# CHAPTER 6

# INSTITUTIONAL DEVELOPMENT

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# CHAPTER 6 INSTITUTIONAL DEVELOPMENT

## 6.1 Current Institutional Environment

### 6.1.1 Background to the Organisation of the Water Supply Sector in RSA

(1) National Water Legislation

National water policy in South Africa was laid down in the Water Act of 1956 (Act 54 of 1956) which has had 34 amendments since its inception. The Act laid down regulations governing the construction and maintenance of water works and the responsibility for managing different parts of the water network. It defined three types of water management institutions:

- State Water and Irrigation Schemes.
- Irrigation Boards; and
- Water Boards.

State Water and Irrigation Schemes are managed by DWAF and financed from the Central Government's consolidated budget. Irrigation Boards are statutory bodies established by groups of farmers to provide a service in an area in which they all have a common interest. In the case of water boards, the Minister of Water Affairs and Forestry recommends the establishment of a Water Board for a specific area to distribute bulk water for urban, industrial or agricultural use by local, state, and some central government authorities.

(2) Changes to Policy

Act 54 of 1956 did not clearly define the functions and responsibilities of the Central and Provincial governments. The new Government has been mindful of these problems and has taken a number of important steps:

- A new Department of Water Affairs and Forestry (DWAF) was established in July 1994 to replace the old Department of Water Affairs and to assume responsibility for water resources management, water supply, sanitation, and forestry functions and to better meet and manage the water related objectives of the RDP.
- A policy document, the White Paper on Water Supply and Sanitation Policy was published in November 1994 to clearly set out the policy for the new department in regard to water supply and sanitation services.
- New legislation has been promulgated to replace existing legislation in the areas of Water Services and the Water Laws. The former is of direct relevance to the Study and is discussed in Section 6.2 below.

### 6.1.2 DWAF

DWAF has the national responsibility for ensuring that the water supply and sanitation needs of the people and of the economy which sustains them are met effectively. As part of the reform process within DWAF, a new *Chief Directorate of Community Water Supply and Sanitation* was established to promote water supply and sanitation. The responsibilities of the Chief Directorate are to:

- Assure effective on-going operation of potable water supply systems for which DWAF is responsible;
- To plan and promote the expansion of services in collaboration with provincial governments;
- To develop organisations at the local and regional level to achieve the goals of the RDP; and
- To monitor and regulate water supply and sanitation activities in accordance with the constitution.

The White Paper on water supply and sanitation is geared towards the establishment of a clear framework to enable Third Tier institutions to play their role in implementing service provision at the local level.

As concerns the Study Area the regional office of DWAF are located in Mmabatho and Nelspruit which are distant from the FS Areas. It should not therefore be expected that any significant support can be provided in the Feasibility Study Areas. The DWAF regional office has however contributed actively to the Study process.

### 6.1.3 Water Boards (Bulk Water Supply)

(1) Traditional Role

Water Boards will continue to function as autonomous, not-for-profit utilities, but will assume expanded responsibilities:

- They will continue to supply water to organized communities and individual consumers which may also include the provision of sanitation services;

- They will assist in the establishment of statutory LWC's and will provide technical and administrative training to LWC's and local authorities. To ensure that water boards fulfill their new role DWAF has made the board of directors of water boards more representative; changed their supply areas to include former homelands; redefined their

functions to include supplying water to local communities where no authority exist and to include sanitation; and established new water boards where none exist.

(2) Changes to Role

A national study on the Scope and Functions of Water Boards was conducted to provide a framework for instituting necessary changes to existing as well as new water boards in areas not serviced by water boards so that they can undertake the duties and responsibilities outlined in the White Paper. The White Paper proposed that water boards increase the scope and extent of their functions to ensure that all Sough Africans have access to basic water supply and sanitation. To this end their new role is to:

- Establish a system of communications with communities within their area and explain the services and capabilities that the water board can offer;
- Establish procedures for the establishment of LWCS, including application for funding, technical assistance and training;
- Make funds available to LWCs including the provision of technical assistance in the planning of any local water supply and sanitation schemes; and
- Monitor the expenditure and application of funds for projects.

### 6.1.4 Specific Institutional Environment in the FS Area

(1) Rustenberg District Council

As indicated in the description of the project area, the North Mankwe Feasibility Study Area comprises four discrete groups of communities lying within the Mankwe District of North West Province, which in turn falls under the jurisdiction of Rustenburg DC. RDC has developed an organisational structure as shown in Figure 6-1. The chart illustrates the inclusion of a Technical Planning and Service Delivery Department which is intended to provide for the need to become involved in facilitating service delivery. It is significant to note that none of the posts in this department have yet been filled. The structure chart is summarised in Table 6-1.

**Table 6-1 Rustenburg District Council Staffing**

| | Posts | % of Total | Comment |
|---|---|---|---|
| **Total Organisation** | 48 | 100% | Significantly larger than Eastern DC which has 31 posts. |
| **Functions :** | | | |
| Finance / Treasury | 22 | 46% | |
| Administration | 15 | 31% | |
| Tech. / Planning / Development | 11 | 23% | None of these posts are filled |
| **Classification :** | | | |
| Management | 4 | 8% | |
| Technical & Professional | 10 | 21% | |
| Junior Administrative & Support | 34 | 71% | |

Note : Numbers in the table are for illustrative purposes only. These were correct at the time data was gathered. Actual numbers at any one time are likely to be slightly different due to staff movements and ongoing organisational change.

The above table illustrates that although RDC has a significant structure in place its capacity in service delivery is limited as there are only a small number of posts directly related to this process and these posts are not yet filled.

RDC has however created significant planning capacity by dividing the area of its jurisdiction into planning zones, allocating a councillor to each zone (Zonal Councillor) and appointing a Zonal Engineer (a firm of consulting engineers). Together with the councillor, these engineers are responsible for developing an integrated service delivery program (water, sanitation, transport, electricity, communications etc.) for the zone. In each case an integrated plan is being developed documenting the current situation, community needs, priorities and options. The Zonal Councillors and Engineers relevant to the Feasibility Study Area are shown in Table 6-2.

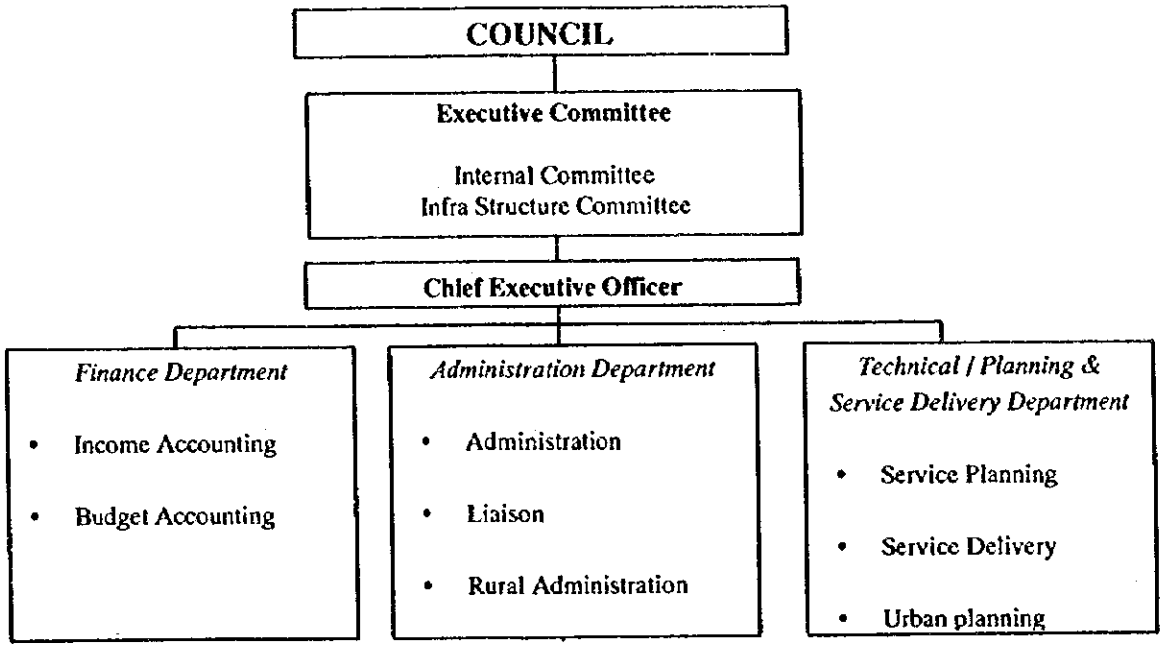
**Table 6-2 Rustenburg DC Portfolios : Service Delivery Program**

| Supply Block | Zone | Zonal Councillor | Zonal Engineer |
|---|---|---|---|
| Mokgalwaneng | Mankwe Zone 1 | Clr. Sibande | Stewart Scott |
| Sefikile | Mankwe Zone 1 | Clr. Sibande | Stewart Scott |
| Saulspoort (part) | Mankwe Zone 2 | Clr. Ntshwagong | VKE |
| Ramokokstad | Mankwe Zone 5 | Clr. Dibetso | Van Heerden, Calitz & Hayes |

Note: The Rustenburg DC area of jurisdiction is subdivided into 16 zones in total.

An area planning forum has been set up as discussed and this includes the North Mankwe Feasibility Study Area.

**Figure 6-1 Structure of Rustenberg District Council**




(2) Magalies Water

The North Mankwe FS Area is in relatively close proximity to MW's main center of operations. MW has recently revised its organisational structure to cater for assistance / support for the process of community service i.e. retail as well as bulk water supply. The absorption into this function of staff in the area who were formerly employed by NWWA has changed the whole profile of the MW organisation as is illustrated in Figure 6-2.

This figure illustrates that MW, (in addition to its functional divisions) is also organised on a regional basis. The Mankwe Area falls in the Western Bulk Supply Region of MW and the closest facilities where staff resources are concentrated is at Vaalkop WTW.

The whole of the former Rustenberg Region of NWWA has been absorbed by MW and has its headquarters at Mogwase. A major function of this unit is the maintenance of a large number of boreholes, pumps and pipelines. Regional capacity of MW of relevance to the Feasibility Study Area is illustrated in Table 6-3:

Figure 6-2 Current Structure of Magalies Water Board

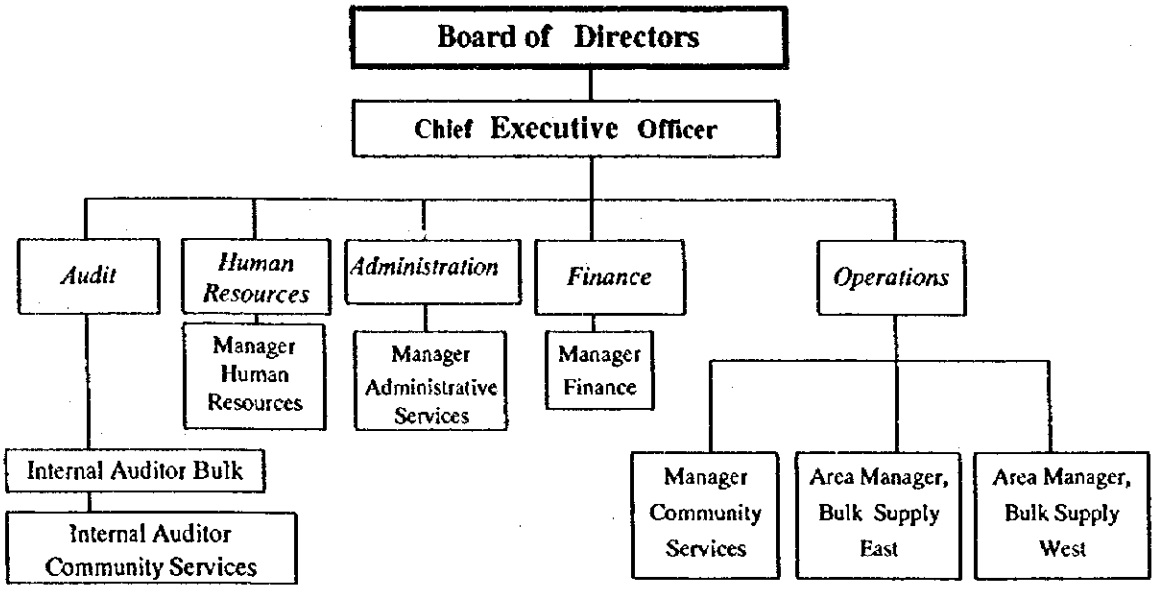



Table 6-3 Capacity of Magalies Water in Western Region

| Western Region | Staffing |
|---|---|
| **Bulk Water Supply :** | 62 Total |
| Vaalkop WTW | 34 |
| **Community Services :** | |
| Western District | 116 |

Note : Numbers in the table are for illustrative purposes only. These were correct at the time data was gathered. Actual numbers at any one time are likely to be slightly different due to staff movements and ongoing organisational change.

