

## **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 South 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) Eastern District Council

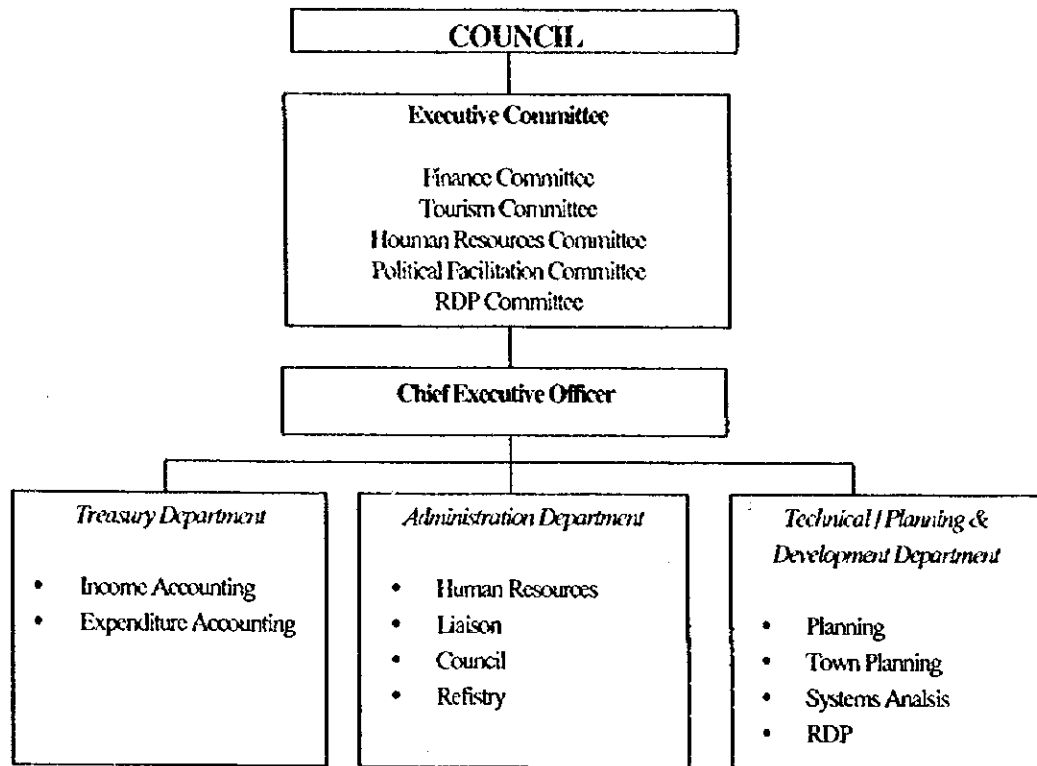
As indicated in the description of the project area, the Moretele 1 and Odi Districts within which the Klipvoor Area lies, fall under the jurisdiction of Eastern District Council. EDC has developed an organization structure chart shown in Figure 6-1. The chart illustrates the inclusion of a Technical Planning and Development Department which starts to provide for the need to become involved in facilitating service delivery. Within this department are posts for a Planning Engineer (which has not yet been filled) and RDP facilitation. The structure chart is summarised in Table 6-1 as follows:

**Table 6-1 Summary of Functions and Classification of Eastern District Council Staff**

	Posts	% of Total	Comment
<b>Total Organization</b>	31		Compares with Rustenberg DC which has 48 posts.
<b>Functions :</b>			
Finance / Treasury	7	23%	Director of Finance post vacant.
Administration	16	52%	
Tech. / Planning / Development	8	35%	The two most senior posts are vacant
<b>Classification :</b>			
Management	4	13%	50% vacancy in managerial posts.
Technical & Professional	11	35%	
Junior Administrative & Support	16	52%	

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

**Figure 6-1 Structure of Estern Distret Council**



The above table illustrates that although EDC has put structures in place its capacity is limited as there are only a small number of posts directly related to the service delivery process and there are vacancies in key managerial and technical positions. Currently there is one RDP Officer, (Simon Ramodike who has actively participated in the PEG) and two RDP Facilitators. In particular it is noted that EDC has no resources in planning functions.

As a result of this lack of resources in the planning function, EDC has not yet been able to set up zonal planning structures such as exist in the area of RDC. An area planning forum has however been established which is now operating successfully and demonstrates the benefits of cooperation between key stakeholders in the Study Area.

The forum consists of:

Eastern District Council  
 Rustenberg District Council  
 Magalies Water  
 Department of Water Affairs and Forestry  
 Rand Water  
 SANCO

Some TLC Representatives  
Some TRC Representatives

Magalies Water chairs the forum and Stewart Scott (consulting engineers) provide the facilitation and secretariat support. The forum has had to initially focus its attention on immediate problems, current plans and budgeting for next year. It is however the objective to coordinate development of comprehensive and long term plans for the area. In this regard Magalies Water has been considering longer term developments while EDC has addressed short term needs.

## (2) Magalies Water

The Klipvoor Area is in relatively close proximity to MWs main operations (although more distant than North Mankwe). MW has recently revised its organizational 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 organization as is tabulated in the following table:

**Table 6-2 Summary of Functions and Classification of Magalies Water Staff**

Profile	Posts	% of Total	Comment
<b>Total Organization</b>	408		Includes the staff formerly of part of NWWA
<b>Functions :</b>			
Bulk Supply (East)	80	20%	Illustrates the impact on MW of absorbing former NWWA staff.
Bulk Supply (West)	61	15%	
Community Services	244	60%	
Finance	10	2%	
Administration	10	2%	
Human Resources	1		
Internal Audit	2		
<b>Classification :</b>			
Management / Admin.	105	26%	Illustrates the depth of capacity of MW.
Operations	92	23%	
Technical / Maintenance	211	52%	

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 organizational change.

Figure 6-2 illustrates that MW, (in addition to the functional divisions) is also organized on a regional basis. The Klipvoor Feasibility Study Area falls in the Eastern Bulk Supply Region of MW and the closest facilities where staff resources are concentrated are the water treatment works at Temba and Klipdrift. Operations of NWWA which were absorbed by MW also have their headquarters at Temba. Regional MW capacity of relevance to the Feasibility Study Area is tabulated in the Table 6-3.

