Our BioDiverse City...

THE VALUE of DURBAN'S BIOLOGICAL DIVERSITY

ETHEKWINI MUNICIPALITY

ETHEKWINI MUNICIPALITY ENVIRONMENTAL MANAGEMENT DEPARTMENT

2008 / 2009

HIS WORSHIP THE MAYOR

COUNCILLOR

Obed Mlaba

Never before has a living generation faced a challenge that they cannot leave to future generations to solve

We need to recognise that our activities are destroying valuable ecosystems and threatening the continued existence of thousands of species. Many of us do not understand that it is these very species and ecosystems, the biodiversity of our planet, which supports life on earth by providing critical goods such as food, medicines and building materials, and services like flood control and water supply. We do not realise the extent of the damage that will be done to people, infrastructure and the economy if these behaviours continue.

The United Nations Millennium Ecosystem Assessment was the largest study ever done of ecosystems around the world, involving 1300 scientists from 71 countries. In March 2005 it released its report stating that 60 percent of the ecosystem services that support life on Earth are being degraded. The report warned, "Any progress achieved in addressing the goals of poverty and hunger eradication, improved health, and environmental protection is unlikely to be sustained if most of the ecosystem services on which humanity relies continue to be degraded."

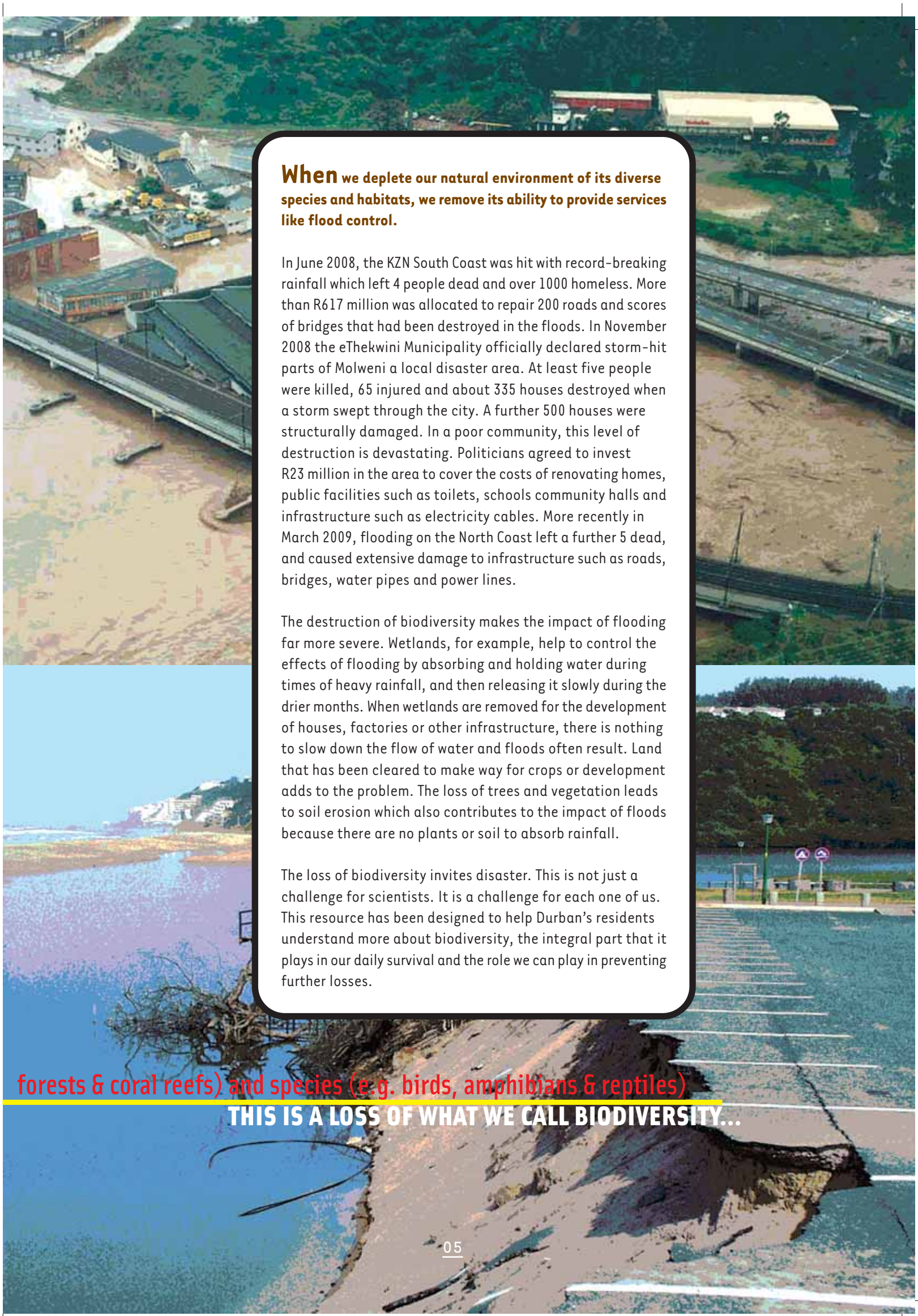
Durban residents can be proud of the fact that eThekwini Municipality has been a pioneer in biodiversity planning and management since the late 1970's, and that much of this work predates national legal and policy requirements. As part of its commitment to raising the profile of urban biodiversity, eThekwini Municipality supported the City of Cape Town in initiating the Local Action for Biodiversity (LAB) Project, which now involves 21 pioneer local governments around the world. This is a groundbreaking initiative lead by ICLEI - Local Governments for Sustainability. In 2007, as part of our commitment to LAB, we carried out a biodiversity audit and developed a comprehensive Biodiversity Report. You will find this report on the CD attached to this resource.

But the conservation of biodiversity is not just the responsibility of the Municipality and other concerned individuals and organisations. Each of us is a decision-maker and we have a role to play, regardless of whether we are ratepayers, politicians, business owners, managers or developers. This resource has been designed to help people understand the concept of biodiversity and to highlight its value and the ways our lives will be negatively impacted by its loss.

The wisdom of our science tells us that if we do not act now, we may pass a point of no return. I encourage you to take the time to read this resource, and to integrate an awareness of biodiversity and its importance into all your decision-making.

Councillor Obed Mlaba June 2009

One clear sign of a crisis in our environment is the loss of ecosystems (e.g. wetlands,



When we deplete our natural environment of its diverse species and habitats, we remove its ability to provide services like flood control.

In June 2008, the KZN South Coast was hit with record-breaking rainfall which left 4 people dead and over 1000 homeless. More than R617 million was allocated to repair 200 roads and scores of bridges that had been destroyed in the floods. In November 2008 the eThekwini Municipality officially declared storm-hit parts of Molweni a local disaster area. At least five people were killed, 65 injured and about 335 houses destroyed when a storm swept through the city. A further 500 houses were structurally damaged. In a poor community, this level of destruction is devastating. Politicians agreed to invest R23 million in the area to cover the costs of renovating homes, public facilities such as toilets, schools community halls and infrastructure such as electricity cables. More recently in March 2009, flooding on the North Coast left a further 5 dead, and caused extensive damage to infrastructure such as roads, bridges, water pipes and power lines.

The destruction of biodiversity makes the impact of flooding far more severe. Wetlands, for example, help to control the effects of flooding by absorbing and holding water during times of heavy rainfall, and then releasing it slowly during the drier months. When wetlands are removed for the development of houses, factories or other infrastructure, there is nothing to slow down the flow of water and floods often result. Land that has been cleared to make way for crops or development adds to the problem. The loss of trees and vegetation leads to soil erosion which also contributes to the impact of floods because there are no plants or soil to absorb rainfall.

The loss of biodiversity invites disaster. This is not just a challenge for scientists. It is a challenge for each one of us. This resource has been designed to help Durban's residents understand more about biodiversity, the integral part that it plays in our daily survival and the role we can play in preventing further losses.

forests & coral reefs) and species (e.g. birds, amphibians & reptiles)

THIS IS A LOSS OF WHAT WE CALL BIODIVERSITY...

DID YOU KNOW?: **In many ways, biodiversity begins and ends with soil. Beneath its quiet surface millions of species interact, producing the chemistry that life depends on. We owe a great deal to the biodiversity that lies hidden in dirt and mud.**

What is Biodiversity

The term biodiversity refers to the variety of life on earth, and includes all the species and ecosystems that are found in any region. Biodiversity also includes the genetic differences within and between species.