The above tables and chart illustrate the considerable capacity which MW has, which could be tapped to support service delivery in the Feasibility Study Area. Furthermore it is noted that while traditionally MW was exclusively only involved in bulk water supply, through the absorption of staff from NWWA and changes in strategy which recognise the role which MW can play in developing this market, MW is now actively involved in the retail area.

It is however important to note that MW is not in a position to fund or subsidise development and supply in communities. Support therefore needs to be provided within existing budgets (i.e. limited support) or on a basis where costs can be recovered.

(3) Local Authorities

The North Mankwe FS Area comprises 26 dispersed communities which are largely rural. No formal local authorities are yet in place i.e. existing structures are all transitional organisations and have little or no formal institutional capacity. Only once the local authorities create structures and have the financial resources to employ people to execute key functions can formal capacity be considered to exist.

RDC has provided some support for the planning and development process by allocating zonal Councilors to specific communities / areas as discussed above.

It is also relevant that RDC has appointed a Masakane Coordinator to work with communities in its area of jurisdiction. This is a national program aimed at achieving sustainable services by addressing the issues of cost recovery and payment.

(4) DWAF

The regional office of DWAF is located at Mmabatho which is some distance from the Feasibility Study Area. It should not therefore be expected that any significant support can be provided in the Area. DWAF's regional office has however contributed actively to the Study process particularly with regard to policy matters and this input will continue to be relevant to the Feasibility Studies.

DWAF organisational development officers working in the region have a good knowledge of local communities and this can be tapped for planning and institutional development purposes.

(5) Overall Assessment

In the Feasibility Study Area no capacity is in place at local authority level to execute the function of future project implementation, operation and maintenance. Also the administrative capacity necessary to ensure effective cost recovery is not present. The local government structures are all transitional and will become fully fledged municipalities in due course. Furthermore there are probably many areas where this transition may never occur given the rural nature of the area and socio-economic conditions. From a practical perspective alternative solutions therefore need to be considered.

By contrast MW (including the operations absorbed from NWWA) has significant capacity in the North Mankwe Area.

RDC while not having O & M capacity, through its planning structures has potential planning and implementation capacity.

## 6.2 Requirements of the Water Services Bill (1997)

### 6.2.1 Introduction

The Bill was published for comment in May 1997 and will have a significant impact on the institutional structures in the water supply sector. The Government requested comments on the bill and to date a large number of submissions requesting modifications have been received. These submissions do not challenge the main provisions of the bill but rather deal with aspects of detail. It can therefore be assumed that the bill will pass through parliament largely unchanged. For the purposes of this study its main provisions have been used as the basis for institutional planning.

### 6.2.2 Objectives of the Bill

The objectives of the bill include inter alia the requirements for:

- Setting national standards and norms for tariffs.
- Preparation of water service development plans.
- A regulatory framework for water service institutions.
- Establishment of water boards
- Monitoring of water services.
- Financial assistance to water services institutions.
- A national information system on water services.

### 6.2.3 Right of Basic Access

Section 3 of the proposed Bill lays down two requirements:

- Firstly that everyone has a right of access to basic water supply and basic sanitation.
- Secondly that Water Services Authorities must take reasonable measures to realise this right and plan to achieve it.

A Water Service Authority is essentially a municipality. In terms of the bill these institutions have a legal obligation to meet service requirements.

### 6.2.4 Duties of Water Services Authorities

The main duties as set out in the Bill are:

- Subject to certain conditions, to progressively ensure that all consumers and potential consumers in its area are provided with efficient, affordable, economic and sustainable water services.
- To prepare a water services develop plan for their area of jurisdiction. Key aspects of this plan are identification of the Water Services Providers, proposed infrastructure, water sources, capital outlays and operating costs.
- To provide the water services itself or to contract with a Water Service Provider to provide water services.

### 6.2.5 Water Services Provider

This is the function of actually providing the service (Water Services Provider) as distinct from the legal obligation to do so which resides with the Water Services Authority. The obligation to provide the services cannot be delegated. The actual provision of the service can be delegated by means of a contractual relationship. The draft Bill clearly specifies the terms and conditions for contracting out the Services Provider function.

### 6.2.6 Water Boards

Water boards are also dealt with in the Bill . These are not new structures and their primary function is to provide water to other water service institutions. The role of the water board as the bulk supplier is largely unaffected by the type of institution which is the Water Services Provider.

It is noted that bulk water is provided with the proviso that the board must not financially prejudice itself or other consumers in doing so.

### 6.2.7 Water Services Committees

Water Services Committees, are corporate bodies which can be established by the Minister in terms of the Bill to provide water supply within a service area where there is no Services Authority to perform the function.

It is necessary that formation of a Water Services Committee has the support of the community or area served.

### 6.2.8 Institutional Framework Created by the Bill

Institutional options need to be built around the possibilities provided for in the proposed Water Services Bill. In summary there are four distinct institutional structures which could be involved in the service delivery process:

- Water boards providing bulk water supply.
- Water Services Authorities which must give effect to the right of all people to basic water and sanitation services.
- Water Services Authorities acting as Water Service Providers and delivering services directly to consumers.
- Water Services Providers which are third party institutions which the Authority contracts to deliver services on its behalf.

### 6.2.9 Fee for Services

It is important to note that the proposed bill also provides that the duty to supply water to consumers is subject to the duty of consumers to pay reasonable charges for the service.

### 6.2.10 General Observations

A Water Services Authority is essentially a municipality. It is not clear from the bill as to where this responsibility resides in situations where there is no municipality although it is understood that it then becomes the responsibility of the next level of government. In the Feasibility Study Area the local government structures are all transitional. Furthermore there are probably many areas where the transition to fully fledged municipalities may never occur. From a practical perspective alternative solutions will therefore need to be considered.

In areas that there are no municipalities and therefore no Services Authorities; by default this role will then fall on the district council. Because of the lack of capacity of district councils this creates another set of problems to be addressed.

## 6.3 Needs Identified from Pilot Project Experiences

(1) Overall Assessment

It is clear from interaction with the communities in the FS Area that capacity in the following areas is very limited:

- Operation of water supply infrastructure.
- Maintenance of infrastructure.
- Collection of service revenues
- Administration of service delivery process.

(2) Lessons Learned

We note that the findings and lessons learned from the pilot projects are fully dealt with in a separate volume of the report. The intention here is to simply list the key lessons which must be taken into account in the planning form the feasibility studies:

(a) Identification of the WSA and WSP roles are essential first steps in setting up a project.

(b) The identified WSA and WSP (if not he community) should be involved in the planing process from the start.

(c) Proper social, institutional and training assessment are essential parts of the planning process.

(d) The community must be assessed in the context of the wide area in which resides taking into account factors in the area / other communities which may impact on the project e.g. illegal connections in neighboring communities and payment history.

(e) In the context of (d) above some area planning initiatives may be necessary if the project is to succeed.

(f) The establishment of PSCs need to be carefully coordinated and can be a time consuming process. An effective PSC is however an essential ingredient for success. Requirements include:

- Involving all existing committees.
- Ensuring representivity of all groups in the community e.g. women and young people.
- Initial training of the PSC in its role is essential.
- Ongoing monitoring of the dynamics in the PSC is important.
- The PSC must have decision making authority.

(g) The last point above is particularly important and key decisions such as appointment contractors must be seen by the community to be made by the PSC.

(h) Business planning must start early in the project life style and directly involve the community. This should be a very practical form planning focusing on how key aspects of the project will be handled e.g. tariff collection, operation and maintenance. RDP type business plans have in the past been to high level and generally be prepared by outsiders.

(i) Some up front financial commitment from the community should be encouraged as a means of strengthening commitment to the project and ensuring sustainability.

(j) Generally the amount of time to achieve sustainable plans is under estimated. This will also vary from community to community and the assessment referred to in (c) above is essential before time frames and budgets are finalised.

(k) Training and mentoring be prominent in plans and require a substantive budget.

(l) Institutional and development cost will vary from project to project and should therefore not be generalised without taking into account the needs of the particular community. These may be as low as 3% of total project cost or as high as 15%.

The implementation of pilot projects has therefore provided some very useful lessons which need to be taken into account in planning.

The Kameelboom Local Project Steering Committee has been functioning effectively, as discussed more fully in Volume 6, and has taken the initiative in a number of areas including a project to obtain a water supply for the local schools. This community is seen as a model for how development and service delivery can take place where people begin to create planning capacity.

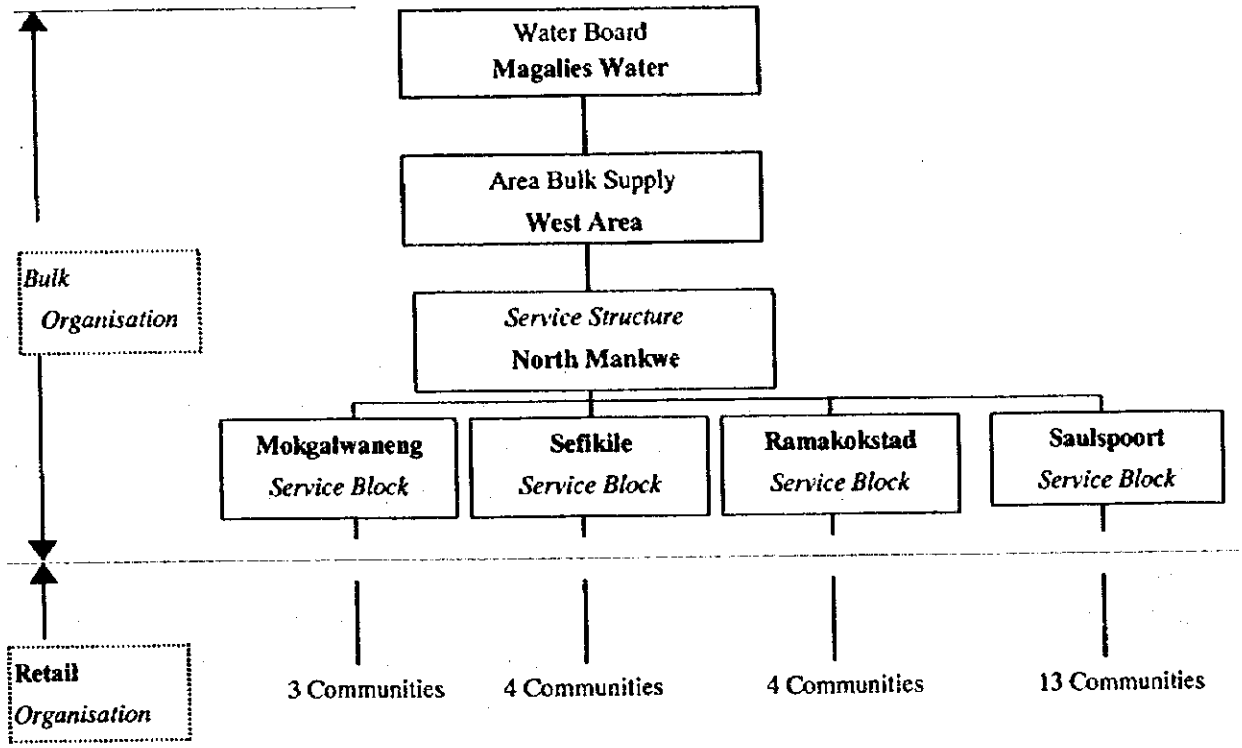
## 6.4 Institutional Structures: Bulk Water Supply

The FS Area falls with the traditional area of supply of MW. There are no other institutions which could therefore be considered to carry out this function. MW also has the capacity to provide the bulk supply. The only issue is the financial viability of supply as the draft Water Services Bill lays down that a water board should not financially prejudice itself or other consumers in meeting bulk supply needs.

Figure 6-3 shows the proposed structure for bulk water supply to North Mankwe. It illustrates that MW will need to create service structure or branch falling under the Vaalkop WTW to serve this area. This structure could include sub units for the service blocks particularly for example Saulspoort which consists of larger number of individual communities.

The role of the water board as the bulk supplier is largely unaffected by the type of institution which is the Services Provider (i.e. retail supplier) as discussed below provided such supplier can meet the contractual commitments entered into in the bulk supply contract.