Figure 6-2 Proposed Structure of Magalies Water Board

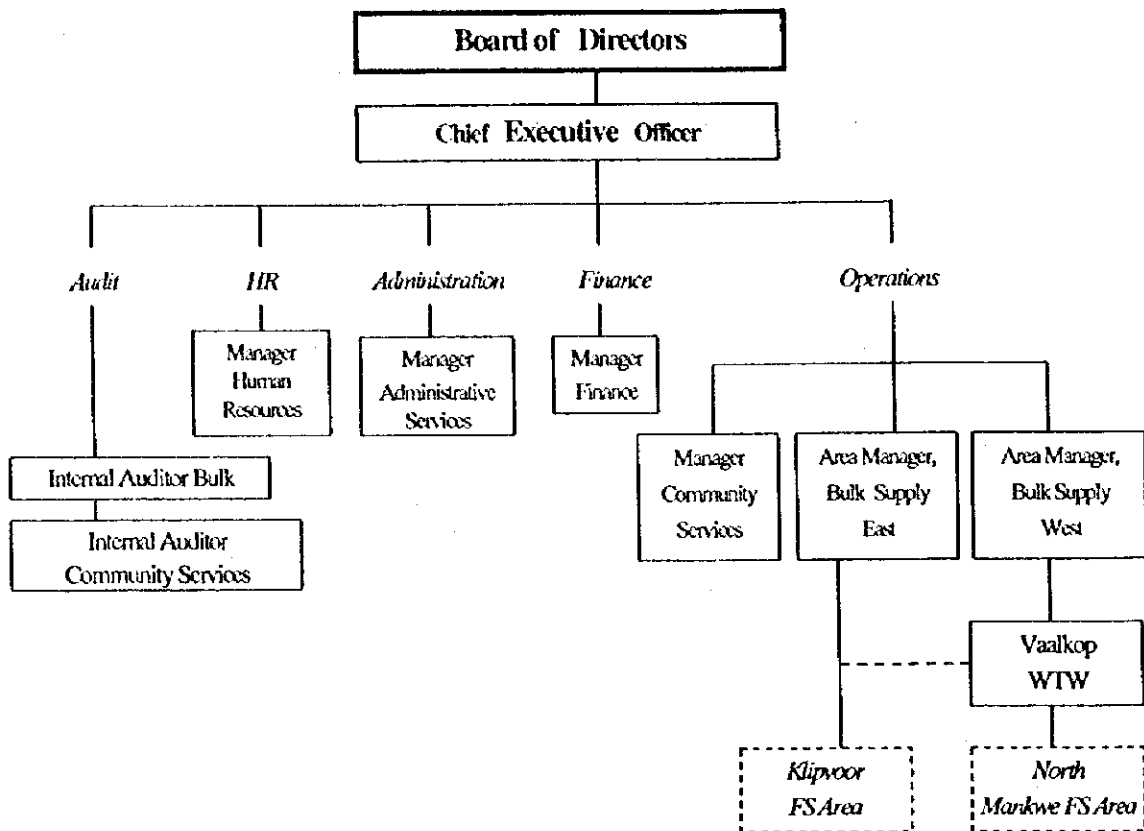


Table 6-3 Capacity of Magalies Water in the Eastern Region

Eastern Region	Staffing
<b>Bulk Water Supply :</b>	63 Total
Klipdrift WTW	22
Temba WTW	15
<b>Community Services :</b>	
Eastern District	112

The figures and tables above 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 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

No formal local authorities are yet in place i.e. existing structures are all transitional organizations 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.

EDC has sought to provide some support for the planning and development process by allocating councillors to specific communities / areas. The success of the process has largely depended upon the enthusiasm of individual councillors. Communication of this deployment has been a problem. In relation to the Klipvoor Area the allocation is as shown in Table 6-4

**Table 6-4 Allocation of District Councillors in the Klipvoor Area**

Area	Councillor
Legonyane, Sepai, Fafung, Ga Rasai	Clr. S. Kunene, Clr. E. Masala
Shakung, Dikgopaneng, Dipongpong	Clr. Modiga, Clr. Kgwele
Lebotloane, Tlholwe	Clr. Selomo
Dipetlolang, Swartboom, Olverton, Kgomo-Kgomo	Clr. Motshabi

### (4) DWAF

The regional office of DWAF is located in Mmabatho which is very distant from the Klipvoor Area. It should not therefore be expected that any significant support can be provided in the Feasibility Study Area. The DWAF 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 Study.

DWAF organization 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 Klipvoor Area.

## **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 Ga Rasai Project Steering Committee is now functioning effectively although some problems were experienced initially, as discussed more fully in Volume 6. Planning teams are now being formed which will address all aspects of the institutional development process and articulate specific needs. It is however clear from interaction with the community to date that capacity in the following areas is very limited:

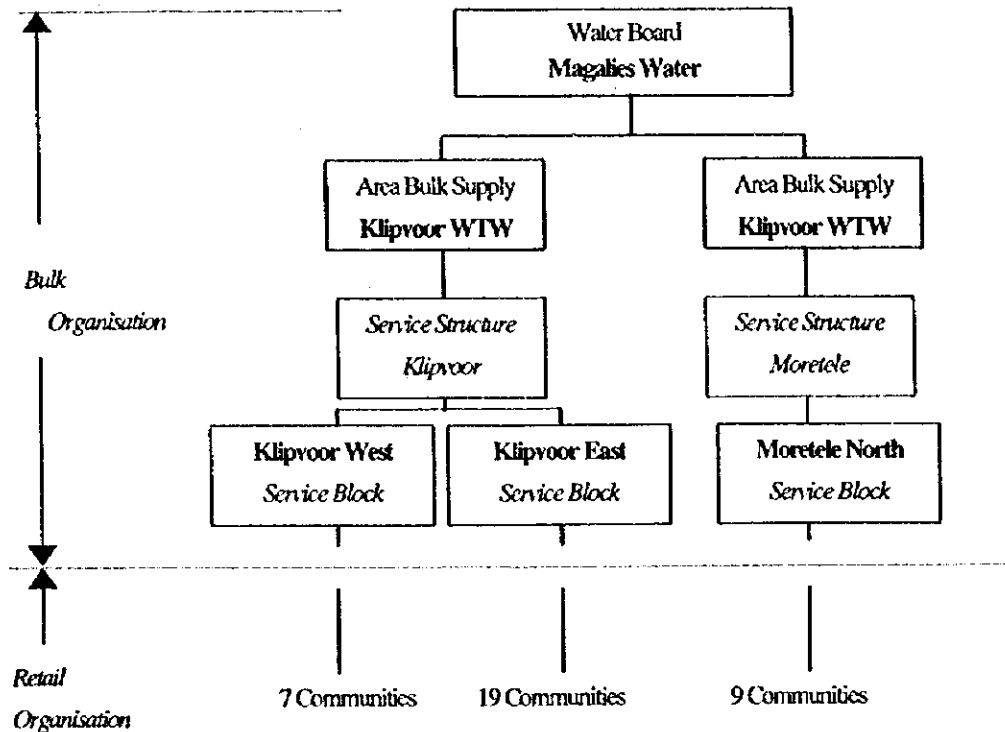
#### **6.4 Institutional Structures: Bulk Water Supply**

