Viumbe hai

African Cities, Ecosystems, and Biodiversity
“The importance of biological diversity to human society is hard to overstate. An estimated 40 per cent of the global economy is based on biological products and processes. Poor people, especially those living in areas of low agricultural productivity, depend especially heavily on the genetic diversity of the environment. The effective use of biodiversity at all levels – genes, species and ecosystems – is therefore a precondition for sustainable development. However, human activities the world over are causing the progressive loss of species of plants and animals at a rate far higher than the natural background rate of extinction.”

United Nations Environment Programme (UNEP)

“Viumbe Hai” is a Swahili term for biodiversity meaning living creatures
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Ecosystems, human well-being and cities in Africa

“New links need to be made between protecting biodiversity and human needs. If viable populations are to be preserved, particularly in the light of an uncertain future climate, biodiversity conservation cannot be restricted to protected areas, but has to be incorporated as part of sustainable land use even in densely settled areas.”

UNEP, Africa Environment Outlook 2, p256.

We live in a world comprising a myriad of cities, all connected by the global economy and all reliant on biodiversity and ecological services for sustained existence and growth. Although Africa is mostly rural, it has the fastest rate of urbanisation worldwide. In 2007, for the first time in history, the world’s urban population will exceed the rural population and the majority of that continued population growth over the next 20 years will occur in cities of the developing world, including African cities. In Africa, urbanisation is often linked with increased levels of poverty and the growth of urban slums which lack access to basic environmental and social services.

For cities across the globe, this mass urbanisation trend will have major impacts on the planet’s natural resources. Currently, cities occupy just 2 percent of the total land surface of Earth, but they use 75 percent of the planet’s natural resources. This dependence on natural resources and on ecological services, illustrates that healthy resilient ecosystems and biodiversity are vital to the sustainable functioning of cities and the quality of life of their inhabitants.

Biodiversity is defined in the Convention on Biological Diversity as the “variability among living organisms from all sources, including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems”.

Biodiversity forms the foundation of ecosystems, which provide important ecological services.

Ecosystem services are defined in the Millennium Ecosystem Assessment as “The benefits people obtain from ecosystems. These include provisioning services such as food and water; regulating services such as flood and disease control; cultural services such as spiritual, recreational, and cultural benefits; and supporting services such as nutrient cycling that maintain the conditions for life on Earth.”

Cities rely heavily on these ecosystem services for their existence and growth. African cities are particularly dependent on ecosystems because of the large proportion of poor inhabitants. It is especially the urban poor who cannot afford to purchase services. As ecosystems form the foundation upon which economic, social and environmental benefits and productivity are derived, they rely on ecosystems to provide water, food, fuel, construction material, clean air and other services.
Introduction

Africa’s wealth of biodiversity, accounting for about 25 percent of global biodiversity, is spread across various habitats – from savannahs and deserts to wetlands and tropical forests. However, Africa’s biodiversity is threatened by factors including climate change, land use change, invasive species, human-wildlife conflicts, pollution and over-exploitation. These threats to biodiversity and ecosystem services have far-reaching socio-economic and environmental impacts. For example, the pollution of an ecosystem may decrease the area’s tourism-generating potential, increase health risks and also degrade or eliminate biodiversity and weaken the ecosystem’s resilience to these and other changes. Therefore, it is important that the threats to biodiversity are appropriately mitigated and managed.

Cities have many opportunities to generate wealth through activities that draw on environmental services, whilst at the same time promoting the conservation of these resources.

_The Millennium Ecosystem Assessment defines well-being as “A context- and situation-dependent state, comprising basic material for a good life, freedom and choice, health and bodily well-being, good social relations, security, peace of mind, and spiritual experience.”_

By adopting a holistic approach to management, decision-making and planning of cities’ ecosystems, local authorities can promote conservation and sustainable use of natural resources in an equitable way that can also have great economic benefits for cities. For example, sustainable tourism can create jobs and generate substantial revenues for the city.

Biodiversity has become a global concern. The international community has agreed to significantly reduce the loss of biodiversity by 2010. This requires immediate and continued conservation measures – at global, national, regional and local levels – with cities playing crucial roles in securing its protection, management and sustainable use. City authorities are well-placed to take local action to enhance conservation and management of biodiversity, thereby enhancing global biodiversity targets and initiatives. For example, some cities border areas that are resting and nesting places for migratory species which travel thousands of miles across continents.

Despite the negative effects of rapid biodiversity loss on ecosystems and cities, some African cities are pioneering the use of cooperative, innovative and sustainable initiatives involving urban ecological conservation, restoration and maintenance that will help ensure that the continent’s rich natural heritage is not destroyed. These case study examples aim to encourage other African (and non-African) cities to become leaders in biodiversity protection and management and to inform global policy development on urban biodiversity. Cities are key to ensure a better tomorrow and the survival of life on Earth.
Brett Myrdal, Manager of Table Mountain National Park (Cape Town)

As Park Manager of South Africa’s prestigious Table Mountain National Park (TMNP), the iconic landmark in the heart of the city of Cape Town with its 3.2 million city inhabitants and 4.2 million annual park visitors, Brett Myrdal sees his primary role as being to “focus and inspire the team” working to implement the vision for the park, which is ‘A Park for All, Forever’.

