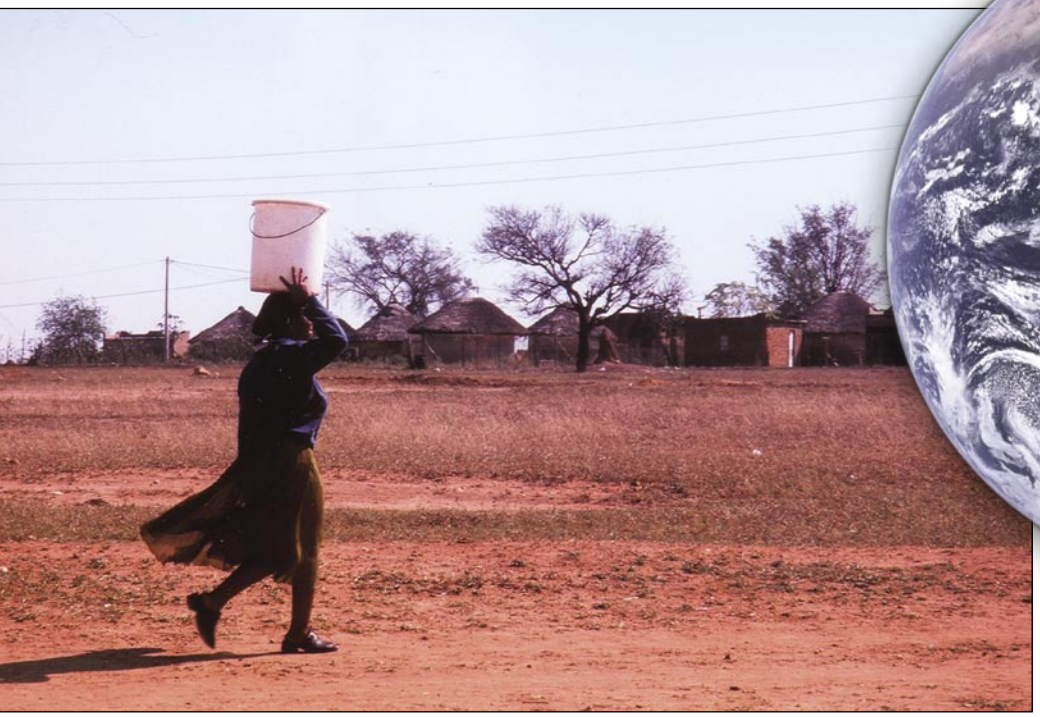


CLIMATE CHANGE:

The Last Straw for Communities at Risk?

Much has been said about the potential effects human induced climate change will have on Southern Africa, its biodiversity, its water resources, the economy of the region and the health of its people. However, this phenomenon is only one stressor in the lives of the area's most vulnerable communities, and should not be viewed in isolation, experts warn. Lani Holtzhausen reports.

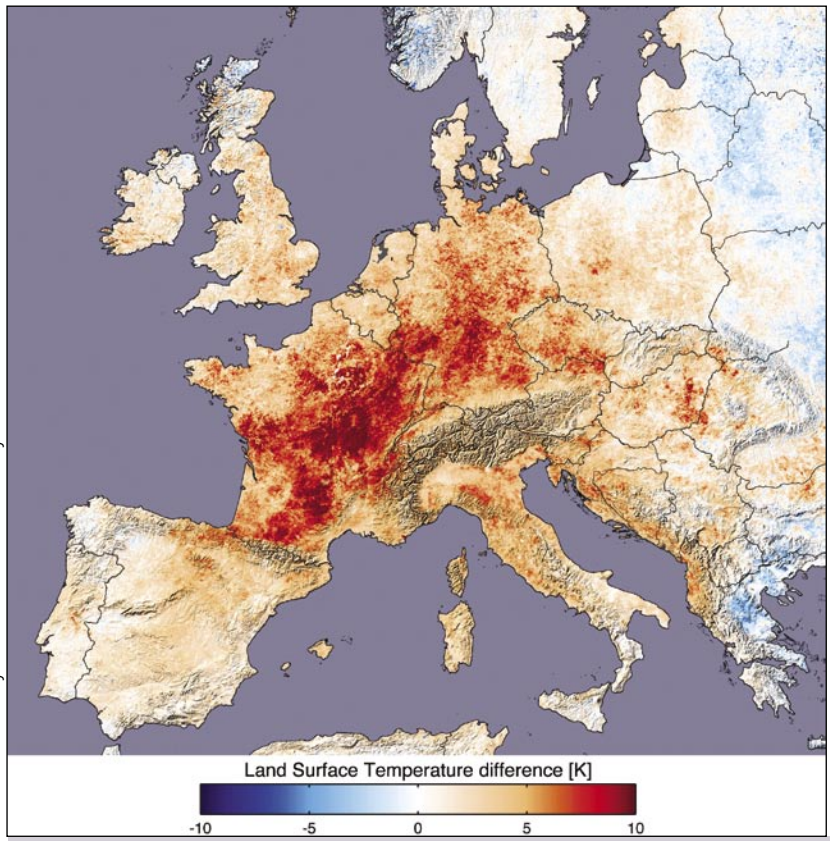
Most scientists agree that climate change is happening, and will continue to happen in the foreseeable future even if the global gas emissions responsible for this phenomenon are curtailed significantly in the short to medium term. According to South Africa's National Climate Change Response Strategy, approved by Cabinet in September 2004, there is now more confidence than ever before that global climate change is a threat to sustainable development, especially in developing countries. It could undermine global poverty alleviation efforts, and have severe implications for food security, clean water, energy supply, environmental health and human settlements.