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 Klipvoor. 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.

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 Klipvoor 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 Klipvoor 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 EDC's lack of O&M capacity this role will be difficult to achieve. The possible institutional options are as follows:

#### (1) EDC as Services Provider

In terms of this option EDC 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 EDC 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) EDC Contracting with a Services Provider**

There are two possibilities:

**(a) Contracting with an Existing Institution**

In terms of this option EDC would contract with an existing entity to fulfill the functions of service provision. The obvious possibility is for EDC 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 EDC would contract with a new entity to fulfill the functions of service provision. This could be an existing 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. EDC 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 6-5 and these help to further expand understanding of the impact of choosing each of the different approaches:

**Table 6-5 Advantages and Disadvantages of Options for Services Provider**

Option	Advantages	Disadvantages
EDC as Services Provider	<ul style="list-style-type: none"> <li>- Appropriate role for EDC.</li> <li>- Builds EDC's capacity.</li> <li>- Some existing capacity to support new functions.</li> <li>- Structure could serve other areas.</li> </ul>	<ul style="list-style-type: none"> <li>- Limited resources to get structure going.</li> <li>- Establishing structure will take time.</li> <li>- May take EDC focus away from other strategic needs.</li> </ul>
EDC Contracted Services Provider	<ul style="list-style-type: none"> <li>- Role remains with EDC.</li> <li>- Could be quickly implemented.</li> <li>- Contractual requirements can be differentiated i.e. implementation, O&amp;M.</li> <li>- Enables utilisation of existing capacity in the area i.e. MW.</li> </ul>	<ul style="list-style-type: none"> <li>- Opportunity for EDC to create more capacity internally missed.</li> <li>- Institutional development is taking place at one level up from communities.</li> <li>- Could distract MW from its primary function of bulk water supply.</li> <li>- Some conflicts of interest could arise.</li> </ul>
Water Committee	<ul style="list-style-type: none"> <li>- Closer to the transitional local structures and communities which is where the function ultimately belongs.</li> <li>- Creates a formal corporate entity to carry out the required functions.</li> <li>- Would create new / additional capacity in the area.</li> </ul>	<ul style="list-style-type: none"> <li>- Will be time consuming to implement.</li> <li>- Could be perceived as a DWAF imposed solution.</li> <li>- Benefit limited to one specific area.</li> <li>- No existing capacity to support this development.</li> </ul>
Transitional Local Authority as Service Provider	<ul style="list-style-type: none"> <li>- Closer to the local communities which is where the function ultimately belongs.</li> <li>- Could be more than one service structure depending upon local situation.</li> <li>- Would create new / additional capacity in the area.</li> </ul>	<ul style="list-style-type: none"> <li>- Will be time consuming to implement.</li> <li>- Subject to local political / community dynamics.</li> <li>- No existing capacity to support this development.</li> </ul>

## 6.5.2 Joint Venture Partnership Option

It is highly relevant to note that EDC and MW have already discussed a joint venture which could 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:

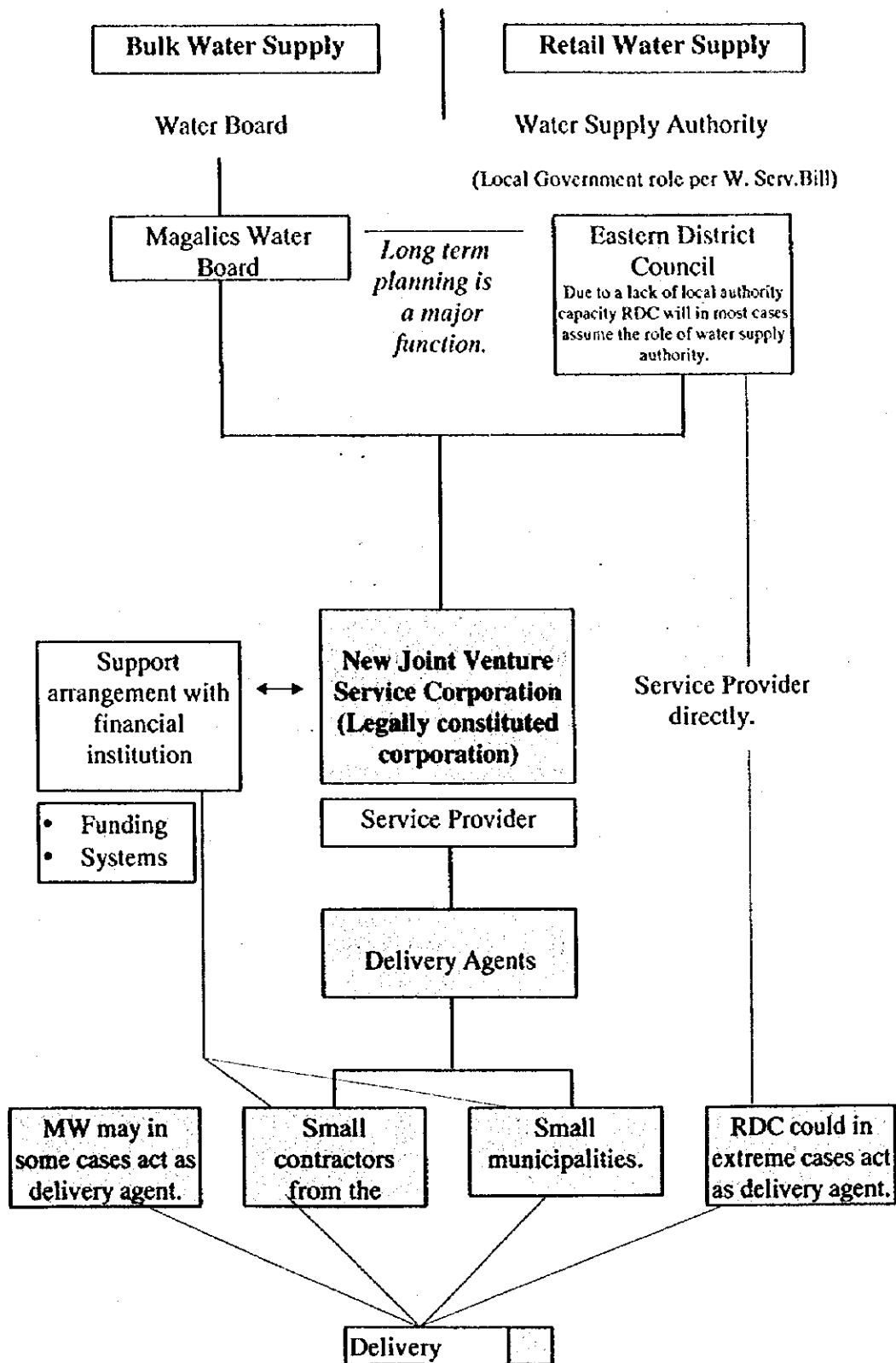
- Will the proposed option promote **delivery** of water especially to remote and poor rural communities?
- Will the proposed option build **partnerships**, and produce a sustainable **institutional framework**?
- Will the proposed option achieve the **sustainable management** of existing and planned 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?

