

Decision Making Framework for Municipalities



NORAD

DIREKTORATET FOR
UTVIKLINGSSAMARBEID
NORWEGIAN AGENCY FOR
DEVELOPMENT COOPERATION

TOOLKIT for WATER SERVICES: Number 7.3

This document is written primarily for municipalities in making decisions for water supply and sanitation. It is designed to be used in conjunction with the A1 size poster entitled 'Appropriate Solutions for Water Supply and Sanitation: Decision Making Framework for Municipalities'.

Decision Making Framework for Municipalities

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under the Community Water and Sanitation Programme in South Africa**

Foreword

Toolkit for Water Services

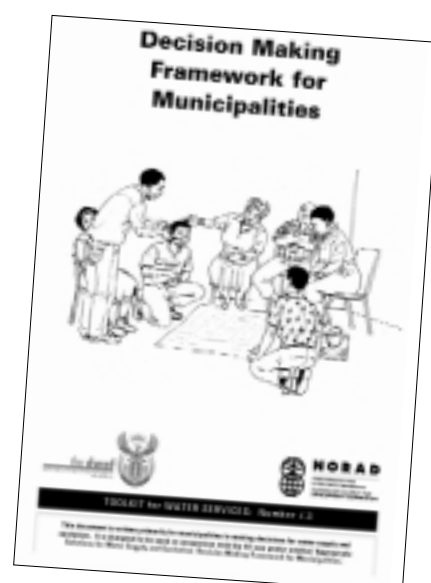
Groundwater has historically been given limited attention, and has not been perceived as an important water resource, in South Africa. This is reflected in general statistics showing that only 13 % of the nation's total water supply originate from groundwater. However, because of the highly distributed nature of the water demand in rural and informal peri-urban settlements, regional schemes are, in most instances, not economically feasible. And because of generally increasing water scarcity and decreasing available river and spring flows during low flow and drought periods, as well as wide-spread problems of surface water pollution in rural areas, groundwater will be the most feasible option for a large part of the new water demand. Already it is estimated that over sixty percent of community water supply is from groundwater, making it a strategically important resource.

The NORAD-Assisted Programme for the Sustainable Development of Groundwater Sources under the Community Water and Sanitation Programme in South Africa was managed by the Department of Water Affairs and Forestry (DWAF) between 2000 and 2004. The Programme undertook a series of inter-related projects aimed at enhancing capacity of water services authorities and DWAF to promote and implement sustainable rural water supply schemes based on groundwater resources and appropriate technologies.

Page 2 has a full list of the Programme outputs. The formats for these range from documents to software programmes and an internet portal, to reference sites where communities have implemented appropriate technologies. For more information on the "package" of Programme outputs contact your nearest DWAF Regional Office or Head Office in Pretoria.

It is our sincere hope that this Programme will contribute to the body of work that exists to enable more appropriate use and management of groundwater in South Africa.

The ***Decision Making Framework for Municipalities*** is Number 7.3 in the Toolkit for Water Services. This document is written primarily for municipalities in making decisions for water supply and sanitation. It is designed to be used in conjunction with the A1 size poster entitled **Appropriate Solutions for Water Supply and Sanitation: Decision Making Framework for Municipalities**.



Toolkit for Water Services

1 Overview documentation

- 1.1 A Framework for Groundwater Management of Community Water Supply
- 1.2 Implementing a Rural Groundwater Management System: a step-by-step guide

2 Descriptors

- 2.1 Standard Descriptors for Geosites

3 Groundwater Protection

- 3.1 Involving community members in a hydrocensus
- 3.2 Guidelines for protecting springs
- 3.3 Guidelines for protecting boreholes and wells
- 3.4 Guidelines on protecting groundwater from contamination
 - 3.4.1 Animal kraals, watering points and dipping tanks
 - 3.4.2 Burial sites
 - 3.4.3 Informal vehicle servicing, spray painting and parts washing facilities
 - 3.4.4 Pit latrines
 - 3.4.5 Runoff water
 - 3.4.6 Subsistence agriculture
 - 3.4.7 Informal waste disposal