**Figure 6-3 Bulk Water Supply Structure Serving North Mankwe Feasibility Study Area**




## 6.5 Establishment of Institutional Structures: Retail Water Supply

### 6.5.1 Institutional Options

The retail institutional options need to be built around the institutional models provided for in the proposed Water Services Bill which were discussed in Section 6.2.

In the Mankwe Area it has been indicated that there are no established local authorities and therefore no Services Authorities; by default this role will then fall on the district council. In practical terms because of the RDC's lack of O&M capacity this role will be difficult to achieve. The possible institutional options are as follows:

(1) RDC as Services Provider

In terms of this option RDC would need to become directly involved in service provision by setting up the necessary sub-structures within its organization to take on the functions of implementation, operations and maintenance. The result would be that RDC would have to create a fully staffed division to undertake the work. In terms of the provision of the draft bill this division would need to be accounted for separately from the other activities of the council.

(2) RDC Contracting with a Services Provider

There are two possibilities:

(a) Contracting with an Existing Institution

In terms of this option RDC would contract with an existing entity to fulfill the functions of service provision. The obvious possibility is for RDC to contract with MW to perform some or all of the functions in the area. MW is the institution in the area which has capacity and could therefore be considered capable of fulfilling this role.

(b) Contracting with a New Institution

In terms of this option RDC would contract with a new entity to fulfill the functions of service provision. This could be an exisiting institution which is new to the area, (i.e. one operating in the field of water supply in other parts of the country), or a totally new institution which has yet to be created. RDC and MW have discussed the formation of a new institution for this purpose in the form of a joint venture partnership. The joint venture idea is discussed more fully in Section 6.4.6.

(3) Water Committee Contracting with a Services Provider

In terms of this option the stakeholders in the area would call on the Minister to establish a Water Committee in the area. This Committee would be established as a corporate body which is allowed for in the proposed bill. There are then two possibilities for operation, either the Committee establishes its own institutional structure or contracts with another institution to be carry out the functions of service provision. Given that there is little institutional capacity in the Feasibility Study Area the possibility of a Water Committee being able to create its own working structure in the short term is doubtful. The route of the committee contracting with a Services Provider is more realistic. As with the above option MW is the most obvious candidate for consideration as the contracted Services Provider.

(4) Transitional Local Institution as Services Provider

While the three options outlined above assume a higher level institution in the role of Services Provider, the possibility of a community taking on the functions should not be ruled out. This seems unlikely in the short term given the lack of capacity and structure amongst communities in the Area. However in the medium to long term this option should be encouraged. It is not precluded by the three options above which should all have as an ultimate goal the transfer of the functions to local government institutions.

Some of the advantages and disadvantages of the above options are shown in Table 6-4 and these help to further expand understanding of the impact of choosing each of the different approaches:

**Table 6-4 Advantages and Disadvantages of Options for Services Provider**

| Option | Advantages | Disadvantages |
|---|---|---|
| RDC as Services Provider | - Appropriate role for RDC.<br>- Builds RDC's capacity.<br>- Some existing capacity to support new functions.<br>- Structure could serve other areas. | - Limited resources to get structure going.<br>- Establishing structure will take time.<br>- May take RDC focus away from other strategic needs. |
| RDC Contracted Services Provider | - Role remains with RDC.<br>- Could be quickly implemented.<br>- Contractual requirements can be differentiated i.e. implementation, O&M.<br>- Enables utilisation of existing capacity in the area i.e. MW. | - Opportunity for RDC to create more capacity internally missed.<br>- Institutional development is taking place at one level up from communities.<br>- Could distract MW from its primary function of bulk water supply.<br>- Some conflicts of interest could arise. |
| Water Committee | - Closer to the transitional local structures and communities which is where the function ultimately belongs.<br>- Creates a formal corporate entity to carry out the required functions.<br>- Would create new / additional capacity in the area. | - Will be time consuming to implement.<br>- Could be perceived as a DWAF imposed solution.<br>- Benefit limited to one specific area.<br>- No existing capacity to support this development. |
| Transitional Local Authority as Service Provider | - Closer to the local communities which is where the function ultimately belongs.<br>- Could be more than one service structure depending upon local situation.<br>- Would create new / additional capacity in the area. | - Will be time consuming to implement.<br>- Subject to local political / community dynamics.<br>- No existing capacity to support this development. |

### 6.5.2 Joint Venture Partnership Option

It is highly relevant to note that RDC and MW have already agreed in principle to enter into a joint venture which will lead to the formation of a new organisation in a corporate form in the area. This is depicted in Figure 6-4. The functions of this organisation will be:

- To act as Services Provider or to ensure that the role is fulfilled, (Main function).
- To provide support for small municipalities and contractors.
- To facilitate redeployment of former NWWA staff into service delivery in the area.

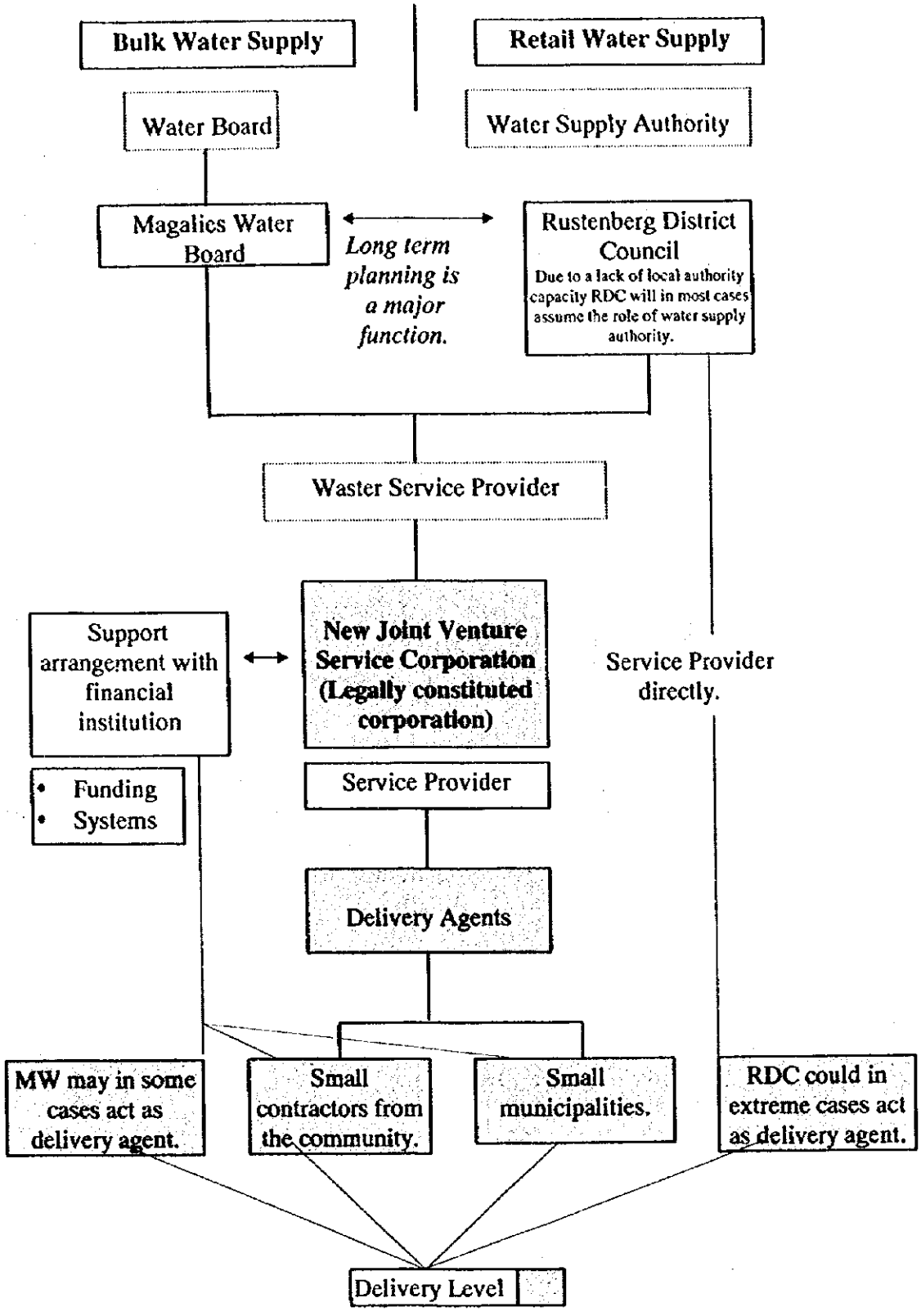
Formation of this structure will solve a number of issues around the question of responsibility for planning, implementation, operation and maintenance.

### 6.5.3 Criteria for Evaluating Options

Criteria which have been identified in this and other studies in the water sector against which institutional options can be evaluated are as follows:

- Will the proposed option promote **delivery** of water especially to remote and poor rural communities?
- Will the proposed option build **partnerships**, and produce a sustainable **institutional framework**?
- Will the proposed option achieve the **sustainable management** of existing and planned local and regional water schemes and infrastructure.
- Will the proposed option enjoy the **support of stakeholders**? (Regional, district and local government and communities).
- Is the period of implementation of the option realistic given the **urgency** of meeting needs?
- Is **capacity** available to implement the solution?
- Is the option **financially viable** in the medium-long term?
- Will the proposed option promote the necessary **strategic leadership** and management around regional water services?

Figure 6-4 Structure of Proposed RDC - MW Joint Venture



### 6.5.4 Assessment of Options Against Criteria

Assessment of the options against the criteria, and discussion of the possibilities with key stakeholders, has led to the conclusion that there is no single option which will provide a solution to meet the needs in the FS Area. Rather that a solution which integrates the different options has the best probability of success. An integrated solution will also be acceptable to all stakeholders and this acceptance is essential to implementation of the option. The approach which has been adopted is therefore to develop a comprehensive solution integrating the different possibilities with particular attention given to the criteria of delivery, capacity, financial viability, sustainability and acceptability to stakeholders. It is also important to recognise the urgency of the needs. The approach is described in the next section.

### 6.5.5 Most Feasible Solution

Figure 6-5 illustrates solution which is proposed and described as follows.

(1) Bulk Supply

MW will be the bulk supplier as described in Section 6.4 and this does not need further elaboration.

(2) Water Services Provider (Area)

The RDC-MW Joint Venture and Partnership which is in the process of formation will become the Services Provider in the FS Area as a whole. This role will require the JV to provide water services directly to communities or to intermediaries which may be created as discussed in Point (4) below.

The advantages of this JV functioning as Services Provider are that it can be put in place relatively quickly and therefore can address the need for urgency. It will through links with its parent organisations also have considerable capacity to draw on. Delivery to communities is therefore more likely to take place in the short to medium term than without such a structure.

It is understood that this JV will not be constituted as a significant structure in its own right but rather as a vehicle for deploying resources and assuming contractual obligations. Staff are likely to be seconded to the JV on a transitional basis. Ultimately local authorities will be the main employers of O&M staff. It is therefore not appropriate to draw up an organisational structure chart.

(3) Community Level Structures (Local Services Provider)

It has become clear from the findings of the pilot projects that the sustainable supply of water to communities cannot be achieved unless some institutional capacity is in place at community level. Without such capacity being in place the criteria of sustainability and financial viability cannot be achieved. Thus while it has been strongly noted in Section 6.2.3 that there is no capacity at local level, the development of some capacity is essential to meeting service needs and therefore must be an integral part of the proposed solution.

Community level institutions will be the service providers at the point of delivery. The function at this level will need to operate in collaboration with the area Services Provider and it is likely that there will be contractual agreements in place between the two.

A variety of structures are possible at this level depending upon community size and service level. Some possibilities used for costing purposes are illustrated in Table 6-5.

(4) Intermediary Level Structures (Service Cooperatives)

There are twenty four communities in the FS Area with which the JV will need to interact in the process of service delivery. This presents a major challenge and given capacity limitations may lead to some communities being less well served than others. It is proposed that introducing an intermediary level structure may be important in coordinating service delivery. These intermediary structures have been shown in Figure 6-5 as "service cooperatives" for two reasons: Firstly the idea of sharing limited resources was introduced as a recommendation in the first stage of the JICA Study and was well received by stakeholders. Secondly in a number of circumstances water resources need to managed on an area wide basis and this will require a "cooperative" approach. The form of such intermediary structures may range from simple coordinating committees, through formal constituted cooperatives (partnerships) , to registered companies. Furthermore the need for such intermediaries will vary from one supply block to another and the form may change over time.

Introduction of this level of structure will contribute to achieving the criteria of acceptability amongst stakeholders of the service process and the promotion of leadership around planning and regional water management.