### 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.



Figure 6-4 Structure of Possible MW Joint Venture



### **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)**

An EDC-MW Joint Venture and Partnership which is in the process of discussion could 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 6-6.

#### **(4) Intermediary Level Structures (Service Cooperatives)**

There are thirty five 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 co-ordinating 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 phase of the JICA Study and was well received by stakeholders. Secondly in a number of circumstances water resources need to be 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 co-operatives (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.

## **6.6 Staged Institutional Development Plan**

### **6.6.1 General**

The plans of institutional development and capacity building in water sector shall be prepared 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, i.e. first, second and third stages.

- (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:**

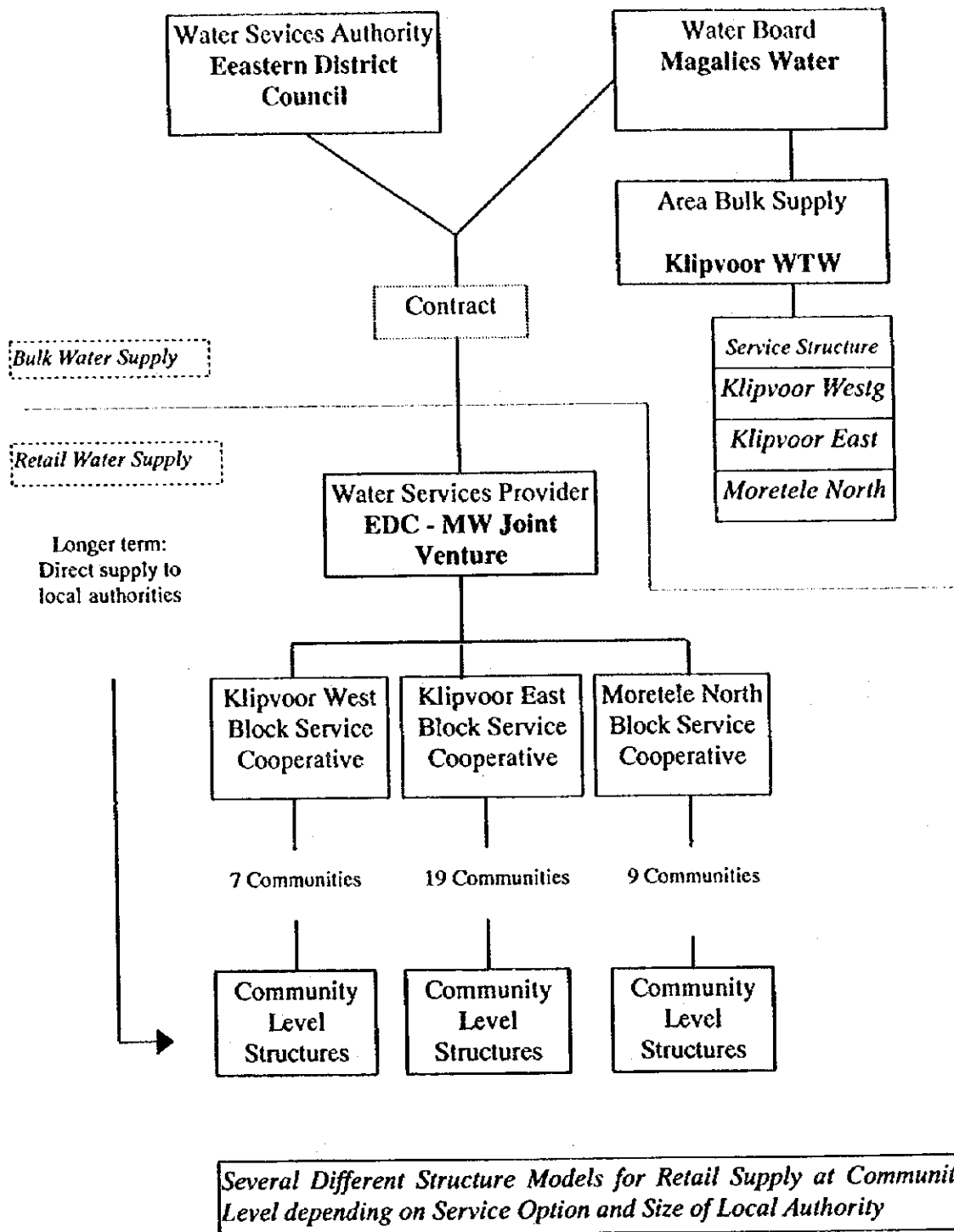
- **First (1st) Stage (1988-2002):** Implementation of construction work and establishment of 3rd Tier institutional for Water Service Level A
- **Second (2nd) Stage (2003-2007):** Implementation of up-grading of infrastructures and re-structuring of 3rd Tier organisation
- **Third (3rd) Stage (Beyond 2008):** 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 Table 6-6.

