

CHAPTER 8 - WATER CONSERVATION AND WATER DEMAND MANAGEMENT STRATEGIES

NEED FOR WATER CONSERVATION AND WATER DEMAND MANAGEMENT STRATEGIES

The options for further augmentation of water supply through new physical infrastructure are limited in this ISP area. Attention needs to be devoted to managing the demand for water, encouraging its efficient and effective use, and the minimisation of loss or waste. The foundation of effective water conservation and demand management is the creation of a water conservation and demand management culture within all water management and water services institutions and among water users.

The National Water Conservation and Demand Management Strategy is based on the reasonable premise that many water users can maintain their quality of life and achieve the desired outcomes from their water use, whilst using less water. Significant reductions in water use can be achieved by changes in behaviour and the adoption of water-saving technologies. DWAF will continue to encourage all water users to voluntarily comply with the water conservation and demand management principles and strategies.

The *Water Conservation and Demand Management Main Strategy* is required to address urban, agricultural and industrial conservation measures and water demand management.

RELEVANT IDENTIFIED STRATEGIES

The following specific strategies have been developed further:

- 8.1 Urban and industrial water conservation and demand management;
- 8.2 Agricultural water conservation and demand management;

8.1 URBAN AND INDUSTRIAL WATER CONSERVATION AND DEMAND MANAGEMENT

Management objective:

Utilisation of the opportunities created through the NWA to identify the need for regional urban and industrial water demand management measures and to promote the implementation thereof through co-operative governance, assistance, buy-in and capacity building.

Situation assessment:

As urban use is volumetrically small in this area, not that much can be saved. Many small towns are however in severe trouble (refer to **Table 5.1**, which contains information on WDM initiatives and successes, where known) and water conservation and demand management (WC&DM) is absolutely essential for these towns if they are to survive and grow. There is often little or no other source of supply.

The level of WC&DM is unacceptable for most municipalities in the ISP area. There is notably a need to urgently address it in areas such as Ngqushwa (larger Peddie area), Graaff-Reinet, Middelburg and Jansenville. There is a lack of information which is needed to prioritise the WC&DM initiatives for each municipality. It is up to the district municipalities and municipalities to implement demand management programmes – not always easy in the face of non-payment, illegal connections and unmetered water use.

WDM studies and projects

The Ngqushwa (larger Peddie area) Water Demand Management (WDM) Study showed that unaccounted for water (UAW) is above 60%, which is a general problem in the area. Many of the water services schemes in the area have been badly designed and there are many illegal connections.

A WDM Strategy was completed for Graaff-Reinet. WC&DM was a condition for Graaff-Reinet to acquire Nqweba Dam, although their progress with the implementation of WC&DM is still regarded as inadequate. Graaff-Reinet has poor water management, metering and maintenance. The municipality needs to advertise for a WC&DM post. Payment for water is good, up to 90%, while UAW is 37% and bulk meters have been installed.

A ‘learn to value water’ project was done by DWAF in Grahamstown, which was one of the first pilot towns for WC&DM. Chris Hani DM agreed to implement a holistic WC&DM project. Uitkeer also recently improved their WC&DM. WDM is insufficient in Bushmans River Mouth/Kenton-on-Sea.

Industrial water demand management

The ISP area has no mining activities of particular significance and no large-scale power generation. Most industries fall within municipal boundaries. Limited industrial demand management initiatives have so far been undertaken.

Strategic approach:

WC&DM must be promoted throughout the ISP area. Each town will be required to develop and implement a WDM Plan, according to identified priorities in terms of the WC&DM principles. Although District Municipalities are responsible for ensuring that local authorities implement WDM, DWAF should in the interim continue to assist, until the District Municipalities are capacitated financially and technically.

The only direct control which DWAF has over water use and its efficiency is through the issuing of licences. The implementation of further augmentation options that require infrastructural development will not be approved if serious and adequate steps have not been taken by municipalities and industries to ensure that water is not being wasted and UAW is at an acceptable level. Municipal water tariffs should also be increasingly used to contain water demand in order to avoid new expensive water schemes.

It is advisable that the DWAF head office and regional office, and/or the CMAs in future should assist the municipalities by appointing consultants to do situation assessments and to develop water demand management strategies, guide them with the implementation thereof and do monitoring and evaluation. Otherwise it is unlikely that such measures will be implemented in many municipalities. Funds for such studies could be generated through water tariffs.

