

Insurance industry responds to changing disaster risks

As the effects of climate change intensify, large areas of South Africa could become uninsurable, according to Santam's chief executive Ian Kirk. "Our organisation is paying claims now to farmers and property owners in the southern Cape for fire damage. Two-and-a-half years ago they were under water. It's affecting us and we have to rise up to this," Kirk said.

Kirk said Santam was following the lead of insurance companies in Europe and the USA and re-examining the rating of insurance risks in certain areas where the affects of climate change were already being felt. The organisation was working with UCT climate change specialists to plot areas of high risk, particularly regions vulnerable to sea level rise and flooding. Infrastructure built too close to the coast and in flood plains was particularly at risk.

"We're looking at the coastline, at areas around the Vaal Dam and there are parts of the West Coast which are a problem. Langebaan is a problem and so are parts of the Southern Cape. The situation is going to get worse and we're going to have to re-rate those areas." Kirk said municipalities that continued to allow housing and infrastructure to be built in flood plains and too close to rivers and the coast, were being irresponsible, "because we're going to have to deny cover on that".

Another climate change-related risk is the risk of increased wildfires as the climate becomes hotter and drier in some areas. In 2008 Santam made a groundbreaking move by lowering insurance premiums for farmers who manage their fire risk by belonging to Fire Protection Associations (FPAs). FPA members now pay lower premiums and excess contributions, and enjoy more lenient terms of accountability, while policyholders who do not belong to FPAs might in future be denied insurance against veld fires. FPAs involve members in cooperating with government agencies to clear aliens and burn firebreaks, reducing the risk of big wildfires that get out of control and destroy lives and property.

Biodiversity Briefing Series



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Adapting to increased coastal risks

At the local level, municipalities deal with the impacts of natural disasters, including those likely to become more frequent with climate change, such as flooding, coastal erosion and fires. Adaptation to climate change involves finding ways to manage these increasing risks, including natural solutions that conserve and restore biodiversity.

Although scientists' predictions vary, sea level could rise by up to a metre by the end of this century, with serious implications for low-lying areas along the coast of Cape Town, Durban, Port Elizabeth and East London. Risk assessment studies are currently underway to see which parts of coastal cities may become inundated with seawater.

A study for Cape Town also predicts an 85% chance of extreme winds causing a 4.5 metre rise in the level of storm surges in the next five years, which could cause about R20 billion of damage to infrastructure. Storm surges along the KwaZulu-Natal North Coast in 2007 damaged roads and made a dent in tourism earnings. The Integrated Coastal Management Act will play an important role in establishing and managing set-back lines for future coastal development.

Maintaining natural habitat along the coastline can protect human settlements against storm surges and coastal flooding. In South Africa, however, many of the natural buffers provided by functioning ecosystems have already been removed or damaged.

Erosion at Willards Beach, Ballito in KwaZulu-Natal after March 2007 storms



© photo by S Bundy

This has occurred through land reclamation, removal of coastal dunes, removal of mangroves on the east coast, stabilisation of sand that historically replenished beaches, development of estuaries and mining of sand – all of which have made the coast more vulnerable to damage from increasingly variable and rising seas.

In some cases, engineering approaches to adaptation may be appropriate, such as sea walls, groynes, dolosse and gabions. More cost-effective, however, and less vulnerable to damage themselves, are "natural solutions" that maintain biodiversity and ecosystem functioning along the coast.

Examples of this approach could be maintaining sand dunes along the coast that allow beaches to shift and reform, protecting coastal mangrove swamps that buffer storms, rehabilitating estuaries and wetlands to maintain the balance between seawater and freshwater resources, and conserving kelp beds that buffer tidal swells offshore. Sometimes a combination of natural and engineered methods may be best, for example, the Milnerton golf course in Cape Town might be saved by creating vegetation buffers along the coastal dunes.

Dune drift fences at Isipingo to promote reestablishment of dunes as a natural buffer



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Biodiversity as a Resource for Adapting to Climate Change

South Africa has a wealth of natural resources that are key to our development as a nation. Our natural resources include our minerals, our soil, our water and our biodiversity – for example, fish stocks, medicinal plants and game. Natural resources are a form of capital, like infrastructure, land, labour or finance – we can see them as "natural capital".

As a nation, we need to invest in maintaining, restoring and building our natural capital, so that it can help support socio-economic development for all our people. Investing in looking after our biodiversity is a way of ensuring that it works for us, to fulfil our goals of:

- Creating work and sustainable livelihoods
- Achieving rural development, food security and land reform
- Delivering water for the nation's needs
- Providing protection against climate change**



Andrew Brown

What is Biodiversity?

Biodiversity is the full variety of life on Earth – from the tiniest plant to the largest animal.

Its complexity is measured in terms of variations in: the number of different species, the genetic wealth within each species and the interrelationships between species in ecosystems.

South Africa is one of the most biodiverse countries in the world: with a land area of 1,2 million km² - representing just 1.24% of the Earth's surface - South Africa contains almost 10% of the world's known bird, fish and plant species, and over 6% of mammal and reptile species.