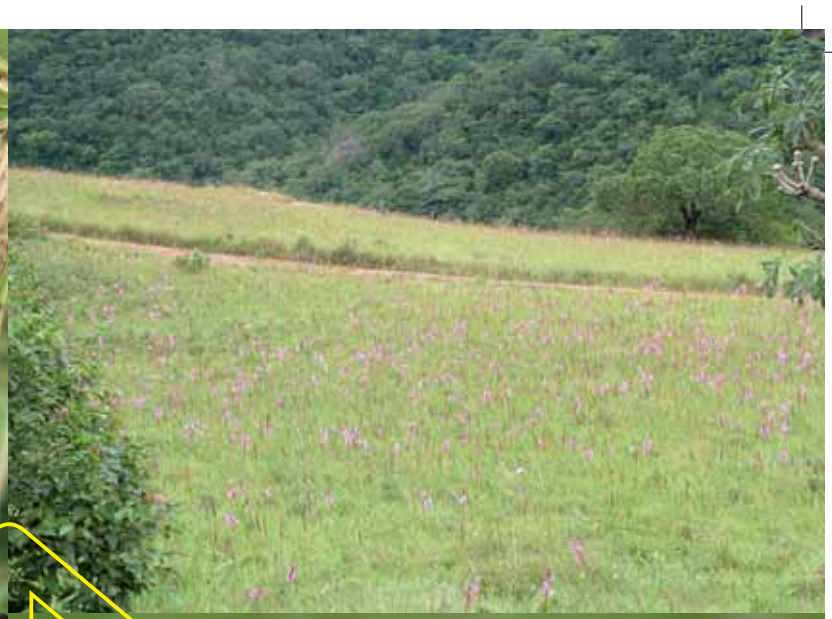
The earth contains a whole variety of different species and ecosystems which have evolved into different roles. Birds and insects, for example, play a role in pollinating plants. Forests help to produce oxygen for all life forms to breathe. Frogs control disease causing insects. Grasslands prevent soil erosion.

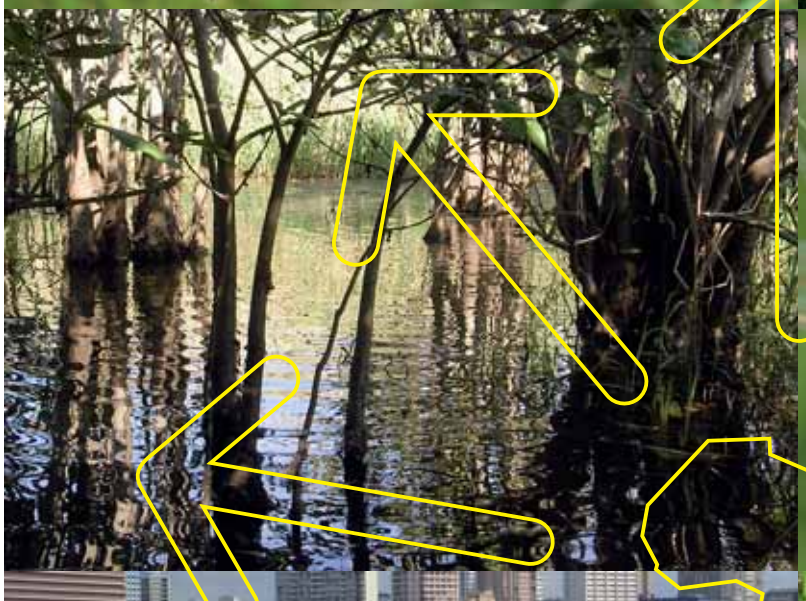
The removal of a single species can compromise the ability of an ecosystem to function properly. If enough species are destroyed, entire ecosystems will collapse and the survival of life on earth will be seriously threatened.

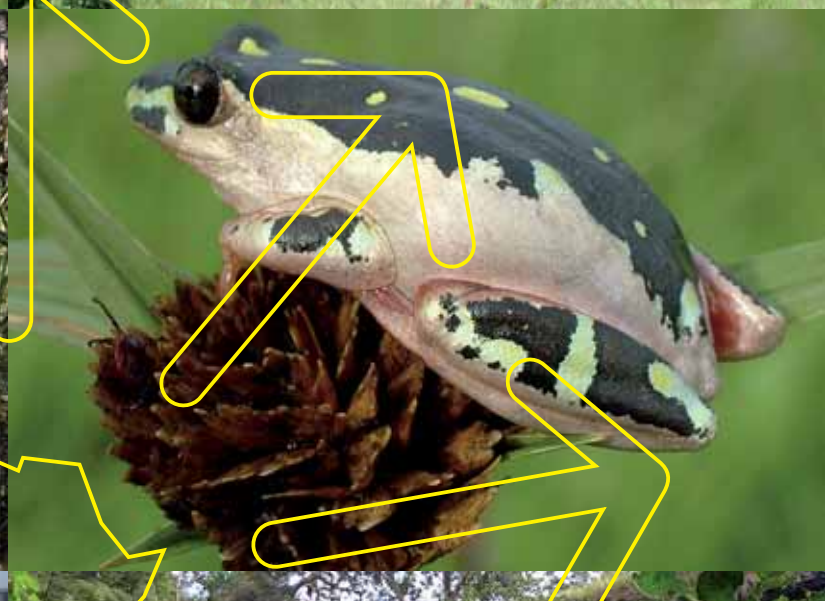
An ecosystem that has a wide variety of living things is much more likely to adapt to human-caused environmental change than one that only has a few. An ecosystem with a rich biodiversity also tends to recover more quickly from natural events like storms and fire because it is more resilient to change.

"A diverse ecosystem will also be resilient, because it contains many species with overlapping ecological functions that can partially replace one another. When a particular species is destroyed by a severe disturbance so that a link in the network is broken, a diverse community will be able to survive and reorganize itself ..." **FRITJOF CAPRA** *FOUNDING DIRECTOR, CENTER FOR ECOLITERACY IN BERKELEY, CALIFORNIA*

In other words, the more complex the network is, the more complex its pattern of interconnections, the more resilient it will be.







DID YOU KNOW?: The high-rise concrete jungle of the inner city centre of Durban is the home of several pairs of Lanner Falcons, a Red Data species, which feed on the city's burgeoning pigeon population and nest on ledges on some of the skyscrapers.

The City of Durban is in a HOTS

A 'hotspot' is an area that has both the richest and the most threatened collection of plant and animal life on earth. Conservation International defines a hotspot as an area that contains at least 1500 species of vascular plants as endemics (unique to that particular area) and that has lost at least 70 percent of its original area.

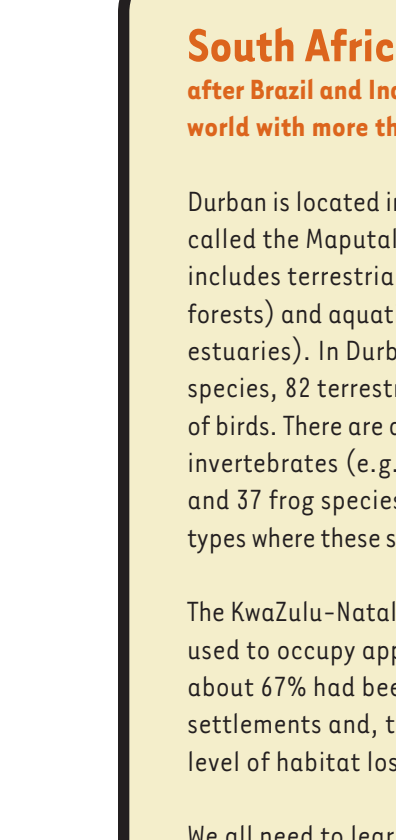
South Africa **is the third most biodiverse country after Brazil and Indonesia and is the only country in the world with more than one biodiversity hotspot.**

Durban is located in the middle of one of these hotspots, called the Maputaland-Pondoland-Albany Region. This includes terrestrial ecosystems (like grasslands and forests) and aquatic ecosystems (like rivers, oceans and estuaries). In Durban alone, there are over 2000 plant species, 82 terrestrial mammal species and 380 species of birds. There are also 69 species of reptiles, 25 endemic invertebrates (e.g. butterflies, millipedes and snails) and 37 frog species. However, many of the vegetation types where these species occur are under serious threat.

The KwaZulu-Natal Coastal Belt vegetation for example, used to occupy approximately 65% of Durban. By 2007, about 67% had been transformed by formal urban settlements and, to a lesser extent, cane farming. This level of habitat loss places many species in danger.

We all need to learn more about indigenous plants and animals. Most of us can name hundreds of consumer brands but we cannot name the species that occur in our immediate environment. We need to begin taking notice of nature and appreciate the diversity of life around us.

biodiversity POT!



FOR A MORE DETAILED DESCRIPTION OF DURBAN'S BIODIVERSITY, PLEASE REFER TO PG 19 IN THE DURBAN BIODIVERSITY REPORT ON THE ATTACHED CD.