**Figure 6-5 North Mankwe Feability Study Area Option : First and Second Stage**

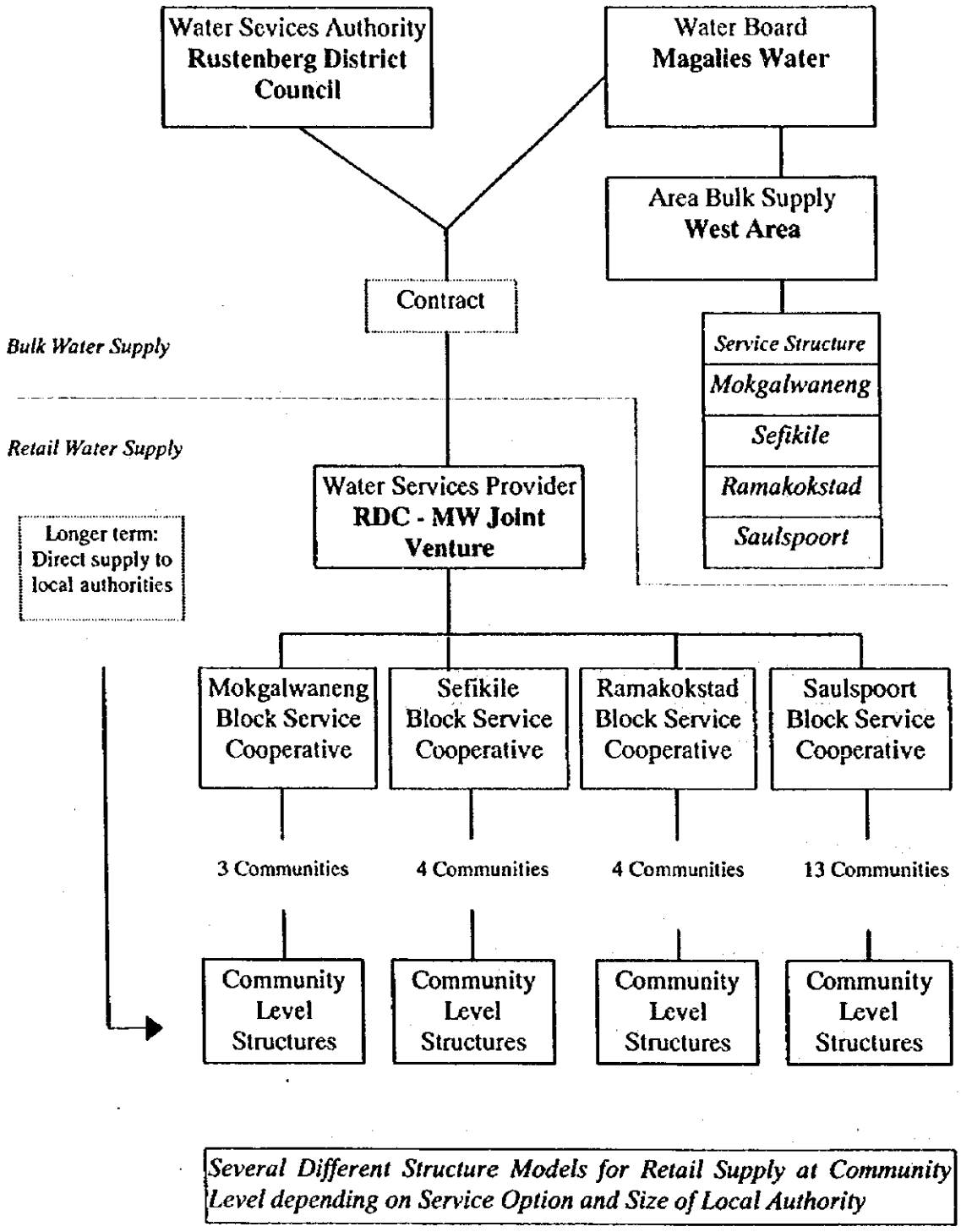
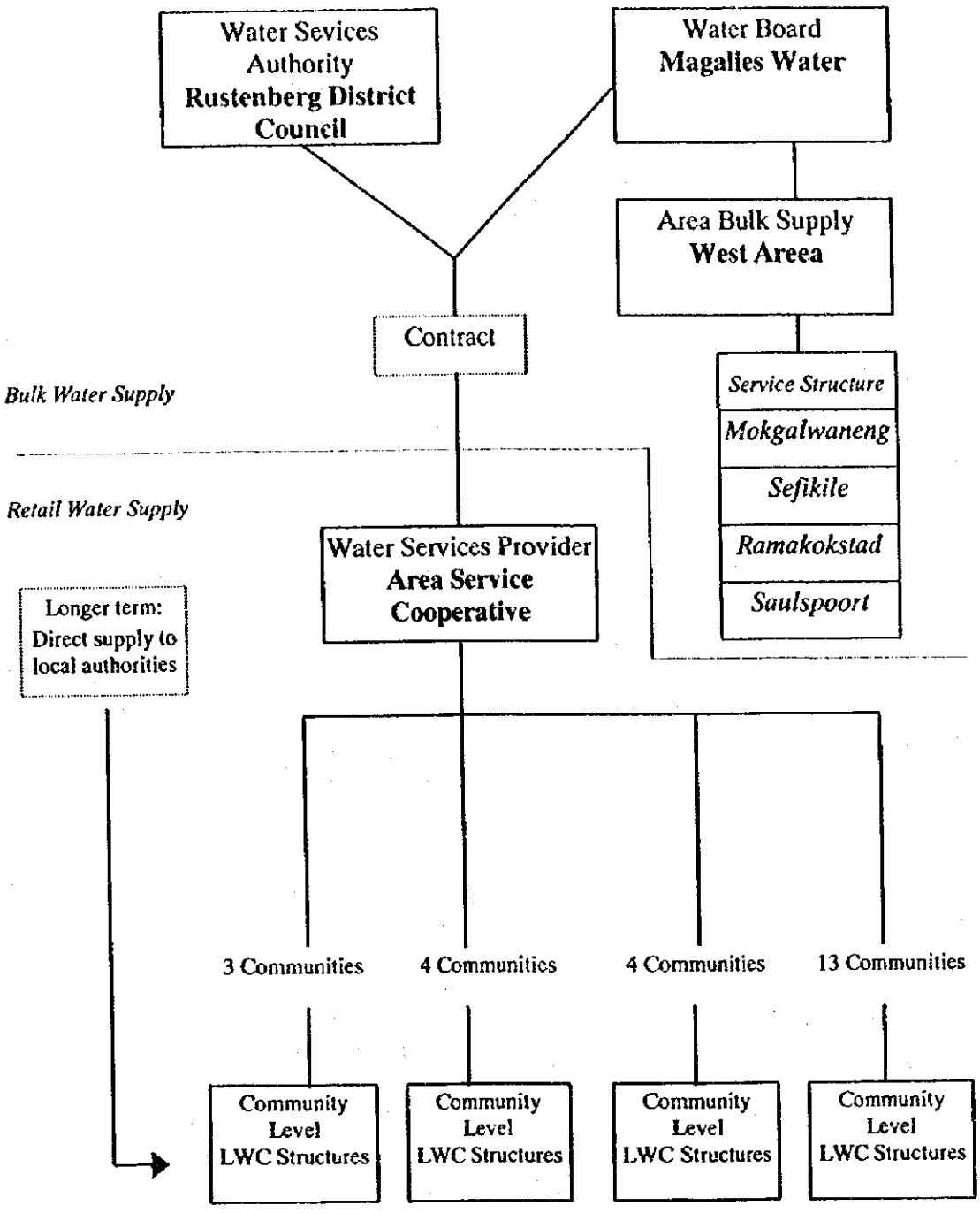


**Figure 6-6 North Mankwe Feasibility Study AreaOption : Third Stage**




*Several Different Structure Models for Retail Supply at Local Community Level depending on* Service Option and Size of Local Authority

Table 6-5 Different Local Structure Models (Retail Supply)

| | Service Level A | |
|---|---|---|
| | **Structure Model 1** | **Structure Model 2** |
| Size | Small Community: e.g.<br>350 Households<br>2100 People | Medium: e.g.<br>800 Households<br>4800 People |
| Mngt. | Water Committee:<br>- Chair person<br>- Vice Chair<br>- Secretary<br>- Treasurer | Water Committee:<br>- Chair person<br>- Vice Chair<br>- Secretary<br>- Vice Secretary<br>- Treasurer |
| Staff | Operator (x 1)<br>Water Bailiff (x 1)<br><br>• Part-time employee/s.<br>• Functions may be combined. | Bookkeeper / Administrator<br>Operator (x 2)<br>Water Bailiff (x 2)<br><br>• Part-time employee/s. |

| | Service Level B | |
|---|---|---|
| | **Structure Model 3** | **Structure Model 4** |
| Size | Small Community: e.g.<br>350 Households<br>2100 People | Medium: e.g.<br>800 Households<br>4800 People |
| Mngt. | Water Committee:<br>- Chair person<br>- Vice Chair<br>- Secretary<br>- Treasurer | Water Committee:<br>- Chair person<br>- Vice Chair<br>- Secretary<br>- Vice Secretary<br>- Treasurer |
| Staff | Operator (x 1)<br>Pipe / Meter Maintenance (x1)<br>Meter Readers / Collection Officers (x 2)<br><br>• Some permanent positions.<br>• Functions may be combined. | Bookkeeper / Administrator (x1)<br>Operator (x 2)<br>Pipe / Meter Maintenance (x2)<br>Meter Readers / Collect. Officers (x 2)<br><br>• Some permanent positions. |

## 6.6 Staged Institutional Development Plan

### 6.6.1 General

The plans of institutional development and capacity building in water sector shall be prepares taking into account current situation of communities, project implementation plan and operation and maintenance schedules. In particular, institutional development of 3rd Tier in the project will be carried out by the following agencies concerned.
The master schedules of such development plan for the project divided into three stages 1st, 2nd and 3rd stage.

(1) Agencies : Project Implementation Agency (infrastructure development ) and Water Service Provider (operation and maintenance )is JV between DC and WB or Bott, and Water Service Authority is District Council

(2) Staged Development:
- First (1st) Stage (1988-2002): Implementation of construction work and establishment of 3rd Tier institutional for Water Service Level A

- Second (2nd) Stage (2003-2007): Implementation of up-grading of infrastructures and re-structuring of 3rd Tier organisation.

- Third (3rd) Stage(2008-2012): Continuation of O & M and water tariff collection.

The concept charts of institutional development for each stages are illustrated in Figure 6-5 and 6-6 and staffing proposal for each service level tabulated in Table6-5.

(3) Master Schedule:

- Master schedule of each stages indicated in Table 6-6.

## Table 6-6 Master Schedule of Institutional Development

| Desvription | 1998 - 2002 | | | | | 2003 - 2007 | | | | | 2008 - 2012 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **A. Construction Schedule** | | | | | | | | | | | | | | | |
| (1) Level A Facility | | | | | | | | | | | | | | | |
| (2) Upgrading (1) Facility | | | | | | | | | | | | | | | |
| (3) Upgrading (2) Facility (if any) | | | | | | | | | | | | | | | |
| **B. Water Supply Service** | | | | | | | | | | | | | | | |
| (1) Service Level A | | | | | | | | | | | | | | | |
| (2) Service Level B (1) | | | | | | | | | | | | | | | |
| (3) Service Level B (2) | | | | | | | | | | | | | | | |
| **C. Institutional Development** | | | | | | | | | | | | | | | |
| **C1. Stage 1 Development** | | | | | | | | | | | | | | | |
| (1) Contracting JV | | | | | | | | | | | | | | | |
| (2) Appointment of WSP | | | | | | | | | | | | | | | |
| (3) Establishment of LWCs | | | | | | | | | | | | | | | |
| (4) Preparation of Action Plan | | | | | | | | | | | | | | | |
| (5) Formation of BWSCs | | | | | | | | | | | | | | | |
| **C2. Stage 2 Development** | | | | | | | | | | | | | | | |
| (1) Strengthening of LWCs/BWSCs | | | | | | | | | | | | | | | |
| (2) Operation of Basic Level Service | | | | | | | | | | | | | | | |
| (3) Consensus of Upgrading | | | | | | | | | | | | | | | |
| (4) Mentoring/Strengthening OM | | | | | | | | | | | | | | | |
| (5) Formation of AWSCs | | | | | | | | | | | | | | | |
| (6) Fund / Loan Management | | | | | | | | | | | | | | | |
| **C3. Stage 3 Development** | | | | | | | | | | | | | | | |
| (1) Consolidation of AWSCs | | | | | | | | | | | | | | | |
| (2) Permanent Operation | | | | | | | | | | | | | | | |
| (3) Tariff Collection/Loan Payment | | | | | | | | | | | | | | | |
| (4) Mentoring/ Strengthening OM | | | | | | | | | | | | | | | |
| **C4. All Stages** | | | | | | | | | | | | | | | |
| Capacity Building Activities | | | | | | | | | | | | | | | |

### 6.6.2 Stage 1: 1998 - 2002

(1) Step 1: Preparatory Work

The main purpose of this step of the work is to get the policy decisions made necessary for project implementation to proceed, put in place the necessary institutional infrastructure and commence the process of engaging communities in planning.