4 Maps

- 4.1 Thematic Groundwater Maps

5 Software

- 5.1 Sustainability Indexing Tool (SusIT)
 - 5.1.1 SusIT User Guide
 - 5.1.2 SusIT Field Data Capturer's User Manual
 - 5.1.3 SusIT Questionnaire
 - 5.1.4 SusIT Information Brochure
- 5.2 AquiMon Management System
 - 5.2.1 AquiMon Information Brochure
- 5.3 Geohydrological Data Access System (GDAS)
 - 5.3.1 GDAS Information Brochure

6 Monitoring

- 6.1 Groundwater Monitoring for Pump Operators

7 Sustainability

- 7.1 Sustainability Best Practices Guidelines for Rural Water Services
- 7.2 Introductory Guide to Appropriate Solutions for Water and Sanitation

7.3 Decision Making Framework for Municipalities

8 Reference Sites

- 8.1 Genadendal Information Brochure
- 8.2 Kammiesberg Information Brochure
- 8.3 Maputaland Information Brochure

Introduction

This document has been compiled as A4 pages – and is designed to be used in conjunction with the A1 size poster entitled **Appropriate Solutions for Water Supply and Sanitation: Decision Making Framework for Municipalities**.

The A4 pages are intended for use as notes pages in discussions, workshops, or municipal planning sessions – along with the poster.

Frequently, inappropriate technical solutions are implemented in water and sanitation projects owing to a lack of understanding of institutional, affordability, water availability and demand issues.

The **Decision Making Framework for Municipalities** (A1 size poster and this document) are useful tools to assist stakeholders understand the issues and ensure that correct information is gathered for informed decisions around sustainable water and sanitation services.

These were developed on the assumption that, at present, the default service is a pressurised water supply inside a house; and a flush toilet leading to a local or centralised treatment plant. If the Framework indicates that the requirements for this level of service cannot be satisfied then it guides the user to more appropriate solutions. It focuses on three areas – available water resources, water demand and affordability.

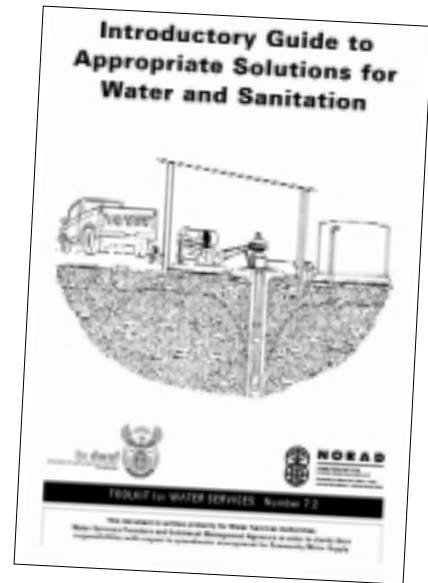
The Framework is designed to be used by:

- 1) Municipal-run public discussions on appropriate service solutions. These discussions feed through ward committees into municipal decision making processes.
- 2) Municipal officials and councillors when deciding how to provide services to their residents.
- 3) Provincial and national officials when reviewing applications for conditional grant funding, water abstraction and discharge, and Environmental Impact Assessments.

The Framework guides users through a number of important factors. If a decision cannot be made owing to lack of information the Framework alerts users to the fact that more information must be gathered for the process to continue. The Framework encourages a number of information gathering processes to proceed in parallel – significantly speeding up the process.

When one is asked in this document to “look for other water sources and / or solutions” or “consider more appropriate options”, the ***Introductory Guide to Appropriate Solutions for Water and Sanitation*** (Number 7.2 in the Toolkit for Water Services) serves as a reference document.

The Introductory Guide contains information on a range of appropriate solutions – covering areas such as the capital, operating and maintenance costs; and the socio-economic, institutional and geographic requirements. It also provides information on payment options and technologies.



