THE CUVELAI-ETOSHA BASIN MANAGEMENT APPROACH:

ASSESSING WATER RESOURCE MANAGEMENT IN THE IISHANA SUB-BASIN

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EXECUTIVE SUMMARY

PROBLEM OVERVIEW

Scarce water resources in Namibia make the country dependent on sustainable water management. The government has established community-based approaches and strategies to make this happen, and has begun to implement them in selected basins across Namibia. The question is 'are they successful?' and can they be applied to all of Namibia's water basins. The goal of this project was to provide analysis and recommendations for the Desert Research Foundation of Namibia and other organizations to support the promotion and facilitation of community-based water resource management in Namibia. Specifically, the team investigated the current state of the implementation of the Water Resources Management Act No. 24 of 2004 (WRMA)[1] in the Iishana sub-Basin (one of four sub-basins in the Cuvelai-Etosha basin). The region has the highest population density and fastest growth rate in Namibia, which puts a heavy strain on limited water resources. However, the area remains primarily rural making centralized control of water resources near impossible, and community-based management essential. To achieve the project goal the team assessed the implementation of Section IV and V of the WRMA and the issues affecting the current state of water basin management. The project's areas of focus were on community participation and the existing knowledge and perceptions of water management issues.

BACKGROUND

Since its independence in 1990, Namibia has been evolving very quickly as a nation. The government faces many challenges as it tries to improve the country's standard of living, empower communities to manage resources, and to foster a sense of individual responsibility in its citizens. It is hoped that each of these aims will ensure sustainable development of water resources.

Water scarcity is driving the need for community-based water management in Namibia. The shortage of water is directly attributed to the region's landscape and climate. Namibia is the driest sub-Saharan country, predominantly consisting of arid regions. The climate of Namibia and the limited nature of its freshwater sources make it necessary for Namibia to practice sustainable water management. The combination of the country's limited water resources and a history of subjugation under apartheid and colonization have led the Namibian government to adopt a decentralized water management concept. Specifically, it empowers the people to take part in community-based management and a participatory democracy. As an emerging nation, Namibia used these ideals to draft policy to manage scarce water resources.

In 2004, the Namibian parliament passed the Water Resources Management Act No. 24. The Act follows the ideals of community-based management, decentralization

[1] For the purposes of this report, WRMA refers specifically to the Water Resources Management Act No. 24 of 2004

and participation. It is a policy that works towards "achieving sustainable management of water resources" (WRMA No. 24 of 2004), and it was the first policy that specifically established a detailed framework for water management in Namibia. The WRMA governs the uses of water and most importantly provides for community-based water resource management and the institutional framework capable of achieving sustainable water management.

Community-based management on a basin level was successfully piloted in Namibia's Kuiseb Basin and is now being implemented in the Cuvelai-Etosha Basin in central northern Namibia. Its success in this area is important to alleviate the water related challenges in the region, and to provide another example of basin management leading to successful and sustainable resource use and development in other water basins throughout Namibia.

RESEARCH METHODOLOGY

The research focused on gathering stakeholders' perceptions surrounding community-based water resource management, as outlined in the WRMA. Using interviews and focus groups, the team interviewed 104 people from all levels of water management, from ministry officials to the end-user. Initially, the team talked to strategy and implementation level personnel in order to understand the ideals and thinking behind the WRMA, as well as the Basin Management Approach (BMA). See section 2.4 of the attached report for a full description of the BMA. Next, the team conducted a field expedition to the Iishana sub-basin, where interviews were conducted with primary and secondary stakeholders, who are directly connected and affected by the implementation of water management strategy. Interviews and focus groups were conducted with Water Point Committees, Local Water Committees, members of the Iishana sub-Basin Management Committee, as well as the Directorate of Rural Water Supply (DRWS) who provides a governmental support structure for these committees. These interviews were conducted throughout different areas in the sub-basin, to provide the team with a diverse set of information that was representative and accurate. From data gathered in these interviews, the team was able to provide analysis and results on the current implementation of the BMA and WRMA.

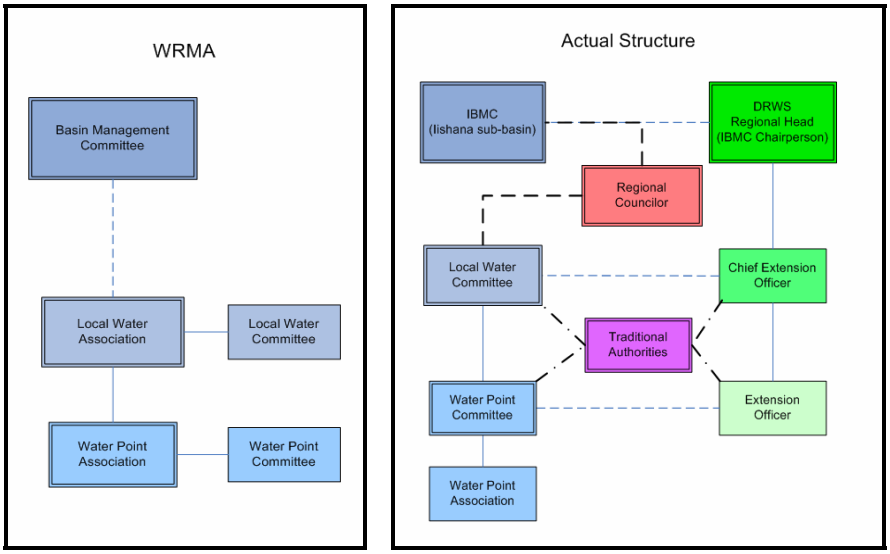
FINDINGS

1. The current implementation of the WRMA differs than both the DRWS strategy and what is written in Sections IV and V of the Act.

From the research performed in the Iishana sub-Basin, it became clear that the structure of rural water management differed from the WRMA-established structure described in section 2.3.3 of the attached report. Additionally, the DRWS has created a strategy that differed from both the law and the actual implementation. The key differences between the structures can be seen in the diagram below.

Community-based water management as it is written in Sections IV and V of the WRMA does not currently exist. The differences from the law include the introduction of two new key players that affect the management structure and a centralization of

knowledge and power in the committees rather than the associations. These two previously unaddressed key players, Regional Councilors and Traditional Authorities, have assumed important roles in water management in the sub-basin. They can play a pivotal role by filling communication gaps, and providing an established authority-base that the DRWS can use to promote community-based water resource management.



Actual implementation structure in the Iishana sub-Basin compared to the WRMA structure

2. The majority of water users do not see the entire framework of water management in the Iishana sub-Basin.

The perceptions of organizations involved with water management in the Iishana sub-Basin are critical to the effectiveness of the program. Many communities do not understand their roles and responsibilities in the greater scheme of water management, and this hinders their ability to practice sustainable water management. Because of this limited awareness and understanding, water users are suspicious of committee actions, are hesitant to cooperate with management programs, and do not contribute to basin-wide planning and strategies.

Communities who understood their part in the larger picture had a better understanding of their responsibilities in community-based water management. These communities could make much more effective decisions, and were more successful at managing their water resources towards long-term sustainability.

3. The perceptions of the end-user surrounding payment and volunteerism are affecting the success of community-based water management in the Iishana sub-Basin

Before long-term sustainable development and management can be achieved in the Iishana sub-Basin, there are issues that need to be addressed. These major issues of payment and volunteerism are rooted in communities' awareness and understanding.

Water payment must be addressed because it is consuming the efforts of basin management in the Iishana sub-Basin. Stakeholders involved in the management structure are stuck focusing on water payment rather than thinking to the future. Currently many people do not understand why they have to pay for water. This is derived from a history of non-payment, a lack of knowledge about the process of providing potable water, and financial limitations. Essentially, because of the issue of water payment, the Iishana sub-Basin is at the stage of providing a basic need rather than managing for long-term sustainable basin development. According to the Ministry of Agriculture, Water, and Forestry (MAWF) employees interviewed, the accumulating debt of communal water users in the Cuvelai-Etosha area demonstrates that the community-based management system is facing challenges. The team found in communities where the challenge of water payment was taken care of, they were working towards sustainable solutions to other water management issues. If the challenges surrounding water payment are addressed, and awareness is raised, then the basin can move towards a more sustainable future.

The second critical issue in the Iishana sub-Basin is volunteerism. Community-based water management is, at its core, a participatory process where full decentralization can be practiced. Without the fundamental principle of volunteerism, there is the potential for a collapse of the structure and a failure of basin management implementation. Volunteerism is the most fundamental principle of community-based water management; without participation community-based management cannot exist.

The 5-day initial DRWS training for establishing water point committees was enough for the committee to be able to start functioning. However, from the interviews it seemed that the Water Point Committee members did not fully understand the ideals and the importance of community-wide participation and volunteerism. The Iishana sub-Basin management system is hampered by the lack of volunteers. Through the interviews, the team found that committees that have many active volunteers succeeded more often in providing sustainable solutions to issues of water management. If volunteerism is addressed, the entire Iishana sub-Basin can move towards a more sustainable future.

RECOMMENDATIONS

The primary focus of this project was to assess the implementation of Sections IV and V of the WRMA, and community-based water management in the Iishana sub-Basin. This assessment resulted in the development of several focus areas, which are the benefits of increased awareness in communities regarding water management ideas, and the issues of water payment and volunteerism, and. As an extension of these focus areas, the project produced recommendations for future analysis about water management in the Iishana sub-Basin. They are as follows:

Communities' awareness and understanding

- Focus awareness campaigns on the importance of long-term sustainable community-based water management (CBWM).

    - Explain to the communities *why* they should practice CBWM, not just what it is. This can help communities understand the long-term benefits, and prevent them from just going through the motions to receive water.
- Stress 'awareness development' during the initial training.
    - Non-Governmental Organizations and the DRWS should stress the importance of developing awareness when they give the initial training to Water Point Committees.
    - This can foster a sense of individual responsibility among community members, so they can be aware of issues and participate in solutions.
- Assess the potential and enhance the ability of Regional Councilors and Traditional Authorities to promote the ideals of CBWM.
    - Local authorities can play a pivotal role in water management, so it is important that they understand the principals and ideals of CBWM, and promote these concepts when they interact with their constituents.
    - Local political figures should be involved with the awareness building process.
    - These individuals can greatly benefit water management through aiding communication and providing an established political foundation for new water management ideas.

Challenges of water payment

- Increase awareness about why people have to pay for water.
    - The team found that an increased awareness about why people must pay for water generally resulted in communities having fewer issues with water payment.
    - This could be accomplished through educational tools and awareness campaigns undertaken by the Iishana sub-Basin Management Committee (IBMC), the DRWS, and especially the community members, who should be proactive in developing awareness.
    - Overcoming payment issues allows the community to address the further sustainability and development of their water resources.
- Further research should be done to determine why some communities overcome payment problems while others are struggling.
    - The team found that there were a few communities that had moved pass the issue of water payment.
    - More specific research needs to be done on water payment issues in order to discover the differences between successful and unsuccessful communities.
    - This will allow more communities to benefit as these ones have, contributing to the long-term sustainability of water management in the basin.

Challenges of volunteerism

- Better communication flow is needed so that communities can see the 'bigger picture' and can understand their roles and responsibilities in the process of water resource management.
    - More information and awareness campaigns from the IBMC would be beneficial.
    - Awareness needs to be increased so that stakeholders, especially water point users, understand their part in basin-wide water management.

SUMMARY

The recommendations and areas of focus developed in this report were given to the Desert Research Foundation of Namibia to aid in the implementation of community-based water management in the Iishana sub-Basin. These project outcomes were derived through careful organization of the key points collected from research in the Iishana sub-Basin. In accomplishing the project's objectives the team highlighted three major findings. First, the current implementation of the WRMA is different from the DRWS strategy, and what is written in Sections IV and V of the Act. Second, the majority of water users do not see the entire framework of the water basin management structure. Third, volunteerism and payment are affecting the successes of community-based management in the area.

The current structure of rural water management in the Iishana sub-Basin is different, but is conceivably the most appropriate implementation for this region. Most importantly, there is an emphasis on the committee decision making, rather than associations. Traditional Authorities and Regional Councilors play a crucial role in water management activities. They can mobilize water users, and provide a venue for committees to voice concerns and problems about water management. Lastly, there is no direct connection from the lower levels of management to the IBMC.

Most water users lack the knowledge and understanding of the complete framework of water management structure in the Iishana sub-Basin. These differing perceptions can affect the success and effectiveness of the management program. Many communities do not understand their roles and responsibilities in the greater scheme of water management, and this hinders their ability to practice sustainable water management. Because of this limited awareness and understanding, water users are suspicious of committee actions, hesitant to cooperate with management programs, and do not contribute to basin wide planning and strategies.

The issues of payment and volunteerism hinder the implementation of CBWM in the Iishana sub-Basin. Communities' efforts are consumed in dealing with paying their water bills, and are unable to take the next step in the growth and sustainable management of water resources. Many of the groups interviewed also commented that there were problems motivating people to become involved in water management. The problems with volunteerism cause a lack of support for the management structure. This leads to problems filling positions in the committees, and so the organization of water management in the community falls apart. Addressing the problems of volunteerism and

payment will provide the motivation and commitment in this region necessary to take water management beyond survival to effective long-term sustainability.

The analysis presented by this project contributes to water resource management by providing areas of focus for improving the implementation of the WRMA in the Iishana sub-Basin. Once people understand they are able to contribute to resource management in their area, they can understand that their actions affect their day-to-day activities, as well as the long-term development of their water resources.

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By

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ABSTRACT

This project assessed the implementation of community-based water resource management in the Iishana sub-Basin of the Cuvelai-Etosha Basin, Namibia, as outlined by the Water Resources Management Act No. 24 of 2004. Through interviews, the team identified factors that affect its implementation and provided recommendations and areas of focus for future research to promote the sustainable and successful implementation of community-based water management. This project was completed in cooperation with the Desert Research Foundation of Namibia.

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AUTHORSHIP PAGE

This report was co-authored and edited equally by each contributing author.

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LIST OF ABBREVIATIONS

BMA	Basin Management Approach
BMC	Basin Management Committee
CBM	Community-Based Management
CBRM	Community-Based Resource Management
CBWM	Community-Based Water Management
DRFN	Desert Research Foundation of Namibia
DRWS	Directorate of Rural Water Supply
DWA	Department of Water Affairs
EO	Extension Officer
GRN	Government of the Republic of Namibia
GTZ	Deutche Gesellshaft für Technishe Zusammenarbeit
GWP	Global Water Partnership
IBMC	Iishana Sub-basin Management Committee
ILWM	Integrated Land and Water Management
IRWM	Integrated Water Resource Management
LWA	Local Water Association
LWC	Local Water Committee
MAWF	Ministry of Agriculture Water and Forestry
NamWater	Namibian Water Corporation Ltd.
NWRMR	Namibia Water Resources Management Review
PLAN	People's Liberation Army of Namibia
RC	Regional Councilor
RH	Regional Head
RWS	Rural Water Supply
RWS-EO	Rural Water Supply Extension Officer
RWS-RH	Rural Water Supply Regional Head
SDP	Summer Desertification Programme
SHs	Stakeholders
SWAPO	South West Africa People's Organisation
TA	Traditional Authorities
UN	United Nations
WASP	Water and Sanitation Sector Policy
WPA	Water Point Association
WPC	Water Point Committee
WRMA	Water Resources Management Act No. 24 of 2004

1 INTRODUCTION

Water is necessary for all human life. It is needed for personal sustenance as well as for agriculture and livestock. Namibia's primarily rural population relies on an adequate sources of water for survival. Unfortunately, Namibia's extremely arid climate makes water resources both scarce and valuable. Careful water management is necessary to preserve Namibia's water sources for sustainable, long-term use. To solve this problem of water management, the Namibian government has come up with a specialized, community-oriented strategy, which requires ongoing assessment to ensure its success across the country.

