

CHAPTER 12

PROCESSES THAT WILL INFLUENCE RESOURCE ALLOCATION IN THE REPUBLIC OF SOUTH AFRICA

S. Rademeyer

National Water Resource Planning, National Department of Water Affairs and Forestry, Pretoria, South Africa

ACRONYMS

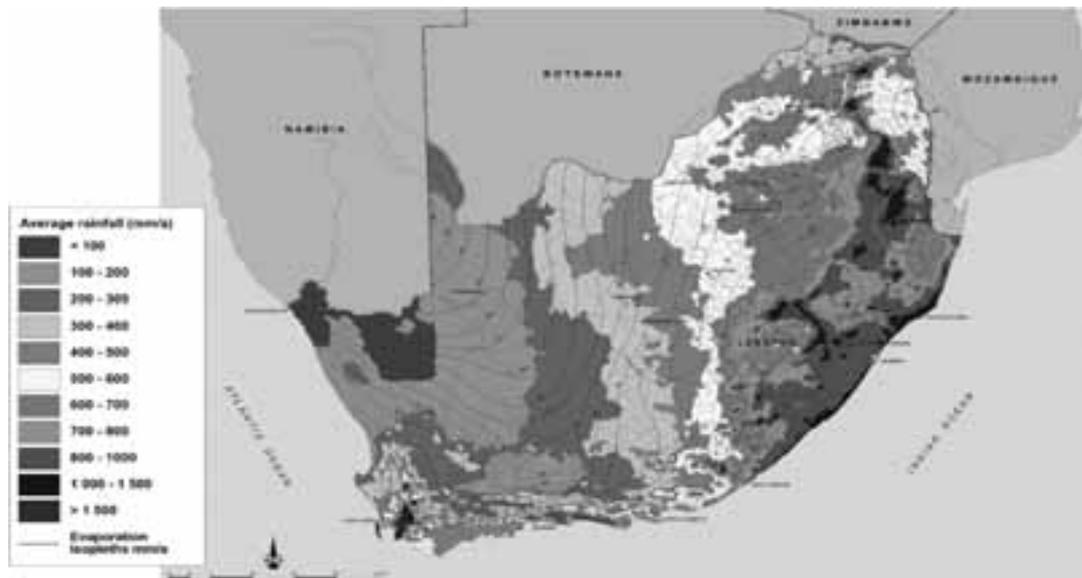
CMA	Catchment Management Agency
CMS	Catchment Management Strategy
DWAF	Department of Water Affairs and Forestry
EWR	Ecological Water Requirements
ISP	Internal Strategic Perspectives
NWA	National Water Act
NWP	National Water Policy for South Africa
NWRS	National Water Resource Strategy
WMA	Water Management Area

South Africa is located in a predominantly semi-arid part of the world. The climate varies from desert and semi-desert in the west to sub-humid along the eastern coastal area. The average rainfall for the country is about 450 mm per annum, which is well below the world average of about 860 mm/annum; however, evaporation is comparatively high. As a result, South Africa's water resources are, in global terms, scarce and extremely limited. The country has no truly large or navigable rivers, and the combined flow of all the rivers in the country amounts to approximately 49 000 million m³ per annum, less than half of that of the Zambezi River, the closest large river to South Africa. Groundwater plays a pivotal role, especially in rural water supplies. Because of the predominantly hard rock nature of South African geology, only 20 percent of groundwater occurs in major aquifer systems that could be utilized on a large scale.

Owing to the poor spatial distribution of rainfall, as shown in Figure 1, the natural availability of water across the country is also highly imbalanced. This situation is compounded by the strong seasonality of rainfall, as well as high within-season variability over virtually the entire country. Consequently, surface runoff is also highly variable. As a result, stream flow in South African rivers is at relatively low levels for most of the time. The sporadic high flows that do occur limit the proportion of stream flow that can be relied on to be available for use. To aggravate the situation, most urban and industrial development, as well as some dense rural settlements, have been established in locations remote from large watercourses, dictated either by the occurrence of mineral riches or by political dispensations of the past. As a result, in

several river basins, the requirement for water already far exceeds its natural availability, and widespread and often large-scale transfers of water across catchments have already been implemented in past decades.

FIGURE 1
Rainfall and evaporation map of Southern Africa.



EVOLUTION OF WATER USE AND WATER LAW IN SOUTH AFRICA

Background

South Africa was under Netherlands rule from the time of Van Riebeeck to the United Kingdom occupation early in the nineteenth century. All land was held in leasehold, therefore the State had ownership of all water and had absolute control over its applied use. Irrigation was from direct diversion of rivers. The responsibility for water resource development was in the hands of private enterprise.

