified systems. In its broadest sense, an ecosystem includes environmental, social, and economic elements (E.B. Wiken and A.M. Turner, State of the Environment Directorate, Environment Canada, personal communication). The root words of ecosystem are *eco*, a derivative of the Greek term for house or home, and *system*, which addresses the relationships and connections between the biological and physical parts.

Ecosystem Approach (Source: Environment Canada – State of the Environment Report: wwww.ec.gc.ca)
A comprehensive and holistic approach to understanding and anticipating ecological change, assessing the full range of consequences, and developing appropriate responses. It recognizes the complexity of ecosystems and the interconnections among component parts. Among other things, the ecosystem approach recognizes that humans are an integral part of ecosystems and that human social and economic systems constantly interact with other physical and biological parts of the system. Within the context of sustainability, all interactions must be considered in an integrated fashion".

2. African Cases in the Spotlight

The Environmental Services Management Plan (ESMP) of Durban
www.durban.gov.za

The ESMP provides a framework for the utilisation, protection, development and management of key environmental resources of Durban, South Africa. It builds on previous Open Space Planning initiatives dating back to 1989, e.g. the Durban Metropolitan Open Space System (D'MOSS). The overall aim of the ESMP 2001 is to support the realisation of Durban's Vision by contributing to sustainable development and an acceptable quality for the residents of and visitors to the city.

Open Spaces, and the biodiversity they support, provide **Environmental Goods and Services** such as climate regulation, water supply, erosion control, waste treatment, food production, natural products, recreation etc, which all provide benefits to the residents of Durban. Different ecosystems or habitat types (e.g. forests, grasslands, wetlands,

floodplains, rocky shores etc) provide these services to varying degrees. In general, the bigger and less disturbed an area or habitat, the better its ability to provide these services. A network of key, important open spaces and habitats have been mapped and quantified as the **critical open space asset** of Durban. These areas have been selected based on their position in catchments, their ecological condition and their ability to provide essential services to Durban's residents. The mapping used the 18 major river catchments within Durban as it's base, as these make logical planning and management areas.

Using the tool of resource economics and international research, it has been estimated that the critical open space asset **provides environmental services to the value of R 3.3 billion per annum**. It should be noted that this excluded the value of tourism to Durban. Open space assets thus play a significant role in the day to day functioning of the city through the delivery of highly valuable environmental services.

In addition to mapping the open space asset of Durban, the plan has identified **implementation strategies** which focus on:

a) the effective management of the open space asset;

b) legal, planning and financial tools for the long-term protection of the asset;

c) guidelines for the integrated management of the surrounding land uses and activities that impact on open spaces; and

d) appropriate institutional structures that have the mandate and capacity to manage and implement open space planning and environmental management initiatives. Contact: Dr. Debra Roberts, Manager – Environment, 166 Old Fort Place, Durban – tel. 27-31-300 2527.

Johannesburg, South Africa: Environmental Management through the Eyes of Sustainable Development
http://ceroi.net/reports/johannesburg/csoe/html/nonjava/Perspectives/SustainableDev. htm

Nine principles guide the formulation of A Sustainable Development Policy in the Greater Johannesburg Context:

- Respect and Care for the Community of Life: access to basic services, equity and environmental education.
- Improve the Quality of Human Life: improve the quality of life in informal settlements, better medical services, and improved access to income, credit, land education, training, health care, information for women.
- Conserve the Earth's Vitality and Diversity: preservation of nature reserves and protected areas, reduction of pollution, etc.
- Minimize the Depletion of Non-Renewable Resources: use of new sources of renewable and non-polluting energy, promotion of public transport and energy efficiency measures.
- Keep within the Earth's Carrying Capacity: waste minimization, sustainable use of environmental resources and services.
- Change Personal Attitudes and Practices: Environmental education and awareness.
- Enable Communities to Care for Their Own Environments: Ownership and accountability, information and knowledge.
- Provide a National Framework for Integrating Conservation and Development: Law and institutions consistent with economic realities and social norms.
- Create a Global Alliance: partnerships and cooperation.

The Midrand EcoCity Program
http://ecocity.org.za

Midrand is a district (11) of the city of Johannesburg. The EcoCity Program is driven by the following principles (summary):

- **African renaissance**
  Use of Africa-specific solutions, combining knowledge from the West with indigenous African knowledge in developing an environmentally friendly city.
- **Equity**
  Environmental justice: equal access to resources and an equal bearing of environmental costs.