In the past, resources management were controlled by the central government, and most resource users had no say in what was happening around them. During the century of colonization and apartheid rule, the majority of Namibians were not able to participate in their government. Now that Namibia has established a democratic government, there is a desire to involve every citizen in the decision-making process. In response to the pressing need to manage scare water resources and to reverse the implications of its political history, Namibia has institutionalized a decentralization policy to encourage the delegation of government power through all the levels of government, to the individual Namibian.

The management of natural resources, specifically, is intended to be the responsibility of the end users. In 2004, the Namibian Parliament passed the Water Resources Management Act No. 24. This legislation provides specifically for local, participatory control of water resources, especially in rural areas, where centralized control is inappropriate. The Act is being implemented through the Basin Management Approach (BMA) developed by the Desert Research Foundation of Namibia (DRFN) and the Ministry of Agriculture, Water, and Forestry (MAWF). It provides the guidelines and structure necessary to empower the people, and work towards successful and effective community-based management throughout the water basins of Namibia.

The first implementation of this BMA was in the Kuiseb Basin on Namibia's western coast. Based on the success of this pilot basin management program, the Cuvelai-Etosha Basin in the central northern region of Namibia has been chosen by the

MAWF as the next location for the development of community-based water management. This basin was selected because of the many issues affecting water use in the area. Water sources are limited in the region, and there is a high demand from a very large, densely settled, and quickly growing population. However, the area remains highly rural, which leads to problems because a lack of established infrastructure. The goal of establishing community-based water management in the Cuvelai-Etosha Basin is to allow water resource users to manage their water resources for greater sustainability and future development.

The goal of this project was to provide analysis and recommendations for the Desert Research Foundation of Namibia and other organizations to support the promotion and facilitation of community-based water resource management in Namibia. The team's objective was to investigate the current state of water resource management in the Iishana sub-Basin (one of four sub-basins in the Cuvelai-Etosha Basin). Specifically, the team assessed the implementation of Sections IV and V of the Water Resources Management Act No. 24 of 2004 and community-based water management.

While this report exclusively addresses issues in the Iishana sub-Basin, its findings can contribute towards sustainable use and participatory management of natural water resources, and the coordination of such programs, throughout Namibia. This report covers relevant background topics, the projects research methodology, the findings and analysis of the information collected, and a set of recommendations aiding community-based water management in the Iishana sub-Basin.

> "When I was a boy, the ponds and waterholes used to last the whole year through. Now they are dry and empty. When the rains came and filled the Oshanas, we used to take our baskets and go fishing. Now the fish baskets hang from the roof poles as ornaments. They are never used. We walked to school through long grass as high as our arm-pits, as far as you could see. Now the grass has all gone and there is nothing for the cattle to eat."
>
> *Witness to the changing water landscape in the Cuvelai basin, Oshakati, October 1999.*

2 BACKGROUND: NAMIBIA'S PHYSICAL AND SOCIAL WATER ISSUES

Since its independence in 1990, Namibia has been evolving very quickly as a nation. However, for many, conditions remain similar to what they were under South African mandate rule and the government faces many challenges as it tries to improve the country's standard of living. Part of this includes the maintenance of a reliable supply of potable water. However, Namibia faces many challenges in supplying water to its citizens, which include the following:

- Namibia has a severely dry climate;
- The geography in Namibia is not suited for convenient water extraction;
- Colonization and apartheid resulted in a political culture of citizens being denied participation and responsibility;
- Namibia's history demands a decentralized scheme for management;
- Legislation and policy are heavily reliant on community participation and still face obstacles and challenges with implementation.

This section introduces the conceptual framework for the project, illustrating how the above issues affect communities' sustainable use and management of their water resources and the elements affecting the potential success of community-based water management. These items provide the background of the research, an understanding of the topic, and provide a direction for the methodology and analysis.

2.1 GEOPHYSICAL ATTRIBUTES

The problems with water shortage within Namibia begin with the region's landscape and climate, which is predominantly arid or semi-arid. The limited nature of Namibia's freshwater sources makes the practice of long-term sustainable water management necessary. This section covers each particular geophysical attribute, its relevance towards water scarcity in Namibia, and its role in the bigger picture of water resource management.

2.1.1 Climate

The challenges of enacting successful water management arise from Namibia's arid climate. It is the driest country in sub-Saharan Africa (Du Toit & Sguazzin, 1995). The climate can be harsh and is often unpredictable. Specifically, the low and irregular levels of precipitation, as well as the high levels of evaporation, bring about conditions that make the provision of potable water difficult.

The chief characteristic of arid to semi-arid environments is a significantly small amount of annual precipitation. According to the Ministry of Agriculture, Water and Forestry (MAWF), there is an "annual rainfall ranging between below 25mm at the coast to more than 600 mm in the Caprivi Region…only the north-eastern [area] has more than 350mm annually" (Namibia Water Resources Management Review (NWRMR), 2004). Namibia's dramatic variation in annual rainfall occurs because of its relatively large size, 825,418 sq km (Central Intelligence Agency, 2007). Local differences combined with the scarcity of precipitation make water management essential. The coastal and southern regions of Namibia receive virtually no rainfall, and these landscapes are typified by sprawling deserts. The northern regions have a much higher rainfall, making farming a sustainable source of food and income. While rainfall around the country is generally low, Figure 1 below illustrates the differences by geographic location, where the light colors denote aridity and the dark colors denote areas of higher rainfall.

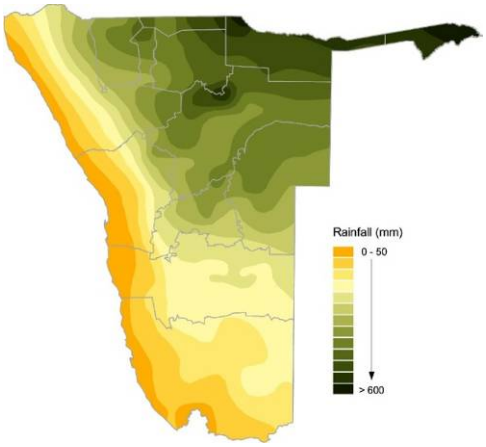

Figure 1: Average annual precipitation[2]

Variations in annual precipitation magnify the regional differences already present. Rainfall is unpredictable, and Namibia often experiences changing dry and rainy seasons (U.S. National Oceanic and Atmospheric Administration's National Weather Service, 2006). Figure 2 shows the scope and level of rainfall variation that the country can experience in any given year, and clearly illustrates the unreliability of precipitation in Namibia. The changing weather patterns make it difficult for people to predict yearly rainfall yields and perpetuate the constant struggle to maintain a sustainable water management strategy. Areas of high variation in precipitation make the inhabitants' livelihoods very difficult. Sub-surface water sources such as wells and aquifers become very important in these areas, most notably in the south and west. However, all of Namibia suffers from unpredictable rainfall.

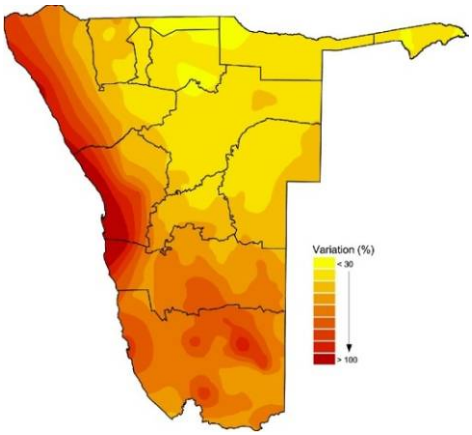

Figure 2: Average annual rainfall variation[3]

[2,2] *Source: Namibia Nature Foundation, 2006*

Rainfall is not the only factor that affects the water supply. Weather patterns can influence the local temperatures in Namibia, causing fluctuations in evaporation rates, which affect the country's available water resources. High average temperatures combined with an average of three hundred sunny days each year causes "potential evaporation [to exceed] rainfall by a factor of 5 in the north-east to more than 100 in the south-east." (NWRMR, 2004) Figure 3 displays the average annual evaporation rates. In comparison with Figure 2, it is possible to see that evaporation, by a fair margin, exceeds rainfall throughout the country.

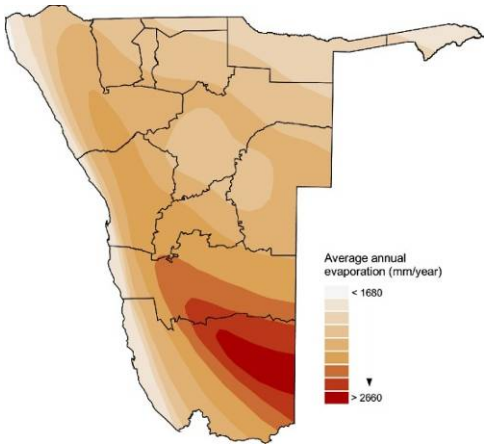

Figure 3: Average annual evaporation[4]

The "combined influence of low, erratic rainfall and high evaporation rates result in the regular occurrence of drought situations" (NWRMR, 2004) and typifies the difficulties that the Namibian climate causes. This makes the implementation of sustainable water management strategies difficult and the efficient management of Namibia's limited fresh water resources paramount.

2.1.2 Namibia's Water Resources

Rivers and aquifers are the two main sources of Namibia's fresh water. Population areas that lack constant surface water depend on sub-surface supplies, or aquifers. While these two sources are prevalent throughout Namibia, they are often unreliable. Additionally, the major water sources of the Cuvelai-Etosha region in the

[4] *Source: Namibia Nature Foundation, 2006*

north and the Orange River basin in the south cross international borders, compounding water problems with political issues. The lack of reliable water emphasizes the importance of proper and sustainable water management in Namibia.

Namibia's surface water resources exist in two categories, ephemeral rivers that flow seasonally, and perennial rivers that exist on a long-term basis. "With the exception of short lengths of the Okavango and Kwando Rivers in the north-east of Namibia, all rivers in Namibia's interior are ephemeral" (Namibia Water Resources Management Review [NWRMR], 2003). The ephemeral rivers provide a temporary water supply at best, within the boundaries of a few river basins.

Across Namibia, there are over twenty-four river basins that are delineated by eleven major basin groupings (DRFN, 2005). Figure 4 below is a DRFN map showing the demarcations of the river basins in Namibia.

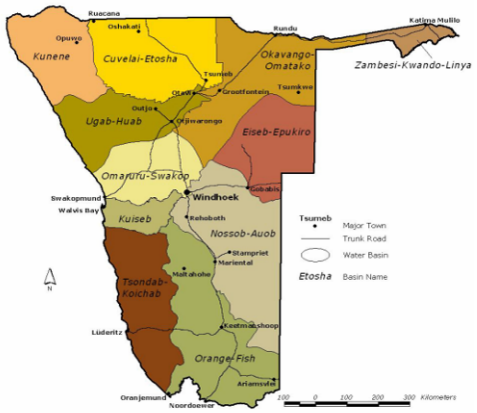

Figure 4: River basins of Namibia[5]

The largest catchment of water is the Okavango Basin group, located in the northeast region of the country and is primarily fed by the Kavango, Omatako, and Okavango rivers (NWRMR, 2003). In the northwest portion of the country, the Kunene Basin is fed by the Kunene River, while the Zambezi River Delta feeds the Zambezi Basin in the far eastern portion of the Caprivi Strip (NWRMR, 2003). The Cuvelai-Etosha Basin exists in the central northern part of the country, where it receives water from Angola. A large portion of the central plains receives water from the Auob and Nossob Rivers that make up the eastern Molopo River Grouping and from the Orange

[5] *Source: Department of Water Affairs, 2005*

and Fish River that comprise the southern Orange River Grouping (NWRMR, 2003). The final grouping is located along the border of the Namib Desert and extends north and south for nearly half of the country. It is made up of "Low Potential Western Basins" that have too little water for sustainable inhabitance (NWRMR, 2003). The rivers that feed these basins provide the environment with the nourishment it needs to sustain life. The rivers, however, are ephemeral, and there is heavy reliance on sub-surface aquifers in these basins.

Groundwater aquifers are the primary source of water when surface water and rivers evaporate. The rugged terrain of Namibia's landscape yields significant runoff water that collects in various types of aquifers across the entire country, which can vary from five meters to over 200 meters below the surface (NWRMR, 2003). Alluvial, or sand aquifers, are the typical type of aquifer from the western flowing rivers in the Namib Region. The Kuiseb, Omaruru, Kahn, Oanob, and Fish rivers feed these alluvial aquifers, which are characterized by limited storage capacities and rapid-recharge rates (NWRMR, 2003). Another type of classified aquifer in Namibia is the fracture aquifer, which is formed by fracturing and faulting in the bedrock. These aquifers are typically much deeper than most aquifers and require significant effort to remove the water (NWRMR, 2003). Karst aquifers in the Otavi Mountains are formed by water dissolving the limestone rock from the carbonic acid rich water. Karst aquifers typically hold the largest volume of water, but often the water is not as pure as the alluvial aquifers (NWRMR, 2003). The final type of aquifer found in Namibia is artesian aquifers, which are characterized by their high internal pressure. These aquifers require no pumping system to remove the water from the aquifer, because the surface pressure is far less than the internal pressure of the aquifer (NWRMR, 2003). Regions that depend on aquifer boreholes can benefit from local management of a water extraction scheme, especially when surface water sources are not available. It is beneficial to carefully manage the supply of water from these boreholes to ensure the sustainability of the water source (Irving, T.F. 1996).

Namibia also relies on fresh water sources that originate in foreign countries. This adds a political dynamic to the issue of water scarcity and management. The

Cuvelai-Etosha basin is primarily reliant on the Kunene River catchment in Angola while in the south, the Orange basin relies on rivers that feed from South Africa. Thus, a significant population of Namibia relies on water sources that can be controlled not only by climate but also by foreign policy. This situation, though stable at the moment, could easily result in further water management and scarcity issues. The unpredictability of these foreign water sources makes successful and effective management of Namibia's limited domestic water resources very important.

Water sources in Namibia are complex and ever changing. Ephemeral rivers offer sustainable life throughout Namibia by replenishing aquifers and providing seasonal water sources. However, the severe limitations of total water sources in Namibia create a significant need for efficient management of these scarce resources. It is important to understand how these issues of water scarcity have led Namibia to implement water resource management strategies in the context of a developing post-apartheid country.

2.2 SOCIAL AND POLITICAL ISSUES AFFECTING WATER RESOURCE MANAGEMENT

Water management in Namibia is intrinsically connected to the country's political history. The long road to independence and the country's relatively recent recognition as a sovereign nation affects the perceptions and expectations surrounding water management, and the supply of potable water. While the climate plays a critical role in developing water management strategy, Namibia's history provides insight into the Government's efforts to create a culture of individual responsibility, and the efforts to promote community-based water resource management.

2.2.1 Political History

As the country confronts the challenges of resource scarcity, it also faces the difficulties in forming a new country and new government. The Republic of Namibia gained its independence on March 21, 1990. Prior to that, the people of Namibia were under a changing and repressive authoritarian rule since German colonization in the early 1900s. This has led modern Namibia to strive towards an equitable distribution of resources and complete democracy for all of its people (Article 95, Namibian

Constitution). The demands on government resources from creating this new administration have contributed to a need for participatory democracy and management of the country's scare water resources.