During United Kingdom occupation in the early nineteenth century, freehold land tenure was introduced. Under English law, the natural rights appertaining to the land belonged to the owner. The riparian principle, namely that all owners of land along rivers had common rights to the water in such rivers, became established. Special water courts were created to apportion water and to determine individual rights. The Irrigation and Conservation of Water Act (No. 8 of 1912) was eminently suited to promoting irrigation development in accordance with these principles. With this, the State concentrated on the construction of works to benefit irrigation.

But the country developed, and it was realized after the Second World War that the 1912 act was obsolete in that it did not make provision for the growing needs of industry and other users in what had turned out to be a water-deficient country. As the result of a Commission of Enquiry,

which reported in 1952, a new Water Act (No. 54 of 1956) was promulgated, which was the first attempt in South Africa to regulate the use of public water for all demand sectors of the economy to the best national advantage. Unfortunately, the concept of State control was reintroduced (portion in excess of existing users' rights). The principle of private ownership was still enforced, and access to water for production purposes was still tied to landownership (the riparian system).

The National Water Policy

Since the advent of a democratic South Africa in 1994, government policy has focused strongly on equitable and sustainable social and economic development for the benefit of all people in South Africa. However, many existing laws – including the law relating to water – were not at all appropriate in achieving these objectives. The National Water Policy (NWP), adopted by Cabinet in 1997, was introduced in response to the new direction set by government and as part of a thorough review of existing water law.

The NWP was preceded in 1996 by the development of 28 Fundamental Principles and Objectives for New South African Water Law. Principle 7 is particularly relevant and states that:

The objective of managing the quantity, quality and reliability of the nation's water resources is to achieve optimum, long-term, environmentally sustainable social and economic benefit for society from their use.

This became the cornerstone for the priorities for water resource management in South Africa.

Three fundamental objectives for managing South Africa's water resources, which are firmly grounded in the provisions of the Bill of Rights of the Constitution of South Africa (No. 108 of 1996), arise from these principles. These objectives are to achieve:

- equitable access to water;
- sustainable use of water;
- efficient and effective water.

Important proposals to facilitate achievement of the NWP objectives include the following:

- Water will be regarded as an indivisible national asset. National government will act as the custodian of the nation's water resources, and its powers in this regard will be exercised as a public trust.
- Water required to meet basic human needs and to maintain environmental sustainability (the reserve) will be guaranteed as a right, while water use for all other purposes will be subject to a system of administrative authorizations.
- The responsibility and authority for water resource management will be progressively decentralized through the establishment of suitable regional and local institutions. These will have appropriate community, racial and gender representation to enable all interested persons to participate.

Implementation of the NWP proposals will fundamentally change the ways in which South Africa's water resources are managed.

The National Water Act

The National Water Act (NWA) (No. 36 of 1998) derives directly from the Fundamental Principles and Objectives for a New South African Water Law and the NWP proposals for managing water resources. The NWA is the principal legal instrument relating to water resource management in South Africa and contains comprehensive provisions for the protection, use, development, conservation, management and control of South Africa's water resources. These legal provisions enable the proposals in the NWP to be implemented. The NWA was therefore enacted in recognition of the following:

- the water cycle, and water's scarcity and uneven distribution;
- although water belongs to all the people of South Africa, some were excluded from its use in the past;
- water is a national asset, and the national government should therefore be its custodian;
- the ultimate aim of water resource management is to achieve sustainable use;
- the quality of water should be protected to ensure sustainability;
- the need for integrated management of all aspects of water resources and the delegation of management functions to the regional or catchment level.

However, the NWA is not the only instrument through which the objectives of the NWP will be achieved. It is supported by other legislation such as the Water Services Act (No. 108 of 1997) and the National Environmental Management Act (No. 107 of 1998).

The National Water Resource Strategy

The implementation of the NWA is a progressive process that will subject the country to gradual water reform for a long period. An important initial step was the development of the first edition of the National Water Resource Strategy (NWRS). The NWRS describes how the water resources of South Africa will be protected, used, developed, conserved, managed and controlled in accordance with the requirements of the policy and law. The central objective of managing water resources is to ensure that water is used to support equitable and sustainable social and economic transformation and development.

The NWA is a national framework for managing water resources, developing catchment management strategies and giving information on the Minister's intentions for water resources management. The NWA is also utilized to identify development opportunities, as well as constraints.

Catchment Management Strategies

A vital element of the NWRS is the progressive decentralization of the responsibility and authority for water resource management to Catchment Management Agencies (CMAs) and, at the local level, water user associations. The initial functions of the agencies include the important responsibility of developing a Catchment Management Strategy (CMS) for each Water Management Area (WMA). This strategy may not be in conflict with the NWRS, and must give effect to the NWRS's provisions and requirements, providing the

framework for managing the water resources of the area. In particular, it must determine the principles according to which the available water will be allocated among competing user groups.