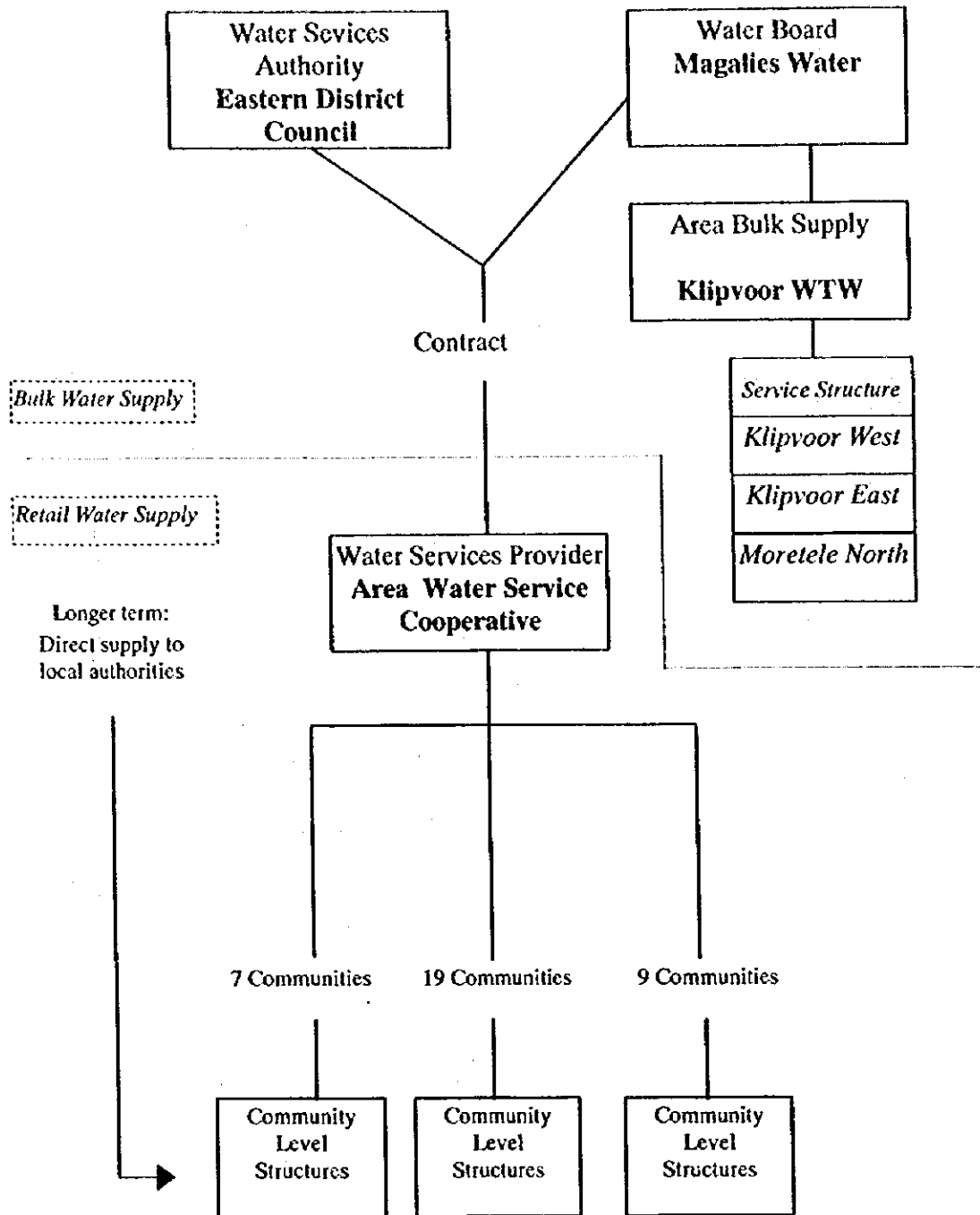
**(3) Master Schedule:**

Master schedule of each phases indicated in Table 6-7.

Figure 6-5 Klipvoor Study Area Option : First and Second Stage



**Figure 6-6 Klipvoor Feasibility Study Area Option : Third Stage**



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

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

<b>Service Level A</b>		
	<b>Structure Model 1</b>	<b>Structure Model 2</b>
<b>Size</b>	<b>Small Community:</b> e.g. 350 Households 2100 People	<b>Medium:</b> e.g. 800 Households 4800 People
<b>Mngt.</b>	<b>Water Committee:</b> - Chair person - Vice Chair - Secretary - Treasurer	<b>Water Committee:</b> - Chair person - Vice Chair - Secretary - Vice Secretary - Treasurer
<b>Staff</b>	Operator (x 1) Water Bailiff (x 1)  <ul style="list-style-type: none"> <li>Part-time employee/s.</li> <li>Functions may be combined.</li> </ul>	Bookkeeper / Administrator Operator (x 2) Water Bailiff (x 2)  <ul style="list-style-type: none"> <li>Part-time employee/s.</li> </ul>
<b>Service Level B</b>		
	<b>Structure Model 3</b>	<b>Structure Model 4</b>
<b>Size</b>	<b>Small Community:</b> e.g. 350 Households 2100 People	<b>Medium:</b> e.g. 800 Households 4800 People
<b>Mngt.</b>	<b>Water Committee:</b> - Chair person - Vice Chair - Secretary - Treasurer	<b>Water Committee:</b> - Chair person - Vice Chair - Secretary - Vice Secretary - Treasurer
<b>Staff</b>	Operator (x 1) Pipe / Meter Maintenance (x1) Meter Readers / Collection Officers (x 2)  <ul style="list-style-type: none"> <li>Some permanent positions.</li> <li>Functions may be combined.</li> </ul>	Bookkeeper / Administrator (x1) Operator (x 2) Pipe / Meter Maintenance (x2) Meter Readers / Collect. Officers (x 2)  <ul style="list-style-type: none"> <li>Some permanent positions.</li> </ul>