Because of the history of colonization and apartheid, there is a tradition against individual participation that hinders progress. For the past century, people have been prohibited from contributing to the management of their resources, with the result that most people have no experience participating in management strategies. This creates basic challenges when introducing a community-based water management policy because it requires a high degree of individual involvement. In gaining independence, people felt they should be entitled access to the services and resources that were limited during apartheid, and that these services and resources should be provided by the new government free of charge (Department of Information and Publicity, SWAPO of Namibia, 1981). Indeed, many people throughout Namibia have a personal perception that they should not have to pay for their water, and that it is the government's responsibility to provide this basic need.

These expectations combined with a history of non-participation in governmental affairs continue to provide challenges for the evolving government. As a result, Namibia is making efforts to foster a sense of individual responsibility, involve its citizens in the management of their scare water resources, and provide for a participatory government through its decentralization policy

2.2.2 Decentralization Policy

The decentralization strategy of the Namibian government centers around four main objectives (Namibian Decentralization Policy, 1998):

1. Extending, enhancing and guaranteeing participatory democracy.
2. Ensuring and safeguarding rapid sustainable development.
3. Transferring power to the regional councils and local authorities based on national ideas and values.
4. Improving the capacity of regional and local government councils to plan, implement, manage and monitor delivery of services for their constituents.

The concept provides the backdrop behind many of the country's policies and laws, and the government's efforts to devolve "participatory decision-making [to the] lower levels

of government and to the lowest levels of society" (DRFN, 2005). While Parliament and the central government retain the responsibility to create the overarching, community-based management policy, control of resource management is given to those who are in direct contact with the issues being addressed. Through this decentralization, Namibia is working to reverse the history and implications of colonization and apartheid. Through the creation of progressive and forward thinking water policy, the concepts of decentralization and individual responsibility have great potential to contribute to the country's effective and sustainable water resource management.

2.3 GOVERNMENT WATER LAW AND POLICY: A DECENTRALIZATION APPROACH

As an emerging nation, Namibia needed to begin empowering communities and provide the country with potable water. To ensure "that every citizen has a right to fair and responsible access to public facilities and services in accordance with the law," the Government of the Republic of Namibia utilized decentralization and community-based water management to draft its water policies (Article 95, Namibian Constitution). This resulted in the formation of the Water and Sanitation Sector Policy, the Water Resources Management Act No. 24 of 2004, and the establishment of the parastatal Namibia Water Corporation. Decentralization provides the fundamental framework for Namibia's current water policy, and is the reason Namibia is so vested in the strategies of community-based water management.

2.3.1 Community-Based Water Management

While the government is ultimately responsible for creating overarching policies to protect the welfare of its people, participation and actions at the community level are essential if effective water management is to succeed. Knowledge of the principles and the complexities of community-based water management is essential towards the understanding of the policies that Namibia has created since independence.

The principles of community-based water management are centered on the premise "that [communities] who live close to a resource and whose livelihoods directly depend upon it have more interest in sustainable use and management than state

authorities or distant corporations" (Li, 2002). While this assumption holds true for most applications, interest is not equivalent in any way to participation, which is one of the fundamental principles of this community management strategy. "It is only when [participation] is addressed that people will feel in control of their resource-based livelihoods and only when that appropriate sustainable and ecologically-sensitive policies can be put effectively into practice" (Twyman, 2000).

Due to the effects of apartheid, colonialism, and corrupt imperialistic governments, winning over the individuals to participate in governmental ideals is sometimes difficult. "At the community level, individuals, and households are acutely aware of the power dynamics in operation…Their perception for the project [can be] shaped by past experiences of both natural resource dispossession and failed government development programmes" (Twyman, 2000). In order to maintain and promote the essential involvement, community empowerment can be a helpful and effective tool to encourage and promote successes with community-based water management. The ideals and spirit of community-based water management have shaped water policy in Namibia.

2.3.2 Water Policy in Namibia

The first water policy adopted by the Namibian government after independence in 1990 was the Water and Sanitation Sector Policy (WASP) in 1993 (Department of Water Affairs (DWA), 1993). These principles replaced the mandates created by the South African Water Act of 1956, which directed control over water management to the South African Minister of Water Affairs and Forestry (Water Act No. 54, of 1956). This policy set the framework that water management must work under and provides the foundation for later water management policies. The key principles of the WASP can be abbreviated as follows:

1. Water supply and sanitation services are available to all Namibians, and are affordable to the country as a whole.
2. Equitable improvement of services is based on community participation.
3. Communities have the right to choose which solutions they desire, and beneficiaries must contribute towards the cost of these services.
4. Environmentally sustainable accommodation of the service need.[6]

[6] *WASP of Namibia, Department of Water Affairs 1993*

Unlike the previous government, it is clear from the third principle of the WASP that community involvement is paramount. The WASP was Namibia's first step towards long-term sustainable use and development of water resources, and it led to the Water Resources Management Act No. 24 of 2004.

2.3.3 The Water Resources Management Act No. 24 of 2004

In 2004, the Namibian parliament passed the Water Resources Management Act No. 24 (WRMA[7]). This was the first policy to follow the WASP that specifically established a detailed framework for water management in Namibia. The WRMA created the Water Advisory Council, the Water Regulatory Board, and the Water Resources Agency. It also ensures that the ideals outlined in the WASP are put into practice. The WRMA governs the uses of water, and most importantly, it provides for the Basin Management Approach and the committee framework necessary to achieve successful and sustainable water management.

The chapters of the WRMA relevant to this project are Sections IV and V, which establish the structure for community-based management of water resources. These called for the creation, and outlined the responsibilities, of Basin Management Committees, as well as the community level committee structure. While these are two distinct and separate components in the Act, there must be a symbiotic relationship between them so that the BMC can effectively address basin-wide issues. Figure 5 below, graphically depicts the connections envisaged by the architects of the law necessary to effectively implement and ensure proper water management.

[7] Note: The correct name of this act is the Water Resources Management Act No. 24 of 2004. For the purposes of this report, the abbreviation WRMA will be used to refer to this specific act.

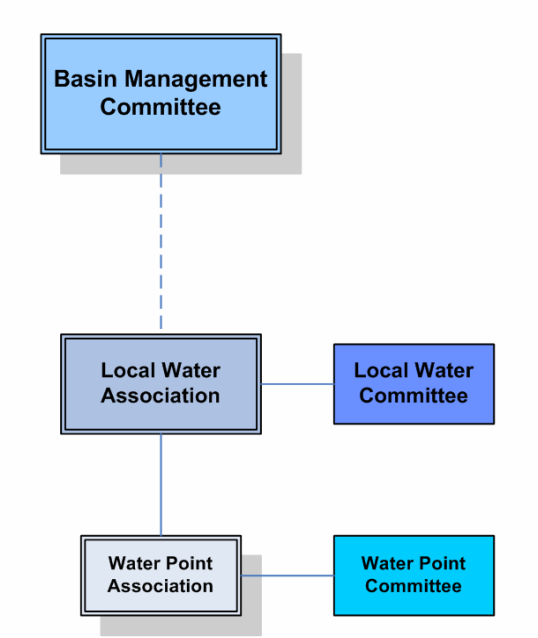

Figure 5: Section IV & Section V Relationship

In this structure, the function of the BMC is to promote community participation and self-reliance, collect data on water resource use, and monitor the effectiveness of policy in "achieving sustainable management of water resources." As outlined in Section V, the main responsibility of the water associations is to manage the water supply. At the water user level this is the management of a specific water point (Note: Water Point user Associations, or WPAs, are organizations comprised of all the households and users for a specific communal water point). At the local level, the responsibility is to "coordinate and oversee the activities and management of water supply" (WRMA No. 24 of 2004). In this regard these associations must work:

1. to foster a sense of ownership among the users;
2. to promote economic development; and
3. to ensure sustainability of such service[8].

Accomplishing these objectives determines the success of communities to work towards eventual efficient and sustainable water use and development.

[8] Section IV of the WRMA

The WRMA also regulates acceptable levels of environmental damage to water sources, and the usage of trans-boundary water sources. It stipulates that "ownership of water resources in Namibia below and above the surface of the land belongs to the State" (WRMA No. 24 of 2004). The most over-arching effect of the WRMA is the outline it provides for the water-related responsibilities of the Ministry of Agriculture, Water and Forestry (MAWF). The Ministry is responsible for overseeing the national-level water management strategy, the construction of any water-related infrastructure, and organizing the accumulation of data, both hydrological reports and records on human-water interaction (WRMA No. 24 of 2004).

One of the key points in this project was to investigate the implementation of this legislation in the Cuvelai-Etosha Basin. Specifically, the project looks at the success and state of the management structure outlined in Section IV and Section V of the WRMA.

2.3.4 Implementing the WRMA

Creating a framework for how to engage people in public discourse and management is simple in theory. In practice, however, it is extremely challenging, and requires an effective implementation strategy. The policies and legislation outlined in the sections above form the foundation for community-based water management (CBWM). The Namibian government is attempting to increase the levels of participatory democracy and individual responsibility amongst its citizens, putting control into the hands of the resource users. The next challenge, above everything, is to practice effectively and efficiently what has been drafted in policy. The Desert Research Foundation of Namibia, in cooperation with the MAWF, created a management strategy, known as the Basin Management Approach (BMA) as the method of implementing the government's water policies.

2.4 THE BASIN MANAGEMENT APPROACH

The BMA "refers to management of all activities aimed at enhancing functioning of a water basin" to include the interactions between "people, water, land, vegetation and fauna, and the water basin's ecosystems" (BMA Guidebook). In the late 1990s, these ideas and theories behind the management of water resources at the basin level were

introduced to and accepted by stakeholders. These theories came from the WRMA, and were initially refined during the pilot program in Namibia's Kuiseb Basin. This acceptance was crucial because the management strategies focus on the involvement of the stakeholders through an iterative process of collecting and sharing information. Under the guidance and framework of the BMA Namibia is working towards a viable and sustainable water management solution.

2.4.1 Formation Concepts

The concepts, and strategies of the BMA specifically relating to water management help frame CBWM in Namibia's geophysical and socio-political situation. These are derived from the Dublin Principles, decentralization and the empowerment of communities.

The Dublin Principles are four defining principles that address many of the issues surrounding water management practices, and they provide much of the foundation for the BMA in Namibia. These principles were developed during an international forum on water resource management, and led to the United Nations (UN) declaring water as a basic human right in 2002 (Simonson, 2003). The Dublin Principles are (ICWE, 1992):

1. Fresh water is a finite and valuable resource.
2. **Water development and management is participatory.**
3. Women play a central role.
4. **Water should be treated as an economic good.**

As highlighted above, the most important principles to this project are the conclusions that water management is participatory, and that water is an economic good, for which consumers must pay.

These concepts of the BMA provide a framework, in which communities are in control of their resources, and community members are empowered to responsibly and effectively manage their water resources. The BMA, through CBWM, helps to further the formation of a strong participatory democracy, and works to foster a sense of individual responsibility for the country's limited resources. It is an approach that aims to most efficiently and successfully manage the country's scarce water resources.

2.4.2 Basin Management Approach in Namibia: Principles and Ideals

The BMA provides Namibia with a sustainable water management strategy that will ensure continued water use and development, through community-based management and an empowerment of community members. Its goal is to "place basin communities at the centre of their own development with strong support from the relevant service providers" (DRFN, 2005). It provides an opportunity for the government and communities to work together in order to guarantee that integrated water basin management is achieved under the legislation and principles of the WRMA. Furthermore, reflecting Namibia's Vision 2030, the BMA "ensures the development of Namibia's natural capital and its sustainable utilization for the benefit of the country's social, economic and ecological well-being" (DRFN, 2005). The BMA in Namibia focuses on "a variety of generic and specific principles" that guides its implementation and provides for community empowerment, the tools necessary for sustainable development, and reflects the Namibian government's strategic planning.

The BMA outlines the principles and ideals of its implementation, specifically focusing on the community framework needed for success. According to the BMA Guidebook, the approach should focus around community involvement, and provide a forum in which all water users have the ability to participate in the management of water resources. The BMA must facilitate a "shared vision and understanding" that can "enhance the capacity of all stakeholders" (DRFN, 2005). In doing so, it develops "understanding of the basin and its structure and functions" as well as improving the ability of all stakeholders to contribute to, participate in, and gain from basin management.

The second group of principles is centered on the idea of sustainable development, which is especially important in Namibia, due to the country's limited resources. Although water is its main focus, the BMA also "promotes integrated multi-sectoral approaches to basin management and development, encompassing land and all renewable natural resources" (DRFN, 2005). By adopting this strategy the BMA promotes, under the framework provided by the WRMA, continued development as well as sustainable use.

The BMA also strongly reflects the policy, principles and legislation of the Namibian government. At the core, it reflects water related issues stipulated within the Constitution of the Republic of Namibia, and Namibia's Vision 2030. It contains the principles and ideals of the Namibia Water Resource Management Review (NWRMR), the National Water Policy White Paper, and the Water Resources Management Act No. 24 of 2004. These policies and papers are founded in community participation, the "principles of ownership, equity, promotion of development [and] awareness and participation" (DRFN, 2005). However, it also supports and reflects many of Namibia's non-water specific policies and strategies such as the Poverty Reduction Strategy, the Decentralization Policy, National Land Policy, and Namibia's National Agriculture Policy. This multi-sectoral and detailed framework allows for the effective and successful implementation of the BMA, fostering individual responsibility, and ultimately resulting in a viable and sustainable water management solution.

2.4.3 The Kuiseb River Basin Test Drive

The Kuiseb Basin, located in the western portion of Namibia, was chosen as the pilot implementation site for basin management. It is important to review the successes of basin management in the Kuiseb Basin to aptly analyze the implementation of CBWM strategies in the Cuvelai-Etosha Basin. The significant points are the reasons for the selection of the site, the process to set up the BMA, and the framework that guided implementation through the process.

The Kuiseb river basin was chosen as the first application of the BMA because of the apparent conflict between water user groups as a part of the diverse stakeholder population. "There was perceived competitions between upstream commercial farmers and downstream communal farmers and between communal farmers and the municipality of Walvis Bay" (DRFN, 2005). These conflicts led to a community originated request to establish a management strategy that could alleviate the tension and conflict between competing stakeholders. However, there needed to be initial analysis in order to implement the BMA.

The Environmental Learning and Action in the Kuiseb (ELAK) project, implemented by the DRFN, laid the groundwork necessary for BMA to be successful and

sustainable. Specifically, ELAK gathered information concerning stakeholders' needs and expectations of integrated water resource management and the perceived level of involvement and participation (ELAK 2004). It also created the foundation for developing and testing an integrated basin management approach through the Kuiseb Basin Management Stakeholders Forum as well as the Kuiseb Basin Management Committee (ELAK 2004).