TMNP comprises 25 000 hectares of land, surrounded on three sides by a 1000 km$^2$ of marine protected area. It is one of the core sites of the Cape floral Kingdom, a World Heritage Site and a global biodiversity hotspot.

Cape Town’s National Park provides massive investments

The park provides Cape Town with assorted benefits: ecosystems services like clean air, job creation, skills development, poverty alleviation, a place for recreation, the basis of a major source of tourism and economic development for the city and South Africa and it underpins spiritual, aesthetic and cultural values. Myrdal recognizes the importance of ecosystem services within urban contexts and the economic benefits of investing in natural capital. “It plays a very strong economic role as it drives the City’s tourism economy. If we invest in the Park’s natural capital, it provides massive returns to the City of Cape Town”, says Myrdal. This economic impact has been measured by the Graduate School of Business study, “Towards Triple Bottom Line Reporting”, and is demonstrated by the R377million contribution the park has made to South Africa’s Gross Domestic Product from 1998 to 2003.

Ecosystems are important in alleviating poverty and enhancing human well-being. According to Myrdal, “…the restoration of natural capital is labour intensive and that’s fantastic because then we can simultaneously employ previously unemployed people in a career path in conservation, and enhance the ecology of the TMNP, through fynbos restoration, path building and and afro-montane forest restoration. We then get a benevolent circle or triple bottom line which has a knock-on effect into the financial health of the park and the economy of the city – with social, natural and financial returns”.

Some Park challenges

The most significant problems facing the park are ensuring visitor safety from urban crime, mitigating the destructive impact of alien vegetation, managing dogs that cause

“The park plays a very strong economic role as it drives the City’s tourism economy. If we invest in the Park’s natural capital, it provides massive returns to the City of Cape Town.” Brett Myrdal
disturbances to the park’s natural ecosystems, preventing inappropriate
development near park boundaries and managing too frequent park fires.
Myrdal acknowledges that economic sustainability of the park is “absolutely
vital” to its success. He is of the opinion that urban parks with their greater
access to markets should contribute financially to the conservation of rural
national parks.

Forward-thinking and creative management solutions
The parks’ vision “A park for All, Forever” translates into biodiversity conservation, social development and economic
sustainability and acts as a guide to addressing problems facing the park. For example, a sophisticated approach
to visitor safety using dog handlers, observation points and Closed Circuit Television systems has addressed many
visitor safety concerns. A newly negotiated environmental management plan will regulate dog walking in the park in
conjunction with a zoning system to manage access. Extensive alien clearing programmes, path building for erosion
control, and a circum-peninsula fire belt to fire-proof the city are ongoing management responsibilities.

TMNP partnerships for sustainability
The park’s investment in infrastructure and management and its predominantly open access regime, attracts visitors
to the park. More than 70% of the park is freely accessed by citizens who walk the 500km network of paths now
upgraded by the poverty relief teams. Educational programmes for 20 000 scholars a year and impact related voluntary
user payment tariffs encourage visitors to protect the park’s ecosystems. Partnerships with relevant stakeholders are
often responsible for the success and sustainability of conservation initiatives. Myrdal agrees that partnerships “… are
absolutely vital. Our primary partnership is with the City of Cape Town, who invest in tourism infrastructure that turns
temporary jobs into more permanent tourism opportunities created by the business-wise Hoerikwaggo Trails. It’s a
mutually beneficial partnership.” Other partnerships include the provincial and national government and NGOs.

In accordance with the ecosystem approach to conserving biodiversity, TMNP is involved with other urban biodiversity
conservation initiatives in Cape Town such as CapeFlatsNature (a partnership urban biodiversity project in Cape Town
administered by the South African National Biodiversity Institute’s (SANBI) Urban Conservation Programme) about which
Myrdal remarks “… our particular interest is to see that there is a link from crest to coast so we don’t have ecosystem
conservation stopping at the boundary of the park”.

Myrdal concludes that “ultimately the vision for the park is that by 2010 we want to be recognized as one of the
world’s leading urban national parks giving citizens an unquenchable taste for nature and a desire to visit South
Africa’s National Parks and wilderness areas”.

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Samuel Kwame Anku, The Environmental Protection Agency (Ghana)

Samuel Kwame Anku, the Director of Intersectoral Networks at Ghana’s Environmental Protection Agency (EPA), is tasked with managing wetland ecosystems in the fast growing urban metropolis of Accra. The EPA is one of the primary national institutions that manage Ghanian wetlands and Anku’s function within the EPA is to “co-ordinate interests and efforts of different stakeholder institutions and governmental departments to determine cross-programme requirements and develop solutions to any complex issues” that will be acceptable to all interested and affected parties involved in the management of wetlands.

Accra, Ghana’s largest city and its administrative, communications, and economic centre, is home to a human population of 1.7 million and three major wetlands – the Sakumonu Ramsar site, the Densu River Delta and the Korle Lagoon wetlands.