WATER RESOURCE

**What type of water sources are available?
How much water is available from the source?**

**Choose one or more of the following available water source options
Note the points for consideration for each water source**

◆ **BULK PIPELINE**

- Size of pipeline
- Allocation
- Capital and maintenance costs

◆ **SURFACE WATER**

- Assess minimum flow (rainfall and evaporation)
- Environmental reserve
- Other allocations
- Capital and maintenance cost

◆ **SPRINGS**

- Minimum flow
- Sustainable yield assessment
- Environmental reserve
- Capital and maintenance cost

◆ **GROUNDWATER**

- Geology
- Rainfall, evaporation
- Existing borehole information
- Abstraction technology
- Aquifer technology
- Environmental reserve
- Sustainable yield assessment
- Groundwater management plan
- Capital and maintenance cost

◆ **EFFLUENT RECYCLING**

- Effluent quality
- Permissible uses
- Capital and maintenance cost

◆ **FOG HARVESTING**

- Presence of fog
- Net size
- Capital and maintenance cost

◆ **GREYWATER RECYCLING**

- Permissible uses
- Capital and maintenance cost

◆ **SAND ABSTRACTION**

- Quality of aquifer in river
- Abstraction technology
- Assessment of river flow
- Capital and maintenance costs

◆ **RAINWATER HARVESTING**

- Rainfall amount and intensity
- Roof area
- Appropriate ground surface
- Storage capacity
- Channelling / losses
- Capital and maintenance cost

Once possible sources of water are identified, go to the sections on WATER TREATMENT and PUMPING

WATER RESOURCE

WATER TREATMENT

Is treatment of the water source required?

What is the quality of the water source/s?

- ♦ Bulk pipeline
- ♦ Surface water
- ♦ Springs
- ♦ Groundwater
- ♦ Sand abstraction
- ♦ Greywater recycling
- ♦ Effluent recycling
- ♦ Rainwater harvesting
- ♦ Fog harvesting

Are the chosen water sources of Class 2 quality or higher?

NO

YES

Calculate costs for:

- ♦ Treatment options
- ♦ Using different water sources for different purposes
- ♦ Protecting water sources to prevent pollution

If treatment is required, calculate costs for:

- ♦ Treatment options

Once costs are established, go to section on PUMPING (if pumps are to be used)

PUMPING

Is pumping required?
If so, what volumes are required?

Is electricity available and affordable?

NO

YES

Is diesel available and affordable?

