National Climate Change Conference
Session 3
Speech by Ms BP Sonjica, MP, Minister of Water Affairs and Forestry
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The Impacts of Climate Change on Water Resources and how we can adapt to them

It is common knowledge that, during the last fifteen years, South Africa has made profound and fundamental changes in its political, social and economic landscapes.

We won the admiration of the world when we achieved what had been thought by many to be an impossible dream and, in 1994, elected and installed our first democratic and representative government.

Since then we have made great strides in entrenching democracy in our country, and we are on course in creating a better life for all people, irrespective of race, gender or creed. The success being achieved by our young democracy has seen South Africa making meaningful contributions in resolving various challenges the world currently faces. We do not claim to have all the answers but we are always willing to share our experiences in ensuring a better world for all.

But we must not be under any illusions. Although we have proved - to ourselves and to the world - that we have the will and the ability to overcome the challenges that confront us, we will certainly face many more challenges in the years to come, as we seek to forge a new nation. The most pressing of these will be to find ways to release the millions of our people from the burdensome yoke of poverty that continues to stalk our land.

Neither can we afford to become complacent. We must be continuously alert and ready to deal with anything - any circumstance or situation or event - that could threaten our progress.

Global climate change is, beyond any doubt, such a threat.

In its 2003 report *Poverty and Climate Change* the African Development Bank said that climate change poses possibly the single largest long-term threat to poverty eradication efforts in Africa, and threatens to undo decades of development efforts.

And so our deliberations at this Conference must not be viewed as an academic discussion about an interesting scientific phenomenon. Climate change is an issue of the utmost seriousness, and its effects will be felt by everyone all over the world. But, as with all hazards, those in our society with the least resources - the very young, the very old, the poor and the sick - will be the most vulnerable to these effects, and least able to cope with and adapt to them. I cannot overstate the importance of putting the poor and vulnerable at the forefront of all our endeavours.

I find it surprising that there are those who continue to ask if global climate change is actually happening, and that there are those who, whilst accepting that it is a reality, doubt that human activities play any part in causing it. I would like to make my position on this matter clear.

I believe there is overwhelming scientific evidence to show that climate change is a fact. Observations show that the world has been getting steadily warmer since the beginning of the 20th century. About two-thirds of this increase has occurred over the past 40 years, and there is strong evidence that much of this warming can be attributed to human activities - that is, emissions of carbon dioxide and other greenhouse gases into the atmosphere as a result of increasing industrialisation and the burning of fossil fuels since the beginning of the Industrial Revolution at the end of the 19th century. Whilst much of this industrialisation has taken place in the developed countries of the northern hemisphere, the global climate system is such that the effects are felt all over the world.

In this context the Kyoto Protocol was devised precisely to ensure that the onus for addressing the causes of climate change was placed on those countries who were contributing the most to emissions of greenhouse gases.

Although the Protocol has been ratified by a sufficient number of countries to bring it into force, it is regrettable that there are still a few highly-developed countries - that together contribute a significant proportion of the annual

global emissions of greenhouse gases - that continue to refuse to join with the rest of the world in taking concerted action to combat the problem.

We hope that efforts like those stated by the ambassador (Canadian Climate Change Ambassador Bilodeau [*spoke before the Minister]*) in his speech, will see event the most sceptical countries join forces with the rest to continue to look for solutions to the challenge of climate change.

Achieving a global commitment to embracing firm targets for reducing greenhouse gas emissions will help to resolve one of the key uncertainties around climate change. That is, what will future levels of emissions be, what will be the effect on the concentrations of greenhouse gases in the atmosphere, and how will this affect global temperatures? At present we can only make intelligent estimates in this respect, based on the current incomplete commitment to the Kyoto Protocol. Accordingly, developing countries will need to continue to do all they can to persuade reluctant developed countries to embrace multilateral action in this respect. After all what is the right thing to be committed to change, this way protecting our ecosystem for generations to come especially the poor.

What, then, can we say about the effects of climate change in South Africa?

First of all It is important to understand that we cannot make exact forecasts about how the global climate will change in the future and, consequently, we cannot make confident statements about precisely how global changes will affect conditions at local levels.