**Table 6-7 Master Schedule of Institutional Development**

Description	1998 - 2002					2003 - 2007					2008 - 2012				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<b>A. Construction Schedule</b>															
(1) Level A Facility															
(2) Upgrading (1) Facility															
(3) Upgrading (2) Facility (if any)															
<b>B. Water Supply Service</b>															
(1) Service Level A															
(2) Service Level B (1)															
(3) Service Level B (2)															
<b>C. Institutional Development</b>															
<b>C1. Stage 1 Development</b>															
(1) Contracting JV															
(2) Appointment of WSP															
(3) Establishment of LWCs															
(4) Preparation of Action Plan															
(5) Formation of BWSCs															
<b>C2. Stage 2 Development</b>															
(1) Strengthening of LWC/BWSCs															
(2) Operation of Basic Level Service															
(3) Consensus of Upgrading															
(4) Mentoring/Strengthening OM															
(5) Formation of AWSC															
(6) Fund / Loan Management															
<b>C3. Stage 3 Development</b>															
(1) Consolidation of AWSC															
(2) Permanent Operation															
(3) Tariff Collection/ Loan Payment															
(4) Mentoring/ Strengthening OM															
<b>C4. All Stages</b>															
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 6-8 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 EDC..
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 6-9 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.	EDC - 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: <ul style="list-style-type: none"> <li>Processes / systems.</li> <li>Resources</li> <li>Funding</li> </ul>	EDC - 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.	EDC - MW JV
6. Development of area support networks.	This is the first stage 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.	EDC - 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.	EDC - 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 been constructed and developing the necessary operations and maintenance strategies and plans necessary to ensure sustainability.

**Table 6-10 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.	EDC - 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.	EDC - MW JV
3. Finalise and implement local operating structures.		EDC - MW JV
4. Conclusion of hand over agreements.		EDC - 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.	EDC - 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.		EDC - 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 stages is essential if adequate reserves are to be built up to achieve the higher level of service.	EDC - MW JV

### 6.6.3 Step 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 6-11 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 Phase1 is essential.	EDC - 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.	EDC - MW JV
3. Preparation of basic plan.		EDC - MW JV
4. Develop project initiation / promotion schedule and financial plan / budget.	Up-graded level of service	EDC - 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.	EDC - MW JV
6. Preparation of detailed Action Plans by local consultants.	Implementation of up-graded level of service	For EDC - MW JV
7. Strengthening of BWSCs	Undertaking O & M and fees collection	WSP

**(2) Step2: Implementation of Higher Level of Service Projects****Table 6-12 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.	EDC - 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: <ul style="list-style-type: none"> <li>• Processes / systems.</li> <li>• Resources</li> <li>• Funding</li> </ul>	EDC - 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 stage 3 needs by rationalisation of BWSCs..

**Table 6-13 Action Plan (St.-2/Step3)**

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.	EDC - 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.	EDC - MW JV
3. Finalise and implement revised local operating structures.	Preparation of new water tariff system by used volume of water	EDC - MW JV
4. Conclusion of hand over agreements.		EDC - 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.	EDC - MW JV
6. Re-structuring of BWSCs and JV organisations.	Objectives will be to: <ul style="list-style-type: none"> <li>• Utilise local capacity built up during Stages 1 &amp; 2</li> <li>• Delegate to local authority level as much of the EDC - MW JV role as possible.</li> <li>• Reduce the umbrella role of the JV.</li> </ul>	EDC - 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 6-14 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.	EDC - MW JV
2. Enhancement operations and maintenance performance on a continuous basis.		EDC - 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 6-15 Roles and Responsibilities**

<b>Bulk Water Supply</b>			
<b>Institution</b>	<b>Stage</b>	<b>Role</b>	<b>Responsibility</b>
Magalies Water	Set-up	Leadership	<ul style="list-style-type: none"> <li>Assisting EDC set up JV for service provision.</li> </ul>
	Project Implementation	Bulk Supply.	<ul style="list-style-type: none"> <li>Development of necessary bulk infrastructure.</li> </ul>
		Retail Implementation Support	<ul style="list-style-type: none"> <li>Technical design inputs</li> <li>Managing implementation aspects as delegated in JV agreement.</li> </ul>
	Operation and Maintenance	Service Delivery Support	<ul style="list-style-type: none"> <li>Coordination with Services Provider and providing agreed support.</li> </ul>
<b>Retail Water Supply</b>			
<b>Institution</b>	<b>Stage</b>	<b>Role</b>	<b>Responsibility</b>
DWAF (i.r.o.RDP level of service) Eastern District Council(i.r.o.higher level of service)	Set-up	Leadership	<ul style="list-style-type: none"> <li>Setting up JV with MW.</li> <li>Initiating programme to develop local level service structures.</li> </ul>
	Implementation	Services Authority	<ul style="list-style-type: none"> <li>Planning service delivery, (i.e. preparation of a plan as required in the WS Bill)</li> <li>Ensuring funding is sourced for delivery infrastructure.</li> </ul>
	Operation and Maintenance		<ul style="list-style-type: none"> <li>Ensuring service delivery takes place.</li> </ul>
EDC - MW JV	Set-up	Leadership	<ul style="list-style-type: none"> <li>Implementing programme of local level structure / community development.</li> </ul>
	Implementation	Implementing Agent.	<ul style="list-style-type: none"> <li>Detailed planning for projects.</li> <li>Implementation of projects.</li> <li>Commissioning of projects.</li> </ul>
	Operation and Maintenance	Services Provider in the stage 1 (area and local level) and stage 2 (area level).	<ul style="list-style-type: none"> <li>Operating local level supply in the stage 1.</li> <li>Planning (and ensuring) hand over to local level structures.</li> <li>Development programme necessary for hand over.</li> </ul>
Intermediary Structures	Implementation	Leadership	<ul style="list-style-type: none"> <li>Coordination amongst stakeholder communities.</li> <li>Area water supply planning coordination.</li> <li>Cooperative ventures between communities.</li> </ul>

**Table 6-15 Roles and Responsibilities (Continue)**

Retail Water Supply			
Institution	Stage	Role	Responsibility
	Operation and Maintenance.	Possible Services Provider in the stage 2.	<ul style="list-style-type: none"> <li>Operating area level supply in the stage 2</li> <li>Planning (and ensuring) hand over to local level structures.</li> <li>Resource development and pooling of resources necessary for hand over.</li> </ul>
Local Authorities / Communities	Set-up	Leadership.	<ul style="list-style-type: none"> <li>Setting up legitimate and effective PSCs and similar structures.</li> </ul>
	Implementation	Implementing agent support.	<ul style="list-style-type: none"> <li>Inputs to planning process.</li> <li>Contracting with Services Provider for service provision.</li> </ul>
	Operation and Maintenance.	Services Provider at local level in the stage 2 and 3.	<ul style="list-style-type: none"> <li>Operating local level supply in the stage 1.</li> <li>Planning (and ensuring) hand over to local level structures.</li> <li>Institutional development programme necessary for hand over.</li> </ul>

## **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 EDC-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 three packages each corresponding to three 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.