Internal Strategic Perspectives

The first step towards the CMS, which is the writing up of the so-called Internal Strategic Perspectives (ISPs), has already been done, and ISPs for a number of WMAs are already available in the public domain.

The Department of Water Affairs and Forestry's (DWAF) regional offices have to manage the water resources in their areas of jurisdiction until they can hand over some of these management functions to established and fully operational CMAs. In accordance with the NWA, the Minister of DWAF will retain ultimate responsibility for the management of the water resources.

In light of this responsibility, DWAF's corporate perspective on how the water resources should be managed needs to be formally put on paper. This is with a view to maintaining consistency when answering requests for new water licences, and informing existing water users (including authorities) on how DWAF will manage the water resources within the area of concern and which decision support information still needs to be collected.

SOUTH AFRICA'S WATER SITUATION AND STRATEGIES TO BALANCE SUPPLY AND DEMAND

Background

Although South Africa's water resources are limited and highly variable, they will be sufficient to support social and economic development for the foreseeable future, provided that they are judiciously managed and wisely allocated and utilized.

An important basic concept relating to water resources management that needs to be explained is the portion of the available water, in respect of both quantity and quality, in each WMA that is under the direct control of the DWAF Minister in terms of his or her national responsibilities. This includes the reserve water necessary to meet international obligations, provision to meet realistic future requirements, transfers between WMAs and water of strategic importance.

Once these obligations are met, the balance is allocated to the various other users in the catchments.

The reserve

In the NWA (and therefore also the NWRS), the highest priority is afforded to the provision of water for the purposes of the reserve. The first objective is to ensure that sufficient quantities of water of appropriate quality are readily available to provide for basic human needs.

The second objective is the provision of water for safeguarding and sustaining healthy ecosystems, including fauna and flora. This can also be termed the Ecological Water Requirements (EWR). Owing to the complex interdependence among species in nature, and our extremely limited knowledge of the wide spectrum of habitat and water requirements, only provisional estimates of the EWR are presented in the NWRS.

In simple terms, it can be said that the EWR is the water that should be left in a river (or wetland or estuary) for the healthy ecological functioning of the system. This water is not available for abstraction and therefore limits the available yield from the system. Allowance for EWR has been made in all yield numbers quoted in the NWRS.

Water required for international rights and obligations

Four of South Africa's rivers are shared with other countries. These are the Limpopo, Inkomati, Pongola (Maputo) and Orange (Senqu) rivers, which together drain about 60 percent of the country's land area and contribute about 40 percent of its total runoff (river flow). Approximately 70 percent of South Africa's gross domestic product (GDP) and a similar percentage of the population are supported by water supplied from these rivers, making their judicious joint management of paramount importance to South Africa.

Water use of strategic importance

Electricity is fundamental to the functioning of modern society, and the abstraction and storing of water for use at power stations operated by Eskom, as the organization entrusted with generating the bulk of the country's electricity, is therefore regarded as being water use of strategic importance.

Reservation for transfer between WMAs

The allocation of reserves for transfer between WMAs is also regarded as water use of strategic importance, and is established by the Minister in the NWRS.

Contingency to meet projected future growth

As part of the reconciliation of supply and demand, projections were made of the future requirements for water, together with an indication of the resource potential that could still be developed. The best strategies for the future reconciliation of requirements and availability will be combinations of various possible interventions. Only under certain conditions will further developments and transfers of water prove to be desirable. It is therefore not generally practical for reservations to be made of specific quantities of water to allow for future growth. However, there are certain instances in which the limited resources still available must be reserved (e.g. where known quantities of water need to be reserved for specific uses or transfers; where general reserves that are not quantifiable at present need to be made for future priority uses; and where dam sites need to be reserved for specific purposes).

This will ensure that optimal development choices are not foregone and developments are not allowed in one area that will unwittingly prejudice another.

STRATEGIES FOR WATER RESOURCES MANAGEMENT

Background

Strategies, objectives, plans, guidelines, procedures and institutional arrangements are necessary to implement the provisions of the NWA. This paper has alluded to some of these, such as the reserve and other water use under the direct control of the Minister and water management institutions. We need briefly to explain some of the other important provisions.

Protection of water resources

It was indicated in the preceding section on the evolution of water use and water law that the fundamental objectives for managing South Africa's water resources are to achieve equitable access to water resources, and their sustainable and efficient use. In the section on the strategies needed to balance supply and demand, it was concluded that the country's water resources will be sufficient to support development for the foreseeable future.

Equitable access has both a short-term and a long-term dimension. It is important that the needs of current and future generations are considered in the management of water resources.

To give effect to the interrelated objectives of sustainability and equity, an approach to managing water resources has been adopted. This introduces measures to protect water resources by setting objectives for the desired condition of resources, and putting measures in place to control water use to limit impacts to acceptable levels.

