

INTRODUCTION

FROM THE DESK OF THE PRESIDENT AND CEO: DR SIBUSISO SIBISI

The CSIR's natural environment research theme focuses on the wise use of resources, with a view to establish a secure future environment. Water is a particularly important resource, especially in South Africa, and is central to social development, human dignity and health, and economic development.

WITH LIMITED NATURAL water resources, the challenge for South Africa lies in the efficient and wise use of these resources, and the protection of the resource base to create an environment for social and economic well-being. Although some parts have higher rainfall than others, South Africa's average rainfall of 450 mm per annum is far below the global average of 860 mm per year.

Careful calculations of runoff, yield and water use indicate that South Africa has enough water to meet the nation's needs in the foreseeable future.

However, the reality is that there is relatively little water to start with, and several factors – such as climate change, water pollution and international obligations – have an influence on and limit the amount of water that South Africans have at their disposal. As the South African population increases, our water resources become more pressured, and to balance water supply and water demands is an ever-increasing challenge.

The examples of multidisciplinary research illustrated in this edition of ScienceScope provide some indication of the complexity of managing a critical natural resource, subject to intense demand, within a diverse and changing ecosystem.

Chapter 1 features research into the effective use of the water resource. There are two aspects to the management of water: First, there is a need to manage and protect the integrity of freshwater ecosystems so they continue to provide ecosystem services (principally, a sustained supply of quality water). The other aspect of water management is to ensure that the available water is used wisely, based on a sound understanding of the role that water plays in society and the economy.

Adding to the concern about the state of South Africa's water resources are indications that pollution is making a significant portion of the water resource unfit for use. Poor quality water not only limits the utilisation value of the water; it also places an economic burden on society through cost to clean the water.

Chapter 2 provides some examples of the impact of compromised water supply and quality on human health, and how new knowledge may be used to reduce these impacts. The chapter also deals with research aimed at preventing pollution and treating water that has been polluted, with a particular focus on treatment of acid mine drainage.

Water resources are inextricably linked to climate, but there is uncertainty over the exact impacts of climate change at

the catchment scale in South Africa, and consequently, there is uncertainty over the impacts on water resources. However, there is a general expectation of increased droughts and floods arising from a changing climate, and subtle changes in climate can make a significant difference to water resources. Climate change research is also receiving a significant boost within the Department of Science and Technology Global Change Grand Challenge. Chapter 3 provides some examples of research activities in this field.

In chapter 4, we look at the growing field of research into the governance of water resources. This research investigates the decision-making processes and institutional arrangements that support resource management, and which are critical in ensuring that there is evidence-based policy and effective implementation of policy.

There are many other research projects in support of water resource management, and still more that require new research. We hope that the outcomes of this research will be noted in the improved availability and quality of water to meet the growing needs of society.



Sibusiso Sibisi