Accra benefits from its wetland ecosystems

Wetland ecosystems provide a variety of services which can benefit cities and contribute towards well-being and poverty alleviation. Anku says that the residents of Accra derive “unimaginable benefits” from the major wetlands in the city because they “provide services such as flood control; clean healthy water; a greenbelt to regulate the micro-climate in the city; prevention of coastal erosion thereby reducing costs of reclamation of shorelines; eco-tourism (bird watching); as well as providing diversity in the city landscape and environment and at the same time enhancing scenic views and aesthetic beauty for hotels and beach resorts.” The combination of these ecological functions and the products they provide, as well as their cultural/heritage attributes, makes wetlands highly valuable to the communities which are located in their proximity. Anku is very aware of the fact that wetlands particularly support the urban poor, and states their importance in fishing, crabbing, provision of raw materials like raffia for cottage industries, herbs for traditional medicine and dry season urban vegetable farming. Anku added that where wetlands are used for salt production and beach or tourist holiday resorts, these facilities provide employment for the urban poor.

Threats to the wetland ecosystem

“Wetland ecosystems thrive as a result of the interdependence between physical, biological, social, cultural, economic, technological and environmental conditions” says Anku and as a result, “the main challenge faced by environmentalists, planners and city
authorities, is how to understand the interplay and dynamics of human and environmental parameters at play in its management.” Anku lists various impacts that the city of Accra has on the wetlands: “City expansion calls for space, which if not properly planned leads to encroachment in the wetlands for housing developments; discharges of municipal effluent into wetlands thereby increasing pollution levels; over-exploitation of wetland resources/services; siltation of wetlands resulting in annual floods; and loss of biodiversity and aesthetic value.” These impacts and challenges facing wetlands in Accra call for sustainable and integrated management strategies. Anku remarks that cities can better manage their wetland ecosystems if they plan and implement integrated wetlands strategic programmes that recognize wetland values and ensure an effective enforcement of building regulations and pollution control. Anku adds that such programmes should be mainstreamed into the city’s overall development agenda.

**How Accra has overcome or mitigated these problems**

Accra’s approach to managing problems facing the wetlands has included the designation of two RAMSAR sites (RAMSAR refers to the Convention on Wetlands, signed in Ramsar, Iran, in 1971, an intergovernmental treaty which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources); collaborative management systems on the site; development of environmental sensitivity mapping of the coastal area; delineation of greenbelts to stop urban sprawl; and continuous awareness creation programmes through the Site Management Committees. Through the establishment of Site Management Committees in the RAMSAR site area and a series of awareness creation programmes, residents of Accra have been attracted to participate in their conservation. Finally, regarding the management of wetlands, Anku sees the role of partnerships in conservation of the wetlands as important for transparency, accountability, knowledge-sharing leading to improvement in environmental governance and understanding, and appreciating the importance of conservation.

**Accra showcases the benefits of healthy, functioning ecosystems**

The Accra study showcases that the benefits of healthy, functioning ecosystems are overwhelming and wetlands thus not only provide environmental and social benefits, but have the potential to be powerful economic assets to cities if sustainably and equitably managed.

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Wilson Korir, Assistant Director of Kenya Wildlife Service’s Southern Area

Wilson Korir, Assistant Director of the Southern Area of Kenya’s conservation area, works for Kenya Wildlife Service (KWS). KWS is charged with the protection and conservation of the country’s biodiversity and their aim is to be world leaders in wildlife conservation. Korir says that he manages a “big conservation area, formed by three national parks (Nairobi National Park, Amboseli National Park, and Ol Donyo Sabuk National Park) and the wildlife that lives outside the parks.” Korir sees the importance of managing ecosystems holistically, saying that “up to 80% of the wildlife is outside the protected areas, so we have to build a good working relationship with the communities and to make them aware of the importance of wildlife.”

Nairobi, Kenya’s capital city, has just over 3 million residents which is predicted to grow to 10 million by 2020. Only a few kilometers from the city centre is Nairobi National Park (NNP), a unique protected game reserve, spanning 117 km. NNP has a variety of fauna, including lion, cheetah, rhino and buffalo, plus over 400 species of birds and its dry savannah plains, permanent river and riverine forest make it a prime tourist destination within Kenya. NNP is unique in that it is an open ecosystem that allows migration of wildlife, as the park has no southern fence.

NNP provides a variety of benefits to the City of Nairobi

Korir remarks about the importance of NNP to the city of Nairobi: “Nairobi is growing and has many industries, and consequently a lot of carbon emissions. So, the major role of NNP is to act as a carbon sink. Unfortunately, most of the people do not realize that this important role exists. NNP is also a source of entertainment: a place where people can go and enjoy themselves over the weekend. Moreover, it acts as an education facility for city residents who have the Nairobi Safari Walks, the Animal Orphanage and the park itself. Many learning institutes take lessons from the park. And finally, it acts as beautification, giving the city a character since Nairobi is the only city in the world with such a big assembly of wildlife and cohabitation between big animals and people.” The Park’s location and its interesting wildlife are important for tourism and its associated economic benefits – tourism being the largest foreign exchange earner for Kenya.