**Table 6-7 Action Plan (St.-1/Step-1)**

| Requirements | Notes | Responsibility |
|---|---|---|
| 1) Formulation and achieving agreement on implementation and funding policy. | Policy responsibility for the sourcing of funding is essential. | DC |
| 2) Establishment / designation of project implementation agency i.e. water service provider (WSP ) | Establish JVs which is the key institution in the proposed structure. Once established these entities can take on the role of services Provider in the FS Areas and also the role of implementing agent for the FS projects. | MW and RDC.. |
| 3) Preparation of basic work plan. | | JV |
| 4) Develop project initiation / promotion schedule and financial plan / budget. | | JV |
| 5) Recruitment of local consultants or private company to assist implementing agent with execution of work. | It is anticipated that due to lack of capacity identified amongst the key role players that outside assistance will be sought. | Implement. Agent: DWAF |
| 6) Preparation of Short, Medium and Long Term Action Plans by local consultants. | | DWAF or delegated party |
| 7) Conduct basic socio-economic survey and institutional environment assessment. | This is the first step in the process of project implementation. | DWAF or delegated party |
| 8) Establish / identify Local Water Committee / LPSC in each community providing for project promotion strategies and community awareness building. | Given that the proposed solution requires a level of institutional capacity to be developed at community level, it is essential that a programme is put in place in the stage 1 to achieve this. Such a programme will need to draw heavily on the experiences of the pilot projects. | DWAF or delegated party |

(2) Step 2 : Initiation of Construction of Water Supply Infrastructure

The key focus during this step is to achieve the institutional development and functioning necessary for the implementation of the basic (i.e.RDP) level of service.

**Table 6-8 Action Plan (St.-1/Step-2)**

| Requirement | Notes | Responsibility |
|---|---|---|
| 1. Capacity building with LPSCs. | Ongoing capacity building to develop the foundations laid during Step 1 is essential. | DWAF or delegated party. Handover to WSP i.e JV |
| 2. LPSC engagement of project planning and participation in decision making on project design and selection of contractors. | Active involvement by communities in all key decisions is necessary. | RDC - MW JV |
| 3. Assistance with and involvement in the construction process. | Communities will participate in the construction process. | Contractor |
| 4. Development of Operation and Maintenance plan for service level A. | In preparation of for the commissioning of the basic level of service infra structure. Plans must detail the requirements in terms of:<br>• Processes / systems.<br>• Resources.<br>• Funding | RDC - MW JV |
| 5. Establishment of Block Water Supply Cooperatives (BWSC). | A lack of capacity within communities lead to the need identified in the pilot projects for a support infra structure beyond the boundaries of each project. This has been addressed in the Study recommendations by the concept of BWSCs whereby communities can share capacity and scarce resources. | RDC - MW JV |
| 6. Development of area support networks. | This is the first step in the process of generating the interaction necessary for the ultimate formation of area water supply cooperatives which may take over the role of the JV. | RDC - MW JV |
| 7. Preparation of a policy in respect of the proposed reserve / accumulation fund for higher levels service and the promotion of a project to achieve this to the communities. | Necessary for transition to stage 2 planning. | RDC - MW JV |

(3) Step 3: Commissioning and Trial Operation of Initial Projects

This step is concerned with the operationalising the initial basic level of service infrastructure which has be constructed and developing the necessary operations and maintenance strategies and plans necessary to ensure sustainability.

**Table 6-9 Action Plan (St.-1/Step-3)**

| Requirement | Notes | Responsibility |
|---|---|---|
| 1. Review, evaluation and amendment of operating and training manuals as necessary. | Contractors have a history of not providing for hand over nor preparing adequate operations manuals. Monitoring is thus essential. | RDC - MW JV |
| 2. Capacity building with LPSCs and local operating structures which have succeeded them. Focus on operations and maintenance. | Ongoing capacity building to develop the foundations laid during Step 1 and 2 is essential. | RDC - MW JV |
| 3. Finalise and implement local operating structures. | | RDC - MW JV |
| 4. Conclusion of hand over agreements. | | RDC - MW JV |
| 5. Trial operation of infrastructure and mentoring of operations, maintenance and administration staff. | A major barrier to sustainability in the past has been the lack of mentoring involved in projects post handover. | RDC - MW JV |
| 6. Formalise area service network and formulate plan with JV for transition to a cooperative to combine BWSCs into an overall organisation performing WSP role. | | RDC - MW JV |
| 7. Set up of reserve / accumulation fund for higher levels of service and commencement of collection of reserve contributions. | Establishment and accumulation of reserves from initial steps is essential if adequate reserves are to be built up to achieve the higher level of service. | RDC - MW JV |

### 6.6.3 Stage 2: 2003 - 2007

(1) Step 1: Preparatory Work and Implementation of Process for Higher Service Level

Local structures developed during Stage 1 will need to be developed to play a full role in project implementation, commissioning and operation and maintenance. Also in the development of the process of planning and providing for up grading of service levels.

**Table 6-10 Action Plan (St.-2/Step-1)**

| Requirement | Notes | Responsibility |
|---|---|---|
| 1. Capacity building with local operating structures. Focus on operations and maintenance sustainability. | Ongoing capacity building to develop the foundations laid during Stage1 is essential. | RDC - MW JV |
| 2. Formulation and achieving agreement on implementation and funding policy for upgraded level of service. | Policy responsibility for new / additional sources of funding is essential. | RDC - MW JV |
| 3. Preparation of basic plan. | | RDC - MW JV |
| 4. Develop project initiation / promotion schedule and financial plan / budget. | Up-graded level of service | RDC - MW JV |
| 5. Recruitment of local consultants or private company to assist with execution of work. | It is anticipated that due to lack of capacity identified amongst the key role players that outside assistance will be sought. | RDC - MW JV |
| 6. Preparation of detailed Action Plans by local consultants. | Implementation of up-graded level of service | For RDC - MW JV |
| 7. Strengthening of BWSCs | Undertaking O & M and fees collection | WSP |

(2) Step2: Implementation of Higher Level of Service Projects

**Table 6-11 Action Plan (St.-2/Step-2)**

| Requirement | Notes | Responsibility |
|---|---|---|
| 1. LPSC engagement in project planning and participation in decision making on project design and selection of contractors. | Active involvement by communities in all key decisions is necessary. | RDC - MW JV |
| 2. Assistance with and involvement in the construction process. | Communities will participate in the construction process. | Contractor |
| 3. Development of Operation and Maintenance plan for service level B. | In preparation of for the commissioning of the basic level of service infra structure. Plans must detail the requirements in terms of:<br>• Processes / systems.<br>• Resources Funding | RDC - MW JV |
| 4. Deposit of reserve funds and disbursement of credit loans | Management of reserve funds and loans | WSP |

(3) Step 3: Commissioning and Trial Operation of High Service Level Projects

Intermediary structures necessary will need to transformed to cater for third stage needs by rationalisation of BWSCs..

**Table 6-12 Action Plan (St.-2/Step-3)**

| Requirement | Notes | Responsibility |
|---|---|---|
| 1. Review, evaluation and amendment of operating and training manuals as necessary. | Contractors have a history of not providing for hand over nor preparing adequate operations manuals. Monitoring is thus essential. | RDC - MW JV |
| 2. Capacity building with local operating structures. Focus on operations and maintenance higher service level infrastructure. | Ongoing capacity building to develop the foundations laid during previous stages / steps is essential. | RDC - MW JV |
| 3. Finalise and implement revised local operating structures. | Preparation of new water tariff system by used volume of water | RDC - MW JV |
| 4. Conclusion of hand over agreements. | | RDC - MW JV |
| 5. Trial operation of infrastructure and mentoring of operations, maintenance and administration staff. | A major barrier to sustainability in the past has been the lack of mentoring involved in projects post handover. | RDC - MW JV |
| 6. Re-structuring of BWSCs and JV organisations. | Objectives will be to:<br>• Utilise local capacity built up during Stages 1 & 2<br>• Delegate to local authority level as much of the RDC - MW JV role as possible.<br>• Reduce the umbrella role of the JV. | RDC - MW JV and BWSC |
| 7. Funds management | | WSP |

### 6.6.4 Stage 3: 2008-2012

Roles and responsibilities will change over time and realignment will necessarily need to take place. To illustrate this it is noted that in the second stage the JV structures may fall away with the intermediary structures amalgamating to fulfilling this role. In the long term as capacity is developed the local structures will take full responsibility for service provision themselves with no intermediary structures.

Table 6-13 Action Plan (St.-3)

| Requirement | Notes | Responsibility |
|---|---|---|
| 1. Capacity building with local operating structures. Focus on sustainability. | To achieve the situation where local structures assume responsibility for the Services Provider role there will need to be significant strengthening of these structures in the stage 2 to Stage 3 | RDC - MW JV |
| 2. Enhancement operations and maintenance performance on a continuous basis. | | RDC - MW JV |

## 6.7 Roles and Responsibilities

Given the proposed institutional solution and the requirements of the development plan outlined, it is important that the related roles and responsibilities are clear. It is proposed that these be as follows:

Table 6-14 Roles and Responsibilities

| Bulk Water Supply | | | |
|---|---|---|---|
| **Institution** | **Stage** | **Role** | **Responsibility** |
| Magalies Water | Set-up | Leadership | • Assisting RDC set up JV for service provision. |
| | Project Implementation | Bulk Supply. | • Development of necessary bulk infrastructure. |
| | | Retail Implementation Support | • Technical design inputs<br>• Managing implementation aspects as delegated in JV agreement. |
| | Operation and Maintenance | Service Delivery Support | • Coordination with Services Provider and providing agreed support. |

**Table 6-14 Roles and Responsibilities (Continue)**

| Retail Water Supply | | | |
|---|---|---|---|
| **Institution** | **Stage** | **Role** | **Responsibility** |
| DWAF (i.r.o.RDP level of service) Rustenberg District Council(i.r.o.higher level of service) | Set-up | Leadership | • Setting up JV with MW.<br>• Initiating programme to develop local level service structures. |
| | Implementation | Services Authority | • Planning service delivery, (i.e. preparation of a plan as required in the WS Bill)<br>• Ensuring funding is sourced for delivery infrastructure. |
| | Operation and Maintenance | | • Ensuring service delivery takes place. |
| RDC - MW JV | Set-up | Leadership | • Implementing programme of local level structure / community development. |
| | Implementation | Implementing Agent. | • Detailed planning for projects.<br>• Implementation of projects.<br>• Commissioning of projects. |
| | Operation and Maintenance | Services Provider in the stage 1 (area and local level) and stage 2 (area level). | • Operating local level supply in the stage 1.<br>• Planning (and ensuring) hand over to local level structures.<br>• Development programme necessary for hand over. |
| Intermediary Structures | Implementation | Leadership | • Coordination amongst stakeholder communities.<br>• Area water supply planning coordination.<br>• Cooperative ventures between communities. |
| Local Authorities / Communities | Operation and Maintenance. | Possible Services Provider in the stage 2. | • Operating area level supply in the stage 2<br>• Planning (and ensuring) hand over to local level structures.<br>• Resource development and pooling of resources necessary for hand over. |
| | Set-up | Leadership. | • Setting up legitimate and effective PSCs and similar structures. |
| | Implementation | Implementing agent support. | • Inputs to planning process.<br>• Contracting with Services Provider for service provision. |
| | Operation and Maintenance. | Services Provider at local level in the stage 2 and 3. | • Operating local level supply in the stage 1.<br>• Planning (and ensuring) hand over to local level structures.<br>• Institutional development programme necessary for hand over. |

## 6.8 Monitoring and Evaluation

### 6.8.1 Task Force / Forum

It has been proposed that a task force or forum is put in place to take implementation forward after the conclusion of the JICA Study, particularly in the period before the provisions of the Water Services Bill are implemented, and the RDC-MW JV is in place. This proposal has been agreed to by the PSC. The main function of the group will be to monitor implementation of the recommendations made in the Final Report.