- **Enhancing natural resources**
  'Natural capital' such as rivers, soil, biodiversity, air and so on must be improved in the creation of EcoCity.
- **Improving quality of life**
  Basic services should be provided to people who do not have access to potable water, sanitation, waste removal or safe energy, in a way to improve the environmental quality in the city.
- **Poverty eradication**
  EcoCity wishes to eradicate poverty by investing in 'social capital' (training and access to resources and opportunities).
- **Self-reliance**
  People must create their own jobs and upgrade their neighborhoods using their own resources and initiative.
- **Green transformation**
  Jobs in EcoCity must be ecologically sustainable (integrated environmental management systems, sustainable and environmentally friendly products and services)
- **People involvement**
  People must be involved in every aspect of the planning and the development of the EcoCity Program.
- **Providing a future for our children**
  Meeting the needs of present generations without compromising the needs of future generations.

An independent organization (the EcoCity Trust) drives the EcoCity Process.

The EcoCity's Vision: "EcoCity is a needs-driven people's programme addressing poverty alleviation through local economic development. Facing its developing-world challenges EcoCity seeks out innovative, technically relevant and ecologically-sound solutions"

The EcoCity Program includes agricultural cooperatives, an EcoVillage, an organic market place, prototypes for green energy, solar heaters, water pollution control and recycling projects, an EcoBanking initiative, etc.

3. Annotated Bibliography on Ecosystem Approach, Urban Development and Environmental Management

Baltimore Ecosystem Study (BES)
www.ecostudies.org/bes/right.html
The BES aims to understand metropolitan Baltimore as an ecological system. The program brings together researchers from biological, physical, and social sciences to collect new data and synthesize existing information on how both the built and wild ecosystem of Baltimore work. The site includes information on the people and institutions involved in the project, the research framework (Goals, theory, human ecosystem diagram, projects, education, meteorology, modeling, etc.), the educational component, and databases.

Central Arizona – Phoenix Long Term Ecological Research (CAP – LTER)
http://caplter.asu.ed/

The CAP-LTER aims to study the structure and function of the urban ecosystem, assess the effects of urban development on the Sonoran Desert, and define the impact of ecological conditions on urban development.

Long Term Ecological Research (LTER)
http://lter.edu/
The US Long Term Ecological Research (LTER) is a collaborative effort involving more than 1100 scientists and students investigating ecological processes over long temporal and broad spatial scales. The Network promotes synthesis and comparative research across sites and international research programs. The research includes 24 sites representing diverse ecosystems and research emphases. BES and CAP are parts of the LTER.

State of the Environment – Greater Johannesburg
http://ceroi.net/reports/johannesburg/csoe/Default.htm
The report provides environmental information for sound decision-making and general awareness raising in cities. The DPSIR-model (driving force, pressure, state, impact, response) was used to analyze the six priority issues identified through the LDO's (Land Development Objectives): (i) pollution, (ii) poverty, (iii) environmental health, (iv) conservation, (v) parks and open spaces, and (vi) waste.

Durban Metro State of the Environment and Development
http://ceroi.net/reports/durban/index.htm
The report addresses the key issues (air, terrestrial resources, marine resources, fresh water resources, waste, cultural resources, noise, and crime), analyses sector affecting the natural environment (population, economy, climate, transport) and proposes an environmental management plan (Local Agenda 21).

Cities Environment Reports On the Internet (CEROI)
www.ceroi.net
CEROI facilitates access to environmental information for sound decision-making and general awareness raising in cities. CEROI provides city authorities with an efficient tool to produce and present a report on the cities' environment on Internet. The CEROI concept includes a template with standard indicators and a tailor-made software fore easy presentation of graphs, maps, photographs and text. The state of environment (SoE) report will (i) give an overview of human-induced impact on the environment for a number of selected thematic topics, (ii) indicate the present state of the environment and current trends, (iii) show political responses to these trends, (iv) indicate the degree to which these responses have been attained, and (v) allow the end user to compare the environmental situation in different cities.

Sustainable Cities Programme
www.unhabitat.org.scp/scphome.htm
The Sustainable Cities Program (SCP) is a joint UN-Habitat/UNEP facility for building capacities in urban environmental planning and management. SCP has developed several capacity building and knowledge resources: Introductory Training Materials on the Urban Environmental Planning and Management; Building an Environmental Management Information System (EMIS); Urban Air Quality Management; Implementation and Replication of the SCP process at City and National Level – Case studies from nine cities.