Management actions:

Develop and implement a regional urban water conservation and demand management strategy as follows:

Promotion of WC&DM

1. Use the water allocation process to promote water conservation and demand management principles;
2. Promote the principles of water conservation and demand management through forums and the media. Encourage the use of printed and electronic media to disseminate information to all stakeholders and contribute regular articles to relevant publications to promote the concepts of water conservation and demand management;
3. Regularly liaise with responsible officials and if necessary politicians at municipalities where water demand management interventions are required and aggressively promote the implementation of demand management measures;

WSDPs

4. Ensure that the WSDPs of local authorities address the implementation of local water conservation and demand management strategies prior to the development of new schemes, as well as plans for the use of water saved through effective demand management measures;
5. Review submitted WSDPs to ensure that water conservation and demand management objectives have been adequately addressed;

WDM Plans

6. Facilitate the establishment of a water demand management plan for each local authority, according to priority, through co-operative governance;
7. Assist municipalities to draw up detailed local urban conservation and demand management strategies where required, co-operatively with the responsible District Municipality;
8. WC&DM plans should include benchmarking. Set benchmark targets for water savings with local authorities through co-operative governance;
9. Ensure through co-operative governance that the WDM Plan for Graaff-Reinet is properly implemented;
10. Promote the drafting and implementation of WDM Strategies through co-operative governance in Aberdeen, Alicedale, Middelburg, Jansenville, Fort Beaufort and Seymour, as well as in other small towns where it is required.

Capacity building and assistance

11. Build capacity of municipal officials in local authorities by providing appropriate support services where these are needed in local planning, development of new supply schemes or rehabilitation of existing schemes. Specific attention may be required for the Ngqushwa (larger-Peddie) area, where the responsibility rests with the Amatole DM;
12. Ask the Directorate Water Use Efficiency and the regional Water Use Efficiency division to assist district and local municipalities with the implementation of WDM, as a national priority, to overcome the technical barriers many municipalities face;
13. Assist the municipalities financially by appointing consultants to do situation assessments, to develop WDM strategies and to assist with the implementation thereof. The funds can be generated through water resource management tariffs.

Develop and implement a regional industrial water conservation and demand management strategy as follows:

1. Identify the largest water consuming industries;
2. Classify those businesses that have the greatest impacts on the water resources in terms of water utilised, wastewater discharged and the efficiency and effectiveness thereof;
3. Develop regional and local levels of databases for the purposes of monitoring the water-related performance of businesses, and prioritise;
4. Undertake performance auditing on identified industries;
5. Ensure or facilitate the implementation of measures in industries where wastage is noted, such as fixing leaks to reduce further wastage;
6. Analyse the efficiency of production processes to understand how water is being utilised;
7. Design and implement communication, public awareness and education programmes as required;
8. Set up water conservation forums;
9. Identify and undertake pilot projects;
10. Manage non-conforming industries.

Responsibility:

Water Service Authorities and large individual water users are responsible for implementing urban water use demand management programmes that have developed with the assistance of DWAF. The

RO has a regulatory and advisory role but will continue its monitoring and mentoring role to build capacity and to promote the concept. D: WUE is responsible for a national framework and the development of standardised demand management methods and procedures. District Municipalities are responsible for ensuring that local WC&DM Plans are compiled and are implemented by the local municipalities.

Priority:

Priority 1: Very high.

8.2 AGRICULTURAL WATER CONSERVATION AND DEMAND MANAGEMENT

Management objective:

To ensure that irrigation water is beneficially and effectively used and that water conservation and demand management principles are applied by the agricultural sector.

Situation assessment:

An evaluation of agricultural water conservation and demand management shows that irrigation accounts for 94% of water requirements (excluding the ecological Reserve) in the ISP area. Generally, but especially outside of government water schemes, not enough is known about the efficiency of use. Inefficiencies in irrigated agriculture are significant, although the irrigation in the Lower Sundays Irrigation Board area is regarded as very efficient.

Along with verification of existing use, agricultural WC&DM is the most important measure in refining the water balance and making more water available to users. WC&DM must therefore take account of the water saved and ensure that where possible this is returned to the system for further allocation.

Irrigation water losses are considered in two categories, namely:

- Canal and river losses incurred in conveying water from the dam in which it is stored to the farms where it is used for irrigation, and
- On-farm losses, which consist of (a) conveyance losses, which occur in conveying the water from the point at which it is abstracted from a canal, river or farm dam to field edge and (b) application losses due to inefficient technologies.

As reliable information on farm conveyance losses is not available, estimates of combined canal and on-farm conveyance losses were done by officials of the DWAF Eastern Cape Regional Office for ORP water use and have been allowed for in water quotas. River conveyance losses have been separately calculated for ORP water.

Irrigation water distribution from the main canals to field edge in most of the large schemes and in all the small schemes is via earth canals in the Fish River catchment. Canal losses are therefore significant. Improved monitoring is required to more accurately determine the losses. Inefficient forms of flood irrigation is still practiced widely outside GWSs.

River losses are very significant (112 million m³/a in the ISP area) of which most is due to losses from transferred Orange River water for irrigation. There are also operational losses that can be reclaimed if operation of the water supply system is improved, although operation of the OFSWSS is already quite complex.