### 6.8.2 Requirements of the Water Services Bill

The Water Services Bill discussed in Section 6.2 makes specific provision in Section 19 for the process of the Water Services Authority reporting on progress in implementing water services. This reporting must be against a water services plan which covers inter alia:

(1) Five Year Period

The plan must cover a five year period including the detailed programme for the five year period.

(2) Method of Services Provision

This includes the appointed water service providers and the contractual relationships with them.

(3) Infrastructure

The proposed infrastructure necessary for delivering the services.

(4) Capital and Operating Cost

The estimated capital and operating costs of the water services and the financial arrangements to fund these services including tariff structures.

Reporting against the above itself is required to be done for each financial year within four months of the year end. A summary of the report is to be published in the area of operation.

Based on this report the Minister has powers to intervene and thereby ensure that the provision of service takes place.

# CHAPTER 7

# IMPLEMENTATION ARRANGEMENT

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# CHAPTER 7 IMPLEMENTATION ARRANGEMENT

## 7.1 Project Implementation Schedule

### 7.1.1 Overall Schedule

The proposed project (Case C-1) will be implemented in three stages starting at year 1998 and ending 2012, comprising stage 1 (1998 – 2002), stage 2 (2003 – 2007) and stage 3 (2008 – 2012). The stage 1 involves preparation of water supply facilities under the service level A with necessary establishment of LWCs (Local Water Committees) and BWSCs (Block Water Supply Cooperatives). The Stage 2 includes commission and operation of the Level A services and preparation of upgrading the service level as well as restructuring of BWSCs. The stage 3 does commission and operation of the Level B services as illustrated in Figure 7-1.

### 7.1.2 Implementation Schedule for Service Level A (Stage 1)

An initial cost estimate has been prepared for both the level of service A and B, however detailed design would make it possible to arrive at more accurate costs. Strengthening the institutional capacity of the proposed Water Services Authority and Provider would commence during the implementation period through maximum mobilisation and involvement of the beneficial communities. The overall implementation will require a 5-year period. The first two years will be used for arranging the loan and finalising the detailed design while the remaining three years will be for construction works as shown in Figure 7-2.

The implementation schedule shows the first three quarters of 1998 during which arrangement of the loan funding will take place; the detailed design will follow and is scheduled for completion by late 1999. The first tenders for construction will be called at the beginning of 2000.

It is also envisaged that the construction work will be separated into two packages each corresponding to two of the four Supply Blocks in the Area. This arrangement will increase the amount of administration required but is necessary to ensure the completion of the project by the end of 2002, the target year for providing the RDP minimum level of services.

The first package for the Ramokokstad and Saulsport Supply Blocks includes installation of large lengths of pipeline and is estimated to require approximately 20 months for completion. The work in the second package for the Sefikile and Mokgalwaneng Supply Blocks is less significant in scope and can be completed within 12 months. Priority for implementation is given to the first package as it includes extension work to some components of the existing MW

infrastructure which will be necessary for supply to all four supply blocks. It is assumed that extension work currently planned by MW for the strengthening of supply to Vaalkop South, Sun City and the Mabeskraal area will be completed by the end of the year 2001 at the latest, as it is necessary for the immediate commissioning of the scheme installed under the first package.

As for the second package, careful scheduling of work during the construction stage will allow partial commissioning of the system to begin even before completion of the contract.

### 7.1.3 Implementation Schedule for Service Level B (Stage 2)

Basically, implementation of the stage 2 will start from year 2003 including two years for fund preparation, detailed design and tendering processes, three years for construction of upgrading facilities with test run and commissioning. During the said five years term, restructuring of water supply cooperatives will take place under the institutional development programme, through which sustainable operation and management of the water supply facilities will be assured. In some case that a certain community will not able to make consensus among members for upgrading the facilities, there will some room to implement the upgrading process as the stage 3.

**Figure 7-1 Overall Implementation Schedule**

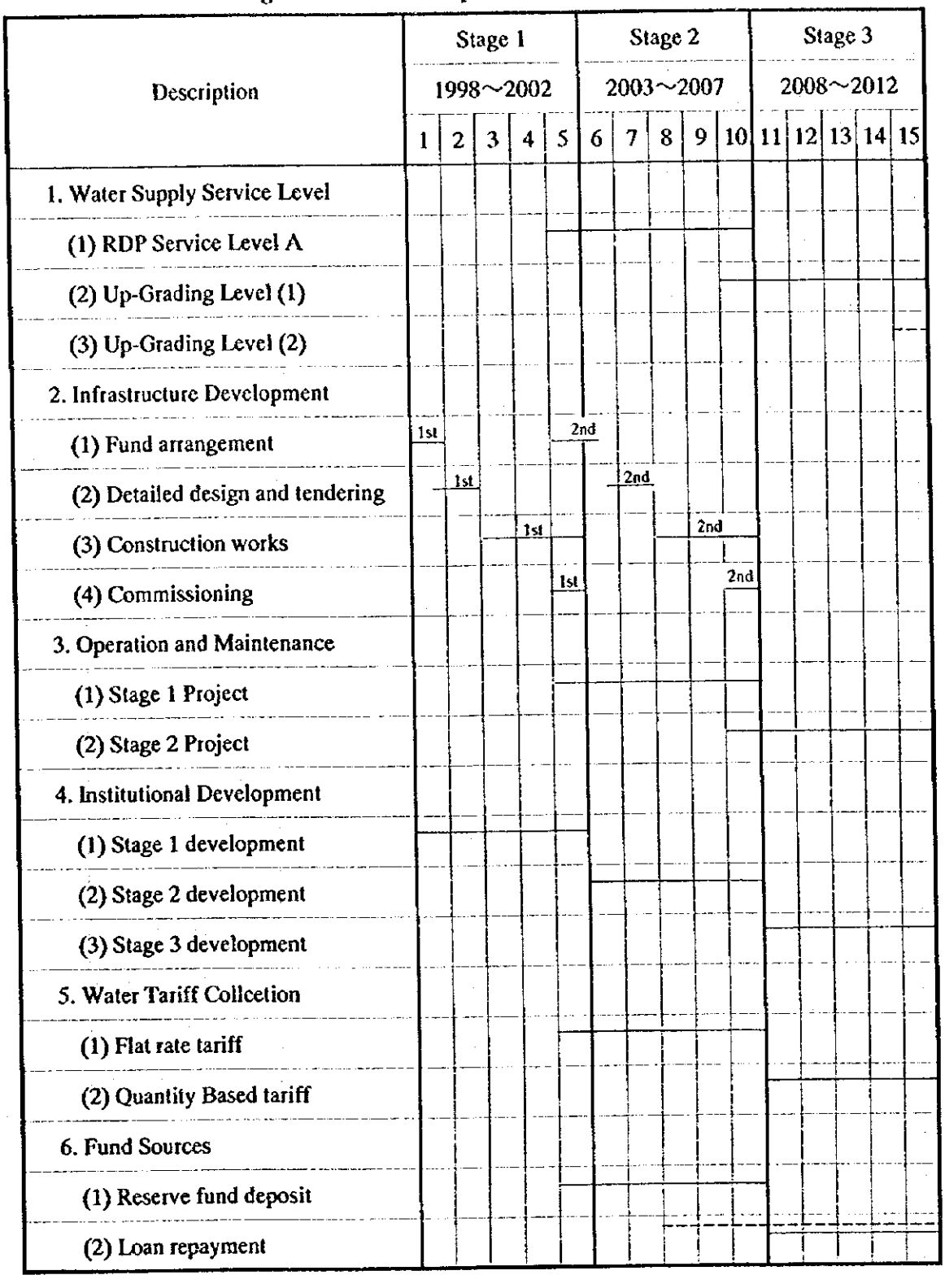
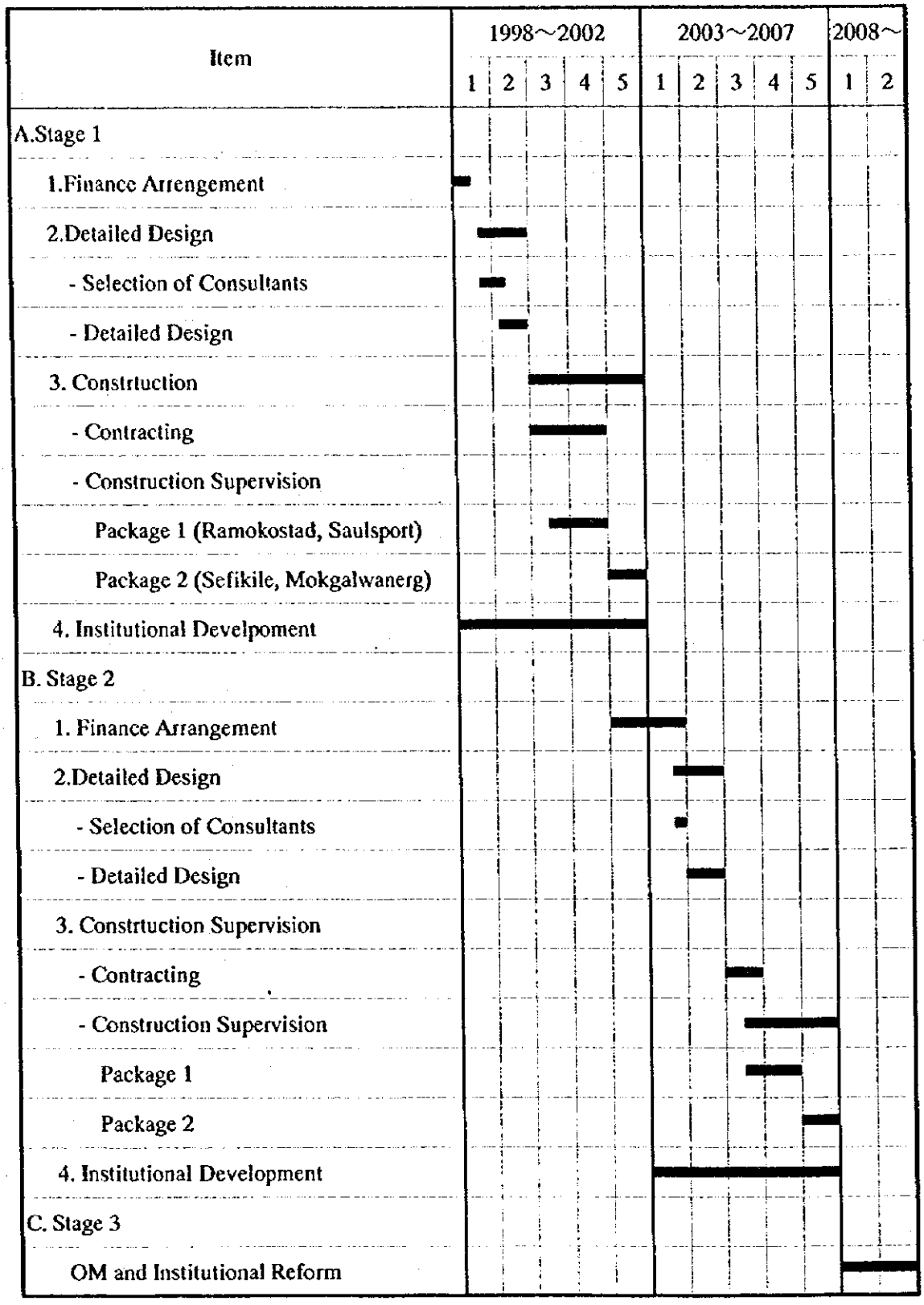


**Figure 7-2 Implementaiton Schedule (Infrastructure)**



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# ENVIRONMENTAL IMPACT ASSESSMENT

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# CHAPTER 8 ENVIRONMENTAL IMPACT ASSESSMENT

## 8.1 Objectives and Scope of the Study

### 8.1.1 Objectives

The environmental impact assessment described in this Chapter constituted a study of the potential environmental impacts which can be expected from options considered for the North Mankwe Area Feasibility Study which forms part of the Master Plan to expand the capacity of Magalies Water. Inevitably, development leads to modifications in the environment and negative environmental impacts, which often result from inappropriate management of development activities because of a lack of appreciation of the potential problems. All components of the environment that might be involved were identified so that appropriate ameliorative actions can be integrated with the project as a whole to obtain the best possible results.

It is important to note that the environmental study itself at this stage of the project preparation is also at a feasibility level and aims to prepare a prognosis of relevant issues. Accent has been placed on the impacts of the proposed pipelines and other related surface structures as these were seen as the elements causing greatest concern.