Electric powered pump

NO

YES

Diesel powered pump

Consider alternative energy sources

Wind

Solar

Handpumps

Calculate costs for choice of pump option

Once treatment and pumping costs are calculated, go to section on AFFORDABILITY

WATER DEMAND

WATER USAGE

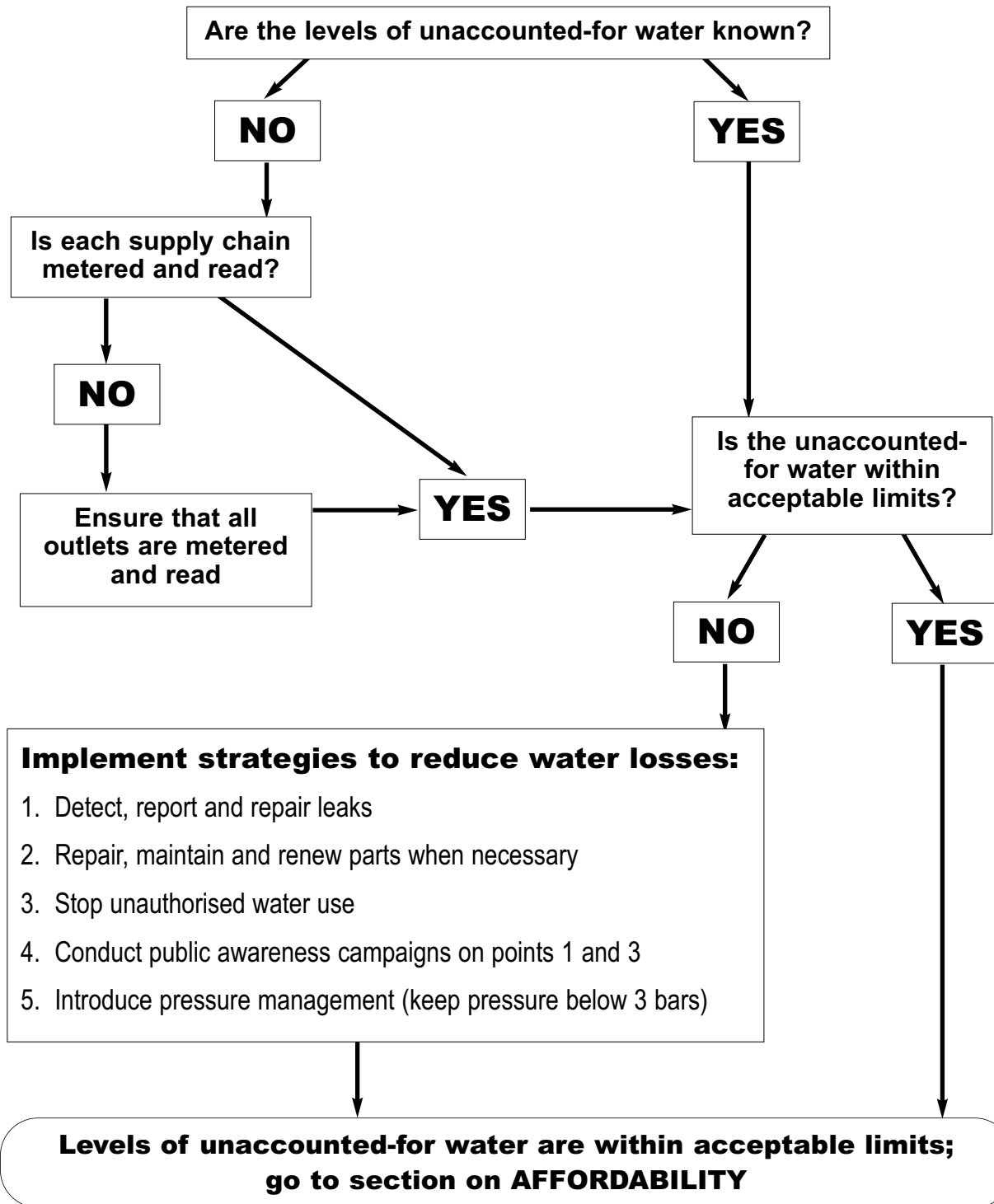
Calculate the water usage for the following:

- ◆ POTABLE WATER
- ◆ RECREATION
- ◆ LIVESTOCK

- ◆ PERSONAL HYGIENE
- ◆ INDUSTRY
- ◆ WATER LOSS (see expanded section below)
- ◆ WASHING CLOTHES
- ◆ COMMERCE

- ◆ GARDENING
- ◆ IRRIGATION
- ◆ SANITATION

WATER LOSS



Remember, WATER DEMAND must be LESS than the capacity of the WATER RESOURCE; implement WATER DEMAND MANAGEMENT until it is

WATER DEMAND

WATER USAGE

Calculate the water usage for the following:

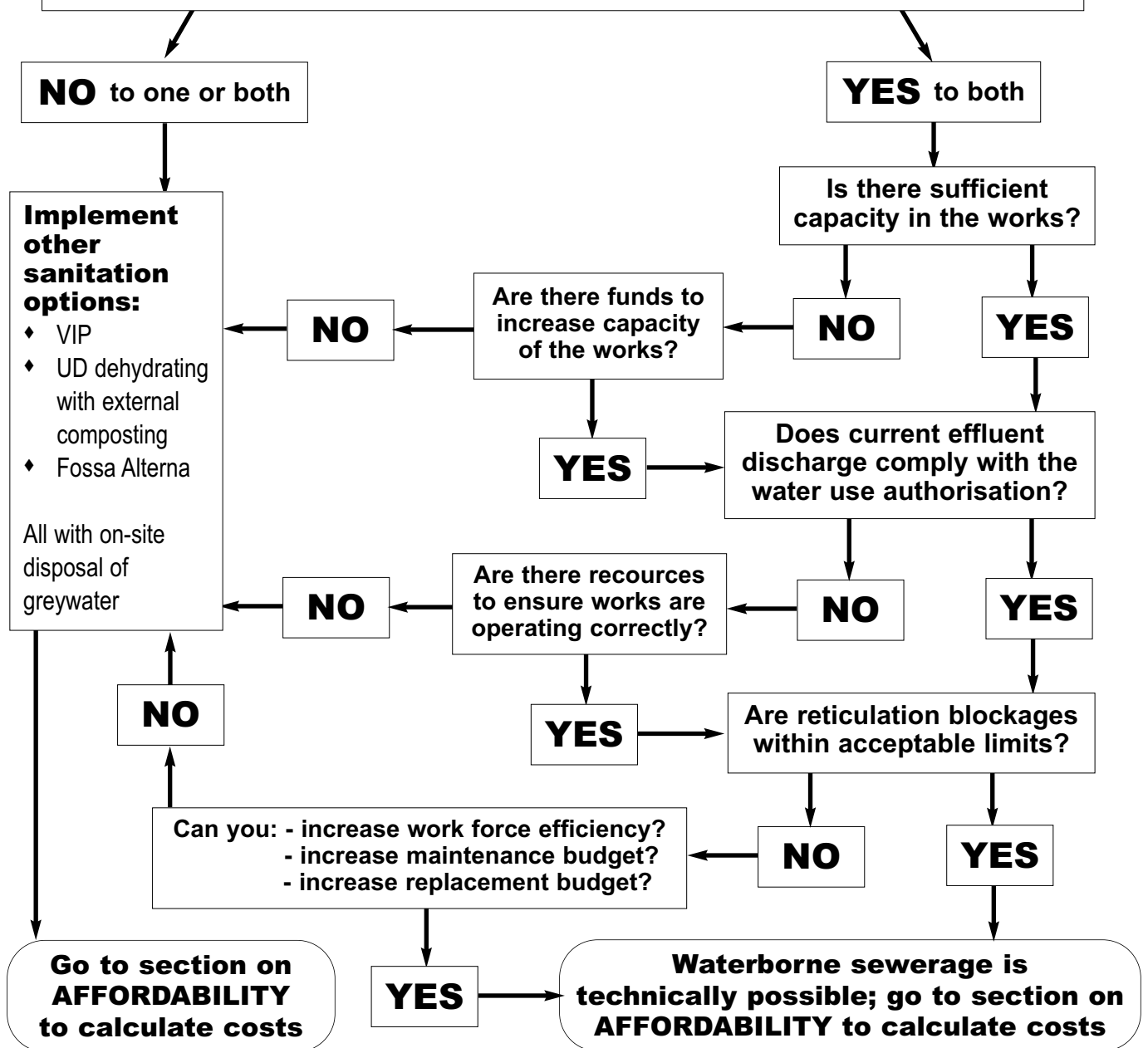
- ◆ POTABLE WATER
- ◆ RECREATION
- ◆ LIVESTOCK
- ◆ PERSONAL HYGIENE
- ◆ INDUSTRY
- ◆ WATER LOSS
- ◆ WASHING CLOTHES
- ◆ COMMERCE
- ◆ SANITATION (see expanded section below)
- ◆ GARDENING
- ◆ IRRIGATION

SANITATION

Sanitation is a focus area where service options are determined by the availability of water and the ability to treat the waste institutionally

Answer the following:

- ◆ Is there a household water connection?
- ◆ Is there sufficient water in the resource? If not, can water demand be lowered to give extra capacity?



Remember, **WATER DEMAND** must be **LESS** than the capacity of the **WATER RESOURCE**; implement **WATER DEMAND MANAGEMENT** until it is

WATER DEMAND

WATER DEMAND MANAGEMENT

Promote water conservation and capacity building in water demand management

Consider the following three questions:

1. If billing is in arrears, are credit controls enforced?

- ♦ Are bylaws in place?
- ♦ Think about what can trigger corrective action.
For example, non-payment could lead to a restriction (6 000l) and then to a cut.

2. Are any of the following metering and billing options used which encourage conservation?

- ♦ Rising block tariffs
- ♦ Limited supply times
- ♦ Prepaid system
- ♦ Trickle feed system
- ♦ Durban tank system

3. Are any of the following water conservation techniques promoted?

- ♦ Household greywater recycling
- ♦ Waterwise gardening
- ♦ Dry or low flush sanitation
- ♦ Water loss management

If DEMAND MANAGEMENT will not reduce water demand sufficiently, look for other water sources and / or solutions which use less water

AFFORDABILITY

Before implementing a water or sanitation service, expenditure needs to be matched with income