Research funded by the Water Research Commission (WRC) has confirmed this, with credible regional projections made available using the latest general circulation models, as well as regional climate models and empirical downscaling techniques. "This is the closest we have ever come in South Africa in projecting exactly what will happen to the region as a result of climate change," reports Prof Bruce Hewitson of the Climate Systems Analysis Group at the University of Cape Town. The other universities who participated in this collaboration were the universities of KwaZulu-Natal (KZN), Pretoria and Witwatersrand (Wits).

HIGHER TEMPERATURES, LOWER RAINFALL

The country as a whole is projected to become warmer, with the highest

increases in the interior. Increases in temperature is already being experienced, with 2005 expected to become the warmest year on record, beating 1998 as the warmest year yet recorded. Higher temperatures mean more evaporation, which is projected to increase by 10% to 20%.



Courtesy of NASA Earth Observatory

"Increases in temperature is already being experienced, with 2005 expected to become the warmest year on record, beating 1998 as the warmest year yet recorded."

This is not great news for a country such as South Africa which already has a high-risk hydroclimatic environment, with low rainfall to runoff conversion and a high inter-annual variability of climate. According to Prof Roland Schulze of KZN University this implies increased evaporation and water losses from dams and increased irrigation demand as soils will dry out more often. "The impact of climate change on the water sector might be felt on the water sector sooner than we think. We could see a significant reduction in runoff in

Left: Europe experienced a historic heatwave in 2003. Here the daytime land surface temperatures of 2003 compared to the previous three years are shown.

COULD SA FARMERS SUE FOR CLIMATE CHANGE DAMAGE?

In the not too distant future, a group of local farmers lose their maize crops due to a severe drought. They go on to sue a number of international fossil fuel companies for damages caused by human-induced global warming.

Improbable? Perhaps not, maintains Myles Allen of the Department of Physics at Oxford University. Speaking via telephone link at the National Climate Change Conference in October last year, he said that civil liability could be another vehicle for redistributing the costs of climate change and reducing emissions. "There is increasingly strong evidence for the human influence on global and regional temperature changes," he told delegates, citing the example of the 2003 European heat wave which led to more than US$10-billion of uninsured damages and between 22 000 and 35 000 heat-related deaths.

According to Allen, the contribution of past greenhouse gas emissions to some present climate risks, including recurring droughts in southern Africa, may already exceed 50% – the threshold for civil tort actions. By 2030 more than 50% of anthropogenic greenhouse gas loading will be due to post 1990 emissions.

"Plaintiffs must show that, more probably than not, their individual injuries were caused by the risk factor in question, as opposed to any other cause. So we must ask how human influence on climate has affected the risk of an extreme weather event." But who will be the defendants? Allen explained that about 80% of the present greenhouse as emissions emanated from the products sold by no more than 20 identifiable companies.

Over the coming decade, both the cost and inevitability of climate change will become clearer, fuelling demands for compensation for floods and droughts, heat wave damages and deaths, threats to water supplies, coastal erosion and hurricanes, he maintained. "The risk, even if remote, of a successful class-action damages suit would have far more impact than any conceivable follow-up to the Kyoto Protocol."

certain areas in the west of the country by as early as 2015," he says.

At the same time the eastern half of South Africa, especially the escarpment and eastward is likely to become wetter, with more rainy days and increases in rainfall intensity, which have implications for, for example, soil erosion and flooding. On the positive side, this might result in greater groundwater recharge. The interior regions to the west of the eastern escarpment show more ambiguous changes in rainfall, with some parts likely to experience slight increases and other slight decreases.

Worrying, however, is that most winter months in the Western Cape show a drying trend. This is consistent with the suggestions that the region will experience weaker frontal systems, whose core will be further south than at present. There are also suggestions across the country of increased inter-annual variability. This means we are likely to see more floods and droughts, with prolonged dry spells being followed by intense storms.

All aspects of the water sector will be affected, including water supply, the incidence of waterborne diseases, and even the Ecological Reserve. South Africa might even have to renegotiate its international water agreements with its neighbours with whom it shares 70% of its water resources.

VULNERABLE COMMUNITIES

But climate change is not only about changes in the earth system, it is also about the impact of these changes on vulnerable communities. According to Prof Coleen Vogel, Professor: BMW Chair in Sustainability at Wits, research into climate change has been largely one dimensional to date. "For many, the focus thus far has been on the projected impacts of climate change, for example, on the environment, human health, and water resources. We need a multi-faceted approach to climate change, focusing particularly on the human dimension of this phenomenon."