With the initial analysis and information gathering accomplished, the BMA was implemented. Below in Figure 6 are the three main phases of the BMA:

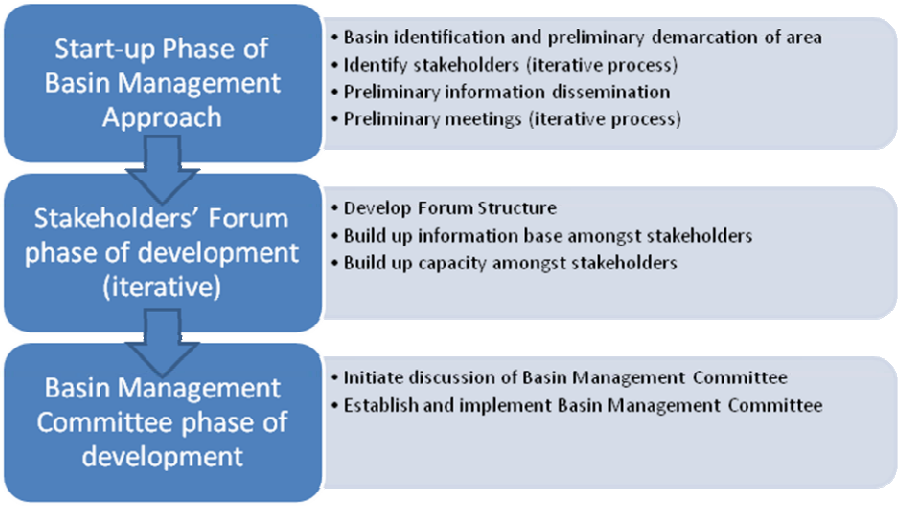

Figure 6: Stages of the Basin Management Approach

The application of this framework in the Kuiseb Basin established an effective Basin Management Committee in the region. The successes of this pilot program proved that CBWM is capable of working in Namibia, and that the policy can be applied to other basins. The conflicts and tensions experienced by stakeholders in the region during the establishment of a Basin Management Committee and the implementation of the BMA provided insight and lessons learned applicable to future water-basin management implementations.

2.4.4 The Cuvelai-Etosha Basin

Based on the successes of the pilot basin management program in the Kuiseb Basin, the Cuvelai-Etosha Basin has been chosen by the MAWF as the next venue for the application of the BMA. This was due to increasingly high demand on water resources in

the area because of population density and growth. This application of the BMA is important, because it will prove that basin management can succeed in multiple basins in Namibia, not just the Kuiseb Basin. The project's objective was to conduct research that would assess the current state of water basin management in this region. An overview of the Cuvelai-Etosha basin's geophysical and demographic characteristics sets the background for the water basin management and frames the challenges it must overcome.

The Cuvelai-Etosha basin is located in the central northern part of Namibia and is comprised of the southern Angola delta in the north and the Etosha Pan in the south. Due to the geography, population distribution, and water infrastructure the Cuvelai-Etosha basin is divided into by four sub-basins: Iishana, Niipele, Olushandja, and Tsumeb. Although it is characterized as a semi-arid region, the Cuvelai-Etosha basin is considered one of the wettest parts of Namibia. It receives between 350 mm and 450 mm of rain annually, which contributes, along with high floods, to the surface flow of the basin. As is the case with most of the entire Namibian landscape, the eastern portion of the Cuvelai-Etosha has much more consistent rainfalls, than the western section (Mendelsohn, et al 2000). Historically, communities develop where the water was most plentiful, and relied on shallow wells to retrieve water during dry periods. Currently there are two major methods to retrieve non-surface water; an extensive network of NamWater and DRWS pipelines from the Kunene River and Angolan reservoirs, and boreholes that use solar, wind, and petrol energy to retrieve water from the aquifers deep underground (Amakali 2003).

Almost half of the Namibian population resides in the rural part of this basin, which is currently experiencing a relative rapid population growth of about 2% per annum. This increase in population is the "biggest threat to achieving sustainable development in the area" (Amakali 2003). Figure 7 presents a map of the Cuvelai-Etosha Basin depicting population density and location. There is a significant concentration of people in the regions surrounding the Angolan canal in the northern part of the region. This population density provides a serious drain on the available water resources in the region. It has been remarked that "there is substantial evidence that the land is unable to support the current numbers of people" (Marsh & Seely, 1992).

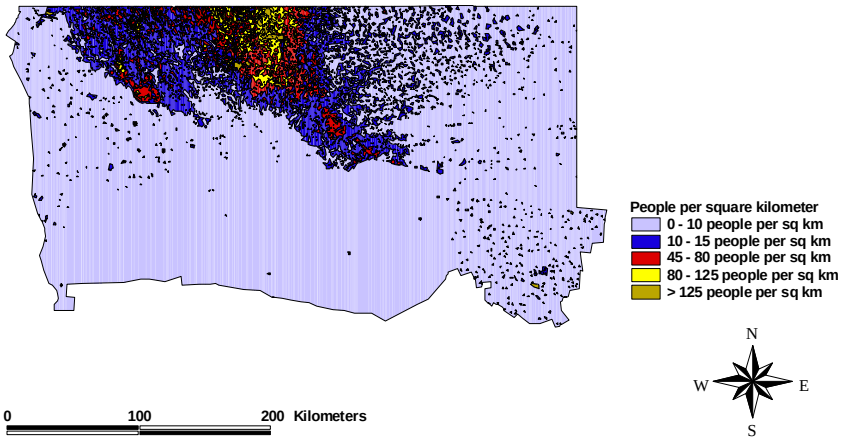

Figure 7: Population density and distribution in the Cuvelai-Etosha Region[9]

Another serious problem with water in the area is the high salinity of the groundwater. In the central area of the Cuvelai-Etosha Basin, which is the most densely inhabited region (and also where this project's research occurred) the particle density in groundwater can be as high as 5000 milligrams per liter (Mendelsohn, et al 2000). To reach clean groundwater, boreholes must often be drilled to high depths, which is difficult and expensive. Although the remainder of the region depends primarily on wells and boreholes, the central region including the Iishana sub-Basin relies almost exclusively on the NamWater pipeline schemes for pure water when surface water sources are not available. Below in Figure 8 is a map depicting the salinity in the Cuvelai-Etosha Basin. From this and the other problems of water scarcity in the region, combined with a "growing population and bad land use practices …place severe stress on [the] already strained natural resources" (Amakali 2003).

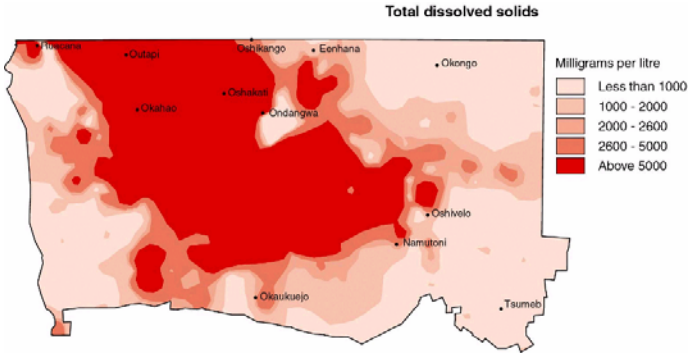

Figure 8: Total dissolved solids in the Cuvela-Etosha Basin[10]

[9] *Source: Summer Desertification Programme 13 Draft Report, 2005*

For water basin management to succeed in the Cuvelai-Etosha Basin, it must take into consideration the previously mentioned challenges and limitations. The Iishana sub-Basin, where water is primarily supplied by pipeline, is also the only area in the Cuvelai-Etosha Basin formally practicing CBWM at this time.

The project's objective was to investigate the current state of water resource management in the Iishana sub-Basin. Specifically, the project assessed the implementation of Sections IV and V of the WRMA and community-based water management.

2.5 CHAPTER SUMMARY

In response to Namibia's very arid climate and political history, the government has founded a decentralization policy that empowers the people to manage their own water resources. Through its progressive water legislation, Namibia is working towards a strong participatory democracy and the individual responsibility amongst its citizens to overcome the challenges of sustainable water management. The next step is to practice successfully what has been drafted in policy, through Namibia's Basin Management Approach. While it has succeeded in the Kuiseb, the question remains of whether this will be successful in the Cuvelai-Etosha Basin, where water basin management is still in the process of implementation. The success of water basin management in this basin will be vital to Namibia's continued development and survival. The country's future is dependent on effective and sustainable water management, because water is Namibia's most valuable resource. Water management strategies must continually be reviewed, and methods must be adapted and improved. Only in this way, can Namibia foster community participation, a sense of individual responsibility, and ensure successful and effective water management.

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[10] *Source: Mendolsohn, et al 2000*

3 METHODOLOGY

The Ministry of Agriculture Water and Forestry in Namibia is currently in the process of implementing components of the Water Resources Management Act of 2004 and the Basin Management Approach in select areas of the Cuvelai-Etosha basin. The goal of this project was to provide analysis and recommendations to the DRFN to promote community-based water management and to enhance the coordination of such programs in Namibia. Specifically, the project is providing recommendations towards the promotion and facilitation of community-based water resource management in rural areas of central-northern Namibia.

In order to develop the recommendations and accomplish the project objective, a research objective was created to focus the scope of the research on gathering stakeholders' perceptions and knowledge of the issues and subjects related to water management. Specifically, the objective was to:

Analyze Water Resource Management in the Cuvelai-Etosha basin through:

a. Perceptions of Ideals and Basis of WRMA No.24 of 2004 and BMA
b. Evaluate Awareness of the WRMA No. 24 of 2004 and the BMA
c. Assess Integration of the BMA and WRMA No. 24 of 2004

The project considered various research approaches and tools that could be used in order to ensure the project goal and objective was accomplished. This section provides an overview of the research approaches selected and outlines the specific methodology. All interviews conducted were kept anonymous to protect the individuals involved the project's research.

3.1 RESEARCH APPROACH AND TOOLS

This project selected an approach that could facilitate discussion with and responses from stakeholders. Since the project objective was heavily reliant on perceptions and opinions, the project principally used qualitative over quantitative methods. The basic characteristic of qualitative research is that the results are often abstract and that the researcher is "making an interpretation or drawing conclusions about

its meaning personally and theoretically" (Creswell, 2003). In particular, the main qualitative research tools used were interviewing and focus groups.

The main reason why individual interviews were selected is because they are beneficial for "eliciting information about individual needs and experiences and are likely to bring underlying problems and conflicts to light, especially if repeated with many individuals" (ADB, 2001, 34). Interviews also have the potential to extract delicate or personal information from participants. Interviewing can involve a set of generalized questions that act as a flexible checklist of issues that the interviewers can use to focus the conversation. It also allows participants to introduce and discuss issues they judge important.

Another important aspect of the research was the use of focus groups. The main reasons for the use of focus groups are because they are "small, often informal discussion groups whose participants are selected to represent either a cross-section or specific category of project stakeholders" (ADB, 2001, 28). Meetings are held at the field level and near the locations of stakeholders. Focus groups also provide greater opportunity for dialogue that provides insight and information that can aid in the accomplishment of project objective.

3.2 RESEARCH OBJECTIVE & DATA COLLECTION PROCEDURES

This section of the methodology is divided by research areas. It first discusses the research performed in Windhoek, prior to the field research in the Iishana sub-Basin. The second section describes the research process the project used in the Iishana sub-Basin. By tailoring the project's research approach to each area, it was ensured that the best results could be attained with the limited time available. The following sections outline the steps and methods used during the project research.

3.2.1 Pre-Field Work Research

Prior to the field research session in the Iishana sub-Basin there was a need for preparation and background research. This preparation was divided into two stages. First, the team identified key resource personnel in Windhoek possessing important

information on the Cuvelai region. These people were also secondary stakeholders in water management in Namibia, so it was important to collect their perspective on the WRMA and BMA as the baseline for the government-side perspective. Second, interviews were performed and the results were analyzed to establish the higher-level institutions' ideals and the basis behind the WRMA and BMA.

Choosing research targets

The project needed to recognize several areas where interviews of personnel would provide useful information, to select specific interviewee targets. In order to create a picture of the government-side perspective and ideals on water resource management in Iishana sub-Basin and Cuvelai Basin, three distinct institutions were chosen to be studied, as follows:

1. Government persons involved with creating the WRMA and BMA
    a. Ministry of Agriculture, Water, and Forestry employees
    b. Directorate of Rural Water Supply employees
2. NGO persons, specifically DRFN persons, involved with the BMA creation and implementation
3. Persons with social research experience in the Iishana region

The first group listed above includes individuals who could provide the necessary policy-side perspective on water management from the developers of the WRMA principles and BMA strategy. Specific persons interviewed for these categories of focus held positions within the Ministry of Agriculture, Water, and Forestry and the subordinate Directorate of Rural Water Supply. Several interviewees were involved with the development of national water policy, most notably the National Water Management Review theme reports. The individuals interviewed from the DRWS included a national deputy director of rural water management and the Regional Head of the RWS office in the Iishana region.

The second and third groups of resource individuals interviewed were DRFN affiliates involved with the development of the BMA as well as water management research in rural areas of Namibia. Their perspective provided a key part of an evaluation of the implementation of the Approach. It was also important to gather a social perspective on the Iishana sub-Basin region to tailor the project's field research approach

to the specific concerns of Iishana sub-Basin communities. The NGO persons interviewed about the BMA included two individuals who directly participated in the creation of the BMA. The project also interviewed two individuals with research experience in the Iishana region, giving perceptions on the state of water management in Iishana.

All the individuals selected for pre-field-research interviews gave information on their perceptions of the BMA and the WRMA. This was used to create a map of the policy-side structure of water management in the rural Iishana sub-Basin.

Developing pre-field work interview questionnaires

To gather useful information from the resource persons selected for interview, specific interview outlines needed to be developed for each interview. To ensure that the interview questionnaires were appropriate for the resource persons, the questionnaires were developed in concert with the project's DRFN liaisons. The full text of each interview questionnaire can be found in the Appendix. These questionnaires were developed for semi-standardized interviewing. The nature of the background interviews made standardized interviews, which allow only a pre-formulated list of questions and fully un-standardized interviews not applicable because there needed to be integration between each interview with the same topics addressed in all interviews. The interview questionnaires were developed with a primary list of key points that needed to be covered in the interview, followed by a list of questions that addressed specifics behind the key points. Below is a table with the key points covered by each of the pre-field-research interview questionnaires.

1. Perspective and ideals of BMA and rural water management
    a. Community-based management ideals and realities
    b. Specific issues with community-based management
2. Effectiveness of implementing the WRMA- what leads to successes and failures

For each key point, the detailed questions created allowed the project to gather more specific information in support of the project objectives. These questions provided a way to cover the same topic from several angles within each interview, reinforcing the information gathered. The resource person interviews were also designed to collect perspective on Namibian water management in general as well as water management

specifically in the Cuvelai-Etosha Basin. This two-level knowledge allowed the project to draw conclusions between the high governmental level of water management policy and the ground-level implementation of water management programs.

Performing interviews

Once the interview designs had been finalized, the interviews were performed. For the interviews to be most effective, the project group employed two specific strategies. First, a minimum number of interviewers would be present during the interview, and second, the format of the interview would be dynamically adjusted during the interview to increase the validity of the information gathered. All of the interviews took place in locations where the interviewee would be most comfortable.

For all but one interview, the interview format had two interviewers. One interviewer asked questions while a second interviewer took notes and ensured no key points were missed during the interview. This format was decided in order to make the interviewee as comfortable as possible, and also to focus the interview on the key points. Using a semi-standardized format allowed the interviews to collect detailed information on the areas of knowledge specific to each interviewee. Throughout, the interviewers kept in mind maintaining cross-integration between each interview, which is important to allow the qualitative data obtained in interviews to be compared during analysis. The data was used to create a picture of the perceptions of the governmental, strategic segment of water management in Namibia.