Whilst the ideal would be to develop regional forecasts of impacts tailored to the needs of impacted communities, current science allows us only to make credible and defensible probabilistic projections of climate change at a regional scale, based on realistic future scenarios of greenhouse gas emissions. As a country we need to enhance our monitoring of the impact of global climate change so that we can provide solutions that mitigate against its impacts.

Nevertheless, we have made significant advances in our understanding of the implications of climate change during recent years. In this respect I want to thank South Africa's Water Research Commission for initiating, funding and supporting research into climate change during the last eight years or so. In particular, a major study on the impacts on water resources has been completed in the last few months, and the full report will be available soon. This research has put South Africa at the forefront of developing techniques for taking the broad-scale results of the global circulation models and downscaling them a much finer local resolution. Nevertheless, many uncertainties remain to be resolved, and the Water Research Commission has agreed to fund another phase of research to further refine our approaches and understanding.

Some of the results of the research have been presented in detail at the Science Conference by members of the research team, and it will be sufficient for me to give a broad overview.

The research clearly indicates that surface air temperatures will rise everywhere in South Africa, with the interior warming more than the coastal regions. This conclusion is consistent with 50 years of temperature observations in Southern Africa.

Projected changes in rainfall are different for different parts of the country. In the eastern half of South Africa, especially on the escarpment and eastward to the coast, increased availability of moisture in the atmosphere supports a projected increase in summer rainfall. The number of rainy days could also increase, and rainfall could be more intense.

The situation in the interior regions, to the west of the escarpment, is less clear-cut, with some parts likely to experience slight increases in rainfall, and others slight decreases.

In the Western Cape the analysis suggests that the region will experience weaker frontal systems, whose cores will lie further south than at present. Unfortunately this means that most winter months show a drying trend. A previous study suggested that these impacts could be upon us within a decade or so in the south-western areas, and this is one of the climate change hotspots that will require attention from water resources managers in the very near future. The Water Research Commission is currently funding a project that focuses on the potential effects of climate change on small town and community water resources in the Western and Northern Cape, and aims to propose long-term water management strategies for dealing with the impacts.

Ultimately what we need is information on the impacts of projected changes in temperature and rainfall on surface and groundwater resources at local scales, where people depend on water for their lives and livelihoods, and where water resources are actually managed on a day-to-day basis.
Our researchers have shown us that we have the tools and the ability to do this, but it highlights the necessity to understand - and be able to model - the complex interactions between the water and land systems. Potential evaporation, for instance, is projected to rise - perhaps by 10 to 20 percent of present levels - because of the projected increase in surface temperature. This could mean that soils will become drier more often, increasing the demand for irrigation water or reducing crop yields, and possibly resulting in changes in land use. A detailed study of a small catchment in the north-east indicated that surface runoff was likely to decrease and, as a result, the volume of water in storage would be consistently less than at present.

Any changes in the flow regimes of our rivers will mean that we will have to review and reassess the ways in which we operate our dams, our present quantifications of the Ecological Reserve and, in the rivers we share with neighbouring countries, we will have to regularly review the details of our water sharing agreements to match the new physical realities.

How do we begin to deal with the impacts of climate change when, despite the undeniable advances in our understanding of what climate change will mean for us, it is clear that we still have some way to go before we fully understand all the details of all the local implications? Are we able to proceed in the face of uncertainty?

I mentioned earlier that South Africans are no strangers to change, and that most of us have proved that we are able to adapt to new circumstances. By adaptation I mean a sustained change in the way we do things, rather than coping with crisis situations in the short-term.

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 that will continue to change - possibly for 100 years - irrespective of how successful we are in reducing emissions of greenhouse gases into the atmosphere.

We are fortunate that we have, since 1994, developed a national water policy, legislation and an implementation strategy that, together, equip us to deal with scarcity and variability better than before. Among other things, we now have considerable flexibility to continuously review water use, and make whatever changes are necessary to accommodate new circumstances.

Our National Water Resource Strategy (NWRS) document was widely consulted on and discussed. It thoroughly analyses available water resources and establishes the infrastructure development projects that can be viably and sustainably constructed to maximise the water available to us.
It shows that we can increase our available water resources by about 20%. The analysis provides for water, for the biological reserves needed for the health of our rivers including the maintenance of bio-diversity.