Urban Environmental Management - Virtual Library
http://gdrc.org/uem/
The virtual library on urban environmental management includes various publications and resources on capacity building, eco-tourism, energy systems, environmental education, impact assessment, life cycle assessment, Local Agenda 21, slums and squatters, transportation, urban information, urban planning, waste management, water resources.

Cities Alliance
www.citiesalliance.org
Cities Alliance is a global partnership of cities and their development partners committed to improve the living conditions of the urban poor through action in two key areas:
- City development strategies which reflect a shared vision for the city's future and local priorities for action to reduce urban poverty.
- Citywide and nationwide slum upgrading – moving upgrading to scale.

The Cities Alliance Consultative Group is composed of bi-lateral and multi-lateral development agencies and the political heads of the international associations of local authorities who have pledged their commitment to achieving Alliance goals
The web site includes several knowledge resources on urban development and planning. The publication entitled "City Development Strategies (CDSs): Taking stock and signposting the way forward" is a comprehensive assessment of CDS principles and practices with various illustrations from the developed and the developing world.

International Council for Local Environmental Initiatives
www.iclei.org
ICLEI is the international environmental agency for local governments. ICLEI's mission is to build and serve a worldwide movement of local governments to achieve tangible improvements in global environmental and sustainable development conditions through cumulative local actions.
ICLEI completed a worldwide survey of Local Agenda 21. The final report and many other publications are available on the web site. ECLEI has also published "The local Agenda 21 Planning Guide" 1996, which provides a framework for LA21 preparation, implementation and monitoring: chapter 01 on "Sustainable development in the local context"; chapter 02 on "Partnerships"; chapter 03 on "Community-based issues analysis"; chapter 04 on "Action planning", chapter 05 on "Implementation and monitoring"; and chapter 06 "Evaluation and feedback".

City Development Strategies Initiative
www.citydev.org
The initiative was created to recognize the potential problems facing cities and unite international efforts in providing solutions, enhance international awareness of new trends, strategies and processes in urban development and ensure full and free access to expert guidance, shared experience and technological analysis. The initiative includes amongst others a journal and a network of mayors to encourage knowledge sharing.

Integrated Development Planning Guides
www.local.gov.Za/DCD/dcdlibrary/library.html
The library includes various publications on urban development. The Integrated Development Planning Guides present a comprehensive framework for urban planning: overview, guidelines, preparation, methodology (analysis, strategies, projects, integration and approval), and a toolbox.

4.   Resources on Ecosystem Approach/Management and Related Issues

Urban Ecosystem Management Projects: www.umich.edu/~emsnre/urban.html

Urban Ecosystem Model: www.prism.washington.edu/vps/modsdata.uem01.html

Urban Ecosystem Modeling (UEM): http:ei.cornell.edu/UEM/

The Center for Urban Ecology: www.nps.gov/cue/cueintro.html

Institute of Urban Ecology: www.douglas.bc.ca/iue/title1.html

NESH: Exploring the theory and practice of managing human activities and ecosystems for sustainability: www.ecologistics.com/nesh/subjmenu.html

NRCS Ecosystem Management Resources:
www.nhq.nrcs.usda.gov/ESD/comms/esysdocs.html

Ecosystem Management Initiative: www.snre.umich.edu/ecomgt/emapproach/

The ecosystem-based approach:
http://iisd1.iisd.ca/CASL/CASLGuide/Ecosystemapproach.htm

An adaptive Self Organizing Holarchic Open (SOHO) Systems approach to Ecosystem Sustainability and Health: www.fes.uwaterloo.ca/u/jjkay/about/diamond.html

Environment and Resources Studies: www.jameskey.ca/

OECD Environmental Performance Reviews – A Practical Introduction: www.oecd.org

(Agro)Ecosystem Health: A Global Network:
www.ovcnet.uoguelph.ca/popmed/ecosys/research.htm

Methodologies for Extrapolating from Local to Regional Ecosystem Scales: Scaling
Functions and Thresholds in Animal Responses to Landscape Pattern and Land Use:
http://es.epa.gov/ncerqa_abstracts/grants/98/regional/wiens.html

An Ecosystem Panning Framework for DOE:
www.mb.ec.gc.ca/nature/ecosystems/framework/da02s04.en.html

URBANSIM – an Urban Planning and Analysis Software-Based Simulation Model:
www.urbansim.org