The second strategy employed during the interviews was to emphasize the open-endedness of the interviews. This was done to achieve the most complete information from an interview. All the pre-field-research interviews were performed in English. However, many of the interviewees did not use English as their primary language, so the interviewers had to be careful to word questions in the clearest way possible, avoiding colloquialisms and idiomatic expressions. It was important also to steer the discussion away from official, mission-statement style responses and towards information of the resource persons' experience in their respective positions.

3.2.2 Field Research

The second phase of the project research was to conduct field research in the Iishana sub-Basin located in the north central region of Namibia. To accurately evaluate and assess the awareness of and integration of the WRMA No.24 of 2004 and the BMA, it was imperative to conduct on-site field research. In this section, the methodology of the field research is elaborated including differences between pre-fieldwork and fieldwork the use of interviews, the use of focus groups, the development of questionnaires for key stakeholders, and finally the methodology of conducting the research.

Important Differences

While the general techniques for obtaining data are similar to the pre-field work, there were significant differences that needed to be addressed. The first major difference was the use of and reliance on translators. Only high officials in the Iishana sub-Basin spoke English fluently, so translators were needed to conduct interviews with local level stakeholders. The challenge with using translators was that the questionnaires were written in English, and the translation from English to Oshiwambo is not direct. On multiple occasions rewording of questions was needed in order to get relevant answers. The other major difference between pre-field work and the field work was the introduction of focus groups. Previously the project solely relied on interviewing techniques.

Interviews

When researching in the Iishana sub-Basin, the project interviewed both primary and secondary stakeholders. Interviews were used because they were optimal for obtaining the qualitative data needed to fulfill the project objective. For both the primary and secondary stakeholders, interviewing with a predetermined questionnaire specific for the position being interviewed proved to be highly effective in triangulating the overall perceptions. Interviews are also widely applicable to the methodology because of the freedom of responses. On the primary stakeholder level, the interview style was important because the language barrier is difficult to avoid with a written methodology and allowed the opportunity for the interviewer to ask about sensitive subjects. Finally,

the constraint of limited time made interviews the logical choice; interviews can be relatively short, allow the opportunity to have multiple sessions in a day, and provide the most efficient use of the field research. There are many types of interviews, and choosing which structure to utilize is just as important as deciding which data gathering techniques to use.

The primary type of interview used was a semi-standardized interviewing methodology. It was important to approach questions from different angles so that the interviewee would better understand and better answer the questions posed by the interviewer. However, there were times where a more un-standardized approach was applicable. For secondary stakeholders, the structure of the interview was completely semi-standardized and did not require a different approach. However, the project used un-standardized interviewing techniques when taking to water point users, which was due to difficulties with the initial questionnaires. The scope of the questionnaires was too large for the water point users, and thus an un-structured format was necessary to obtain responses pertinent to the project. Although interviews were a large part of the research methodology, in some cases, focus groups were used to obtain the data at the primary stakeholder level.

Focus Groups

Focus groups were used for water point committees as well as water point users in order to address the research objectives. The primary reason for this approach was because it is not customary to interview individual group members when many or all are present or nearby. Focus groups ranged in size from three to twenty-six interviewees. Focus groups provide the chance for an accurate cross-section of the community as well as a comfortable communication setting where people speak because of strength in numbers. While there are specific advantages to focus groups, there are disadvantages that must be considered when debriefing results. Only “group opinions are obtained in results,” but sometimes there are a few dominant persons that can overpower the group and give the interviewer false conclusions (Berg, 2007). After determining which methodologies were best suited for the field research in the Iishana region, the project developed relevant questionnaires for each stakeholder group.

Questionnaires

When developing the methodology for the field research, the project needed a set of questionnaires specific for the various sets of stakeholders targeted. Keeping in mind the project objectives and research objectives, a set of questions were developed for each stakeholder. Each questionnaire can be found in the appendix. Provided below are each questionnaires' primary objectives. Each stakeholder was selected either because of their involvement with the WRMA No. 24 of 2004 or the BMA.

Primary Stakeholders:

IBMC Secretariat

1. Objectives for the BMA in Iishana, and opinion on the effectiveness of the system
2. What is the level of representation of every stakeholder's concerns
3. What kind of feedback is given from local water users (bottom-up information flow)
4. What training does the BMC receive, and what training does it provide

Committees

1. Awareness of BMA and the WRMA
2. What training was done for the committees
3. What are the responsibilities of the committees, including responsibilities towards water monitoring

Associations

1. Do the respective associations follow the outlined responsibilities of the WRMA
2. What is the flow of communication is there between users and representing committees
3. What is the level of awareness of water issues, committees, institutions, and WRMA

Secondary Stakeholders:

DRWS

REGIONAL HEAD/CONTROL OFFICER

1. Perspective and ideals of the RWS-RH, related to the WRMA
2. Responsibilities of RWS in general and RH specifically
3. Interaction between RH and community committees
4. Interaction of RH and NamWater

EXTENSION OFFICER

1. Perspective and ideals of the RWS-EO, related to the WRMA
2. Responsibilities of RWS in general and EO specifically
3. Interaction between EO and community committees
4. Interaction of EO and NamWater

NamWater

1. Perspective, ideals and principals of NamWater responsibilities and functions (practice vs. policy).
2. Perspective of community committees (end users to BMC) and DRWS – their roles and responsibilities
3. Perspective on issues concerning water management and practice

Regional Councilor

1. Perspective, ideals and principals of RC responsibilities and functions (practice vs. policy)
2. Perspective on RWS-EO interactions with community (Committees and users)
3. Perspective of community committees (end users to BMC) and DRWS – their roles and responsibilities
4. Perspective on issues concerning water management and practice

These interview objectives were used to create the specific questions for each individual stakeholder. Every question was derived from an objective, where the research objectives, project objective and goal were considered at all times. The final step toward obtaining data was to go out in the field and to perform our previously mentioned methodologies.

Conducting Field Research

To achieve the research objective, the project needed to identify the key stakeholders in the Iishana sub-Basin. With the help of the DRFN and previous interviews conducted in Windhoek, the project was able to obtain contact information of key individuals. Those individuals were key DRWS employees, the IBMC secretariat, and the Regional Councilor. To get information for WPCs and LWCs, the project identified the committees that the Extension Officers' were responsible for, and the committees that the Regional Councilors' had jurisdiction over. The final methodology

for getting appropriate stakeholders interviews was a simplistic method of driving to different water points looking for users and committee members. From this the project was able to get multiple interviews across a vast region. For the project objective to be met, it was imperative to get a wide selection of data from the end user.

The project team split into two groups each with a translator and another DRFN researcher for a total of four people per group. One project member acted as the interviewer and the other as the scribe for each interview. In cases where the interviewee spoke English, the DRFN researchers acted as advisors. In cases where Oshiwambo was spoken, the interviewer asked questions through the DRFN translator. The interview locations varied across the region and were conducted in the location of choice of the interviewee. Since the project used semi-standardized interview techniques, the interviewee was able to tell their perspectives. The interviewer added or omitted questions based on the knowledge of the interviewee; however, every added question was used with the goal of probing further into answers, in order to better accomplish the research objective.

3.3 CHAPTER SUMMARY

Using the qualitative approach outlined in this chapter, with research tools such as interviews and focus groups, the project was able to collect a great deal of data. Developing and using this methodology was a crucial step in achieving the project objective of assessing the implementation of the WRMA No. 24 of 2004. The methodology provided the project with information about the ideals, perceptions, and awareness of community-based management in the Iishana sub-Basin of the Cuvelai-Etosha Basin. This information provided the raw information to be analyzed and used in creating conclusions and recommendations.

4 FINDINGS AND ANALYSIS

All stakeholders generally accept the idea of community-based water management in the Iishana sub-Basin, and the DRWS remains optimistic towards its success. Given that a centralized water management structure is neither practical nor desired, community-based management of scare water resources continues to be the best option for the sub-Basin. It is seen as a very applicable solution to the specific problems (mentioned previously) of the Iishana sub-Basin. However, community-based water management as it is written in Sections IV and V of the WRMA, does not currently exist. In particular, two new key players are greatly affecting the management structure, and there is a centralization of knowledge and power in the committees rather than the associations. There is also a dramatic difference between how people view water management, depending on their position in the structure. Although the attitude of promoting self-sufficiency in rural water management is held by the Ministry of Agriculture, Water and Forestry, project research found that there is evidence that community-based management currently faces many challenges. The differing, and often incomplete, perceptions along with two major "road-blocks," issues of payment and volunteerism, are preventing water basin management from achieving long-term sustainability and success.

4.1 FINDING 1

THE CURRENT IMPLEMENTATION OF THE WRMA DIFFERS THAN BOTH THE DRWS STRATEGY AND WHAT IS WRITTEN IN SECTIONS IV AND V OF THE ACT.

4.1.1 Observations

From the research performed in the Iishana sub-Basin, it became clear that the structure of rural water management differed from the WRMA-established structure described in section 2.3.3 of this report. Additionally, the DRWS has created a strategy that differed from both the law and the actual implementation. The key differences between the structures can be seen in Figure 9 below.

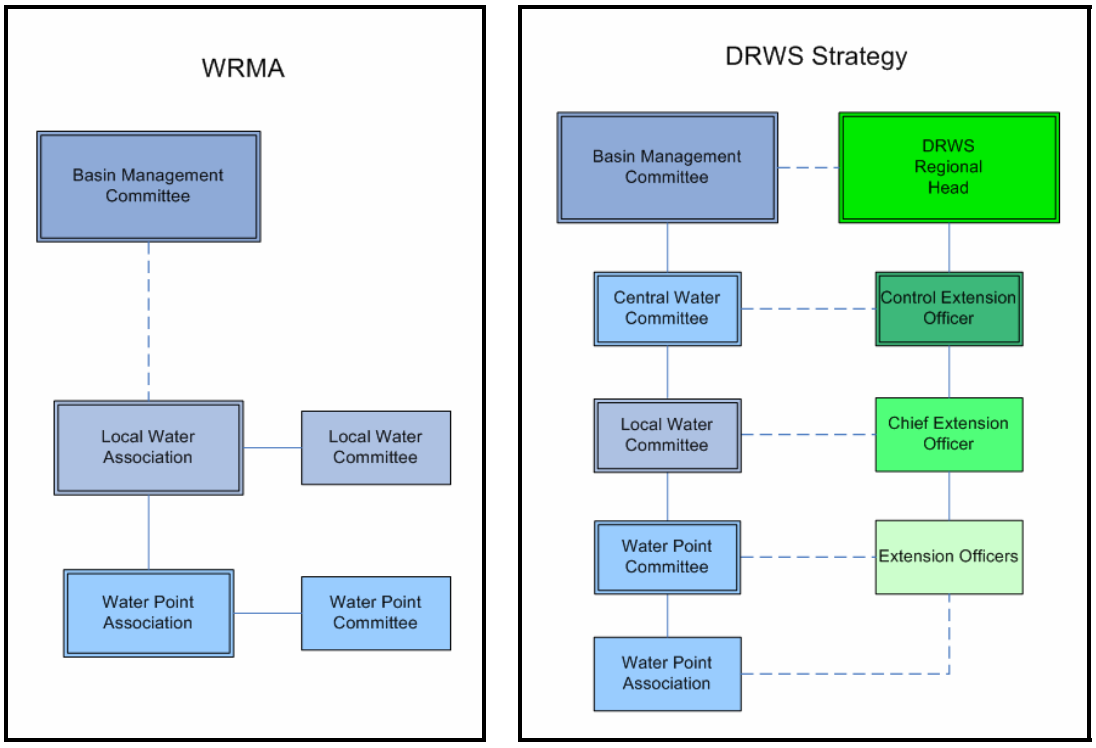

Figure 9: DRWS strategy compared to WRMA structure

DRWS has placed an emphasis on committee management in order to facilitate and promote sustainable water management. Many of the DRWS officers interviewed did not have enough time or resources to visit on a regular basis all of the communities they are responsible for. One Extension Officer said that she wished to visit her communities at least once a month, but was not able to because of limited available

transportation. This is a result of the limited DRWS funds and the large distances separating communities in the rural Iishana sub-Basin. The DRWS Extension Officers and Chief Extension Officers cannot provide information about water management to all members of the rural communities. Instead, they focused on informing the management committees specifically; several of the water users and WPCs interviewed mentioned that RWS only provided training for the committee members, and not for the wider community. This results in the committees making decisions for their communities, rather than the communities making their own decisions.

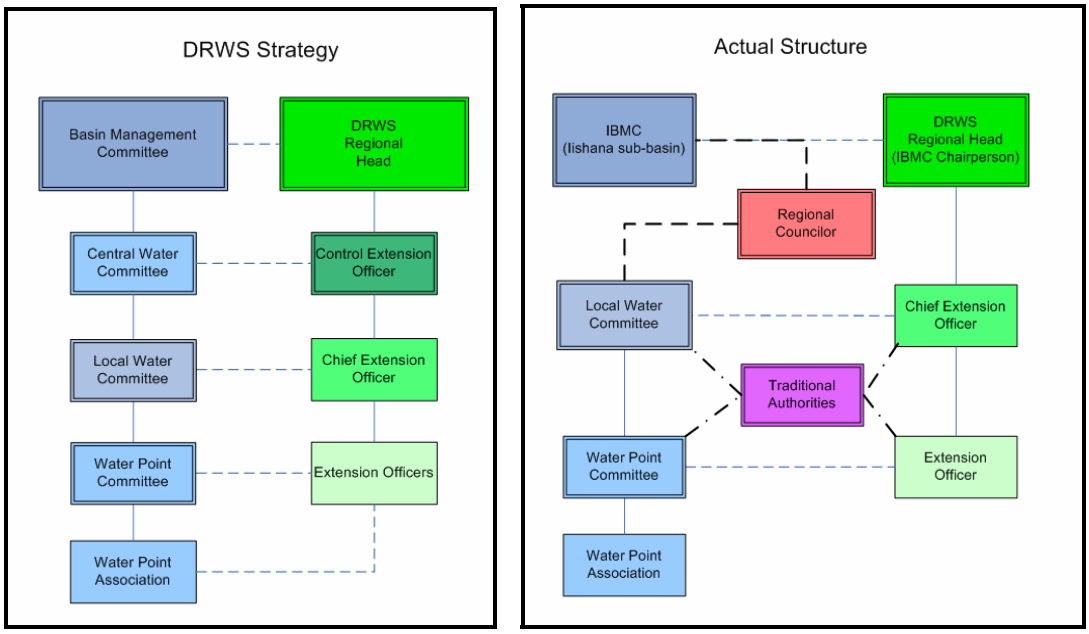

Figure 10: DRWS strategy compared to the actual implementation

Regional Councilors and Traditional Authorities are involved with local water management, as can be seen in Figure 10. In an interview with an Extension officer, it was revealed that DRWS often uses both Regional Councilors and Traditional Authorities mobilize the community for meetings. Community members also voice water-related concerns to their local Regional Councilor as an established political figure. Traditional Authorities, according to interviews with DRWS officers, had to be included in any DRWS undertaking, or communities would not cooperate with the DRWS programs. These figures were heavily involved with water management at least as advisors, and were sometimes full members of the management committees. For

example, one of the WPCs interviewed had their village Headman (a Traditional Authority figure) as the WPC Treasurer, and the Deputy Headman as an advisory member for the committee.

There is no connection between the lower committees and the Basin Management Committee. The Central Water Committee, as described in DRWS interviews, was nonexistent in the Iishana sub-Basin. Central Water Committees were intended by DRWS to be the link between local water management and basin-wide water management. Out of all the WPCs interviewed, not a single member had any knowledge of the IBMC or why basin-wide water management is important. Even some of the IBMC members interviewed were unclear as to their role within the IBMC, although they did agree that a basin-wide forum on water management was a good idea.