Relevant data from preliminary investigation reports was extracted to provide baseline information. Additional, more detailed information was obtained to update the existing information as was presented in the ROIP 1 Report (Relevant Environmental Prognosis Report).

The construction of pipelines, reservoirs and treatment works could have an impact on the socio-economic aspects, i.e. land use, settlement, infrastructure and population, and the ecological aspects, i.e. the vegetation, fauna, habitat, changes in flow regime and changes in water quality. The study was undertaken on an incremental basis with the relevant environmental impact prognosis phase (ROIP2) as the second feasibility step.

The ROIP 2 will identify the anticipated environmental impacts and state the feasibility of the proposed options from both an ecological and socio-economical and environmental viewpoint. The socio-economical impacts are presented in another module. The need for further more detailed studies will be identified from the data available at this point. The extent of further work needed on the ecological and socio-economical aspects will be defined in the ROIP 2 report.

The ROIP 2 constitutes an assessment of the potential environmental impacts which can be expected from options for extending the water supply network in the North Mankwe FS Area.

### 8.1.2 Scope of the Study

The scope of this assessment is to investigate the environmental impacts associated with the proposed water treatment works, pipelines, reservoirs, elevated tanks and pumping stations to supply safe drinking water to the Area. The scheme considered is the preferred option which has been proposed to augment the water supply in the Area.

Accent has been placed on the impacts of the proposed pipelines and the other surface structures as this is seen as the component likely to cause the greatest impact over the largest area.

There are no viable alternative surface water sources to Vaalkop Dam available to supply the North Mankwe Area so it is proposed to supply the unserved areas from Vaalkop Water Treatment Works. Magalies Water is currently implementing a 90 Mld expansion of the treatment facilities which will include sufficient spare capacity to meet the projected primary water demand in the North Mankwe FS Area. No further additional treatment capacity is needed. In addition some of the bulk pipelines are known to have unallocated spare capacity which may be utilised as described in Chapter 4.

The aspects of the project that will be addressed in this report are:

(1) the effect of abstraction from the river downstream of Vaalkop Dam.

(2) the impact of the construction of pipelines, pumping stations, reservoirs and elevated tanks. The main activities to be expected during the construction of the proposed developments are the following:

   (a) Pre-construction phase: Surveying, clearing of vegetation and construction of access routes.

   (b) Construction phase: Typical activities will be clearing of vegetation, stripping and stockpiling topsoil, excavations, disposal of excess material, transporting of pipes, drilling, blasting, additions or alterations to existing infrastructure and the importation of workers, including their accommodation and recreational facilities.

   (c) Post-construction and operational phase: Rehabilitation of disturbed areas, operation and maintenance of the water treatment works, the pipelines, regional and service reservoirs, elevated tanks and pumping stations. Also included will be the impacts on sanitation due to the increased water consumption.

The ROIP 2 report which was incorporated in details in Annex B gives an overview of expected impacts and recommends further environmental investigations to be done during the detailed design stage.

## 8.2 Summary of the Proposed Infrastructure Plan

Features of the proposed Infrastructure Plan are summarised in Table 8-1 and the details are discussed in Chapter 4 of this report.

**Table 8-1 Summary of the Proposed Infrastructure Plan (Service Level B)**

| Supply System | Facility | Specification | Quantity |
|---|---|---|---|
| (1) Bulk Water | Intake | Max. Q = 88.1 ℓ/s | 1 |
| | Treatment Works | 7.3 Mld | 1 |
| | Pumping stations | Max. Q = 0.15 - 2.4 ℓ/s | 6 |
| | Reservoirs | 300 - 1,000 $m^3$ | 5 |
| | Pipelines | Dia. 90 - 350 mm | 200 km |
| (2) Retail Water | Reservoirs | 20 - 480 $m^3$ | 37 |
| | Pipelines | Dia. 63 - 200 mm | 190 km |
| | Yard connections | | 8,490 |
| | Standpipes | | 89 |

## 8.3 The Natural Environment

### 8.3.1 Climate

The North Mankwe Feasibility Study Area comprises four discrete areas lying within Mankwe Magisterial District of North West Province. The four areas lie within the Crocodile River basin and also drain to the Bierspruit and Brakspruit which are tributaries of the Crocodile River. Average annual rainfall is approximately 420 mm and summer rainfall predominates falling mainly between October and March. Annual average evaporation is around 2,500 mm and is higher in summer than in winter and annual monthly temperatures vary from 12 to 25° C. Prevailing winds are light to moderate in a north easterly direction, occasionally south easterly in winter, and typical wind speeds are 2.7 to 3.8 m/s.

### 8.3.2 River Conservation Status

The conservation status of the rivers is likely to be poor in most instances, as all of the rivers are regulated by dams and weirs. The impact on the rivers as a result of the proposed project is seen as negligible although it will depend on future management of the dam and the future rate of increase of return flows further upstream in the catchment.

### 8.3.3 Water Quality

The project will have limited impact on water quality but the water quality may have an impact on the project. If the water quality deteriorates, the purification costs will increase. The water quality changes that will take place will depend on the present and future land use activities but to a greater extent on return flows as referred to above.

The water is generally of a good quality for domestic use. No comment can be made on the bacteriological and other biological qualities of the water as data is not available.

The lack of adequate sanitation facilities in the proposed water supply area can have an impact on the surface and groundwater quality in the area and can also have a negative health implication.

### 8.3.4 Aesthetics

The aesthetics of the North Mankwe Project Area is generally low as it is a rurally developed area with few undisturbed areas..

The construction of pipelines in the road reserve will cause some disturbance and scar the roadside on a temporary basis rather than a permanent basis as the pipeline will be buried. Erosion could be accelerated during construction. The manholes with isolating, air and scour valves will be visible.

The increased water consumption and the lack of adequate sanitation facilities can have an impact on the aesthetics of the supply area.

### 8.3.5 Flora

Vegetation is predominantly bushveld although a variety of veld types are represented. The proposed pipelines within existing road reserves or pipeline servitudes are not seen as areas of major impact as the areas are seen as having low aesthetic values and a highly disturbed natural environment. Construction activities could cause further disturbance of the area, which could result in the infestation of invasives which could be transported to the area in a number of ways.

### 8.3.6 Fauna

Most of the Project Area is disturbed and the proposed development will have a negligible effect on the mammals, birds, reptiles amphibians and other organisms in the area.

## 8.4 The Socio-Economic Environment

### 8.4.1 Recreation

The pipelines and other surface structures will have no impact on recreation.

### 8.4.2 Land use

In general the existing land use in the Project Area will be negligibly influenced except in areas where land is expropriated for reservoir sites.

### 8.4.3 Cultural/Historical Issues

Very little is known about the archaeological and historical sites in the Project Area.

### 8.4.4 Infrastructure

Access to secondary roads may be temporarily disrupted. The construction activities may also result in the premature degradation of the existing road surface due to the increase in heavy vehicle traffic.

Fences may be temporarily broken during construction and local residents should be aware of this in good time, in order to remove any livestock and children in those particular areas.

Disturbance of any existing infrastructure, power and telephone lines, will have a temporary disruptive impact.

### 8.4.5 Interested and Affected Parties

The construction activities will cause some disturbance and inconvenience to the local people.

Construction activities will cause a temporary influx of people which could lead to an artificial economic boom for the area. The influx of people could also lead to poaching and littering. These impacts could also include increased pressure on local resources for food and for accommodation and on community life. This impact is temporary and may not present a large impact.

There will be some employment opportunities for local people.

Apart from the visual impacts of construction work, there will also be a considerable level of noise, dust, vibration and increased traffic. This could have an adverse effect on the inhabitants of the area

close to the construction activities, as well as on the aesthetics of the area. These effects are temporary.

## 8.5 Important Environmental Impacts

The important environmental impacts for the Project were discussed and incorporated in the ROIP 2 Report. The following is a summary of the negative and positive impacts of the proposed development on the environment.

### 8.5.1 Negative impacts

The following is a list of negative impacts that could arise due to the construction of the pipelines and related surface works. This is a comprehensive list and many of these impacts are not considered to be severe.

(1) The construction of the pipelines and the related infrastructure could:

- cause disturbance within the existing road reserves;
- have a negative impact on the aesthetic value of an area;
- cause erosion on the exposed slopes;
- cause/accelerate the invasion by exotic terrestrial plants;
- cause disturbance of a section of the river channels where pipelines crosses the channels;
- cause increased sediment loads within the rivers.
- noise pollution;
- water pollution;
- the introduction and encroachment of alien plants;
- inconveniences to affected local farmers and other local residents;
- social disruption;
- inconveniences to affected road users.

All these impacts are of a temporary nature during construction except for the invasion of exotic terrestrial plants.

(2) The increased availability of drinking water in the North Mankwe Area may have an impact on the sanitation of the area. As sanitation facilities are generally below the RDP level of a VIP latrine. It is expected that the area could be negatively impacted by the increased availability of water. It is expected that the waste and excess water will be discarded randomly. The areas surrounding houses and standpipes may become wet depending on the drainage potential of the soils in the area. This may also lead to an increase in the potential for pollution of the surface water in the area.

Depending on the soil types and the groundwater potential of the area it may also impact the groundwater quality of the area. The lack of adequate sanitation facilities can also have a health implication for the communities. The impact would be greater if the Case B water supply option is pursued.

It is anticipated that after implementation of the proposed scheme groundwater would be utilised for non-potable and emergency purposes only.

(3) At present very little information is available on the occurrence of archaeological and historical sites and a Phase 1 survey is proposed before any construction is started.

In summary, the major negative impacts include the disturbance of an already highly disturbed area of low ecological value, coupled with a low conservation status and aesthetic value. Another negative impact may be on the areas where wastewater is discarded.

### 8.5.2 Positive impacts

The major positive impacts are related to the availability of a reliable and safe water supply to an increased number of people in the North Mankwe Area. Construction activities could cause temporary economic upliftment in the immediate vicinity.

## 8.6 Conclusions and Recommendations

### 8.6.1 Conclusions

The construction of pipelines and related infrastructure will not cause substantial disturbance. The environmental consequences associated with these impacts are not considered to be significant if managed during and after construction as stipulated in the Environmental Management Plan.

The impacts of abstraction from the Vaalkop Dam are not considered to be significant, but with a degree of uncertainty.

The lack of sanitation facilities coupled with an increase in the drinking water supply can impact on the sanitation of the supply area particularly if the higher Service Level is adopted.

### 8.6.2 Recommendations

The issues to be determined in the detail design phase of the scheme are summarised as follows:

(1) Social impacts

- The social and economic impacts associated with construction disturbance on farming activities along the pipeline routes.
- This investigation should include meetings with the local communities to determine the preferences of the communities to any options or alternative developments, especially in the siting of the regional and service reservoirs.
- The lack of adequate sanitation facilities need to be investigated.

(2) Ecological impacts

- A Phase 1 archaeological survey of the proposed pipeline routes and especially the reservoir sites is recommended.
- General rehabilitation measures.
- Identify birds and their nesting sites where appropriate.
- Liaise with all the interested and affected parties.
- Compile an Environmental Management Plan for the construction phase and draw up appropriate rehabilitation guidelines to mitigate the disturbances and aesthetic impacts caused by the construction of the pipelines and associated infrastructure.
- Alert the contractor and labourers to the ecological and social impacts associated with the construction activities.
- Landscaping specification for the river and canal crossings as well as the permanent access roads.

### 8.6.3 Further Action

Implementation agencies shall take necessary action on the conclusion of the committee meeting, which was held on 20th October 1997, for successful execution of the Project. The Minutes of Meeting for the committee incorporated in the Annex B of this report.

# CHAPTER 9

# PROJECT EVALUTION AND RISK ANALYSIS

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# CHAPTER 9 PROJECT EVALUATION AND RISK ANALYSIS

## 9.1 Engineering Aspects

### 9.1.1 Water Source and Water Supply System

Although the planned supply area extends over thinly populated rural areas with few prospects for future economic growth, it is proposed that the area be supplied with a surface water system. Groundwater as an alternative source is available in the area, but the quality, generally low yield and uncertainty of the supply does not meet the basic requirements for community water supply. Vaalkop WTW was the only viable source of surface water for the Areas.

### 9.1.2 Infrastructure Planning

The proposed project has been planned and designed on the basis of the following conditions and background assumptions.

- The primary objective of the project is to meet the requirements of the "White Paper on Water Supply and Sanitation" in the project area; i.e. to provide the RDP minimum service level by the year 2002.