DID YOU KNOW?: **A single insectivorous bat can eat 2000 mosquito-sized insects in a night, providing an invaluable service controlling disease and pests. A species does not have to be cute and cuddly before it deserves to be saved.**

The rich grasslands in KwaZulu-Natal are another example. Grasslands are one of the most essential life-support systems on the planet. Not only do they support a rich diversity of grasses, wild flowers and birds, but they also absorb and direct rainfall into the soil, collecting rainfall in catchment areas and reducing runoff. Grasslands also bind the topsoil and in many cases are the only defence against soil erosion and desertification. The removal of grasslands will increase sedimentation in rivers and since many of the country's major rivers have their catchments in grasslands, this could have a serious impact on water supply for human development. The destruction of grasslands will also impact negatively on the ability of the land to support agriculture, and this will ultimately affect the livelihood and food supply for a large proportion of the population.

BIODIVERSITY: A foundation for human well-being and development

The concept of '*ubuntu*' has become popular in South Africa. This is the idea that humans can't exist in isolation and that the essence of who we are comes from our interconnectedness with others. The same is true of our relationship with the natural environment. We humans are unable to survive without the biodiversity of our environment.

Biodiversity supplies us with a range of ecosystem goods (like food, medicines and building materials) and services (like flood control, water supply, climate regulation and spiritual fulfilment). When we destroy species and ecosystems, we are at risk of losing these life-supporting functions, thereby endangering ourselves.

Think of river ecosystems. Rivers provide water for drinking and irrigation and are also a source of food. Human activities such as settlements, industry and agriculture, place an increasing strain on rivers. Industrial effluent and sewage can affect the animal and plant species that live there. In October 2008 the public was warned not to eat any fish from Inanda Dam, one of Durban's main water supply dams, after some fish were found to contain high levels of mercury poisoning. An industry in the area was suspected of being the source of this contaminant. Farming activities also impact on water quality by increasing stream sedimentation from erosion and by increasing nutrient and pesticide runoff into rivers. If these activities continue, many river species will be threatened and the ability of the river to deliver its goods and services, such as clean water and food, will be compromised. **The impact of this on human welfare, health and economic development can be devastating.**

IN 1997 The value of ecosystem services was costed at $33 TRILLION - ABOUT TWICE

It should be clear that the conservation of biodiversity is critical if ecosystems, and the goods and services they provide, are to be sustained. These goods and services are essential in meeting peoples' basic needs.

The conservation of biodiversity inevitably means maintaining enough open areas in our city for these natural resources to survive.

DID YOU KNOW?:

Loss of biodiversity increases disease causing organisms like the malaria mosquito, because it involves a loss of their natural predators. Malaria makes up 11 percent of disease in Africa. If it had been eliminated 35 years ago, Africa's GDP would have increased by $100 billion.

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FOR MORE INFORMATION ON ECOSYSTEM GOODS AND SERVICES, PLEASE REFER TO PG 8 IN THE DURBAN BIODIVERSITY REPORT ON THE ATTACHED CD.

THE WORLD'S GDP AT THAT TIME

Because the goods and services provided by natural ecosystems are not understood or recognised by most people, they are not valued. In most instances people who benefit from the natural resource base do so without having to pay for the goods and services that they use. When we start to think about open space as 'green infrastructure' containing ecosystems that deliver a service much like a municipal water supply system, road or community health care facility, it becomes possible to value the open space system as a city asset. In 2003, the replacement cost of Durban's environmental goods and services provided by the open space system (DMOSS) was conservatively valued at R3.1 billion per annum, excluding its contribution to the tourism sector. In other words, this is what it would cost the city to replace ecosystem services with the equivalent engineering services, which is often not possible. For example if a wetland is removed which would normally help to control flooding, this would need to be replaced by a detention dam at huge cost to the city.

So what are some of the threats to biodiversity? How is eThekwini Municipality responding to them?

THE FOLLOWING PAGES EXPLORE SOME EXAMPLES...

THREATS to

Habitat Destruction:

One of the most serious threats to biodiversity in our city is the reduction of open spaces through habitat destruction. Activities throughout the City continually threaten open spaces, and natural ecosystems are compromised because of the short-term benefits of development. When open spaces are too small or degraded, their ability to deliver environmental goods and services is reduced or in some cases destroyed

Take forests for example. Forests control soil erosion, absorb carbon dioxide, provide oxygen, detoxify the air by removing pollutants, provide a source of medicines and support a huge variety of plant and animal life. Despite this, more than half of the world's forests have been cut down. In KZN, many of our indigenous forests have been removed to make way for agricultural land (e.g. sugar cane farming in the coastal belt), building developments and timber plantations. There are a number of consequences to this loss such as flooding, which can cause major damage to houses and infrastructure such as roads and bridges, as well as soil erosion and the siltation of dams and estuaries, which will ultimately affect the water supply for human, industrial and agricultural use. There will also be fewer trees to absorb carbon dioxide from the atmosphere, thus increasing the likelihood of temperature increases and climate change.

FOR MORE INFORMATION ON DMOSS PLEASE REFER TO PG 10 IN THE DURBAN BIODIVERSITY REPORT AND THE DMOSS POPULAR DOCUMENT.

DID YOU KNOW?: **Construction at the new international airport site destroyed the only known breeding site of the Black Coucal in Durban. This was also the southernmost known breeding locality of the species in Africa.**

BIODIVERSITY

Facing the challenge:

FOR MORE INFORMATION ON THE ENVIRONMENTAL MANAGEMENT DEPARTMENT (EMD), PLEASE REFER TO THE EMD BROCHURE ON THE ATTACHED CD.

In order to protect and enhance the remaining significant ecosystems and biodiversity in Durban , as well as to ensure that people's basic needs are met and that development of the city can proceed in a sustainable way, the eThekwini Municipality has developed the Durban Metropolitan Open Space System (DMOSS) plan.

DMOSS forms part of the municipality's strategic Integrated Development Plan. It is based on a network of open spaces (approximately 64000 ha in total), which are considered to be the minimum required to sustain the city's biodiversity and the associated supply of environmental goods and services. Examples of areas included in the DMOSS are nature reserves (e.g. Paradise Valley, Burman Bush and Kenneth Stainbank Reserve), large rural landscapes in the upper catchments and riverine and coastal corridors.

To support DMOSS, a number of implementation tools have been used to encourage appropriate environmental management in these areas, particularly since most of the open spaces do not fall within protected reserve areas and are not owned by local government. These tools help to facilitate the protection of open spaces and the ecosystem goods and services that they provide. Examples are: property rates rebates, environmental charges, zoning regulations, land acquisition and environmental servitudes.

Environmental servitudes

The Environmental Management Department (EMD) regularly protects conservation worthy areas by requesting environmental servitudes. A servitude area remains in the ownership of the land owner and can be used for passive recreational purposes that do not compromise the natural environment. The servitude must be managed according to the objectives of DMOSS. It cannot be developed, and only planting that supports rehabilitation of indigenous species is allowed. No collection or damaging of fauna, flora, soil and water resources is allowed. Even potential disturbances like vehicles and domestic animals are prohibited. In compensation, rates relief may be available.

Invasive Alien Species:

DID YOU KNOW?: Many invasive plant species respond well to global warming, elevated atmospheric carbon dioxide, nitrogen deposition and habitat fragmentation, which increases the threat they pose to local biodiversity.

After direct habitat destruction, invasive alien organisms pose the greatest threat to Durban's biodiversity. Alien species are the plants, animals and micro-organisms that people bring, by accident or on purpose, to places where they do not naturally occur. Invasive alien species often reduce the ability of natural ecosystems to supply high quality environmental goods and services because they out compete indigenous plants and animals threatening them with local extinction.

One example is the Indian Mynah, which competes with indigenous bird species for food and nest sites.

Other examples of invasive species are the Brown and Black Rat. These are problematic not only due to their destructive habits, but also because of the diseases they carry. Rat-borne disease-causing organisms known from Durban include the bubonic plague bacterium, the spirochete bacterium, which causes leptospirosis (a jaundice-like disease), and the protozoan which causes toxoplasmosis. Toxoplasmosis is a disease which causes flu-like symptoms but, in more serious cases, can cause inflammation of the brain, neurological damage and ultimately death.

Degradation of natural environments by invasive alien plants wastes South Africa's water resources, reduces our ability to farm, intensifies flooding and fires, promotes erosion and causes the siltation of dams and estuaries, leading to poor water quality. By 2007, 107 species of categorised invasive plants had been recorded in or immediately adjacent to Durban, posing an extremely serious threat to biodiversity.

Facing the challenge:

DID YOU KNOW?: It is conservatively estimated that 6% or 3780 ha of land included in the DMOSS plan has been seriously affected by invasive alien plant species.