“Nairobi is growing and has many industries, and consequently a lot of carbon emissions. So, the major role of NNP is to act as a carbon sink.”

Wilson Korir
Management challenges: pollution, human – wildlife conflicts and the lack of an integrated land use plan

Lamenting on the challenges facing a park like NNP, Korir says that “the pollution stemming from industries located at the periphery of the park is an issue. They discharge effluents into the Park. We have also human-wildlife conflicts: lions eat livestock and owners kill lions. To limit this phenomenon we involved communities and tried to explain the importance of conservation. We have a programme whereby owners are given compensation and we implement a process of verifying, thanks to funds from donors and from the organisation Friends of Nairobi National Park. Kenyan law does not allow for compensation of livestock, only for loss of life, but the government is reviewing Kenya’s wildlife policy and wildlife acts.” KWS is also in the process of having an integrated land use plan for the park approved, to enhance park management.

Partnerships and the way forward for NNP

Korir talks of the importance of partnerships in successful and sustainable conservation initiatives: “It’s really important to have partners because conservation is very involving and expensive work. We cannot do anything without donors. We need partners to work with us in several areas, such as capacity building, financial assistance, infrastructure development and for our work with communities. We would want to have a Management Committee which includes the city authority and all stakeholders, including the communities, so that we can handle the issues together and make it easier. If I bring the Mayor in, even as a chairman, he will understand issues better and he will be able to drive conservation programmes.” NNP provides significant socio-economic development potential for the population of Nairobi, is environmentally significant and constitutes a charismatic peri-urban landscape. KWS, through its park management, partnerships and forward integrated planning plays an important role in the future sustainability of NNP.

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Dr Debra Roberts, eThekweni Municipality (Durban), South Africa
As head of the Environment Management Department of eThekweni Municipality, Dr Debra Roberts says her role “is to ensure that the city’s planning and development processes contribute to the protection and sustainable management of Durban’s rich natural resource base.” Dr Roberts explains that Durban is located in an area of high biodiversity on the east coast of the African continent. She continues that the “eThekweni Municipal Area contains examples of three of the country’s eight terrestrial biomes, namely savannah, forest and grassland. While the aquatic environment includes both freshwater and marine habitats: 18 river catchments and 97 km of coastline.” Durban is also the largest port and urban area on the east coast of Africa, and has a population of just over 3 million.

Durban recognized the contribution that open spaces can make to sustainable urban development, and that Durban’s varied ecosystems provide important life-sustaining environmental services. The city authorities identified and conducted an economic valuation of those environmental services which helped inform the appropriate management and resourcing of Durban’s urban open space system.

The contribution of ecosystems to city life in eThekweni
From the research undertaken by the Environment Management Department, it is clear that natural ecosystems provide a broad range of environmental goods and services to the city of Durban, including climate regulation, water regulation, gas regulation, water supply, erosion control, soil formation, nutrient cycling, waste treatment, biological control, food production, natural products and genetic resources. Durban’s ecosystems are also of social, recreational, aesthetic and economic value, and contribute towards human well-being.

Challenges to ecosystem conservation spurred innovative solutions
According to Roberts, challenges to the conservation of ecosystems and biodiversity in Durban include land transformation (around 60% of the city’s 2291 sq. km. has been transformed by urban and rural development); invasive alien plants; pollution and unlicensed and uncontrolled mining, especially of rivers and surrounds for sand for building and the over-harvesting of fauna and flora.

“My role is to ensure that the city’s planning and development processes contribute to the protection and sustainable management of Durban’s rich natural resource base.” Dr Debra Roberts
Roberts also remarks that biodiversity loss and degradation is a contributor to global climate change, which she suggests is the biggest threat facing the sustainability of natural ecosystems. eThekwini municipality has reacted with creative and innovative strategies to address these environmental challenges, and in so doing has enhanced social and economic benefits.

**Resource economics used to ensure long-term ecological viability in the city**

eThekwini municipality has pioneered the use of resource economics in designing its open space system. Roberts explains that in Durban the natural resource base is regarded as ‘platform infrastructure’ – providing a range of environmental goods and services critical in meeting the basic needs and quality of life aspirations of the city’s residents. The design of the eThekwini Environmental Services Management Plan (EESMP) was therefore influenced by the need to secure a sustained supply of these environmental goods and services. Resource economics was used as a tool to value Durban’s open spaces and this information was then used to determine which portions of the city’s natural resource base should be incorporated into the EESMP to ensure long-term ecological viability and the sustained delivery of environmental goods and services. Dr Roberts reported that the replacement value (as calculated in 2003) of the environmental services delivered by the resulting open space system is conservatively estimated at R3.1 billion per annum (or approximately 440 million US dollars). This case highlights the significance of environmental goods and services in ensuring the city’s financial and environmental sustainability. The municipality is also pioneering the use of a broad range of tools in implementing the EESMP, including a dedicated land acquisition budget, the use of environmental servitudes to regulate development, the use of “green by-laws” which are currently being drafted, and a “green’ Special Rating Area“ is being worked on to protect and sustainably manage what will be Durban’s largest protected natural area.