Canada's Local Government Information Centre: www.icuur.org

Ecological Framework: www.ec.gc.ca/soer-ree/English/Framework/framework.cfm

Integrated Approaches to Long-term Studies of Urban Ecological Systems, Nancy B. Grim
"Urban Ecological Systems present multiple challenges to ecologists – Pervasive human
impact and extreme heterogeneity of cities, and the need to integrate social and ecological
approaches, concepts and theory: www.ecostudies.org/bes

A Prototype: Environmental Strategies for Cities:
http://web.mit.edu/urbanupgrading/urbanenvironment/

An ecosystem approach: http://odin.dep.no/md/html/conf/ecosyst/ecosystem_approach.html

"The city as ecosystem: urban long-term research projects aim to put the pieces together"
Mary Parlange: www.ecostudies.org

The Ramsar Convention on Wetlands: Strategic approaches to fresh water management –
background paper: the ecosystem approach: www.ramsar.org/key_csd6_iucnwwf_bkgd.htm

The Local Government Information Network (LOGIN): www.logincee.org

The Institute of Ecosystem Studies: www.ecostudies.org/

"Cities of the future will embrace the ecology of the landscape, rather than set themselves
apart" John T. Lyle: www.context.org/ICLIB/IC35/Lyle.htm

The State of the Nation's Ecosystem: www.us-ecosystem.org/history.html

Accelerating Sustainable Development: Local Action Moves the World:
www.iclei.org/Johannesburg2002

Ecological Cities Project: www.umass.edu/ecologicalcities/index.html

The ecosystem-based approach: www.issd.ca/CASL/CASLGuide/Ecosystemapproach.html

Toolkit for Sustainable Cities: www.urbanecology.org/cities.toolkit.html

Integrated Planning and Management of Land Resources – UN Commission on Sustainable
Development: www.un.org/esa/sustdev/csd8/land_decision.htm

Australian Research Centre for Urban Ecology: http://arcue.org.rbg.vic.gov.au/

State of the Environment Report – Canada: www.ec.gc.ca/soer-ree/Emglish/1996report/Doc

Toolkit Citizens Participation in Local Governance: www.toolkitparticipation.com

Public-Private Partnerships for the Urban Environment (PPUE): www.undp.org/ppp

Observatory of French Speaking Cities in Africa: www.ovaf.net/

African Waste Net: www.pdm-net.org

Commission on Sustainable Development "Second Local Agenda 21 Survey" submitted by ICLIE: www.iclei.org

"Urban Ecosystems and Human Health" Dr. Trevor Hancock – CIID-IDRC Seminar, Montevideo, Uruguay – April 6-7, 2000: www.idrc.ca/lacro/docs/conferencias/hancock.html

Centre for Urban Policy Research: www.policy.rutgers.edu/cupr/frpage.htm

Urban Poverty: www.worldbank.org/urban/poverty/

Africa Region Environmental Strategy (ARES): http://lnweb18.worldbank.org/essd/essd.nsf/2f8eec6c436b828385256a290067cab0/20923a5b25ea1d9485256a8b007c0fa9?OpenDocument

Urban Development: http://www.worldbank.org/urban/

Convention on Biological Diversity: www.biodiv.org

Ecosystem-Based Assistance (EBA) principles and guidelines – Report of the Ecosystem-Based Assistance Guidelines Action Team, United States Department of Agriculture, Natural Resources Conservation Service – March 17, 1995

Report of the Workshop on the Ecosystem Approach – Lilongwe, Malawi, 26-28 January 1998 – Convention on Biological Diversity

Liaison Group Meeting on Ecosystem Approach – Paris, 15 – 17 September 1999, Secretariat of the Convention on Biological Diversity

"Linking Poverty Reduction and Environmental Management; Policy Challenges and Opportunities" – A Contribution to the World Summit on Sustainable Development Process – Consultation Draft – January 2002 DFID-European Commission-UNDP-World Bank.

Providing Ecosystem-Based Assistance for Management of Natural Resources – NRCS – US Department of Agriculture

Urban Ecosystems Journal: Mark R. Walbridge, Editor-in-chief, Department of Biology, George Mason University, Fairfax, VA, USA.