It is believed that the impacts on both rural and urban communities, particularly in the absence of effective risk-reduction strategies, are expected to be significant in a changing climate scenario and require an effective response. In communities where access to clean water is already a problem, a slight decrease in rainfall has an amplified effect, for example. So climate change will become another stress that cities have to deal with, along with growing informal settlements, pollution, poverty, and health issues, to name but a few.

WHAT THEY SAY ABOUT CLIMATE CHANGE

"From improved disaster management and emergency response planning to the decisions we make about the materials to build our houses, climate change will require adaptation in almost all spheres of life." – **Minister of Environmental Affairs & Tourism, Marthinus van Schalkwyk**

"We run the risk that our grandchildren and great grandchildren may not be able to enjoy the visual splendour of the fynbos of the Western Cape or the daisies of Namaqualand." – **Minister of Minerals & Energy, Lindiwe Hendricks**

"A much neglected aspect of climate change understanding is the role that the continuing and pervasive poverty that afflicts more than a third of the people on this planet has on climate change, and the impacts that climate change will in turn have on the most marginalised in the global context." – **Minister of Science & Technology Mosibudi Mangena**

"Climate change is a serious risk to poverty reduction and threatens to undo decades of development effects." – **Minister of Agriculture, Thoko Didiza**

"We have learned to live with the fact that our water resources are scarce and highly variable in space and time. Now we will have to learn to adapt to a climate that is already changing and will continue to change – possible for 100 years – irrespective of how successful we are in reducing emissions of greenhouse gases into the atmosphere." – **Minister of Water Affairs & Forestry, Buyelwa Sonjica**

Drier conditions exacerbated by climate change could see the Cape West Coast and Namaqualand's floral splendour become a rare occurrence.

"The most pressing challenge is to strengthen the social, economic and environmental resilience of the poorest and most vulnerable against climate change and variability," notes Prof Vogel.

COMMUNITIES IN PERIL

The WRC research emphasised this with two case studies undertaken on the vulnerability of communities to climate change in the Thukela catchment in KZN. The one case study was undertaken in the small-scale community of irrigation farmers at Müden while the other was done in a large-scale commercial sugarcane farming community in the area.

KZN has a long history of past climatic stress events, and it is possible that the area may experience future climate stresses. In addition, several farming and other livelihoods in the area are resource dependent, with many requiring water for small or larger-scale agricultural activities. The area is also characterised by high levels of poverty and other stresses, including HIV/AIDS, malaria and cholera.

"The impact of climate change on the water sector might be felt on the water sector sooner than we think. We could see a significant reduction in runoff in certain areas in the west of the country by as early as 2015."

The case studies showed that how a community deals with the risks of climate change is dependent on the context in which that community finds itself at the time, including the manner in which the community gains access to resources, how well they are linked to development activities and, more critically, how those activities are institutionalised.

In Müden, which is already prone to droughts and flooding, research showed rather than climate change being the key and overarching 'driving' or 'stress' factor, there were several multiple stressors that enhanced vulnerability and constrained adaptive capacity of the small-scale farmers to climate change. These include lack of institutional organisation, lack of access to information and broader governance issues related with relevant authorities.

The commercial farmers, on the other hand, were almost just as vulnerable, with macro-economic and related factors, including the low price of sugar, the strong local currency, legislation, land distribution, high input costs and labour issues, enhancing their exposure to climate variability.

It is essential that all of these stressors are taken into account when assessing the vulnerability of farmers and when implementing plans for assistance and development, particularly if such events increase in frequency and magnitude, the research team concluded.

"The most pressing challenge is to strengthen the social, economic and environmental resilience of the poorest and most vulnerable against climate change and variability."

The South African government has indicated its commitment to assisting the country adapt and prepare for climate change. However, it is clear from this research that one size will not fit all when designing future institutional and local response interventions to enhance adaptation to climate variability in the short term and climate change in the longer term.

It is certain that while the picture is slowly becoming clearer, we are a long way off from knowing all there is to know from this phenomenon that is climate change. We can do little to control the timing and intensity of the expected hazardous events in the short term. All we can hope for is to increase our capacity to cope with the projected extreme climatic events, and increasing climatic variability.

Much still needs to be done to protect vulnerable communities against the onslaught of climate change.

Weather extremities brought about by climate change, such as increased flooding, is only one of the stresses vulnerable communities in urban areas have to deal with.

NEWSFLASH – NEW BOOK ON CLIMATE CHANGE IN AFRICA

A new publication on climate change in Africa is due to be published this year.

Funded by the organisation, System for Analysis Research and Training (START), the book will be an updated, reviewed, scientific synthesis of global change research in sub-Saharan Africa over the last few years, according to Editor Luanne Otter of the Climatology Research Group at the University of the Witwatersrand. Featuring authors from Africa, the book will be presented in five parts, namely past and present climates; human elements; major elements of water, carbon and nitrogen; transport and transformations; global change impacts; the vulnerability of Africa to global change and the adaptations required to adjust to these changes. For more information, visit http://crg.bpb.wits.ac.za or E-mail: Luanne@crg.bpb.wits.ac.za