FOR MORE INFORMATION ON THE WAY WE ARE DEALING WITH INVASIVE ALIEN SPECIES REFER TO PG 61 OF THE DURBAN BIODIVERSITY REPORT

The threat of invasive alien species

is so serious that the government set up the Working for Water programme to address this. The programme was launched in 1995 and was administered through the Department of Water Affairs and Forestry. Since its start, the programme has cleared more than one million hectares of invasive alien plants and has provided jobs and training for approximately 20000 people from the most marginalized sectors of society each year. The programme currently runs over 300 projects in all nine of South Africa's provinces.

The National Environmental Management: Biodiversity Act requires that all organs of state prepare an invasive alien species monitoring, control and eradication plan for land under their control. The eThekwini Municipality has developed a draft Invasive Alien Species Strategy and a State of Invasive Alien Species Report for Durban.

The Environmental Management Department has partnered with several organisations such as the Wildlife and Environment Society of South Africa (WESSA), the Botanical Society and the Durban Botanic Gardens to produce a series of posters with photographs and information about common invasive plants which are available to the public free of charge. These posters are available on the attached CD. Work is also being done on the identification and control of emergent alien species.

Another initiative is the annual Municipal Nursery and Parks Audit which aims to eliminate invasive alien plants in municipal nurseries and parks as a show of best practice.

FOR MORE INFORMATION ON MEDICINAL PLANTS, REFER TO PG 56 OF THE DURBAN BIODIVERSITY REPORT .

Over Exploitation of Species:

The over-exploitation of species

can also reduce biodiversity. Many of Durban's medicinal plants, for example, have disappeared from the wild.

The root of Wild Ginger (*Siphonochilus aethiopicus,* isipiphepheto or indungulo) is one example. It is used to treat malaria, oral and vaginal thrush, fever, headaches, colds and respiratory infections. The plant has gained interest from the herbal and pharmaceutical industries, but is now locally extinct due to over-collection.

The use of indigenous plants and animals for medicinal and magical purposes, known as muthi, is a cultural practice that continues to thrive in South Africa today. Growing demand for medicinal plants has, in many cases, become unsustainable. The medicinal plant trade is recognised as an important local economic sector and in 2007 was estimated to be worth R21 million per annum and supporting some 13 000 traders and harvesters in Durban.

In Kwa-Zulu Natal over 400 plants are actively traded with an estimated trade volume of some 4300 tonnes per year. Unfortunately, many traders are not traditional healers and often harvest plants indiscriminately, thereby reducing natural stocks.

Other examples of over-exploitation of species include over-fishing and excessive harvesting of marine resources such as mussels, crayfish etc. The result of over-exploitation will be insufficient food supplies and the absence of plants for use in medicines.

DID YOU KNOW?: The '74' is a particularly vulnerable local fish species which has been on the protected list for more than a decade. This species used to make up almost 70 percent of the commercial linefish catch in KwaZulu-Natal. It became illegal to catch or sell them 11 years ago, after marine scientists found that the population had crashed to just five percent of its original levels.

REFER TO PG 58 OF THE DURBAN BIODIVERSITY REPORT FOR MORE INFORMATION ON THE WORK THAT ETHEKWINI MUNICIPALITY IS DOING WITH TRADITIONAL HEALERS.

Facing the challenge:

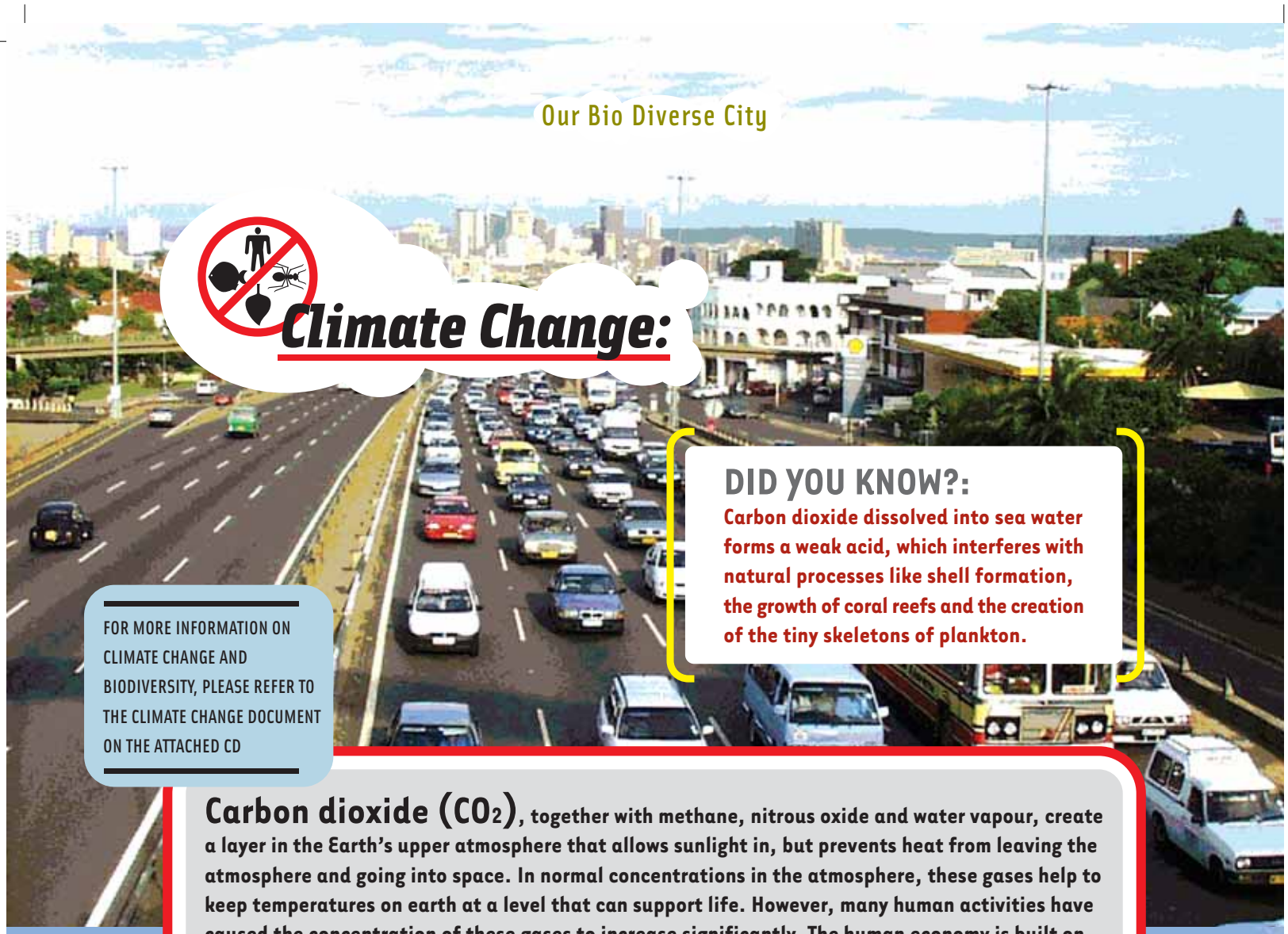
In order to prevent the possible extinction of plant species through overexploitation, a number of projects have been set up. Silverglen Medicinal Plant Nursery in Chatsworth is one example. It was established to prevent the unsustainable harvesting of medicinal plants from the wild. Techniques were developed to cultivate the medicinal plants needed by traditional healers and muthi-gatherers. Today, over 200 medicinal plant species are grown there.

The Municipality has also introduced a free education programme at the nursery to help combat over-harvesting in the wild. Traditional healers and muthi-gatherers are trained in plant identification, propagation, nursery establishment and management.

In the case of the medicinal plant Wild Ginger, the Micropropagation Laboratory at the Botanic Gardens researched and developed a tissue culture medium on which Wild Ginger could be grown under laboratory conditions. Annual plant production is now between 8 000 and 12 000 plants. Plants have been successfully introduced to farms, informal farming communities and Silverglen Nursery for further vegetative propagation.

Other initiatives have also been introduced to reduce over-exploitation of species. To combat over-fishing for example, the Southern African Sustainable Seafood Initiative (SASSI) has produced a consumer's seafood pocket guide to guide people to make more sustainable choices when buying fish.

Climate Change:



FOR MORE INFORMATION ON CLIMATE CHANGE AND BIODIVERSITY, PLEASE REFER TO THE CLIMATE CHANGE DOCUMENT ON THE ATTACHED CD

DID YOU KNOW?:

Carbon dioxide dissolved into sea water forms a weak acid, which interferes with natural processes like shell formation, the growth of coral reefs and the creation of the tiny skeletons of plankton.