**Networking and partnerships for biodiversity**

Dr Roberts discusses partnerships for conservation, stating that eThekwini municipality has established an internal working group, and external working groups focused on natural resource planning and management to improve networking amongst all the stakeholders in the city.

eThekwini’s innovative use of biodiversity conservation tools informs strategies and development plans, ensuring integrated development planning that provides the city with environmental, social and economic benefits. This case exemplifies a dedicated municipality’s approach to mainstream biodiversity conservation through pioneering design and use of integrated environmental planning tools.

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David Uushona, Walvis Bay City Council (Namibia)

David Uushona is the Manager for Solid Waste and Environmental Management (SWEM) at Walvis Bay City Council in Namibia; he is responsible for the effective and efficient management of both the Solid Waste and Environmental Management Section’s overall resources in order to provide a high quality and cost effective solid waste management service to all residents, as well as to ensure sustainable environmental development in the Walvis Bay Municipal Area.

Walvis Bay City Council, situated on the south west coast of Africa, bordering the Namib Desert (the world’s oldest desert) with its high sand dunes and 60 kilometers of Atlantic sea coastline, has a population of 55,000. Uushona notes the importance of the Namib Desert, as an area of special conservation, research priority, eco-tourism and livelihoods. This unique desert boasts many species found nowhere else as well as advanced adaptations to the arid conditions.

Walvis Bay benefits from understanding the interlinkages between ecosystems, services and human well-being

Uushona shows the interconnectivity between ecosystems, the services they provide and their relationship to human well-being, stating that “the environment encompasses the natural resource base that is essential to sustaining the livelihoods of present and future generations of people and animals. For example – lichens (found on the gypsum plains of the dunes) are ecologically important for preventing wind and water erosion and also play an important role in mineral weathering; the !Nara plant (that grows at the base of the dunes) is an important soil binding plant that serves as a food source to the local Topnaar communities and it is also utilized by game. Thus, if one disturbs the ecosystem at one spot the disturbance will be felt somewhere else.” Uushona adds that these untamed dunes provide the community of Walvis Bay with what it needs to survive and thrive on, and appropriate use is particularly important to the growth of the town population for development and eco-tourism.

Challenges to dune management and protection

Uushona says that the primary challenges to managing and protecting the dune ecosystems are disturbances to the dune web or ecosystem through irresponsible recreational activities and more specifically off-road driving. He also attributes the rapid expansion of infrastructure, as a result

“The environment encompasses the natural resource base that is essential to sustaining the livelihoods of present and future generations of people and animals.”

David Uushona
of population growth to the ever increasing land requirement, destruction and disturbance of habitats and wildlife, saying that “we are littering and creating solid waste, and this problem is normally solved by landfills, which in themselves require space. This dune area space that we take out for land filling also has a big effect on the species in the ecosystem.” Uushona continues that traditional landfill sites also pose health risks for nearby residents which explains the number of “recycling and re-use activities” taking place at the landfill site in a very good coordinated manner, as well as the drafting of an Integrated Waste Management Plan.

**Walvis Bay City Council’s approach to the challenges of dune protection and management**

An initiative of Walvis Bay has involved establishing infrastructure, encouraging and facilitating the incorporation of ‘scavengers’ into the recycling market and providing, designing, printing and distributing recycling related information brochures to residents. Uushona argues that recycling and re-use reduce the space area required for land filling and thus minimize the negative impact on the dune ecosystem and thus positively impact on the dune habitat and species as well as the eco-tourism industry. In addition, approximately 100 people make a living from recycling activities at the landfill site and in so doing are also conserving the dune ecosystems by recycling over a thousand tons of solid waste per year. Uushona says this landfill re-use and recycling initiative aims to ensure that solid waste management practices minimize adverse environmental, cultural, social and economic effects while also providing positive effects in terms of community livelihoods and well-being.

“Of course partnership is a building-block for success” says Uushona – and the various stakeholders (including all quad bike tourism operators in the dunes, duneboarders, paragliders, parasailers, hot-air ballooners, anglers, Long Beach residents and relevant ministries) involved in the drafting of a Dune Belt Management Plan stands testament to this statement. It recommends short and long-term actions aimed at integrating the different interests of users of the dunes in a sustainable way that minimizes further adverse environmental impacts, such as zoning the area according to environmental sensitivity allowing for specified activities.

The importance of local government initiatives like this one for improving ecosystem vitality and socio-economic development requires appropriate recognition.

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Julius Maira, Dar es Salaam City Council urban planner

Julius Maira is an urban planner in the Urban Planning, Environment and Transportation Department of Dar es Salaam’s City Council; his role includes coordinating the implementation of the Sustainable Cities Programme (SCP) within Dar es Salaam City which is supported by UN Human Settlements Programme (UN-Habitat) and the UN Environment Programme (UNEP). This SCP uses a participatory bottom-up planning approach, and aims at building partnerships between the city and stakeholders for effective and coordinated city management and planning. Amongst the activities of the SCP is the management of wastewater (sewerage systems and on-site sanitation), affecting coastal ecosystems in Dar es Salaam.