The approach comprises the following two complementary strategies:

- *Resource-directed measures:* These measures focus on the quality of the water resource itself. Resource quality reflects the overall health or condition of the water resource, and is a measure of its ecological status. Resource quality includes water quantity and water quality, as well as the character and condition of in-stream and riparian habitats, and the characteristics, conditions and distribution of the aquatic biota. The class of a resource, the reserve and its resource quality objectives are intimately related to one another. The reserve includes the quantity and quality of water to meet basic human needs and protect aquatic ecosystems. Resource quality objectives provide numerical and/or descriptive statements about the biological, chemical and physical attributes that characterize a resource for the level of protection defined by its class. Resource quality objectives must take account of user requirements and the class of the resource. Accordingly, the determination of the management class of a resource, and the related reserve and resource quality objectives (jointly, a resource-directed measures determination) will usually be undertaken as an integrated exercise.

CONTENTS

	Preface	iii
	Editor's note.....	vii
	Acknowledgements	ix
	Acronyms	x
	Introduction.....	1
PART 1	FAO WATERSHED MANAGEMENT REVIEW	
CHAPTER 1	Preparing the next generation of watershed management programmes <i>Moujahed Achouri</i>	11
CHAPTER 2	Review and assessment of watershed management strategies and approaches <i>Larry Tennyson</i>	19
PART 2	LINKS AMONG LAND USE, TREE COVER AND WATER IN WATERSHEDS	
CHAPTER 3	Land–water relationships in rural watersheds <i>Jean-Marc Faurès</i>	43
CHAPTER 4	Watershed management – can we incorporate more evidence-based policies?..... <i>Ian R. Calder</i>	51
PART 3	FARMING AND WATERSHED MANAGEMENT IN SUB-SAHARAN AFRICA	
CHAPTER 5	Runoff and erosion control under improved fallows in western Kenya <i>Anja Boye and Alain Albrecht</i>	71
CHAPTER 6	Results from ten years of watershed and water resources research in semi-arid southern Zimbabwe	83
	<i>F. T. Mugabe</i>	
CHAPTER 7	Conservation farming – a strategy for improved agricultural and water productivity among smallholder farmers in drought-prone environments	91
	<i>Johan Rockström and Kurt Steiner</i>	
CHAPTER 8	Above-ground transformations in agroforestry systems in watersheds: case of cocoa agroforests of central Cameroon	103
	<i>P. Mbile, N. Besingi, M. Tonka, Z. Tchoundjeu and A. Atanganae</i>	
PART 4	SOCIAL ASPECTS OF WATERSHED MANAGEMENT	
CHAPTER 9	The sociological approach in watershed management: from participation to decentralization	117
	<i>Jean Bonnal</i>	
CHAPTER 10	Catchment property rights and the case of Kenya's Nyando basin	123
	<i>Brent Swallow, Leah Onyango and Ruth Meinzen-Dick</i>	
CHAPTER 11	Managing micro-catchment resources: institutional arrangements for water use in Chiwi district, Zimbabwe	137
	<i>Nontokozi Nemarundwe</i>	

- *Source-directed measures:* These measures contribute to defining the limits and constraints that must be imposed on the use of water resources to achieve the desired level of protection. They are primarily designed to control water use at the source of impact.

Water use

Concerning equity of access, the NWA replaces the previous system of water rights and entitlements (many of which were based on the ownership of riparian land) with a system of administrative, limited-period and conditional authorizations to use water.

“Schedule 1 use” (relatively small quantities of water) and “use under a general authorization” (limited, but conditional, water use without a licence) were introduced in the NWA. These were primarily intended to reduce the administrative effort of authorizing each individual water use in the country. However, a licence is required for any water use that exceeds a Schedule 1 use, or that exceeds the limits imposed under the general authorizations.

It is important to note (as previously stated) that the reserve has priority over all water uses and that the requirements of the reserve must be allowed for before any water use is licensed.

CONCLUSION

Many challenges face South African water resource managers in ensuring that water supports the transformation of society and the economy, and neither the resources nor the time required to address them should be underestimated. However, building on the outstanding foundation provided by the NWA, the NWRS will guide the achievement of the common vision of an equitable and sustainable society.

REFERENCES

- DWAF. Internal Strategic Perspective (24 reports covering all 19 Water Management Areas, some still to be published). Available at: www.dwaf.gov.za/documents/.
- DWAF. 1986. *Management of the water resources of the Republic of South Africa*.
- DWAF. 1997. *White Paper on a National Water Policy for South Africa, April 1997*. Available at: www.dwaf.gov.za/documents/.
- DWAF. 2004. *National Water Resource Strategy, First Edition*. Available at: www.dwaf.gov.za/documents/.
- Government of South Africa. Constitution of the Republic of South Africa.
- Government of South Africa. 1998. National Water Act. No. 36.