It is estimated that approximately 18 months will be necessary for construction in both the Klipvoor West and the Klipvoor East Supply Blocks, while 12 months will be adequate for the Moretele North Supply Block. Priority is given to the West Block since this package includes construction of the new water treatment works. This allows immediate commissioning of the system upon completion.

The second priority is given to the Klipvoor East Block since this package involves the largest bulk and reticulation pipelines in total length. Careful scheduling of work during the construction stage will also allow partial commissioning of the system to commence 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

Description	Stage 1					Stage 2					Stage 3				
	1998~2002					2003~2007					2008~2012				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Water Supply Service Level															
(1) RDP Service Level A															
(2) Up-Grading Level (1)															
(3) Up-Grading Level (2)															
2. Infrastructure Development															
(1) Fund arrangement	1st					2nd									
(2) Detailed design and tendering		1st					2nd								
(3) Construction works				1st					2nd						
(4) Commissioning					1st					2nd					
3. Operation and Maintenance															
(1) Stage 1 Project															
(2) Stage 2 Project															
4. Institutional Development															
(1) Stage 1 development															
(2) Stage 2 development															
(3) Stage 3 development															
5. Water Tariff Collection															
(1) Flat rate tariff															
(2) Quantity Based tariff															
6. Fund Sources															
(1) Reserve fund deposit															
(2) Loan repayment															

Figure 7-2 Implementaiton Schedule of Klipvoor Water Supply Scheme

Item	1998~2002					2003~2007					2008~	
	1	2	3	4	5	1	2	3	4	5	1	2
<b>A. Stage 1</b>												
1. Finance Arrangement	■											
2. Detailed Design		■	■									
- Selection of Consultants		■										
- Detailed Design			■									
3. Construction				■	■							
- Contracting				■	■							
- Construction Supervision												
Package 1 (Klipvoor West)				■	■							
Package 2 (Klipvoor East)					■							
Package 3 (Moretele North)												
4. Institutional Development	■	■	■	■	■							
<b>B. Stage 2</b>												
1. Finance Arrangement					■	■						
2. Detailed Design						■	■					
- Selection of Consultants						■						
- Detailed Design							■					
3. Construction Supervision												
- Contracting								■				
- Construction Supervision									■	■		
Package 1								■	■			
Package 2										■		
4. Institutional Development						■	■	■	■	■		
<b>C. Stage 3</b>												
OM and Institutional Reform											■	■

## **CHAPTER 8**

### **ENVIRONMENTAL IMPACT ASSESSMENT**

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## **CHAPTER8 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 Klipvoor 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 Klipvoor 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.

Three technical alternatives were evaluated during the Master Plan stage for the Klipvoor Project Area. As part of this Feasibility Study, those alternatives were re-examined using the Case B water demand. For Service Level B (Case B) 90 % of households will be supplied through yard connections (85.6 lcd) and the remaining 10 % through standpipes (30 lcd) installed to the RDP level of service, giving a weighted average consumption rate of 80 lcd including an allowance of approximately 15 % for leakage.

The aspects that will be addressed in this report are:

- the effect of abstraction from the river downstream of Klipvoor Dam.
- 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:

- (1) Pre-construction phase: Surveying, clearing of vegetation and construction of access routes.
- (2) 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.
- (3) 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 detail 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	Size/Capacity	Quantity
(1) Bulk Supply	Intake	167.5 l/s (Max)	1 no.
	Treatment Works	15.0 Mld	1 no.
	Pumping stations	1.5 - 48.3 l/s	5 nos.
	Reservoirs	500 - 5,000 kl	6 nos.
	Pipelines	Dia. 90 - 400 mm	231 km
(2) Retail Supply	Reservoirs	10 - 480 kl	79 nos.
	Pipelines	Dia. 63 - 200 mm	438 km
	Yard connections		15,198 nos.
	Standpipes		340 nos.

### **8.3 The Natural Environment**

#### **8.3.1 Climate**

The Klipvoor Feasibility Area comprises the northern parts of Odi 1 and Moretele 1 Magisterial Districts of North West Province. The Area is essentially rural in nature. Average annual rainfall is approximately 500 mm and summer rainfall predominates falling mainly between October and March. The Area drains to the Moretele River or its tributaries and most of the area lies in the catchments upstream of Klipvoor Dam. Annual average evaporation is over 2,200 mm and is higher in summer than in winter. 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 2.5 to 3.5 m/s.

#### **8.3.2 Borakalalo National Park**

The Borokalalo National Park is located within the Area and the environmental sensitivity of the proposed water supply infrastructural development within the Reserve requires particularly careful consideration.

The Borakalalo National Park is of a high aesthetic value and is an important tourist destination for the area. Special consideration need to be given to the proposed developments of the water treatment works, regional reservoir and permanent access roads within the Park boundaries.

#### **8.3.3 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 Moretele River 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.

#### **8.3.4 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.

Eutrophication, the process whereby water systems become enriched with plant nutrients such as ammonia, nitrates and phosphates with the consequent appearance of nuisance growths of aquatic plants and algae, has been identified as one of South Africa's water quality problems. Algae will be present in the water bodies, and it may reach nuisance proportions. Klipvoor Dam is eutrophied and additional treatment will be required to remove taste and odour from the water. The blue-green algae, *Microcystis aeruginosa*, which is said to produce toxins, is present in the water at certain times of the year. Special care should be taken to remove these toxins during water treatment.