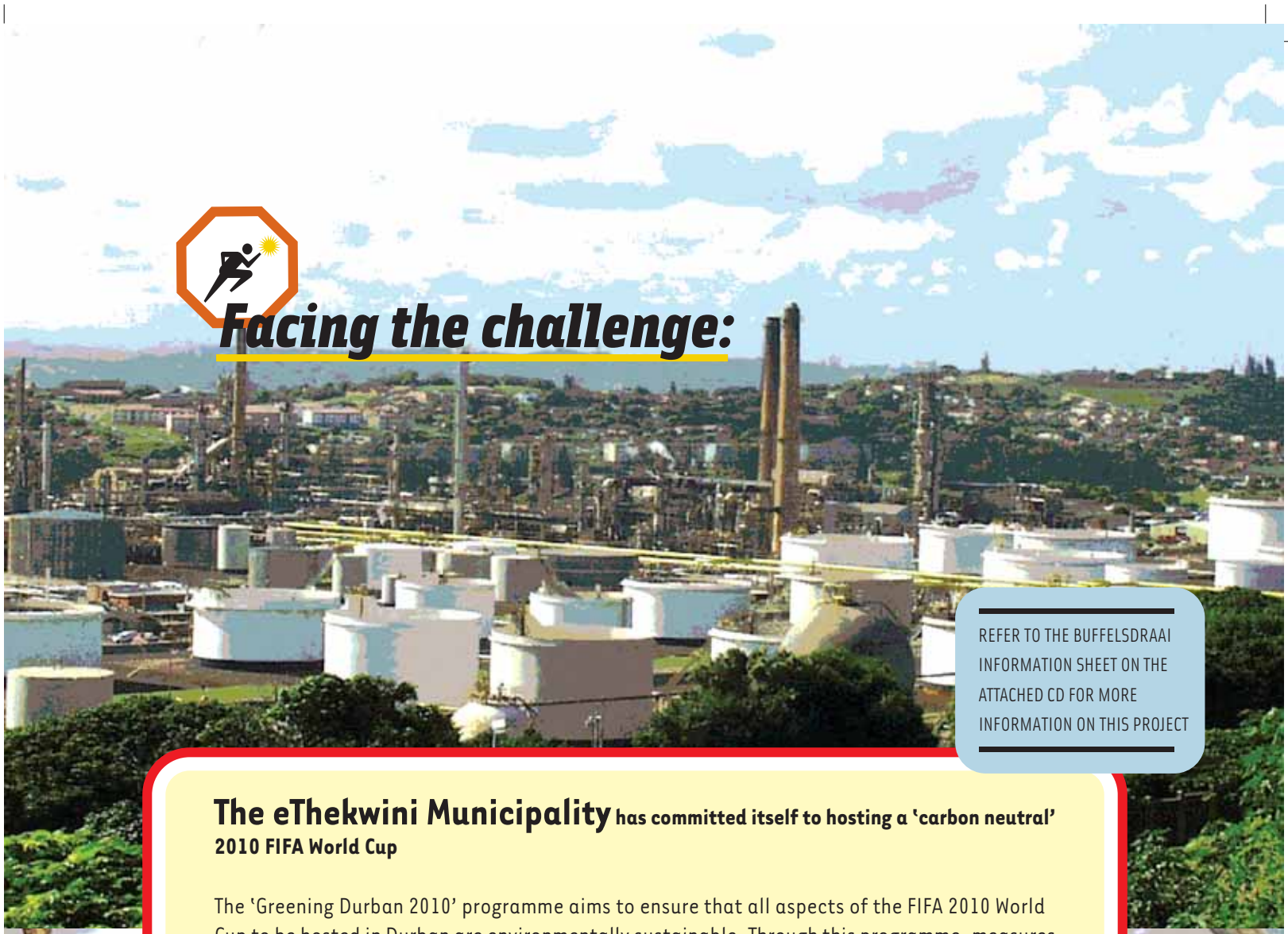
Carbon dioxide (CO_2), together with methane, nitrous oxide and water vapour, create a layer in the Earth's upper atmosphere that allows sunlight in, but prevents heat from leaving the atmosphere and going into space. In normal concentrations in the atmosphere, these gases help to keep temperatures on earth at a level that can support life. However, many human activities have caused the concentration of these gases to increase significantly. The human economy is built on fossil fuels. All processes based on the use of these fossil fuels (e.g. coal fires, electricity generation and fuelled transport) release CO_2 into the air. Other sources of greenhouse gases are the methane released by animals bred in factory farming or the decomposition of organic matter and the thawing of the permafrost. As the amount of these heat-absorbing gases in the atmosphere increases, so does the earth's temperature.

An increase in global temperatures leads to radical changes in weather patterns. In KwaZulu-Natal, this is likely to make droughts more severe. It is also likely to make rain less frequent but more intense, exceeding the capacity of rivers and causing floods. Sea levels will also rise, threatening low-lying coastal areas such as Durban's South Basin – the industrial and economic heart of the city. Progressively higher temperatures and changes in rainfall patterns may also see the spread of vector and water-borne killer diseases like malaria and cholera.

The destruction of climate regulators such as forests (which absorb carbon dioxide) and the melting of the polar ice (which reflects heat away from the planet) only make the situation worse.

According to South Africa Environment Outlook (2006), "The impact of climate change is emerging increasingly as perhaps the greatest threat to biodiversity loss". We are already seeing examples of species responding to climate change. Numbers of the Quiver Tree *(Aloe dichotoma)* in the Succulent Karoo for example, have been declining in the northern part of their range where temperatures are becoming hotter. However, the plant has become more abundant further south, where temperatures are more suited. The problem is that many species will not be able to move to areas where temperature and rainfall are more suitable for their survival, and these species will become extinct.

Facing the challenge:



REFER TO THE BUFFELSDRAAI INFORMATION SHEET ON THE ATTACHED CD FOR MORE INFORMATION ON THIS PROJECT

The eThekwini Municipality has committed itself to hosting a 'carbon neutral' 2010 FIFA World Cup

The 'Greening Durban 2010' programme aims to ensure that all aspects of the FIFA 2010 World Cup to be hosted in Durban are environmentally sustainable. Through this programme, measures are being put in place to offset the carbon emissions associated with the 2010 events. The majority of the anticipated carbon emissions will need to be offset through carbon sequestration (like tree planting and reforestation) and carbon emissions reduction projects (using biogas and landfill gas as energy sources).

Buffelsdraai leads the way

The Buffelsdraai Landfill Site Community Reforestation Project achieves these goals and reduces poverty at the same time. The project involves assisting rural communities to collect indigenous seed, grow trees, plant these in degraded forest areas in the landfill buffer zone, and then maintain them. The project aims to plant 62 500 trees on 125 ha of degraded forest land, offsetting several thousand tonnes of CO_2 over a 20 year period and creating an income generation opportunity for local communities. This will also restore biodiversity and the provision of ecosystem goods and services in an important upper catchment area.

This is the first community reforestation project focusing on carbon sequestration within the city. The landfill site, run by Durban Solid Waste (DSW), is also the first ever to have included in its Terms of Reference the establishment of a Nature Conservancy in the landfill site area and its buffer zone.