4.1.2 Discussion

The key differences in the structure of community-based water resource management in the Iishana sub-Basin are the greater responsibility of the committees, the influence of Regional Councilors and Traditional Authorities, and the lack of a vertical communication link between the IBMC and the lower levels of water management committees. These differences show how the water management structure has been modified to fit the specific needs of the Iishana region. Identifying which changes to the structure are beneficial and which are detrimental is important to aid the future development of water resource management in the area.

Contrary to the ideal, rural water management committees, not individual water users, are the most capable to make management decisions. This is because they receive the most information about water management. As stated above, it is impractical for DRWS to attempt to spread information to every community member. This may alienate the water users from their committee, because they are not included, but it allows water management committees to make the most effective decisions. In a realistic setting, it becomes necessary to concentrate training and information sessions within the management committees, where it can do the most good to promote sustainable decision-making. Although this does not support true decentralization, in order to efficiently establish community-based management of water resources it is appropriate that

committees make decisions about the management and development of their water supply schemes rather than the individual users.

Regional Councilors can provide a useful communication link between local community water management and basin-wide water management. These politicians can fill two roles. First, the DRWS enlists their help to liaise with the communities. This can be very useful in the early development of water management committees. Second, Regional Councilors can provide a venue for communities to voice their problems and concerns with water management issues, as the Regional Councilors already work closely with the communities. The Regional Councilor can then communicate the concerns of the committees of higher offices, where they can be addressed.

However, Regional Councilors can also hinder the effectiveness of community-based water management by not committing to the ideals of community responsibility, and instead reinforcing notions of centralized management or government subsidization. Through discussion with people in the Iishana sub-Basin, the team found that sometimes Regional Councilors, in order to get elected, advertise that people should be getting water for free. This can undermine the ideals of community-based water management. These local political figures are very essential to the effective cooperation of communities with water management practices, throughout a water basin.

Traditional Authorities are important in spreading awareness, motivating community involvement, and most importantly, directly advising community committees. These conventional authorities influence activities within the communities, including water committee decisions. For this reason they must be involved in DRWS awareness campaigns. Additionally, without the support of the traditional authorities, the communities would be unlikely to commit to community-based water resource management at all. For example, in one case a local King traditional authority figure stopped paying his private water bill, which can have a negative influence on the local water users. Involving these traditional authorities is critical to the practical success of decentralized water resource management.

There is no communication link within the committee hierarchy between the local water management and the Basin Management Committee. Communities use DRWS

officers and their Regional Councilor as a way to pass information to the higher levels of water management. There is no committee forum for communication between rural water user committees and the IBMC, i.e. there is no vertical linkage between these organizations. In order for the IBMC to make effective decisions on basin-wide water management, there must be smooth communication channels between the sub-Basin committee and the local water committees operating in the Iishana sub-Basin. Once communication is established between these organizations, basin-wide water management will become much more possible.

4.1.3 Summary

The structure of rural water management in the Iishana sub-Basin differs from the structure planned in the WRMA, but is perhaps more appropriate for this specific region at this time. Despite the differences, the current situation does not truly contradict the law as community-based management is developing. The ideals of the law are not practiced in its entirety because of the limited resources and the limited knowledge of the stakeholders. Traditional authorities play a key role in the day-to-day activities of the water point. Their direct influence to the community is crucial to the success in any local water management activities. It is important to note the Regional Councilor has the ability to replace the duties of the Central Water Committee if the Councilor chooses to be very active. However, if Regional Councilors chooses to be inactive it can result in an obstacle to the flow of communication to the Basin Management Committee. For the BMC to successfully create resource management strategies, it needs information from the stakeholders that will be affected the most. The current community-based water resource management structure that has been adapted for the Iishana sub-Basin is a good start towards a decentralized control of water resources.

4.2 FINDING 2

THE MAJORITY OF WATER USERS DO NOT SEE THE ENTIRE FRAMEWORK OF WATER MANAGEMENT IN THE IISHANA SUB-BASIN.

Through direct field research, the team discovered that water users do not "see," or understand the entire framework of water management that is being implemented in the Iishana sub-Basin. The data in this section focuses on Water Point Associations and Water Point Committees. These groups generally have the most limited scope the entire management structure. Highlighted below in Figure 11 and Figure 12, is the implementation diagram modified to illustrate each respective group's limited view of the roles and responsibilities within the entire framework.

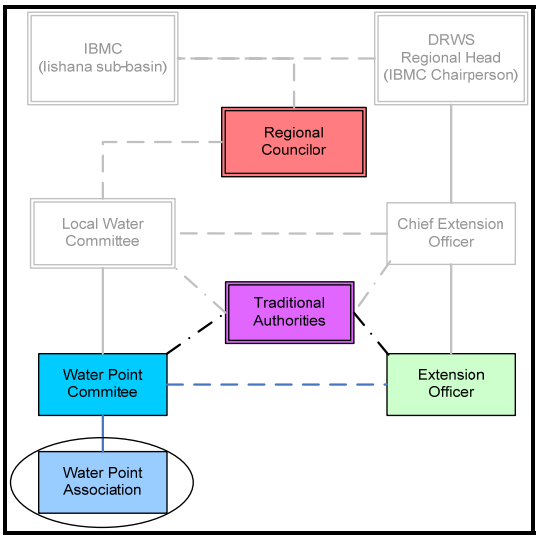

Figure 11: View of management structure from WPA perspective

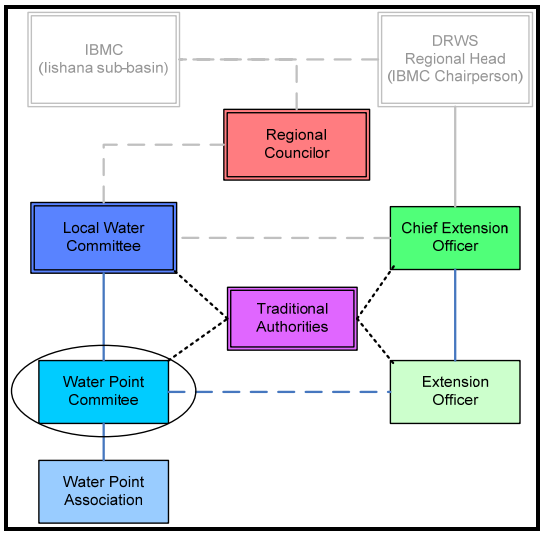

Figure 12: View of management structure from WPC perspective

4.2.1 Water Point Association Observations

Water users generally understood the role and purpose of the Water Point Committees (WPC), because they have direct contact with water point committees on a day-to-day basis. Additionally, water users know that the WPC interacts with the DRWS Extension Officers, but they do not recognize what the Extension Officer's

responsibilities are to the WPC, and their role in facilitating sustainable water management. However, water users are not aware of any other members of DRWS or their responsibilities in water management. Through interviews, the team discovered that most general water users only had limited interactions with DRWS when there was a problem, and the Extension Officers came to meet with committees and communities. In general, their knowledge of the DRWS management support structure starts and ends with the Extension Officer and their connection to the WPCs.

Water point users are often unclear about the role of the Traditional Authorities, and why they are involved. However, they do know that the WPC and Extension Officer work with the Traditional Authority in water management affairs. In one interview, a water point user was unsure if the traditional authorities were the persons responsible for establishing the community-based management structure. He was also unsure why the Traditional Authorities were involved when this was supposed to be a community-based management program. There is knowledge that Regional Councilors interact with the committees and can help resolve water problems, but water users are unsure as to their specific role and place in the process of water management. However, they do perceive that this political figure is higher than WPC in the water management scheme. Finally, out of the seven groups of water users interviewed, none had any knowledge of the IBMC or basin-wide water management. The implication of this will be discussed later in section 4.2.3.

4.2.2 Water Point Committee

Water Point Committees have a clearer understanding of the entire framework compared to the Water Point Association. From their initial training, the committee members had a good understanding of their roles and responsibilities, as well as the day-to-day activities of water management but lacked the knowledge of long-term goals of water sustainability. Also, WPCs have a better understanding that Traditional Authorities act as a support between the WPC and the DRWS officers. Because the Extension Officers work with Water Point Committees directly and on a regular basis, WPCs have a more detailed knowledge of the roles and responsibilities of Extension Officers in this management structure. Furthermore, the WPC members know that the Local Water

Committee manages the branch line of several water points, and that they collect the money for the whole branch line. However, they are not aware of the Chief Extension Officer's role with the LWC, and the support from DRWS provides on management practices. Similar to the water associations, the committees know that the Regional Councilor is important to help facilitate water management. However, they are uncertain as to their specific roles and responsibilities in the management structure, but are aware that they are above Local Water Committees and Chief Extension Officers. Finally, Water Point Committees lack awareness of the upper management structure such as the IBMC and the Regional Head of DRWS.

4.2.3 Discussion

Many communities do not understand their roles and responsibilities in the greater scheme of water management. This hinders their ability to practice sustainable water management. Because of this limited awareness and understanding, water users are suspicious of committee actions, hesitant to cooperate with management programs, and do not contribute to basin wide planning and strategies.

Through the field research, the team found that limited perceptions of water management structure led to some water users being suspicious of WPC and LWC activities. Because water users did not see how the committees fit into the larger picture, they did not understand where their monthly payment for water was going, or what was being done with it. They were suspicious that committee members were stealing the money and using it for personal gain. This distrust of committee actions undermines future activities and reduces the committees' credibility when attempting to implement water management policy that could contribute towards long-term sustainability of the water point.

A community's distrust of committee actions can also lead to a lack of cooperation with water management programs, and limits their acceptance of new ideas. In one interview, the team found that there were many water users in a community who did not attend committee organized meetings because they did not understand why it was important. In another case, there was a water user who explained he was unsure about the roles and responsibilities of his WPC, but admitted that he did not attend the

meetings. Because water users do not see the greater purpose of water point activities, the cooperation between the water users and the committees' management of their water points is crippled. This makes it very difficult to promote community-based water management and for these practices to succeed in addressing Namibia's water scarcity challenges, which is essential to the country's sustainable future.

As mentioned in the first finding, there is no direct connection between the IBMC and the lower levels of water management; however, problems of communication become intensified by the fact that these lower levels are completely unaware of the IBMC and its roles and responsibilities. This limited communication makes it difficult for the IBMC to develop long-term sustainability management strategies, and makes it difficult to involve local committees in basin wide management programs. This is a problem because the IBMC will not be able to effectively address basin wide issues, and will not be able to accomplish its goals of promoting community participation and self-reliance, and achieving a sustainable management of the basin's water resources.

4.2.4 Summary

The perceptions of organizations involved with water management in the Iishana sub-Basin are critical to the effectiveness of the program. There were several instances where an incomplete awareness and understanding of the management structure, resulted in reduced efficiency and effectiveness of water management strategies and practices. Communities who understood their part in the larger picture of water management made much more effective decisions, and were more successful at management their water resources towards long-term sustainability. Therefore, it is optimal for communities and to understand the entire framework to achieve a better understanding of their individual roles and responsibilities.

4.3 FINDING 3

FUNDAMENTAL ISSUES SURROUNDING PAYMENT AND VOLUNTEERISM ARE AFFECTING THE SUCCESS OF COMMUNITY-BASED WATER MANAGEMENT IN THE IISHANA SUB-BASIN.

4.3.1 Individuals do not understand the need to pay for water

Observations

There are many reasons why people do not pay for water, but there were some specific trends that the team discovered throughout the region. One reason why stakeholders did not pay for water is because until recently, water had been provided for free by the government. The team found that people who had been getting water for free are now reluctant to pay for water. Also many water point users believe that water comes from God and that it should be free (Klintenberg et. all, 2006).

An additional problem that was discovered through interviewing various WPCs is that communities do not understand that the service of water supply costs money, rather than the good itself. The process of cleaning water and supplying it to the many water points is not known by many community members. These community members are also unaware of the costs and manpower associated with providing rural communities with potable water.

The last overall reason why stakeholders see payment as an issue is due to the lack of financial resources, and therefore ability to pay a water bill. In the Iishana region, there are many community members that do not have a steady income. For those who can pay, many avoid payment because they believe it is unfair for them to front the financial burden while others do not. In the interviews with the water point users, the team found that individuals also will not pay because they feel that WPCs are "eating the money," and are suspicious towards financial corruption within the committees.

Discussion

Throughout the Iishana sub-Basin, many people and communities do not understand the need to pay for water. This issue affects long-term management practices that could move the basin towards a more sustainable future. In this section, there is a discussion on the immediate effects from not paying water bills, the lack of awareness throughout the region, and finally the long-term consequences from non-payment.

The effect from water users not paying water bills often hurts the community as well as pipe schemes in drastic ways. From the table shown below, it is clear that there is a substantial accumulation of debt within certain communities along a branch line. In fact

there is only one community that has a surplus. From interviews, the team found that communities with substantial debt were prone to have their water points closed by NamWater. These points can remain closed until full debt recovery is achieved. In one focus group, a water point had been shut down for two years. This forces water users to look for alternative water sources such as oshanas or hand dug wells, however during the dry season these are not available.

The team found that successful water payment collection led to committees' development of sustainable solutions to other water management issues. Understanding the need to pay for water is part of the ideals of community-based water management. From this, understanding perceptions of individual roles and responsibilities within the water management structure become more solidified.

Table 1: Pipeline scheme debt, from the DRWS Oshikoto/Onankali region

SCHEME	CUMULATIVE as from last quarter			
	Bill	Paid	Paid %	Outstanding
Onayena - Iikola	700,944.57	39,269.02	5.60%	661,675.55
Onayena - Okankolo	2,513,869.79	50,559.80	2.01%	2,463,309.99
Olukonda	197,874.47	103,670.11	52.39%	94,204.36
Oshali - Ontananga	36,265.00	36,450.00	100.51%	-185.00
Omuthiya - Ambende	1,674,623.72	156,111.53	9.32%	1,518,512.19
Oshivelo - Okankolo Phase I	306,562.52	89,972.22	29.35%	216,590.30
Oshivelo - Okankolo Phase II	96,409.65	80,689.03	83.69%	15,720.62
Oshivelo - Okankolo Phase III	317,279.23	193,758.14	61.07%	123,521.09
TOTAL	**5,843,828.95**	**750,479.85**	**12.84%**	**5,093,349.10**

The reason why payment is such an issue among water point users in the Iishana region is because the awareness of the issues has not been entirely effective. The Dublin Principles declare that water is an economic good, and therefore must be paid for by water users. There are many people in the area that do not pay for water simply because they do not understand why they must pay for water. Many WPCs and LWCs are not doing much to raise awareness in their user associations about the need to pay for water.

Water payment must be addressed because it is consuming the efforts of basin management structure in the Iishana sub-Basin. Stakeholders are stuck focusing on water payment rather than addressing long term sustainable basin development. According to MAWF employees interviewed, the accumulating debt of communal water users in the

Cuvelai-Etosha area demonstrates that the community-based management system is facing challenges. If the challenges surrounding water payment are addressed, and awareness is raised, then the basin can move towards a more sustainable future.