Mark Wing

Understanding **climate change**

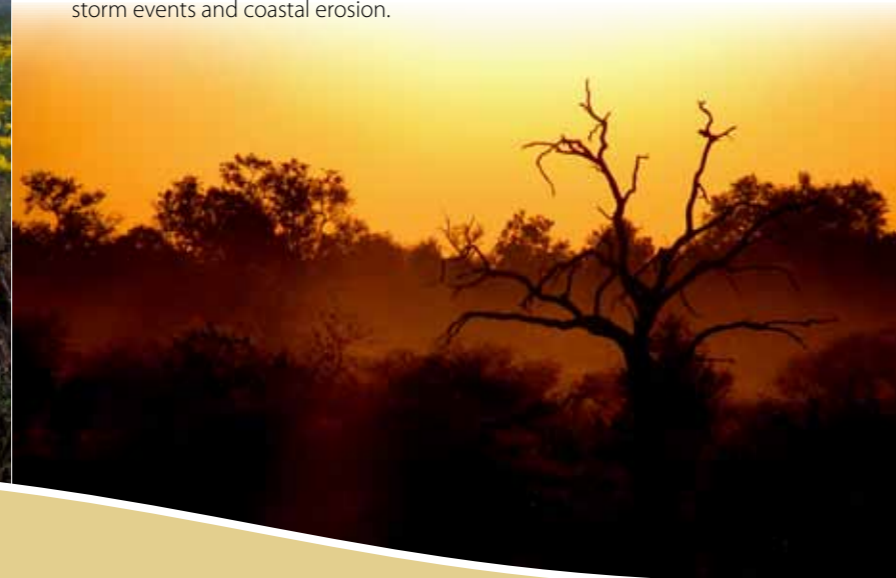
It is now a widely accepted fact that human activity has caused rapid climate change on Earth over the past century. Although fossil and other records show significant climate variations over billions of years, scientists believe the high temperatures recorded over the last century are unprecedented. With the weak outcome of the 2009 Copenhagen climate conference and apparent inability worldwide to reduce carbon emissions, current trends look set to continue. Here are some Frequently Asked Questions about climate change and how it may affect us in South Africa.

Q. What evidence is there of increasing temperatures?

A. Scientific records through the Intergovernmental Panel on Climate Change show a global average surface temperature increase over the 20th century of about 0.6°C. The ten hottest years on record from 1880 have all been since 1990 (*State of the World*, 2006). Temperature records from the Sandveld region on the West Coast over the last 50 years show that average temperatures have risen by about 1°C.

Q. What evidence is there of rising sea levels?

A. The Arctic sea ice has thinned by 40% since the 1950s, and glaciers in the European Alps have lost half their volume since the 1850s (*The Heat is On*, 2001). Scientific records through the Intergovernmental Panel on Climate Change show that the global average sea level has risen 0.1-0.2 metres during the 20th century. Scientists anticipate that coastal impacts of climate change may include a rise in sea level, saltwater intrusions into coastal aquifers, and an increase in extreme storm events and coastal erosion.



Providing protection against climate change

Q. How do greenhouse gases affect climate?

A. Human activity has altered the composition of the atmosphere rapidly through the products of industrialisation, especially carbon-dioxide from fossil fuel consumption. Greenhouse gases are like panes of glass in a greenhouse, allowing short wave energy to pass through them and radiating long wave heat radiation back into the atmosphere. Trapping additional heat energy changes the climate by increasing temperatures and changing rainfall patterns, relative humidity and wind speed.

Q. What are the predictions for the future?

A. Under a "business as usual" scenario, global temperatures are predicted to increase by 4-6.4°C by 2099, and sea level to rise by 0.59m (IPCC, 2007). Impacts on Southern Africa are likely to be significant. Over the next 50 years scientists predict that the interior of our country will become warmer, and the western part of the country will become drier, with more intense and frequent fires. Rainfall patterns are expected to become less regular countrywide – with more sudden downpours and more flooding. Increased storm surges at sea may cause coastal erosion.

Q. How can we respond to climate change?

A. Mitigation measures are interventions to reduce the sources of or enhance sinks for greenhouse gases. The South African government has committed itself to reducing our emissions by significantly more than the minimum required of developing countries by the Kyoto Protocol. Adaptation measures involve adjustments to human and natural systems in response to anticipated change. Creating landscape-level corridors of biodiversity helps a region become more resilient to climate change, e.g. by retaining water in catchments and creating corridors for species to move through.



Adapting to increased risk of floods and drought

Changes in rainfall intensity and variability due to climate change are expected to increase both flooding and drought in many areas inland. The Overberg and Garden Route in the Southern Cape have seen a number of large flood events in the past few years, some because inappropriate development of coastal resorts and holiday homes in low-lying coastal areas was allowed by municipalities. In other cases of flooding, informal settlements were inappropriately located in river floodplains because residents had no other options.

Maintaining indigenous vegetation along rivers can prevent the banks from being eroded when rivers swell during heavy rainfall. Erosion is bad because it means valuable soil resources are lost to agriculture, and also because it puts a large amount of sediment into rivers, which pollutes drinking water supplies further downstream and silts up river mouths where fish breed. Conservation agencies recommend that farmers keep a band of 20-30 metres of indigenous vegetation on either side of the river to enable this ecosystem service to be maintained.

Keeping wetland ecosystems in a healthy state is also critical to preventing floods. About 115 000 wetlands covering 4.21 million hectares, or 3.5 % of our country's surface area, have been mapped in South Africa. These wetlands are part of our natural infrastructure for gathering, managing and delivering water – improving water quality, controlling erosion, sustaining river flows and reducing the impact of floods.

Wetlands act like giant sponges, absorbing large amounts of water during wet periods and floods, and releasing water slowly during drier periods. The destruction of more than 50% of our original wetlands has left us vulnerable to floods in many areas, a situation made worse by climate change. The Working for Wetlands programme is investing in protecting and restoring wetlands as a critical part of adaptation to climate change, as well as creating work opportunities for unemployed people in rural areas.



Road damage following November 2007 floods in the Garden Route

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Restoring wetlands to their natural state helps prevent flooding

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