The Urban Metabolism of Cape Town, South Africa: Planning imperatives in an ecologically unsustainable metropolis. Barris Gasson, School of Architecture and Panning, University of Cape Town. Gassonb@eng.uct.ac.za

5.   Knowledge Sharing and Capacity Building Events

World Bank Safeguard Policies available on CD-ROM for free – Send an email to Ms. L. Makki at lmakki@worldbank.org to obtain a maximum number of 50 CD-ROMs. Content of the CD-ROM and more can be found at the World Bank web site: www.worldbank.org/safeguard

15-17 Apr 2002 - **Regional Conference on Water and Sustainable Development in Africa**, Accra, Ghana

Organized by: African Development Bank.
URL: http://www.afdb.org/knowledge/pressreleases2001/adb_13_2002e.htm
Contact: m.kane@afdb.org

29 April-3 May 2002 – **World Urban Forum**, Nairobi, Kenya
Organized by: UN-HABITAT
URL: http://unhabitat.org/uf/introduction.htm
Contact: UrbanForum@unhabitat.org

6-10 May 2002 – **Mountains High Summit Conference for Africa**, Nairobi, Kenya
Organized by: UNEP in partnership with FAO, Italian Committee for 2002 – IYM, African
Mountains Association, ICRAF, Mountain Forum Africa
Contact: Ms. Monika G. Wehrle: Monika.Wehrle@unep.org

13-17 May 2002 – **Urban transport & Mobility Training Program for Eastern and
Southern Africa**, Addis Ababa, Ethiopia
Organized by: Municipal Development Program-Eastern and Southern Africa (MDP-ESA),
World Bank (Sub-Saharan Transport Policy Program, Urban Mobility Component (SSATP-
UM)
Contacts: gmatovu@mdpesa.org, wsml@mdpesa.org, aezzine@worldbank.org

17-18 June 2002 - **Annual Global Water Partnership (GWP) Consulting Partners (CP)
Meeting**, Accra, Ghana
Organized by: Global Water Partnership. Theme: IWRM and the Regions. URL:
http://www.gwpforum.org/servlet/PSP
Contact: gwp@sida.se

17 June-12 July 2002 – **International Program for Development Evaluation Training**,
Ottawa, Canada
Organized by: World Bank (Operations Evaluation Department) and Faculty of Public Affairs
and Management (Carleton University, Canada)
Contact: Gail Manning – ipdet@carleton.ca

29 Jul - 1 Aug 2002 - **African Sanitation and Hygiene Conference (AFRICASAN)**,
Johannesburg, South Africa
Organized by: Department of Water Affairs and Forestry (DWAF) (South Africa), Water
Supply and Sanitation Collaborative Council (WSSCC) and the Water and Sanitation
Program Africa Region (WSP-AF).
URL: http://www.wsscc.org/about/ccnews.php?id=37
*Contact: Ms. Eirah Gorre-Dale, WSSCC, c/o UN DESA, gorre-dale@un.org ; South Africa,
Mr. Babs Naidoo, DWAF, NaidooB@dwaf.gov.za*

30 Sep - 4 Oct 2002 - **Wastecon 2002 - International Waste Congress and Exhibition**,
Durban, South Africa.
Organized by: Institute of Waste Management of Southern Africa. URL:
http://www.wastecon.co.za
Contact: secretariat@wastecon.co.za

21-23 Jan 2003- **Water, Poverty, and Productive Uses of Water at the Household Level**,
South Africa Organized by: Natural Resource Institute, IRC, International Water
Management Institute (IWMI) and Department of Water Affairs and Forestry (DWAF).
URL: http://www.irc.nl/themes/management/prodwat/index.html
Contact: Patrick Moriarty, IRC, moriarty@irc.nl

21-23 January 2003 – **Joint European – Southern African International Conference:
Pesticides in non-target agricultural environments – Environmental and economic
implications**, University of Cape Town
Organized by: Technical University Braunschweig, Germany, University of Cape Town,
South Africa, Alterra Wageningen, The Netherlands, University of Stellenbosch, South
Africa.

URL: http://www.tu-bs.de/conference-CPT
Contact: pest@botzoo.uct.ac.za

23 September-13 December 2002 – **Impact Assessment for Sustainable Development: Methods and Techniques**, University of Manchester, United Kingdom
Organized by: Institute for Development Policy and Management
URL: http://www.man.ac.uk/idpm/
Contact: idpm@man.ac.uk

MSc/Postgraduate Diploma in **Environment and Development**, University of Manchester, United kingdom – 12 months (full-time) or 24 months (part-time)
Organized by: Institute for Development Policy and Management
URL: http://www.man.ac.uk/idpm/
Contact: idpmapps@fs1.ec.man.ac.uk