Coastal and marine ecosystems have important benefits for Dar es Salaam

Dar es Salaam city is a major administrative, commercial, industrial and transportation centre in Tanzania and one of Africa’s fastest growing cities. Characterized by a coastal marine habitat, coastal wetlands, lagoons and forests, it is home to over two and a half million residents. Maira states that these coastal ecosystems are the primary source of food (fish and other ocean and marine resources), agriculture, tourism, commercial fishing, shipping, salt production, mining, a source of urban development, building materials, cooking fuel and mariculture and as such are of high socio-economic and ecological importance. This zone supports a variety of important ecosystems providing an assortment of ecological services such as storm protection, water filtration, fishery nurseries, waste discharge and dispersal as well as providing recreational opportunities.

Maira notes ways in which these ecosystems can also positively impact development and poverty alleviation: “development of tourism, fishing activities and marine transport generates employment opportunities to city dwellers. The availability of timber enables the development of carpentry as self employment. Communication and transfer of goods between the mainland, Zanzibar and other islands are facilitated by the availability of ferry boats”.

Resource degradation from waste water poses environmental, economic and health risks

However, coastal water quality is negatively affected by various sources. Wastewater is a major polluter and can pose serious health risks to humans, and impacts on the productivity and health of coastal habitats that support resources upon which coastal cities depend.

Resource degradation due to high exploitation pressure; the pollution of habitats resulting from urban wastes being

“Development of tourism, fishing activities and marine transport generates employment opportunities to city dwellers.”

Julius Maira
disposed of in ecosystems; the expansion of both planned and unplanned settlements causing the encroachment of ecosystems; and growing resource use conflicts are all challenges associated with ecosystems being located in or close to cities says Maira.

Wastewater is a key contributor to marine pollution in Dar es Salaam, and is generated from domestic, industrial and tourism activities, affecting coastal, marine and freshwater ecosystems. A history of poor urban management has meant that over 70 percent of the city population lives in unplanned and un-serviced settlements that use septic tanks and pit latrines. Most of the wastewater from these communities is emptied into nearby water bodies. Additionally, approximately ten percent of the population is served by a central sewerage system, which is discharged into the sea. If not appropriately managed, wastewater can contaminate soil, water and crops causing biodiversity loss and ecosystem decay, posing major health risks including outbreaks of waterborne diseases. There are also severe economic ramifications of polluted coastal ecosystems including decreased tourism opportunities, decreased fisheries potential and earnings and a decline in available timber resources.

**Participatory resource use planning for long-term ecosystem management**

Maira says that cities have a variety of tools at their disposal to help them manage ecosystems to ensure provision of services in the long-term. For example, an awareness raising campaign can educate city residents to use marine products and freshwater wisely. Participatory resource use planning will involve residents in planning, implementing and managing various projects and programmes within their area of jurisdiction to achieve sustainable utilization of coastal and marine resources. The delineation of protected areas will prevent further degradation of fragile ecosystems. Dar es Salaam has taken action to help protect remaining biodiversity and enhance ecosystem health by adopting and implementing an Integrated Coastal Environment Management Strategy that was developed by the central government, by establishing a protected marine reserve and through its Sustainable Cities Programme.

Dar es Salaam City Council has also been instrumental in creating awareness of the need for developers to construct on-site sanitary infrastructure, by upgrading existing sewerage infrastructure in the central business district and in various neighborhoods through the Community Infrastructure Upgrading Programme which seeks to improve the living environment of unplanned and un-serviced neighborhoods within the city. The local authorities have also introduced and strengthened water and environmental committees at ward level to implement the National Environmental Act of 2004.

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The importance of local action in protecting and sustaining biodiversity was espoused in the Johannesburg Plan of Implementation that emanated from the World Summit on Sustainable Development held in Johannesburg, South Africa, in 2002. The Plan encourages all stakeholders (from communities and non-governmental organizations, to governments and park managers) to contribute to the aims of the United Nations Convention on Biological Diversity. Decentralised management of biodiversity in cities, involving all stakeholders, may instil a sense of ownership, greater responsibility, accountability, participation and use of local knowledge.

Whilst decentralized management is encouraged, stakeholders also need to form partnerships as these have in many instances proven beneficial to the success and long-term sustainability of conservation initiatives. Specific recommendations can be made for each stakeholder group. Relevant to all stakeholder groups is the importance of information sharing and networking – best practice examples of urban biodiversity conservation should be highlighted to allow stakeholders to exchange findings, solutions and ideas. A method of effectively sharing information and networking would be to create a global biodiversity information network.

The following are recommendations on how to manage and minimize impacts on urban ecosystems from cities to achieve sustainable and long-term availability of such ecosystems. These recommendations are based on findings from the African Regional Workshop on Cities, Ecosystems and Biodiversity (a side event to the AfriCities Summit in 2006 organized by the United Nations Environment Programme (UNEP) in cooperation with the IUCN Task Force on Cities and Protected Areas, the Kenya Wildlife Service, and the Brazilian Embassy in Kenya) and take account of international conventions and literature on biodiversity conservation and management. They also draw on the lessons learned from the case studies presented in this publication.