- Following DWAF policy, the proposed infrastructure plan for Level A included some allowance for upgrading the system, particularly the main pipelines as well as the other basic facilities, in order to avoid excessive cost over-runs when the system is upgraded to Level B.

- Maximum use will be made of locally applicable technology and available resources and materials including labour intensive construction work such as excavation and backfilling.

### 9.1.3 Coordination with Existing RDP Projects

Presently, MW and DWAF are promoting RDP funded projects in the area of jurisdiction of RDC, among which several projects lie within the North Mankwe FS Area. These fall into the categories of implemented, under implementation, budgeted, and planned. In order to avoid duplication of planning and budgetary estimation, information for all of the related projects was collected and screened through consultation with MW and RDC. Where funding has already been allocated, such costs were omitted from the cost estimate prepared for this Study. Generally reticulation and service reservoirs which are provided under planned or implemented RDP schemes would be utilised for the surface water scheme and only the boreholes would not be necessary for the potable water supply system.

## 9.2 Institutional Aspects

### 9.2.1 Water Services Authority

The proposed project is located entirely within the area of jurisdiction of Rustenburg District Council (RDC); thus RDC will be the Water Services Authority under the proposed Water Services Bill. As mentioned previously, RDC has some institutional capacity and will be able to perform its roles and responsibilities as the Services Authority. Through implementation of the proposed project, RDC should take the necessary steps to further strengthen its capacity with support from other external role players.

### 9.2.2 Water Services Provider

It is proposed that Magalies Water assumes responsibility for the bulk water supply and that a Joint Venture of Rustenburg District Council and Magalies Water manages the early stages of project implementation and operation for the retail sector. Finally, Area Water Supply Cooperatives will have responsibilities as WSP.

### 9.2.3 Community Involvement

From the standpoint of project sustainability (even for Level A), it is vital that the beneficiary communities be involved and participate in the project from inception. Experience obtained from implementation of the pilot projects, especially in Kameelboom, and general best practice should be used to provide feedback. Measures might include:

- Establishment of a Local Project Steering Committee (LPSC) involving all stakeholders within and outside the community;

- Preparation of a business plan in collaboration with the LPSC and the development of mutual understanding of the plan by the communities, particularly in tariff setting which is considerably higher than their expectation;

The importance of community involvement and a community driven (demand driven) approach is to motivate communities to accept responsibility and ownership of facilities and to manage, operate and maintain the system.

## 9.3 Financial Aspects

This section reviews the financial implications of providing Service Level B by initially providing Service level A and later upgrading (Case C-1). This is based on a sensitivity analysis for key elements of the project as well as the basic conditions and assumptions made in the financial analysis.

In view of the various real rates of interest applied in the various parts of DWAF, a net present value (NPV) for the two scenarios has been calculated with three different rates: 3%, 5% and 8%, as well as the FIRR. The results are summarised in Table 9-1 below.

**Table 9-1 Financial Internal Rate of Return (FIRR) and NPV**

| | Units | Case C-1 |
|---|---|---|
| **1. NPV** | | |
| - Real Rate of Interest=3% | R x 1,000 | 11,694 |
| - Real Rate of Interest=5% | R x 1,000 | 5,753 |
| - Real Rate of Interest=8% | R x 1,000 | 1,038 |
| **2. FIRR** | | |
| - Original Case | % | 9.2 |
| - Tariff Recovery | | |
| 90% | % | 6.4 |
| 80% | % | 3.6 |
| 70% | % | 0.4 |
| - Capital Cost | | |
| 10% increase | % | 7.8 |
| 20% increase | % | 6.8 |

Among the various items tested for sensitivity including cost / tariff recovery, capital cost, O&M cost, administration cost, water demand (consumption) and reserved fund, the most sensitive item is the tariff collection / cost recovery rate. It was found that 95% recovery is marginal to the real rate of interest of 8%. Hence, institutional reinforcement for the proposed Services Provider as well as the third tier (RDC) and the beneficiary communities is a pre-requisite and absolutely essential. While the designated Services Provider of retail water supply should mobilise a fund amounting to about R66.5 million (at constant 1997 price) for upgrading from Service Level A, the loan amount will be reduced to R20.0 million in combination with beneficiaries contribution to establish a reserve fund for the upgrading. Hence, Case C-1 will be a more realistic option when considering the present financial burden for RDC, who will be a partner in the JV system for retail water supply.

## 9.4 Economic Aspects

### 9.4.1 General

The economic aspects of the project have been evaluated by calculating a net present value (NPV) and economic internal rate of return (EIRR). Since the economic analysis is focusing on efficient utilisation of limited resources available in the entire economy of the FS Area, all components of project cost and benefit have to be valued as the real cost to the national economy. In this connection, such transfer payment as taxes and interest must be deducted from the cost component, but subsidies and grants from Central Government must be included. Furthermore, unskilled labour costs and fuel costs have been converted to their real economic value by applying the conversion factors of 0.3 and 0.7, respectively. The calculation basis for this is detailed in Annex C.

### 9.4.2 Economic Benefit

Through the implementation of the proposed project, the following are, generally, identified and itemised as the key economic benefit:

(1) Key Economic Benefit

(a) Socio-economic benefit:

The proposed water supply scheme will improve access to potable water, reducing the time spent for water collection and cartage by women or children, who have born traditionally such responsibilities, resulted in providing extra free time and opportunities for them to

spend on other activities (Service Level B);

Increased quantity of available water and stabilised water supply will ease the local residents and uplift the living standard of them (Service Level A and B); and

Improved quality water will save the fuel costs, particularly firewood, to be consumed for boiling unsanitary water to obtain drinkable water (Service Level A and B).

(b) Public health benefit

Improved quality and quantity of water will contribute to improve the public health conditions of the local residents through reducing water-borne diseases' cases such as Typhoid, Dysentery, Diarrhoea and Food Poisoning (Service Level A and B); and

Improved access to water will save women or children from collecting and cartage of water, resulted in enhancement of their public welfare.

(2) Quantifiable Benefit

Among the key economic benefits mentioned above, only the time (labour) - saving benefit arising from water collection and cartage activities was selected as a quantifiable benefit for the economic analysis. Thus, the economic benefit is estimated at R3.6 per day or R108 per month per household. Details of the calculation of this economic benefit are compiled in Annex C.

The results of the economic analysis are given in Table 9-2 below.

**Table 9-2 Results of Economic Analysis**

| | Unit | Case C-1 |
|---|---|---|
| **1. NPV** | | |
| I=3% | R1,000 | 28,750 |
| I=5% | R1,000 | 4,383 |
| I=8% | R1,000 | -15,299 |
| **2. EIRR** | % | 5.5 |

## 9.5 Social Aspects

### 9.5.1 Special Consideration of Low Income Groups

The viability of a water supply project is usually identified and considered subject to the supply side and taking into account the average income structure. In this Study, the tariff setting analysis has been carried out on the basis of supply side and demand side approaches. The income profile obtained from the community survey particularly showed that about 50% of respondents are below the poverty line. Although the average household income per month in the area is estimated to be R1,216, about one third of the community is categorised in the low income group with a monthly income of R305. The proposed development scenario (Case C-1) will be able to certainly reduce a cost burden for the low income group, however, it is not an ultimate solution. In this context, all community members who will be a beneficiary of the project, must be motivated to be sincerely conscious of existence of low income group in their community and to assist the group, otherwise sustainable operation of the proposed project will not be definitely attainable.

### 9.5.2 Equitable Supply and Cost Sharing System

One disadvantage of the public/community standpipe system is that cost sharing occurs under a flat tariff system which benefits only some of the community members. This system benefits people living in close proximity to the standpipe. The unfairness of the system is expressed by those who live further away from the tap because they have to expend more time and effort collecting water than those who are located nearer to the tap. To address this issue and to work out a sustainable solution, a prepaid metering system is being tested at Ga Rasai, one of the four pilot projects carried out under the framework of this Study.

In this project, 90% of beneficiaries will finally be supplied with potable water through yard connections, which will reduce the labour required for water cartage on a daily basis. The main burden of transporting water is currently shouldered by women and children who have to waste time queuing in long lines at certain standpipes during the busiest times. For yard connections tariffs will be charged depending on water usage as measured by individual meters. It is hoped that this is a fairer system than public standpipes.

### 9.5.3 Unauthorised/Illegal Connection and Cost Recovery

It can generally be accepted that when beneficiaries are provided with a yard connection, the propensity for making unauthorised or illegal connections is extremely low. In the proposed scenario, Case C-1 however, the public-tap system is planned for the first 5 years of the project life. During this period, the potential threat or actual incidence of illegal or unauthorised connections could be extremely high. To avoid or reduce the risk of illegal connections it is vital to involve the beneficiaries from the beginning of the design stage and to motivate to understand the importance of project sustainability through training, education and communication.

## 9.6 Environmental Aspects

The environmental impact assessment (EIA) was carried out under the DWAF framework for environmental management, namely ROIP2 and the findings are detailed in Chapter 8. The ROIP2 study concluded that no serious environmental impacts can be foreseen during implementation of the proposed project.

# CHAPTER 10

# CONCLUSIONS AND RECOMMENDATIONS

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# CHAPTER 10 CONCLUSIONS AND RECOMMENDATIONS

## 10.1 Conclusions

Since groundwater was found not to be a sustainable alternative source to meet the basic requirements of community water supply, the conclusion of the Study was to supply water to communities using a surface water system, which is rather costly but will be more reliable and sustainable, taking into consideration the socio-economic situation in the FS Area. The proposed infrastructure plan has been made on the basis of two levels of services; Level A covers 100% of beneficiaries with the RDP minimum level as Case A, and Level B covers 10% and 90% of beneficiaries with the RDP level, and with the higher service level of yard connections, respectively as Case B.

The project planning and design had taken into consideration the DWAF policy that allows spare capacity to be provided to meet future demand growth and upgrading of service level, especially for main pipelines and other basic facilities so as to avoid excessive cost when demand increases and upgrading becomes necessary. Currently, MW and DWAF are promoting RDP projects in the North Mankwe Area, and the necessary adjustment and coordination with such RDP projects has been taken into consideration in the project formulation.

From an integrated engineering, institutional, financial and socio-economic viewpoint, it would appear that neither simply implementing Case A nor Case B would be the best alternative considering the viability and sustainability of the project. To this end, it is proposed that a staged development approach, "Case C", be introduced that will start the project with Case A in the early years and then upgrade the system towards Case B. Under Case C the tariff during the first five-year period will not only cover the O&M cost but will also allow a reserve fund to be established for future upgrading of the service level. It is anticipated that the accumulation of the reserve fund will greatly improve the financial position of the Services Provider, by reducing the loan required from R25.7 million to R12.7 million at 1997 constant price.

The proposed project, therefore, is technically feasible, economically and financially viable for implementations of the project.

## 10.2 Recommendations

In order to realise the proposed North Mankwe Water Supply Project on a sustainable basis, the project should be promoted with the following recommendations.

### 10.2.1 Technical Issues

Since the proposed bulk supply facilities under this project will be utilising the same facilities that will be constructed by MW under current fixed planning, it is necessary to adjust and coordinate the timing of implementation of both projects.

In implementing this propose project, it is necessary to adjust and coordinate the project components to take into account other RDP funded projects both already implemented and under planning, which fall within the surrounding Area.

### 10.2.2 Institutional Issues

Full co-ordination, mutual understanding and communication among the role players over all three tiers shall be secured concerning their respective roles and responsibilities.

In terms of institutional reinforcement and/or strengthening:

- Full technical support of the second tier is essential
- Efficient utilisation of the private sector, especially consultants, for capacity building within beneficiary communities, for which the lessons and experiences obtained from the pilot project implementation shall be fully reflected.

### 10.2.3 Financial Issues

The first tier (DWAF) shall secure the initial capital cost of R76.8 million which covers Service Level A (RDP minimum level).

The second tier (MW) shall secure the initial capital cost for upgrading the system to Level B, amounting to R8.1 million.

The third tier or a proposed Services Provider for retail water shall secure R25.7 million for the capital cost of upgrading to Level B.

Beneficiary communities shall accept the set tariff which will include for a contribution to a reserve fund (total of R12.96 million including generated interest) for future upgrading even during the 5 year period at Service Level A.

All costs are expressed at 1997 constant prices.

### 10.2.4 Social Issues

As experienced in the pilot project implementation, positive participation of women in the planning and design of the project must be assured.

Within communities, due attention should be paid to low-income groups.

Beneficiary communities should be motivated to recognise that the water supply facilities are their property by contributing to payment for a reserve fund for upgrading the service level.