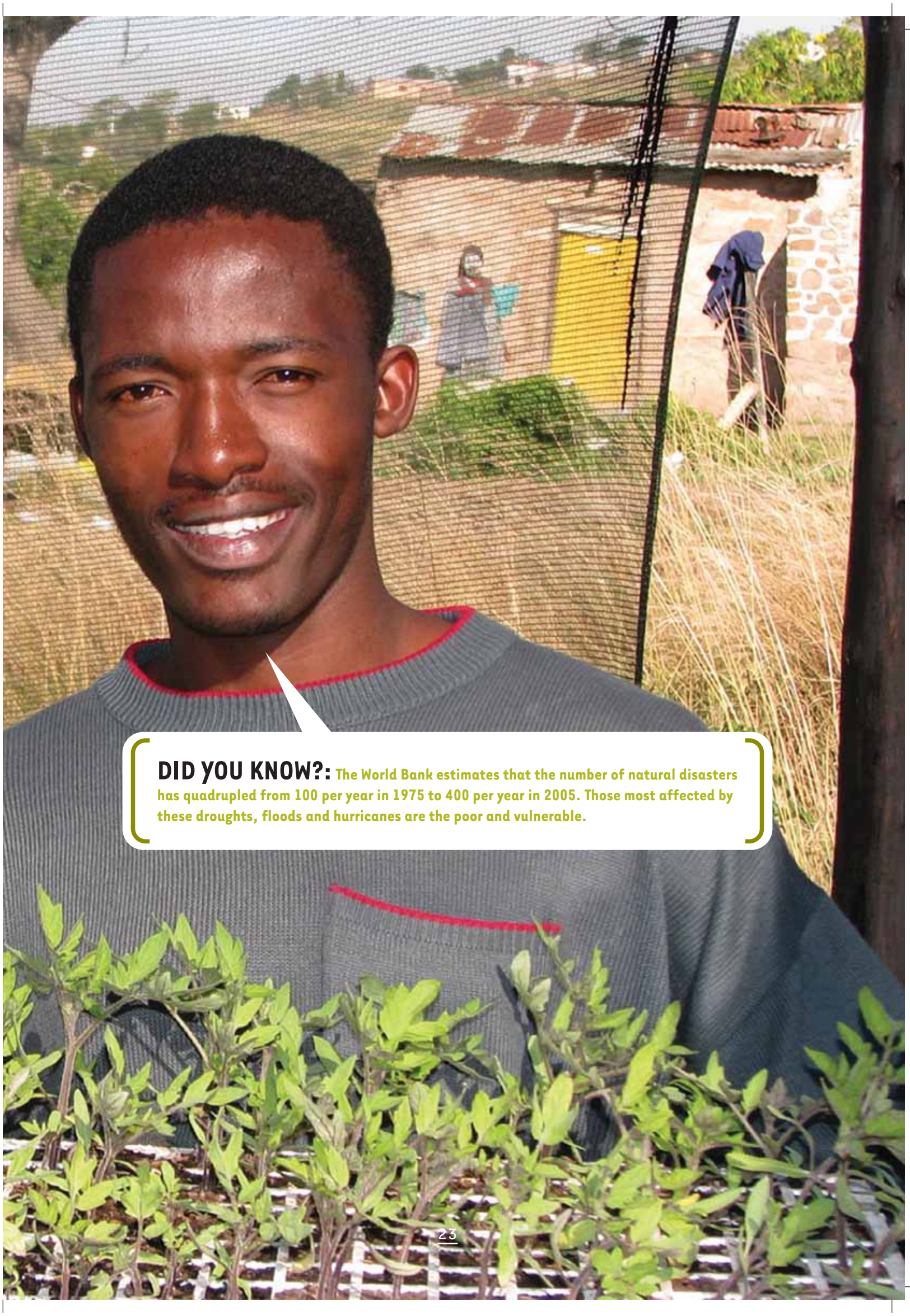
The project is funded by DANIDA (the Ministry of Foreign Affairs of Denmark) and is being managed by the eThekwini Environmental Management Department and Durban Solid Waste in partnership with the Wildlands Conservation Trust. This project is a pilot for a rollout of similar projects throughout the municipality.

Integrating poverty alleviation into biodiversity strategies

The Millennium Ecosystem Assessment reported that biodiversity loss "contributes to food and energy insecurity, increased vulnerability to natural disasters such as floods or tropical storms, poorer health, reduced availability and quality of water, and the erosion of cultural heritage." The most vulnerable members of society are the worst affected.

Poverty alleviation is a key concern for eThekwini Municipality, and it is therefore integrated into its biodiversity strategies. The Buffelsdraai Landfill Site Community Reforestation Project is one example. Another example is the poverty relief and environmental management programme called 'Working for Ecosystems', which was originally funded by the Department of Environmental Affairs and Tourism and is now funded by eThekwini Municipality. This project forms part of the national government's Expanded Public Works Programme and aims to train and employ poor people to do environmental management work. The DEAT funding parameters ensure that women, youth and the disabled are well represented in the project workforce. WESSA has been appointed as the implementer of the 'Working for Ecosystems' project.

Another example is the Department of Water Affairs and Forestry's 'Working for Water' programme. This is the best known of the national environmental poverty relief programmes and is also active in Durban. These initiatives all reflect a broader trend towards the creation of 'green jobs' in many of the globally competitive cities worldwide.



DID YOU KNOW?: The World Bank estimates that the number of natural disasters has quadrupled from 100 per year in 1975 to 400 per year in 2005. Those most affected by these droughts, floods and hurricanes are the poor and vulnerable.

Finding solutions that work for people and the natural environment

Giba Gorge provides an interesting case study

of a situation where a number of different groups, across different socio-economic backgrounds, have worked together to find solutions that benefit both people and the natural environment.

Giba Gorge is a deeply incised gorge near Hillcrest in the west of Durban. The gorge is part of the catchment of the Giba River and is flanked by sandstone cliffs and steep, hilly land supporting forests and grassland.The eThekwini Municipality owns a 45-hectare property in the middle of the gorge, which was purchased some years ago for incorporation into the open space system. Since the 1980's landowners have expressed concern about the need for environmental management of the entire area. The natural resources in the area are threatened by, amongst other things, alien plants, fire, soil erosion, water pollution and over-exploitation of medicinal plant species.

In 2005, one of the landowners suggested applying for the area to be rated as a 'green' Special Rating Area, which effectively allows the municipality to levy an additional rate on property in the area for the purpose of raising funds for improving and upgrading the area. In the following year, the eThekwini Council approved management fund contributions for the portion of land owned by the council. Over the next 2 years, a number of meetings were held with landowners to promote the concept of a Special Rating Area. In February 2009, 67% of the landowners voted in favour of establishing the Special Rating Area. A Section 21 Company will now be established to manage the area. The process of setting up the company will be facilitated by the Municipality but will be driven by the landowners. It is hoped that by June 2009, implementation of an environmental management plan for the area will begin. A number of individuals from previously disadvantaged local communities will be employed to assist with managing the area.

DID YOU KNOW?: **Healthy river habitats have a variety of invertebrate species, including ones that are sensitive to pollution and changes in river flow. For this reason the diversity of invertebrate species can be actively used as an indicator for river health.**

We are at the tipping point...

"Among the environmental trends undermining our future are shrinking forests, expanding deserts, falling water tables, collapsing fisheries, disappearing species, and rising temperatures. The temperature increases bring crop-withering heat waves, more-destructive storms, more-intense droughts, more forest fires, and, of course, ice melting. We are crossing natural thresholds that we cannot see and violating deadlines that we do not recognize."

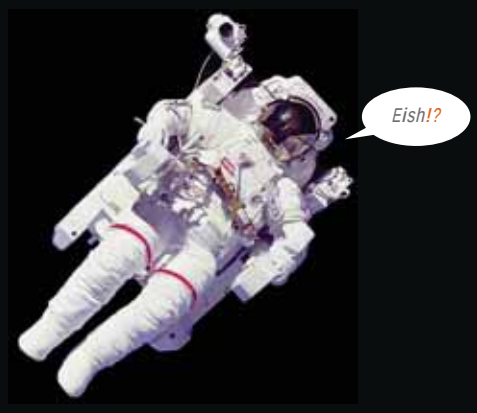
Lester Brown

We like to think that we will always find some technological answer to environmental crises, but the damage we are causing may be irreversible. We may be approaching a tipping point, that is, a fundamental change to everything we know and the way we live. Once we pass this point, we will not be able to go back, and living conditions and human development will become very difficult. We have many indicators warning us of crisis - a reduction in biodiversity, the melting of polar ice caps, the spread of malaria, frequent flooding, soil erosion, air pollution and species extinction to name just a few. These are loud sirens, sounding the alarm and warning us of the threat to our own survival.

Perhaps the greatest danger to biodiversity is human apathy and a reluctance to take the loss of biodiversity seriously. Most of the land that contains functional ecosystems is not included in nature reserves, and is therefore not protected or managed. The conservation of biodiversity will rest in the hands of many individuals, each of whom will need to play their part to ensure its protection.

DID YOU KNOW?: Because the frog's skin acts not only as a protective barrier but also as a lung and a kidney, it is extremely sensitive to chemical changes and can provide an early warning for pollutants in our environment. As a result, frog species are often the first to be impacted by environmental change.

DID YOU KNOW?: Pesticides from lawns, golf courses and agricultural land wash into aquatic habitats, causing the infertility and death of plant and animal species. Pollutants like heavy metals become concentrated in the bodies of fish making them poisonous for humans.



BY 2050

If we have not ch
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OUR PLANET, EARTH, HAS LIMITED RESOURCES.

When human demands on these resources exceed what is available, we surpass our planet's ecological limits and erode the health of the Earth's living systems.

This leads to a huge loss of biodiversity and ultimately threatens human well-being.

The amount of land that is needed to provide all the ecosystem goods and services that a human requires is that person's 'ecological footprint'.
In Malawi each person only needs about 0.5 hectares to meet their requirements.
As a result, Malawi has a small ecological footprint.
In America each person uses 9.5 hectares to ensure the lifestyle they enjoy.
As a result, America has a large ecological footprint.

nanged
e will need
ort our demands

TO VIEW THE LIVING PLANET REPORT 2008, PLEASE REFER TO THE WEBSITE OF THE WORLD WILDLIFE FUND
www.worldwildlife.org

The current ecological footprint per person in South Africa is approximately 2.1 hectares. We need to remember, however, that the vast majority of South Africans are poor with low ecological footprints, while people in the middle class probably have a footprint a lot closer to the average American.