The effluent from the water treatment works will be discharged into the Moretele River after sedimentation in ponds. The quality of the river water will not be negatively influenced because of the low sediment content of the return water and the small quantity of effluent (3 to 4% of the abstracted volume.)

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.

#### **8.3.5 Aesthetics**

The aesthetics of the Klipvoor Area varies from high in the Borakalalo National Park to low in the rural settlements.

The Borakalalo National Park can be impacted upon if a Water Treatment Works (WTW) and a regional reservoir are constructed within its boundaries, especially regarding the aesthetic appeal for tourism. The access road to the regional reservoir will probably impact the most on the aesthetic appeal of the Mogosane Hill as it will leave a permanent scar and can accelerate the potential for erosion on the slopes. Noise will emanate from the WTW. Light at the WTW during the night may be a nuisance to animals as well as to visitors in the National Park.

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.

#### **8.3.6 Flora**

The dominant vegetation type in the Klipvoor Area is mixed bushveld. 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.

#### **8.3.7 Fauna**

Except for the Borakalalo National Park 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**

If water levels in Klipvoor Dam should drop, it may affect recreation. Most dams have varying water levels and given the relatively small volume of water required for the project the impact should not be more severe than the situation at present.

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

The location of the water treatment works and the one regional reservoir with its associated access road can have an impact on the aesthetic appeal of Borakalalo National Park.

### **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 and the abstraction of water from Klipvoor Dam are presented. 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 Klipvoor 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. The other potentially negative impact on the tourism potential of Borakalalo National Park is also very significant.

#### **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 Klipvoor Area. Construction activities could cause temporary economic upliftment in the immediate vicinity.

#### **8.6 Consultations Regarding Borakalalo National Park**

The Borakalalo National Park is an environmentally sensitive area. It is proposed that a raw water intake, a water treatment works, a pumping station and a regional reservoir be constructed within the National Park. The proposed location of the Water Treatment Works and the intake pumping station is downstream of Klipvoor Dam and the regional reservoir location is on top of the Mogosane Hills. Due to the sensitivity of the area the following procedures have been followed:

- A meeting and site visit was held on 23 July 1997 at Borakalalo National Park with representatives of the JICA Study Team and North West National Parks Board.
- A meeting was held with the DWAF Divisional Director of NWP and the DWAF Environmental representatives to discuss the proposals and the scope of further consultation.
- A memorandum, explaining the alternative options for the siting of the proposed development, was compiled by the JICA Study Team and forwarded to the North West Department of Environment Affairs and Tourism (NWDEAT) for comment.

- Comment on the development proposals was received and included in the ROIP 2 Report (Appendix B).
- A site investigation and meeting was held at Borakalalo National Park with the Ecologist, Mr R Schaller, and Park Director, Mr de Vries on 29 September 1997 by the Environmental Scientist, Ms L Rossouw and a Study Team member, Mr Tsuruki, to obtain information on the sensitivity and species composition in the Park.
- The above mentioned memorandum was also sent to Mr J Herbst from the North West Parks Board. Comments are awaited.

## **8.7 Conclusions and Recommendations**

### **8.7.1 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 Moretele River downstream of Klipvoor 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.

### **8.7.2 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**

- Consultation with the North West Department of Environment Affairs and Tourism and the North West Parks Board need to be continued regarding the proposed development in the Borakalalo National Park.
- 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.

**8.7.3 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 EVALUATION 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. To devise the best surface water system for supplying water, three alternative plans for the overall supply system were thoroughly examined.

#### **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 Service 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 New Water Treatment Works and Pipeline Alignment**

Since the service area is rather wide and beneficial communities scatter, three main pipelines from the treatment works were planned, taking into account easier operation and maintenance. The intake point of raw water was selected at which river stream is stable and intake is easier even drought period.

## **9.2 Institutional Aspects**

### **9.2.1 Water Services Authority**

The proposed project is located entirely within the area of jurisdiction of Eastern District Council (EDC); thus EDC will be the Water Services Authority under the proposed Water Services Bill. As mentioned previously, EDC was established in 1994 and is organisationally and financially weak. Through implementation of the proposed project, EDC 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 Eastern District Council and Magalies Water manages the early stages of project implementation and operation for the retail sector. Finally, Area Water Service 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
<b>1. NPV</b>		
- RRI=3%	R x 1,000	19,808
- RRI=5%	R x 1,000	9,738
- RRI=8%	R x 1,000	1,735
<b>2. FIRR</b>		
- Original Case	%	9.2
- Tariff Recovery		
90%	%	6.6
80%	%	3.7
70%	%	0.4
- Capital Cost		
10% increase	%	8.0
20% increase	%	6.9

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 (EDC) 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 R45.8 million (at constant 1997 price) for upgrading from Service Level A, the loan amount will be reduced to R27.3 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 EDC, 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
<b>1. NPV</b>		
I=3%	R1,000	48,095
I=5%	R1,000	4,938
I=8%	R1,000	-29,555
<b>2. EIRR</b>	%	5.3

## 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 R1,167, about one third of the community is categorised in the low income group with a monthly income of R332. 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, except with respect to the proposed water purification plant to be constructed in the Borakalalo Nature Reserve surrounding Klipvoor Dam. The proposed project is planned on the basis that the new water treatment plant will be constructed about 200m downstream of the dam wall within the nature reserve. Two alternative sites located just outside the nature reserve have been identified and the cost implication for construction of either option would not be serious. The final conclusion regarding the location of the treatment plant will be decided during the coming detailed design stage.

## **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. Furthermore, three water supply alternatives were thoroughly reviewed and examined from a technical and financial viewpoint, from which the best alternative was chosen. This alternative includes the construction of a new water treatment works near Klipvoor Dam. The proposed WTW falls within the Borakalalo Nature Reserve which necessitates special consideration.

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 service level in the early years and then upgrade the system towards service level. 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 R52.3 million to R19.6 million at 1997 constant price.

### **10.2 Recommendations**

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

### **10.2.1 Technical Issues**

The operating rules of Klipvoor impounding reservoir shall be reviewed considering the additional releases required for abstraction for water treatment and shall be duly revised prior to project implementation.

The location of the proposed water treatment works shall be confirmed through close consultation between the authorities concerned.

### **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 R129.3 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 R15.7 million.

The third tier or a proposed Services Provider for retail water shall secure R52.3 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 R32.7 million) 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.