The following actions are recommended:

**Communities and NGOs should:**
- Assist in urban ecosystem conservation and initiate community based conservation initiatives in their cities. Nairobi National Park is supported by the association Friends of Nairobi National Park which engages citizens in conservation projects connected with the park.
- Community based organizations should be encouraged to participate in integrated city planning.

**Local, regional and national governments should:**
- Use integrated planning approaches, involving all stakeholders, recognizing ecosystem conservation and restoration needs and poverty reduction goals and strategies. Walvis Bay’s Dune Belt Management Plan is an example case for using an integrated planning approach as the plan was developed in consultation with various stakeholders.
- Conduct community awareness campaigns and education on the need for biodiversity conservation to create recognition of the benefits of ecosystems to cities and their inhabitants. In Accra, residents have been attracted to participate in wetland conservation through a series of awareness creation campaigns.
Recommendations

• Ensure that public consultation processes inform the development of land use plans for cities. Dar es Salaam City Council has involved stakeholders in the formulation of laws, strategies and policies that affect development in the city, through its Sustainable Cities Programme.

• Use integrated and ecosystem planning approaches to development, involving networking and collaborating with other government authorities – and linking ecosystems within cities to enhance their sustainability.

• Encourage the use of tools for enhanced biodiversity conservation such as establishing protected areas; requiring environmental impact assessments for development applications; the use of green accounting; and sustainable procurement strategies.

• Ensure continuous monitoring and data collection of ecosystems and biodiversity.

• Undertake ecosystem restoration projects in urban areas, such as tree planting in urban parks.

• Design and implement a coordinated legislative framework for biodiversity protection, protected areas and integrated ecosystem management. The harmonization of laws that govern cities with international law norms such as the polluter pays and the precautionary principle is advised.

• Market mechanisms that encourage biodiversity and ecosystem conservation, restoration and sustainable use should be encouraged and economic tools such as financial incentives should be created and market failures addressed. eThekwini municipality’s economic valuation of its environmental services from ecosystems, which informed the management of Durban’s open space systems, is an excellent example of this.

• It is also vital that local municipal revenues be invested in the protection and greening of urban ecosystems; often this investment brings great economic returns through tourism or savings through efficient use and protection of ecosystems.

Managers of urban protected areas should:

• Reach out to all sectors of society by providing free entrance and transport to urban parks, establishing informative visitor’s centres with recreational attractions, and work with local schools to include park visits as part of the curricula. Manage urban protected areas using a visitor card system for national conservation. All these measures have proved successful for Cape Town’s Table Mountain National Park.

• Manage communication, including media coverage, as an essential tool to market the benefits of protected areas to the public.

• Work closely with city authorities and communities to create partnerships and understanding and park managers should offer capacity building to city authorities and stakeholders.

• Pro-actively address human-wildlife conflicts and find alternative and creative solutions that benefit both wildlife and communities. The management of Nairobi National Park for example as involved communities to explain the importance of conservation. A programme was established whereby owners are given compensation for cattle killed by wildlife.
“The imperative to improve human well-being can place multiple and often competing demands on ecosystems. Difficult trade-offs may have to be made, for instance between the protection of habitat for biodiversity, and the transformation of ecosystems for human needs. Some ecosystem transformation is inevitable if the Millennium Development Goals (MDGs) are to be met, but the impact on biodiversity will depend on how development activities are carried out. Significant opportunities exist to generate wealth through activities that draw on environmental goods and services, and at the same time promote the conservation of these resources.”

(UNEP, Africa Environment Outlook 2, p237)

The various case studies presented in this publication illustrate the importance and benefits of ecosystems and biodiversity to the overall well-being of city inhabitants. The cases show opportunities that appropriate and sustainable use, management and conservation of such resources can yield – socially, economically and environmentally. The spiritual, cultural and recreational value of biodiversity and ecosystems is another irreplaceable service provided to humankind and especially to urban dwellers. The case studies also highlight the importance of cities in the context of regional and global efforts to protect and manage vulnerable urban ecosystems and biodiversity. Appropriately managed and conserved ecosystems provide cities with a variety of benefits, contribute towards city and national economies, provide an opportunity to improve human well-being and can play a key role in the reduction of urban poverty. In contrast, poorly managed and degraded urban ecosystems can lead to air, water and soil pollution which increases input prices and operating costs for industry as well as for the provision of basic urban services by local governments. Depleted natural resources in and around a city deter new investments, deteriorate the health of city residents and lead to income losses due to sick leave. For example, eThekwini municipality calculated the replacement value of the environmental services provided by its open space system as amounting to R3.1 billion each year, which is what is saves every year through efficient management of its urban biological resources.

With growing urbanization in Africa, cities need to mainstream biodiversity management into city planning. African cities are leading by example: Cape Town, Accra, Nairobi, eThekwini, Dar es Salaam, and Walvis Bay are showing us how cities can reap social, economic and environmental benefits from functioning and integrated urban ecosystems and biodiversity.