4.3.2 Individuals do not understand the purpose of volunteerism in community-based management

Observations

Committees in the Iishana sub-Basin are currently facing challenges with volunteerism. One reason people do not volunteer to help manage the water point is because people become comfortable with the current committee members. In one interview, a caretaker had been reelected three times because everyone felt that he was doing a good job and should continue to serve the community, even though he felt he was getting too old to properly do his job. Another reason for lack of volunteerism was people would rather go to the cities to find a job and earn more money. The team found that community members were resistant to volunteering because they were not compensated for their work. Water users commented that they did not have time to volunteer, and that it would take away from their paying job.

Also, committee positions demanded a time commitment that would take away from time a livelihood. In addition, most water point users were concerned only with their own water use. Communities are relying on the same ideas from the same people for many years. In some cases, as long as the most basic need is being satisfied, people are comfortable with letting someone else take care of the situation.

Discussion

Throughout the Iishana sub-Basin, many people and communities did not understand the role of volunteerism in community-based management. This issue affected long-term management practices that could move the basin towards a more sustainable future. This section discusses the length of time that individuals are committing to community-based water management, the lack of awareness throughout the region, and finally the long-term consequences from volunteerism.

One problem that occurred due to the lack of volunteerism was that community members were staying on committees for far longer than they would like. In many interviews of water point committees, members have been on the committee since the late 1990's because there was no interest among other community members to step in and take over. Furthermore, the elderly members of the communities were running the process and they realized that no new ideas were being introduced to the management scheme. Sometimes these committee members pass away and positions would be unfilled for long periods of time. This created a large gap in the management structure and placed a heavy burden on the members that were left to keep the committee functioning.

Proper awareness had not been raised in order to foster complete understanding of the role of volunteerism in community-based water management, which was evident in the lack of enthusiasm in committee elections. People did want to actively participate for nothing and many looked for a compensation for their services. Stakeholders did not understand that volunteering is an essential component to the success of water sustainability in their communities. Water Point interviews showed that user commitment to the community-based water management program was not high, especially among younger people. Many people, young and old, did not run for elections, and because of this communities relied heavily on a select few to manage the water point. The team found that committees that have many active volunteers succeeded more often in providing sustainable solutions to issues of water management

Without the fundamental principle of volunteerism, there is potential for a collapse of the structure and a failure of the basin management implementation. It is the most fundamental principle of community-based water management, and without participation it cannot exist. The 5-day initial RWS training for establishing water point committees was enough for the committee to be able to start functioning. However, from the interviews it seemed that the WPC members did not fully understand the ideals and the importance of community-wide participation and volunteering. The Iishana sub-Basin management system is currently being hampered by the lack of volunteers. If

volunteerism is addressed, the entire Iishana sub-Basin can move towards a more sustainable future.

4.3.3 Summary

Overall, stakeholders in the Iishana sub-Basin accept and understand the ideas of community-based water management. Water point users are receptive to the idea that water resources are within their control, and management comes from the ground level rather than a top-down approach. However, there is a lack of understanding and awareness as to the meaning behind these ideals. Stakeholders perform the essential duties of water management because it is the only way for them to get water. They do not, however, dig deeper into the meaning to understand that management of a water point benefits the long-term sustainability. Water payment and volunteerism are key issues that need to be addressed because they are currently consuming the efforts of committees at all levels. Iishana sub-Basin management is in its infancy, but these nuances need to be dealt with quickly. Success is linked to overcoming payment and volunteerism, which is currently inhibiting the basin's effective management.

4.4 CHAPTER SUMMARY

Given that a centralized water management structure is neither practical nor desired, community-based management of scare water resources continues to be the best option for the Iishana sub-Basin. Although the current water management structure differs from what is written in the law, it is an appropriate adaptation given the limitations of the Iishana sub-Basin. The DRWS has focused power and knowledge in the committees in order to facilitate decentralized management of water resources, and Regional Councilors and Traditional Authorities play an unexpected role in the success of water management. The limited perceptions of the management structure held by most water users results in major challenges throughout the sub-Basin. Lastly the issues of payment and volunteerism are currently crippling the efforts of committees working towards long-term sustainable community-based water management, and must be addressed if water basin management is to succeed in the Iishana sub-Basin.

5 RECOMMENDATIONS

The primary focus of this project was to assess the implementation of Sections IV and V of the WRMA, and community-based water management in the Iishana sub-Basin. This assessment resulted in the development of several focus areas, which are the benefits of increased awareness in communities regarding water management ideas, and the issues of water payment and volunteerism, and. As an extension of these focus areas, the project produced recommendations for future analysis about water management in the Iishana sub-Basin. They are as follows:

5.1 COMMUNITIES' AWARENESS AND UNDERSTANDING

- Focus awareness campaigns on the importance of long-term sustainable community-based water management (CBWM).
    - Explain to the communities *why* they should practice CBWM, not just what it is. This can help communities understand the long-term benefits, and prevent them from just going through the motions to receive water.
- Stress 'awareness development' during the initial training.
    - Non-Governmental Organizations and the DRWS should stress the importance of developing awareness when they give the initial training to Water Point Committees.
    - This can foster a sense of individual responsibility among community members, so they can be aware of issues and participate in solutions.
- Assess the potential and enhance the ability of Regional Councilors and Traditional Authorities to promote the ideals of CBWM.
    - Local authorities can play a pivotal role in water management, so it is important that they understand the principals and ideals of CBWM, and promote these concepts when they interact with their constituents.
    - Local political figures should be involved with the awareness building process.

- These individuals can greatly benefit water management through aiding communication and providing an established political foundation for new water management ideas.

5.2 CHALLENGES OF WATER PAYMENT

- Increase awareness about why people have to pay for water.
  - The team found that an increased awareness about why people must pay for water generally resulted in communities having fewer issues with water payment.
  - This could be accomplished through educational tools and awareness campaigns undertaken by the Iishana sub-Basin Management Committee (IBMC), the DRWS, and especially the community members, who should be proactive in developing awareness.
  - Overcoming payment issues allows the community to address the further sustainability and development of their water resources.
- Further research should be done to determine why some communities overcome payment problems while others are struggling.
  - The team found that there were a few communities that had moved pass the issue of water payment.
  - More specific research needs to be done on water payment issues in order to discover the differences between successful and unsuccessful communities.
  - This will allow more communities to benefit as these ones have, contributing to the long-term sustainability of water management in the basin.

5.3 CHALLENGES OF VOLUNTEERISM

- Better communication flow is needed so that communities can see the ‘bigger picture’ and can understand their roles and responsibilities in the process of water resource management.

- More information and awareness campaigns from the IBMC would be beneficial.
- Awareness needs to be increased so that stakeholders, especially water point users, understand their part in basin-wide water management.

6 SUMMARY

The recommendations and areas of focus developed in this report were given to the Desert Research Foundation of Namibia to aid in the implementation of community-based water management in the Iishana sub-Basin. These project outcomes were derived through careful organization of the key points collected from research in the Iishana sub-Basin. In accomplishing the project's objectives the team highlighted three major findings. First, the current implementation of the WRMA is different from the DRWS strategy, and what is written in Sections IV and V of the Act. Second, the majority of water users do not see the entire framework of the water basin management structure. Third, volunteerism and payment are affecting the successes of community-based management in the area.

The current structure of rural water management in the Iishana sub-Basin is different, but is conceivably the most appropriate implementation for this region. Most importantly, there is an emphasis on the committee decision making, rather than associations. Traditional Authorities and Regional Councilors play a crucial role in water management activities. They can mobilize water users, and provide a venue for committees to voice concerns and problems about water management. Lastly, there is no direct connection from the lower levels of management to the IBMC.

Most water users lack the knowledge and understanding of the complete framework of water management structure in the Iishana sub-Basin. These differing perceptions can affect the success and effectiveness of the management program. Many communities do not understand their roles and responsibilities in the greater scheme of water management, and this hinders their ability to practice sustainable water management. Because of this limited awareness and understanding, water users are suspicious of committee actions, hesitant to cooperate with management programs, and do not contribute to basin wide planning and strategies.

The issues of payment and volunteerism hinder the implementation of CBWM in the Iishana sub-Basin. Communities' efforts are consumed in dealing with paying their water bills, and are unable to take the next step in the growth and sustainable

management of water resources. Many of the groups interviewed also commented that there were problems motivating people to become involved in water management. The problems with volunteerism cause a lack of support for the management structure. This leads to problems filling positions in the committees, and so the organization of water management in the community falls apart. Addressing the problems of volunteerism and payment will provide the motivation and commitment in this region necessary to take water management beyond survival to effective long-term sustainability.

The analysis presented by this project contributes to water resource management by providing areas of focus for improving the implementation of the WRMA in the Iishana sub-Basin. Once people understand they are able to contribute to resource management in their area, they can understand that their actions affect their day-to-day activities, as well as the long-term development of their water resources.

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X1. AUXILIARY REPORT 1: ASSESSING SDP 13 PROPOSED BASIN MONITORING SYSTEM

Water point water meters, used by NamWater for water billing

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X1.2. SDP 13 PROPOSED BASIN MONITORING SYSTEM

In order to monitor the health of the Iishana sub-Basin, the Basin Management Committee needs to have sources of information on the state of the basin to make appropriate decisions about water management. Currently information about water supply and use by stakeholders and on the environmental health of the basin is supplied either by NamWater data, or is collected by third party organizations performing case studies in the area, such as the DRFN or GTZ (SDP 13 Draft Report, 2005). The DRFN has developed a prototype basin monitoring system, comprised of several monitoring tools. The system was developed during the Summer Desertification Programme 13 by DRFN contributors. It calls for examining water use as well as environmental conditions within the Iishana sub-Basin. The proposed SDP 13 monitoring system contains seven tools as follows:

1. Consumption of water by at Water Points and Private Connections
2. Number of households using a Water Point and change in number over time
3. Number of livestock using a Water Point and change in number over time
4. Revenue collection for water supply at Water Points and Private Connections
5. Condition of Water Point infrastructure
6. Rainfall
7. Availability of surface water sources for livestock

The data collected on the SDP 13 monitoring categories are recorded on cards, which are collated and passed up through the levels of water management. These first seven tools are designed to be used by Water Point Committees and Local Water Committees. Monitoring the consumption of water is desired in order to allow WPCs to charge their users based on the amount individuals or households use in a month, rather than a fixed rate. This proposed payment system is fairer for everyone who uses the water point. The monitoring of this tool is done by reading water meters at water points for the WPCs, and branch lines for the LWCs. Additionally, the records of water use are passed up the hierarchy of the rural water management scheme, to the higher level committees and RWS officers, so that annual and long-term trends can be seen. The other six proposed monitoring tools are designed to provide a base of information for the Basin Management

Committee, Rural Water Supply, and the community water committees, to facilitate design making regarding water management. There are three further proposed monitoring tools developed by the SDP 13 project, and they are listed below:

8. Condition of rangelands within the area of a Water Point
9. Condition of woody vegetation within the area of a Water Point
10. Water flows in oshanas (DWA).

The monitoring tools 8-10 are not specifically developed for use by the WPCs or LWCs, but rather reflect the monitoring being performed by Agricultural Extension Officers, Forestry Extension Officers, and the Department of Water Affairs. The information provided by these three tools, and the other seven above are designed to provide information the BMC, LWCs, and WPCs to increase cross-sectoral management integration, increase awareness within water management structures, and improve the suitability of water management decisions in the area. The implementation of this system is intended to enhance the sustainability of the Iishana Sub-Basin, and provide the IBMC with the necessary information to successfully manage the basin.

X1.3. RESEARCHING THE FEASIBILITY OF THE SUMMER DESERTIFICATION PROGRAMME 13 MONITORING SYSTEM

Through interviews with primary and secondary stakeholders, the team gathered findings to assess the proposed SDP 13 monitoring system. These findings were based on peoples' receptiveness to the idea, an understanding of its effects, and the ability of water users to successfully and effectively use the monitoring cards. The team also looked at a new RWS monitoring system that is currently in its earliest stages of implementation. The RWS model employs two of the seven basic tools proposed by the SDP 13 system; these are water consumption for people, and water consumption for livestock. The perceptions of stakeholders, as well as the issues and successes of the basic RWS system were gathered to help the team assess the proposed SDP monitoring tool.

The team interviewed a range of employees from RWS, members from the different levels of the BMA committee structure, as well as Ministry officials. Some key

ideas resulting from these interviews were the issues surrounding volunteerism, practical knowledge, as well as the resources necessary to implement the proposed system. The specific perspectives of all the categories of interviewees are described below.

X1.4. MINISTRY LEVEL OFFICES

A number of key personnel on the ministry level were interviewed concerning their perceptions of the SDP 13 monitoring system. This provided insight from the highest level of water basin management, and the potential success of failure of the monitoring system.

The biggest issue was the potential impact on water consumption-based payment. Two-thirds of those interviewed expressed that this was the biggest impact that the system could address. Also the ministry level perspective was interested in the other tools of the SDP monitoring system. For example an interest in the benefits of addressing environmental health were addressed. The ministry level interviewees could not comment on how well the communities would be able to implement the program, and were unsure about how to best facilitate the implementation.

X1.4.1. Rural Water Supply Regional Offices

Several key personnel were interviewed in two different RWS regional officers regarding their perceptions of the SDP 13 monitoring system. These included Regional Heads, Chief Extension Officers, Chief Control Officers as well as several Extension Officers. This provided the team with varying perspectives on the monitoring tools. Through talking to managerial staff and the EOs that would be directly involved in the implementation a clearer assessment of the SDP 13 monitoring system's feasibility could be achieved.

Regional Head, Chief Extension Officers, Chief Control Officers

Regional level management interviews provided broad, although not specific, perspective on the SDP 13 system's feasibility. In these positions these officers see much of what happens in different schemes in the region. They provided general perceptions of

how the proposed system would be accepted, and the possible challenges in its implementation.

General findings show that the idea of consumption-based monitoring (and payment) is useful and a good one. The RWS Regional Head indicated that the tools on the proposed cards of the SDP 13 system could resolve many of the disputes over water payment, and provide RWS with valuable information for monitoring and auditing. However, the team found there to be a general concern that the monitoring system would be cumbersome and that there are not enough resources and manpower to handle this demand, both for RWS and on the committee level. The Regional Head also indicated that there might be too much paperwork for an already thin management structure.

Extension Officers

Interviews with Extension Officers, who operate at a field level, provided a much deeper and more specific perspective on the feasibility and implementation of the SDP 13 system. Although they work on a regional level, Extension Officer's perspectives are primarily limited to particular areas, and so are more focused.

General impressions again presented the monitoring system as, in principle, a good idea, and that a consumption-based system would lead to a better and fairer method of water payment. However, four out of five presented issues and challenges surrounding the voluntary nature of the programs. While they believe implementation is possible, some EOs see it's direct implementation as being too ambitious for volunteers because people still want and need to make money. There is potential for the monitoring system to place an extra burden on WPCs that would limit its success. Other difficulties with implementation regard the limited levels of training and resources that would be needed in order to ensure the success of the SDP 13 model. The older generations that make up the majority of the committees require a greater degree of training in order effectively understand the concepts and methodology of programs.

Despite the possible challenges, most Extension Officers believed that if the implementation was broken into steps it would be able to achieve success.

X1.4.2. Committee Level Perspective

Members of the different levels of BMC structure were interviewed to gather data on primary stakeholders perceptions of the monitoring system. These included members of the IBMC, LWCs, WPCs, as well as end-point water users. From these interviews, a picture emerged of the primary stakeholders perception of the water monitoring systems.

Iishana Sub-basin Management Committee

Interviews with the IBMC provided a broad impression of how feasible the monitoring system could be implemented on a sub-basin wide level. Because members of the IBMC are often involved in other levels of government, such as in RWS and as RC, their wide level of contact with communities provide a general perspective.