The analysis is based on the concept of integrated water resources management. The seemingly complex idea is really quite simple. It provides not only a technical approach to water use, to water conservation and storage and water demand management, but provides a social and economic approach.

It ensures that people come first. In the case of SA this means that we must ensure that the development and use of our water resources will favour the achievement of greater race and gender equity in access to water for human consumption and for production.

Global warming will of course affect the availability of water and our demand for water. This will compel us to use developing technologies such as desalination of brak underground water which is already becoming cost competitive with water from dams. This is especially so for smaller remote communities.

Desalination of sea water which demands higher energy use is somewhat more expensive at present. But then newer solar energy technology is also being developed, that will make for lower cost electricity from non-polluting, environmentally friendly sources.

We are confident that agricultural production will also become more water efficient, yielding more crop drop! We shall have to be more water conservation conscious, but in the absence of major catastrophes, we shall always have enough water to drink, to feed ourselves and maintain our economic growth and development.

The importance of research into climate change is that it has provided us - and will continue to provide us - with essential information about how we may best apply our policy and law to managing water resources - especially locally - in times of change.

But we do not have to wait until we have all the detailed information before we begin to take action. The fundamental requirements of our water policy are to achieve equity, sustainability and efficiency in water matters, and there are things we can do now to build adaptation strategies into our normal work to accomplish these goals.

Equity demands that the needs of the poor are our first concern. As I mentioned previously, although climate change presents the same hazards to everyone, poor people are the most vulnerable to its threats, and have the fewest resources available to enable them to adapt to the changes. For the most part poor people are already beset with the problems of making a living, finding enough to eat and staying healthy. We must make every possible effort to deal with any new circumstance that could jeopardise their access to water, or their ability to make productive use of it.

We will, for instance, need to carefully examine the design and implementation of our water allocation reform programme to ensure that climate change considerations are taken into account. We will also have to study our plans for existing and proposed water institutions, and see to it that they are attuned to the needs of the poor, and able to assist them to meet their needs. It will be especially important for all water institutions to be in a position to provide sufficient information to create awareness of the implications of climate change among stakeholders and customers in their areas of jurisdiction, and to provide informed advice on how they may be addressed.

We will all - whether we are an individual householder, an irrigation farmer, a municipality or a large industrial concern - have to examine the ways in which we use water, and make whatever changes are necessary to ensure that our use is sustainable in the long-term, and as wise and efficient as possible. We must not take more water than we need, we must not use water wastefully, and we must not render water resources unfit for use by others because of the waste that we discharge into them.

It will be important to continue the work of clearing invasive alien vegetation undertaken by the *Working for Water* Programme, so as to reduce the amount of water used to little or no purpose by such plants, and to maximize the amount of water running off into our rivers or finding its way into groundwater.
Given that my portfolio has a component of forestry I want to make a call to our scientists to undertake research on how we can harness the potential of trees in mitigating against climate change especially the indigenous plants.

Although the research I mentioned previously focused on water resources, the management of water resources is not an end in itself. We manage water to support social and economic development in all sectors, and any changes in the availability of water will affect development in almost all sectors of the natural and man-made environments.

These linkages between water and other sectors emphasise the pressing need for us to develop and implement an integrated approach to managing the effects of climate change among all role players. The recent establishment of an Inter-Ministerial Committee on Climate Change is an important step towards achieving an understanding of these linkages, and initiating coordinated responses to the effects of climate change.

We are also fortunate to have developed a National Climate Change Response Strategy in recent months, which deals with the measures that each sector can put in place to adapt to climate change. However, in a world where no sector can claim to be independent of the others, the success of this strategy will depend absolutely on the development of a sound framework of co-operation among all relevant institutions, organisations and individuals.

I believe we have made considerable progress in developing our understanding of climate change issues, and laid a strong foundation for assessing its effects on our water resources. The consequences of climate change are significant, but they are manageable if we see to it that the application of policy and the development of adaptation strategies are informed by the results of research.

In conclusion, I trust that you will all participate vigorously in this Conference, and to take its messages with you to your places of work. We will not be doing justice to the intentions of the Conference unless we leave this place with clear ideas on how we are to deal with the threats posed by climate change, and definite plans of action to put our ideas into practice.

I THANK YOU.