Implementation of WC&DM measures in the agricultural sector could result in more water being available to be used for:

- Resolving water over-allocations without resorting to compulsory licensing;
- Resource-poor farmers; and
- Expansion of agriculture and subsequent job creation.

Potential exists for the intensification of irrigated agriculture in the Fish and Sundays River catchments, through conversion to higher value crops, along with the establishment of an associated agricultural processing industry, as well as a move towards more efficient irrigation methods. Unused water rights, that was recently traded for use in the Orange River catchment, is a good example of water that was being used inefficiently (or not at all) and is now put to better use.

Leaching of soils is not widely practiced, although excess water to leach unwanted salts from the soils of irrigated lands is required, in especially the lower catchment areas.

Table 8.1 gives an indication of “usable” return flow in the ISP area, as used in calculations to determine the total local yield (see **Table 3.4**). These are best estimates of DWAF officials.

Table 8.1: Year 2000 estimated irrigation return flows as percentages of field edge irrigation requirements at 1:50 year assurance in million m³/a

Hydrological sub-divisions	Irrigation use	“Usable” Return flow	% Return flow
Groot Brak	59	0	0
Tarka	12	0	0
Upper Fish	171	39	23
Upper Little Fish	45	11	24
Middle Fish	108	25	23
Koonap	20	1	5
Kat	13	1	8
Lower Fish	16	0	0
Fish Total	444	77	17
Bushmans, Kowie/Kariega	11	0	0
Albany Coast Total	11	0	0
Upper Sundays	10	0	0
Middle Sundays	60	12	20
Lower Sundays	104	10	10
Sundays Total	174	22	13
Total for ISP area	629	99	16

Each WUA/irrigation board must have a water management plan. In the Gamtoos Irrigation Board area (Tsitsikamma to Coega ISP area) a pilot study is underway by the WUE Directorate to test the National WC&DM strategy, by assisting the Board to develop a pilot water management plan. The study investigates the efficiency of irrigation water use and possible improvements to operational aspects. The Gamtoos Agricultural WC&DM Pilot Study final report will be available during 2004.

The WUE Directorate will compile a generic document on Agricultural WC&DM. They will then aim to apply it at for each WUA/irrigation board.

Strategic approach:

The approach will be to create awareness, promote WC&DM through co-operative governance and provide advice on efficient irrigation water use. Inefficient water users will be put under pressure to use water more efficiently.

Serious attention must be paid to the option of lining earth canals. Water that can be saved from off-farm distribution canals must be returned to the system. Incentives for WUAs to implement such water saving measures must be devised.

Once the recommendations from the Gamtoos WC&DM study are made, DWAF will formulate further initiatives on effective agricultural water conservation measures. Reuse of effluent from fruit processing/packing industries will be encouraged wherever possible in the agricultural sector.

Unnecessary losses caused by operation of the OFSWSS as well as the high river losses will be assessed, and ways of reducing these losses and putting saved water to better use will be pursued. Exact amounts of water should be ordered and delivered on time. Farmers and WUAs should be held responsible for all water losses once water has been delivered to their area of jurisdiction.

Management actions:

Implement a regional agricultural water conservation and demand management strategy as follows:

Efficiency initiatives

1. Study the results arising from the WUE Directorate study into agricultural water demand management options in the Gamtoos GWS and:
 - a. Facilitate the implementation of applicable lessons learnt and make recommendations;
 - b. Facilitate the undertaking of water development plans for other irrigation schemes;
2. Quantify losses in irrigation and canal systems and provide guidance on rehabilitation and management options;
3. Review the additional releases which are currently provided for canal losses;
4. Include the evaluation of the efficiency of agricultural water distribution (including river losses) and use, as well as salt management at farm level, in the evaluation of the system operation, under the *Orange-Fish-Sundays WSS Management Strategy*, Strategy 12.1;
5. Set targets with WUAs (co-operative governance) for improved water use efficiency;
6. Promote the use of more water efficient irrigation equipment in order to conserve water. Discourage the use of inefficient forms of flood irrigation, which should be accompanied by laser leveling;
7. Provide appropriate support services where these are needed in planning, development of new irrigation schemes and rehabilitation of existing schemes;

Awareness

8. Ensure that WUAs and irrigation boards promote efficient water use by its members;
9. Use the water allocation process to promote water conservation and demand management principles;
10. Encourage the use of the printed and electronic media to disseminate information to all stakeholders and contribute regular articles to local agricultural publications to promote the concepts of WC&DM;
11. Initiate awareness campaigns through workshops, discussion forums, and newsletters.

Responsibility:

WUAs, Irrigation Boards and individual farmers are responsible for implementing agricultural water demand management programmes and the development of Water Management Plans, with the assistance of DWAF where necessary. The RO has a monitoring and mentoring responsibility to build capacity and to promote the principle. D: WUE is responsible for a national framework and the development of standardised agricultural demand management policy, methodology and procedures.

Priority:

1 – Very high.