According to The World Wildlife Fund's Living Planet Report 2008:

"Since the late 1980s, we have been in overshoot - the human Ecological Footprint has exceeded the Earth's biocapacity - by about 25%. Effectively, the Earth's regenerative capacity can no longer keep up with demand – people are turning resources into waste faster than nature can turn waste back into resources. Humanity is no longer living off nature's interest, but drawing down its capital … A moderate business-as-usual scenario, based on United Nations projections of slow, steady growth of economies and populations, suggests that by 2050, humanity's demand on nature will be twice the biosphere's productive capacity."

It is a vicious cycle. As we demand more from our planet, we continue to destroy the very ecosystems that sustain life. And in this, each of us has a role to play in reducing our footprint so that we can stop making these unrealistic demands on a planet which is already under immense strain.

DID YOU KNOW?: Almost a quarter of the world's mammals face a high risk of extinction within 30 years.

THE SIXTH EXTINCTION

FOR INFORMATION ON DURBAN'S ENDANGERED SPECIES, PLEASE REFER TO THE RED DATA LIST ON PG 23 OF THE DURBAN BIODIVERSITY REPORT

DID YOU KNOW?: According to the Institute for Environmental and Human Security, by 2005 there were already 20 million 'environmental refugees' in the world – far more than refuges fleeing war or state aggression. These refugees are fleeing ecological collapse, desertification, deforestation, drought and crop failure.

Five mass extinctions have already occurred **between 440 million years ago and 65 million years ago. It is believed that these mass extinctions were caused by climate change, plate tectonics, volcanic activity, meteor impacts (such as the one that drove the dinosaurs to extinction) and other forces of nature. In October 2008 the International Union for the Conservation of Nature (IUCN) concluded that approximately 17 000 species are threatened with extinction in the near future. The causes of these coming extinctions are almost all directly related to human activities such as the rapid destruction of habitats, the spread of invasive species and climate change. Without rapid action, we will be putting our planet on the road to a sixth mass extinction event which may include the human race.**

"The UN's Intergovernmental Panel on Climate Change suggests that business-as-usual economic growth could cause a 6°C rise in global temperatures by 2100. That would devastate the biosphere, just as did a similar 6°C rise at the end of the Permian period 251 million years ago. At that time 95 percent of the world's species were wiped out. The end-Permian mass extinction was driven by volcanic greenhouse gasses, external to the living biosphere. This will be the first time that an agent of mass extinction has emerged from within the biosphere itself."
Mark Lynas in his book *High Tide: The truth about our climate crisis*

The IUCN provides the world's most objective, scientifically-based information on the current status of globally threatened biodiversity. The plants and animals assessed for the IUCN Red List are the building blocks of ecosystems. Information on their conservation status and distribution provides the foundation for making informed decisions about conserving biodiversity from local to global levels.

The sixth extinction sounds scary, but we cannot play on peoples' fear and guilt, bullying them into environmentally-friendly choices. We cannot scare people into lowering carbon emissions or protecting endangered species. We need to inspire people with a vision of an environmentally sustainable future that they want to live in, where biodiversity plays a meaningful role in peoples' day to day lives. We need to involve them in the process of creating that vision – contributing their ideas of the future they want to live in.

"But I won't be there ... it won't make any difference to me."

Dealing with biodiversity is a difficult challenge because the real solutions take a long time to show any benefit. Many solutions will only benefit the children of our grandchildren. Most people cannot see that far into future. Most people are only concerned with the present, with things that directly affect them and their family.

To save our planet we need heroes that can think hundreds of years into the future. We need heroes who are prepared to make some sacrifices in their own lives to save this beautiful planet. What role will you play in conserving the biodiversity on which our survival depends?

What can you do?

The challenges to biodiversity may seem overwhelming, but decisions are made one at a time, with each individual playing some part in making a difference. Durban residents and ratepayers have an extremely important role to play in protecting and enhancing biodiversity. Here are just some of the things you can do:

PLANT INDIGENOUS

Plant an indigenous garden. Indigenous plants and trees thrive in local soil and climate conditions. They are resistant to pests and diseases and are more likely to attract local wildlife. Let your garden become a wildlife sanctuary in your community. We need to create a mosaic of these sanctuaries all through the city, attracting birds, butterflies and possibly even frogs.

If you have a flat roof, you could even plant a 'green roof'! Only a small layer of soil is needed to be able to start a productive garden on your roof, and this will also help to attract a variety of insects and birds.

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REDUCE YOUR ECOLOGICAL FOOTPRINT

Reduce your ecological footprint by doing things like reducing your use of electricity, conserving water, recycling materials and using environmentally friendly products. Using electricity for example, increases the production of greenhouse gases which cause climate change. Climate change in turn poses a serious threat to both biodiversity and humans. You can conserve energy at home by buying energy efficient appliances, using compact fluorescent light bulbs instead of incandescent bulbs, using natural light wherever possible and using blinds to reduce heat and the need for an air-conditioner. You can reduce further production of greenhouse gases by lowering your use of fuel. Start a lift club and share transport instead of driving alone.

Almost every resource that we use comes at some environmental cost, either through the direct use of a natural product (e.g. wood from trees to make paper and plants for medicinal purposes) or through the destruction of part of an ecosystem. For example, over-extraction of water reduces the ability of river ecosystems to function. You can reduce your water consumption by watering your plants with 'grey water' (used water from your bathroom and kitchen) or by directing your gutters at home towards the lawn or a rain barrel instead of the pavement. The less water we use, the less damage is done to river ecosystems.

The more each of us is able to reduce our footprint, the less we will demand from our natural resources and the lower the risk to biodiversity.

BECOME A CRITICAL CONSUMER

Urban living cuts you off from nature. You are cut off from the sources of your food and the other resources you consume. You are also cut off from the places your waste is taken to. Develop more of an interest in the biodiversity consequences of your consumption.

Buy local fruit and vegetables that haven't used enormous amounts of fuel to get to you. Wherever possible, select organic products that have been produced without the use of pesticides and fertilisers that are harmful to natural ecosystems and biodiversity. Practice green consumerism by buying environmentally friendly products and re-use plastic bags when these are given to you. Plastic is a petroleum based-product and, since petroleum is a fossil fuel, greenhouse gases are released when plastic is produced. Greenhouse gases contribute towards climate change, posing a risk to biodiversity.

BECOME A BIODIVERSITY ACTIVIST

We need to learn to offset our consumerism with activism. Get involved in your local consumer council. Put pressure on your local councillor to consider biodiversity issues in all decision-making. Join a local conservancy which promotes biodiversity conservation, or start your own. Contribute to groups such as World Wildlife Fund (WWF), Endangered Wildlife Trust (EWT) and the Wildlife & Environment Society of South Africa (WESSA) that work to conserve biodiversity. Familiarise yourself with regulations that govern zoning and the use of environmental servitudes and abide by these if your property falls into a category that requires environmental protection. Before developing land, consult with the Municipality's Environmental Management Department to find out about development constraints.

DID YOU KNOW?:

About 15 pairs of the African Crowned Eagle breed in the eThekwini region. They are the continent's most powerful birds of prey, capable of carrying a small antelope, but they are under serious threat. One major threat is the destruction of their natural habitat.

The price we pay fo

The loss of biodiversity is often the price we pay for economic growth and development. Economic growth is often seen as an end for its own sake and not a means to an end. Sustainable development requires that we do not allow economic development to override social and environmental concerns.

> **"GROWTH FOR THE SAKE OF GROWTH IS THE IDEOLOGY OF THE CANCER CELL."**
> **Edward Abbey**

All leaders should see the environment as more than property or a resource to be exploited.

> *"We shall never understand the natural environment until we see it as a living organism. Land can be healthy or sick, fertile or barren, rich or poor, lovingly nurtured or bled white. Our present attitudes and laws governing the ownership and use of land represent an abuse of the concept of private property ... Today you can murder land for private profit. You can leave the corpse for all to see and nobody calls the cops."*
> **Paul Brooks** in *The Pursuit of Wilderness* (1971)

Land developers have a significant role to play in the protection of biodiversity through their adherence to the laws and policies that govern biodiversity planning and protection. One of the most important pieces of legislation in South Africa relating to biodiversity conservation is the National Environmental Management Act, which includes Environmental Impact Assessment (EIA) regulations for developments. Developers who are aware of the value of biodiversity, and who take cognisance of the regulations that aim to protect it, can influence the course of developments that would otherwise be extremely destructive.

r economic growth

DID YOU KNOW?: Simply cutting a road through a forest can cut a species off from its breeding and feeding grounds. The road can also expose and dry out the habitat leaving it vulnerable to invasive alien species which thrive in vulnerable and destabilized ecosystems.