The interlinkages between cities, ecosystems and biodiversity at local and global levels require recognition. Ecosystem services and biodiversity contribute towards many elements of human life and biodiversity loss or changes in ecosystem services can cause deteriorating levels of well-being for people, especially for those who live in poverty.
For example, a forest has multiple functions to city residents including serving as a water catchment area, absorbing rainwater run-off and filtering water; serving as a carbon sink for greenhouse gas emissions, cleansing polluted air, regulating the micro-climate; providing building material, fibres, energy sources and food. Cities and their inhabitants can benefit substantially from safeguarding ecosystem services, as was the case in New York City where billions of dollars were saved by the decision to protect the Catskill watersheds that now efficiently provide accessible drinking water for the city.

### Biodiversity is the wealth of the poor

In African cities, where 72% of the population live in slums and informal settlements and 60% live below the poverty line, the interdependence of poverty and the environment needs special attention. Poor people rely more on the environment for their basic needs than those who can afford to buy these resources on the market. With their huge wilderness areas and rich biodiversity, African nations stand to benefit substantially from properly managed and conserved ecosystems. Urban biodiversity can contribute to poverty reduction and human well-being in various ways – by providing food security, health improvements (through clean air and water), income generation, reduced vulnerability to environmental changes and natural disasters and other ecosystem services.

Given the linkages that exist between ecosystems, biodiversity and human well-being, local leaders must ensure that ecosystem services are appropriately valued and recognized and that the opportunities and benefits of conservation are realised. Locally elected officials should strive to reduce their cities’ footprints by using natural resources more efficiently.

*Cities are part of a highly complex system and cannot be viewed in isolation from their surroundings. They depend on surrounding ecosystems which provide food, freshwater, fuels, plant and animal fibres apart from cultural and spiritual services. In turn, cities export waste in various forms: as solid and liquid waste, and in gaseous form. For example, cities contribute up to 80% of CO₂ emissions worldwide. Cities therefore need far more space to survive than they actually occupy, a concept widely known as the urban ecological footprint.*

Economic tools for valuing biological resources and processes should be employed by decision-makers and used to educate people about the importance of ecosystems and biodiversity for their own well-being. The recommendations which follow detail practical tools and actions which aim to enhance conservation, sustainable use and management of urban biodiversity.

African local governments are faced with priceless opportunities to use their natural wealth of biological diversity to uplift both their people and their economies and in so doing may become leaders in the realm of urban conservation.
**UNEP** is the voice of the environment within the United Nations system. In the field of the urban environment, UNEP supports national and local governments to address key urban environmental issues from the urban perspective. UNEP has launched a Campaign on Cities and Biodiversity to engage local governments in managing and protecting biodiversity and involve them in the global biodiversity debate. In cooperation with the IUCN task Force on Cities and Protected Areas, the Brazilian Government and the Kenya Wildlife Service, UNEP conducted an African Regional Workshop on Cities, Ecosystems and Biodiversity in September 2006. The workshop gave examples how cities and especially poor urban dwellers can benefit from protected areas, biodiversity conservation and services from ecosystems such as wetlands, watersheds, and forests. Some of the case studies presented in this publication are from the workshop (e.g. Cape Town, Nairobi and Accra).

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**UN-HABITAT – Shelter for all**
UN-HABITAT’s mission is to promote socially and environmentally sustainable urban development with the goal of providing adequate shelter for all. In the field of the urban environment, UN-HABITAT supports local and national governments through the Sustainable Cities Programme and Localising Agenda 21 Programme to address key urban environmental issues. As part of the UN-HABITAT led initiative ‘Local Capacities for Global Agendas’, established as one of the partnership implementation commitments of the World Summit on Sustainable Development (WSSD), UN-HABITAT works to integrate local level perspectives into global policies such as those on biodiversity and climate change. UN-Habitat and UNEP have produced a brochure highlighting the importance of biodiversity and healthy ecosystems for cities. It outlines what cities can do to use their surroundings sustainably. These actions can reach far beyond the boundaries of the city, affecting biodiversity on a global scale.

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ICLEI — Local Governments for Sustainability is an international association of local governments and national and regional local government organizations that have made a commitment to sustainable development. More than 500 cities, towns, counties, and their associations worldwide comprise ICLEI’s growing membership. ICLEI works with these and hundreds of other local governments through international performance-based, results-oriented campaigns and programs.

Using participatory sustainable development planning approaches, ICLEI aims to assist local authorities to move beyond general sustainable development planning and to apply this approach in tackling areas of priority concern.

ICLEI recently launched an exciting new urban biodiversity conservation project called Local Action for Biodiversity (LAB) – a 3 year project involving ICLEI, the World Conservation Union (IUCN), Countdown 2010, the South African National Biodiversity Institute (SANBI), RomaNatura and approximately 20 selected global cities. The LAB Project will explore innovative and effective ways for local governments to engage in sustainable urban biodiversity protection, use, and management.

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African Cities, Ecosystems, and Biodiversity