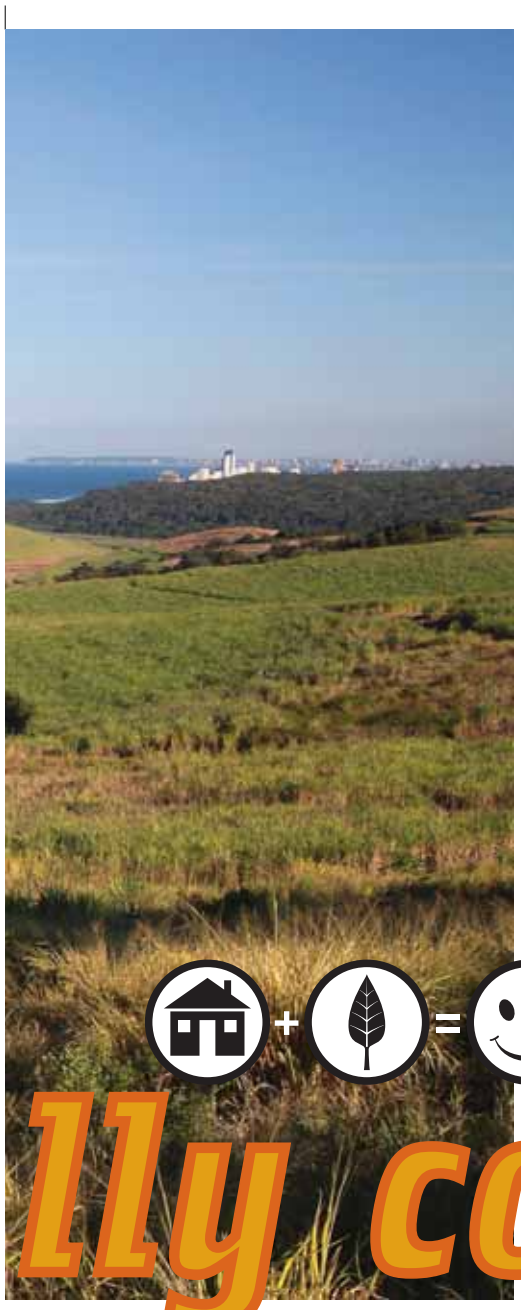
DID YOU KNOW?: **The endangered Pink-footed Giant Black Millipede, *Doratogonus rubipodus*, is only found in the Hillcrest and Kloof areas where it lives in forests. Much of its habitat has been destroyed by development and alien invasive plants.**

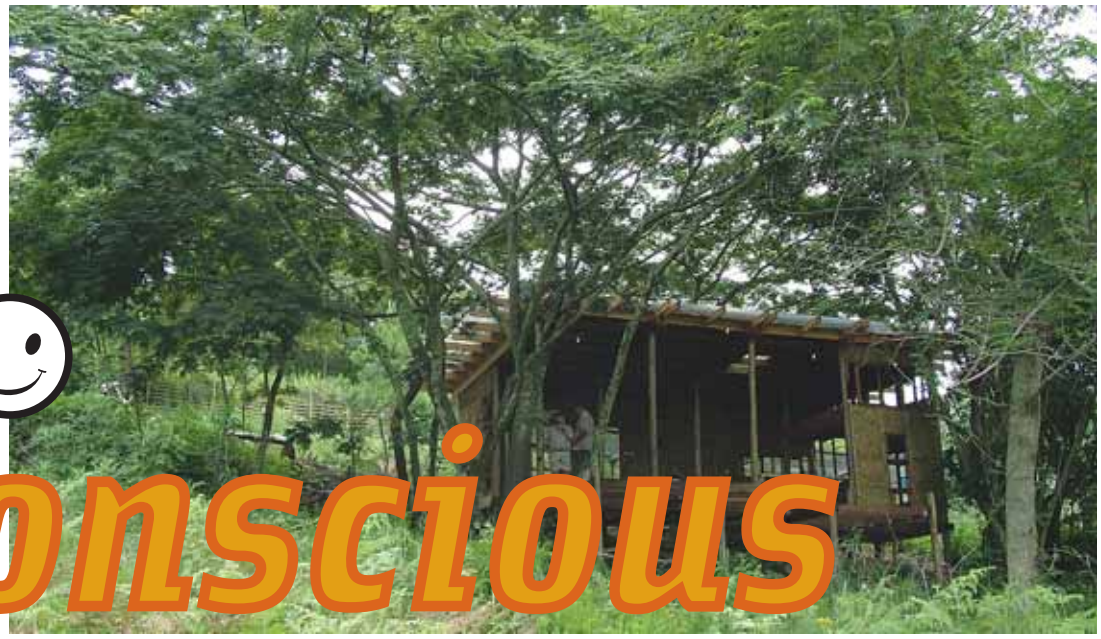
Environmental development

The scale of the problem can be overwhelming but it is amazing to witness the results that can be achieved when leaders make decisions that take the interests of the environment into account.

In the late 1990's, a proposal was submitted by Tongaat Hulett Properties (then known as Moreland Developments) to develop the 'Umhlanga Forest Estate' north of the Ohlanga River. Developers justified this by suggesting that the type of high-end property development that was planned would create a financial platform to manage the forests in the area. The developers were initially granted both planning and environmental approval for the development, despite opposition being voiced from the city and other concerned stakeholders. The property was, however, never developed.

In the mid 2000's, when Tongaat Hulett Properties was ready to develop the land, a new Environmental Impact Assessment (EIA) process had to be started. At this time it was agreed that the entire Sibaya node would be included in a comprehensive EIA process. This once again opened up discussion around the use of the forest areas. The city and other concerned parties continued to argue that development





Ily conscious

in the forest would not be sustainable as the forest would become fragmented. They proposed that development around the forest could achieve a similar financial platform to fund the management of the forest. The City Manager used the opportunity of renewed discussions with Tongaat- Hulett Properties to champion the idea of "no development inside the forest".

As a result of the strong position taken by the city and other groups opposed to the forest development, Tongaat Hulett Properties convened a planning 'charette' to re-conceptualise their development plans. This, together with the EIA process, ultimately resulted in a proposal that excluded development in the forest and followed the 'One Planet Living' model, which promotes environmentally friendly activities such as low energy use and waste recycling within developments. As a result of the environmental authorisation, the forest and nearby environmental assets are legally protected and managed.

It is important to remember, however, that it is not only the responsibility of big developers to take the environment into consideration. In Durban, much of the land is broken up into small pieces and privately owned. It is therefore important for all landowners and potential developers, however small, to assess the biodiversity value of their land and then to conserve as much of this as possible. Advice on how best to do this can be obtained from the Environmental Management Department or from local conservancies. It is only if every individual takes responsibility for biodiversity conservation, that our natural environment will survive to continue delivering the goods and services that are essential for the survival of all life.

A challeng
leaders in

It is no longer only religion or government that influence most peoples' opinions. Big corporations are amongst the most dominant institutions of our age and the consumerism they promote is the dominant ideology. Their leaders are often the least accountable of all leaders in society. When it comes to biodiversity, leadership must come from business and political leaders.

DID YOU KNOW?: In the last 650 000 years CO_2 did not exceed 280 parts per million (ppm). With the burning of fossil fuels, the levels of CO_2 are over 440ppm and rising, thereby increasing the temperature of the planet, its atmosphere and its oceans.

ge to
business

If you are a leader you need to play a role in shifting public opinion – not only through media and technology but through example. You need to:

- *shift your own opinions towards protecting biodiversity*
- *comply with environmental laws and minimum standards that are aimed at protecting biodiversity*
- *ensure that your company or organisation has a biodiversity policy which guides decision-making*
- *reduce your own consumption, waste and negative impacts on the environment*
- *use recycled materials wherever possible*
- *embrace eco-procurement practices that ensure that whatever goods you buy are being harvested in a sustainable way*
- *promote a corporate 'green image' that prioritises biodiversity issues*
- *commit to designing eco-friendly products and services*
- *as part of your Corporate Social Investment (CSI) programme support projects where 'green jobs' are being created to manage, protect and restore the natural environment*
- *participate in the creation and maintenance of meaningful forums where the public and private sector work together to design strategies for the sustainable use of ecosystems*

TALK ABOUT THE BIODIVERSITY OF YOUR CITY!

RESOURCE CONTRIBUTORS

Durban Natural Science Museum
Environmental Management Department

ENVIRONMENTAL MANAGEMENT DEPARTMENT
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