All members of the IBMC that were interviewed believe that some kind of monitoring system is needed, and could be useful. The main benefit of the model is the consumption-based payment that it allows. According to a member (also a RC) of the IBMC people are willing to pay more or less depending on their personal usage as well as the number of livestock they own. However, as they also suggested, there could be a problems with implementation nationally or basin wide because there are areas where people have not started paying. This also ties back to the general misconceptions surrounding the reasons and the necessity behind water payment. The IBMC Secretariat also suggested that while the tools of the SDP 13 system were useful they would have to be implemented by the IBMC members. This is because he believes that, currently, the tools are too complicated and that communities would not have the necessary knowledge to use them effectively.

Local Water Committees and Water Point Committees

Members of LWCs and WPCs provided the team with a direct interpretation of how feasible the proposed monitoring system would be, and how well it could be implemented. The people interviewed are already directly involved with water point issues, and so they present very specific analysis of the system. Members of LWCs and WPCs gave feedback and perceptions of the systems implementation, what they saw were potential benefits, as well as what tools were the most important, and practical.

From the committee perspective, the main information gathered concerning the monitoring system was its possible impact on water payment. Specifically concerning the idea of a consumption-based payment system. In this regard, committee members supported tools that would provide for recording human and livestock consumption. Little consideration was given to the other tools. In one interview, a WPC said they had the RWS cards but were not using them because the WP had very little use, due to the rainy season. Another issue that was revealed through interviews was the growing concern about the amount of volunteer work needed to successfully run a WPC, and the additional work that would be needed to implement the monitoring system. There is a concern that since people are not paid for their continued work, the added burden from the monitoring tool put undue strain on the committees. Lastly, there was an issue with the levels of training currently provided, and those necessary to effectively monitor water consumption. There are often problems with understanding and with continuity between committees that indicated possible problems for the SDP 13 model.

Water Users

Water users provided the team with the most basic perception of the SDP monitoring system. The water user perspective was important because it provided insight into how communities perceived the tools, their values, and the potential benefits of monitoring consumption.

Findings indicated that many people know about, and would be receptive to a consumption-based monitoring system (and payment), especially if it could work towards relieving water use conflicts. The biggest concern was regarding the unequal methods of payment, where no matter how much water was drawn by a house hold, the same flat rate was paid. This was especially pertinent when livestock often drank from the water point, as this greatly increases consumption.

X1.4.3. Overview of Information collected

Through the different perspectives of primary and secondary stakeholders perceptions and value interpretations on the feasibility and possible impact of the SDP 13 monitoring system were gathered. The key issues can be summarized as follows:

1. There is void of information that a monitoring system could help fill
2. The most important component is consumption monitoring. People are very interested in this component
3. Lower levels are focused only on the effect on water payment. Higher levels are interested in possible analysis of environmental health
4. Problems surround volunteerism, and extra work the system could place on committees

These varying perceptions and perspectives of the SDP 13 monitoring system allowed the team to provide practical recommendations on how to better implement the system.

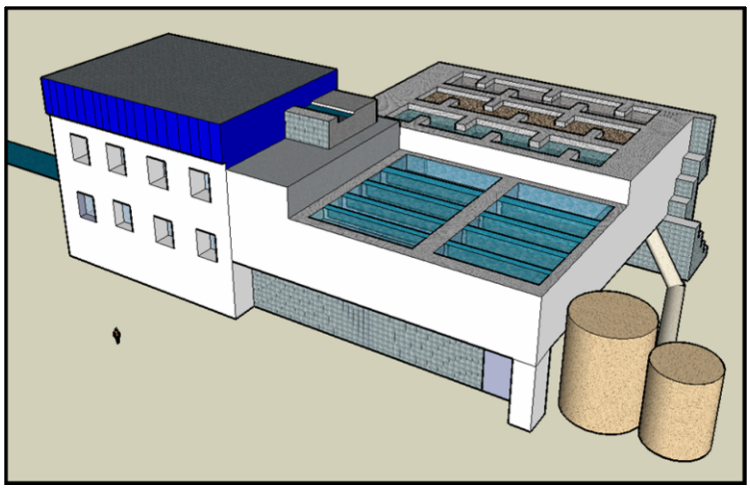
X1.5. RECOMMENDATIONS

The SDP 13 Monitoring system is designed to provide information to the IBMC about the status of water use in the basin, to enhance the decision-making the IBMC needs to perform. They are also intended to provide a wider picture of water use to the local committees, to increase their awareness of how water use changes over time.

The general responses about the monitoring system raised concerns over the time commitment necessary for filling out the monitoring cards. There is a lot of poverty within the Iishana sub-Basin, and almost every interviewee remarked that the system could not work on a voluntary basis, at least at the very lowest level, because people do not have the free time to fill out the monitoring cards. This project's recommendation is to limit the frequency of the data collection, to perhaps a quarterly basis rather than monthly. This would perhaps increase the ability of the local committees to provide the information. It is likely that the monitoring tools other than consumption tracking will not be implemented for a long time, if they remain a voluntary system. There is too much of a time commitment for most of the monitoring tools to be widely used. There was a lot of interest in the consumption monitoring tools; however, RWS has already developed and provided a monitoring system for human consumption and livestock consumption. The information provided by the other tools is not important to everyday survival, so to have individuals be willing to spend the time recording the information, there needs to be a well-developed awareness program. The usefulness of the SDP 13 monitoring system is great, and many of the higher-level officials stated that the

information it would provide would be very useful in decision-making, but presently the system is not practical for volunteers in the Iishana sub-Basin.

X2. AUXILLARY REPORT 2: UNDERSTANDING THE WATER PURIFICATION AND SUPPLY PROCESS IN THE IISHANA SUB-BASIN OF CENTRAL NORTHERN NAMIBIA



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X2.1. ABSTRACT

This report aims to address the issue of understanding why it is necessary to pay for water. That in paying for water a person is not paying for the water itself but rather the service of its purification and supply. This report hopes to enhance people's understanding through an educational model as well as a detailed pamphlet that could accompany it or be distributed independently. The model and pamphlet detail the water supply and purification process, the costs involved, and the heal risks associated with drinking un-purified water.

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X2.4. INTRODUCTION

Water is a limited resource in Namibia. Namibia's water policy, based on Integrated Water Resource management and the Dublin Principles, regard water as an economic good, and therefore individual water users must pay for their water supply. However, payment is often not accepted by water consumers. This can be based on a number of factors: in the past water was supplied and controlled by the central government (free of charge): there are people who do not understand that supplying and purifying water comes at a cost: there is often widespread poverty and unemployment that make paying for water difficult.

The Cuvelai-Etosha Basin has the highest population density and fastest growth rate in Namibia, which puts a heavy strain on limited water resources. By increasing understanding and awareness of water payment, this report hopes to contribute to improved water management in the region.

X2.5. METHODOLOGY

UNDERSTANDING THE WATER SUPPLY AND PURIFICATION PROCESS

This reports project objective was to design an education model displaying the Cuvelai-Etosha's water purification and supply. The model's purpose was to act as a tool for the DRFN to be able to explain the water purification process to the people in the Cuvelai-Etosha region in order to help them gain awareness of the services that led to the delivery of clean potable water. Due to the lack of understanding of the water processing, many people in the Cuvelai-Etosha area refuse to pay for the water. This creates an obstacle for the success of community-based management.

To be able to develop an accurate model, the team needed to understand the water supply and purification processes in the Cuvelai-Etosha Basin. In order to accomplish this, the team visited the different NamWater facilities in the Cuvelai-Etosha region, interviewed three NamWater officials, and performed archival research to collect quantitative data.

X2.5.1. Field Excursion to NamWater facilities

The team visited the NamWater facilities to observe the processes involved in producing clean water. The trip started from the Angolan border to the distribution of the water to different water points. The first part of the field excursion consisted of touring different purification plants in the area. First, the team visited the purification plant in Oshakati, which was the largest plant in the region. A NamWater employee conducted a tour for the team that explained the different water purification processes that turned unclean surface water collected from the Angolan border to clean potable water. The team was able to observe the different points along the purification process such as mixing of chemicals in the water to form coagulants, settling and sand filtration. The team then traveled to a smaller purification plant in Ogongo. The purification process remained the same except the size of the facilities. The tours provided the knowledge to piece together the different steps in the purification process to produce the clean water.

The second part of the field excursion consisted of visiting the canal, dams and the Angolan border. The team was accompanied by the NamWater Canal Manager of the region who guided the travel to various locations in the Cuvelai-Etosha region including the Olushandja Dam, several canal points, and the canal along the Angolan border that supplies the water for the pipeline in the Cuvelai-Etosha. The team was able to gain a general understanding of the distance and the complexity of the delivery of water to the purification plants through observation and explanations by the Canal Manager.

X2.5.2. Developing Semi-standardized interviews with NamWater

Semi-standardized interviews were chosen as a research method for the collecting information to gain a better understanding of the water purification process and to collect quantitative data. It was important to use semi-standardized interviews to have the flexibility to ask more questions or eliminate questions that were not working especially to inquiries concerning perspectives. The interview was structured into five interview objectives with the first four addressing perspectives for research objectives one and two. However, the fifth objective focused on collection of data necessary for development of

the educational model. The questions shown below were asked in the interviews with the NamWater employees.

Information on Physical Model

1. Awareness being done regarding information on the quality of water in the Iishana sub-Basin
2. Number of people that NamWater provides with access to clean, portable water in central northern
3. What is the quantity of water that NamWater supplies to its stakeholders on a monthly basis (average); who are these stakeholders or customers?
4. Information on NamWater's infrastructure such as canals and pipelines
5. Information Water infrastructure cycle: from start to end
6. Ask something about the water supply network in the Cuvelai-Etosha basin- where the water comes from until reaches the end user?
7. NamWater future plans (water supply, usage, awareness raising etc)?

X2.5.3. Conducting semi-standardized interviews with NamWater

Due to the nature of the data collected, the interviewees needed to be familiar with the mission, goals, and present state of NamWater. We interviewed three key personnel of two different fields to achieve a wider range of perspective. The interviewees consisted of the division head of management, the Maintenance manager and the administrative manager. The information collected was used as a different angle to provide a clearer understanding of the water purification process. Furthermore, the interview provided the opportunity to collect literature or other useful information that could aid the development of the model.

X2.5.4. Archival Research

The collection of quantitative data was done through reading of pertinent data provided by the DRFN and NamWater. Quantitative data was crucial to the development of the educational tool because it provided the concrete and tangible information such as length of pipes, volume of water and number of dams. It was used to verify the information collected through the field excursion and interviews.

X2.5.5. Overview

The collection of the data from three different research methods was used to develop a model that could be easily understood by the intended audience. The three

methods complimented each other as it provided different views concerning the water process. The information in the field excursion provided the general schematic that needed to be shown in the model. The interviews highlighted the key processes in the schematic. The quantitative data established the importance of the purification process and the necessity for water payment.

X2.6. INFORMATION COLLECTED

DEVELOPMENT OF THE WATER PURIFICATION AND SUPPLY EDUCATION MODEL

X2.6.1. Interview with NamWater Employees

The interview with NamWater employees produced some general perspectives regarding water resource management. Some WPCs were starting to pay directly to NamWater which created reduction in the problem of non payment. People that paid directly for the private connection understood why they have to pay. Furthermore, NamWater started to take control of some of rural pipelines that included private connections. However, RWS still controlled many parts of the rural areas. NamWater were producing awareness programs on the radio, TV and newspaper emphasizing the importance of paying for water. Difficulty in debt collection was present and NamWater cannot shut off the branch line when there were only pockets of areas with debt. The interview with the NamWater provided some key information about the infrastructure such as providing the schematic layout. However, it was difficult to collect quantitative data from the interviewees because they did not know the exact details on the spot. The information was later collected through readings concerning NamWater.

X2.6.2. Water Supply Infrastructure

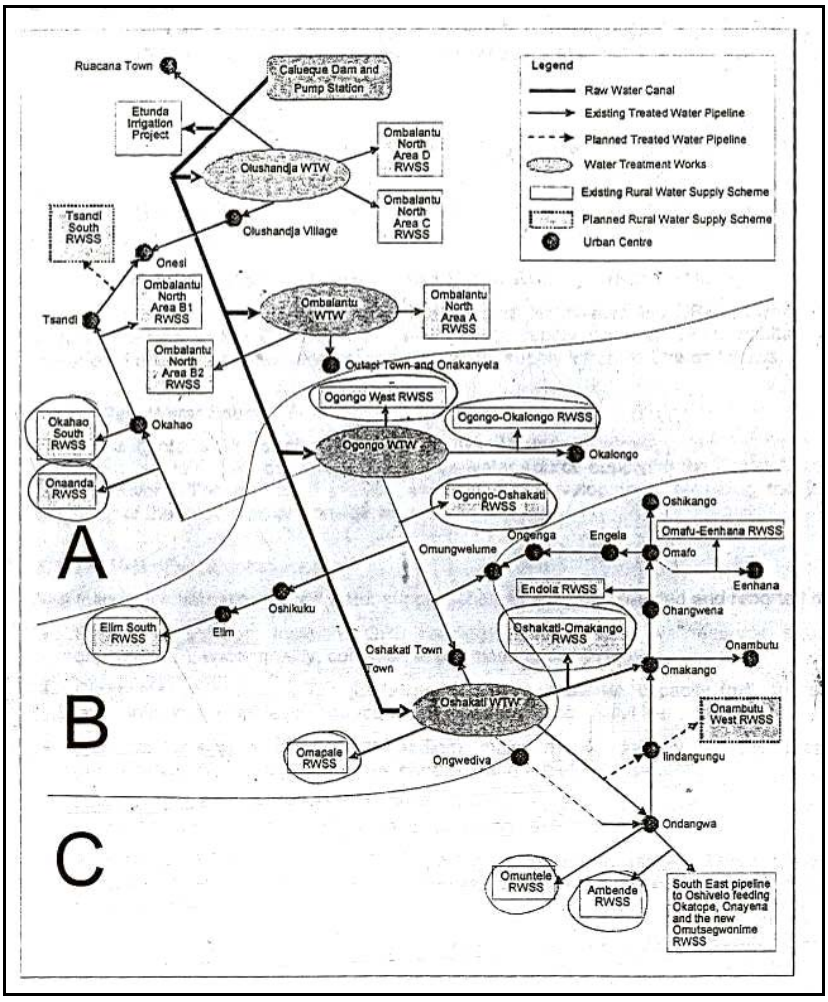

Figure 13: Schematic layout of Iishana pipeline scheme

Details on NamWater Infrastructure	
Dams	14
Water reservoirs	175
Boreholes	>500
Water towers	120
Lined Canals (in km)	300
Cubic meters of water (per annum)	120 million

X2.7. FIELD EXCURSION OBSERVATIONS

The field excursion provided the first hand look of what types of infrastructure is needed to provide potable water. The basic schematic of the water process is as follows:

1. Water source: Calueque from Angola
2. Canal
3. Dam and Pumps
4. Purification Plant
5. Distribution System- pipeline
6. Water Point

Figure 14: Iishana region canal

The water source in the Angolan border was approx 3 meters wide and 2 meters deep according to the NamWater guide but the dimensions of the canal was not constant and it changed as it progressed down the region. Also, the canal had several problems that NamWater was trying to address. People living near the canal had the tendency of breaking the canals and draw free unpurified water for consumption and livestock. Furthermore, others use the canal to swim, wash clothes or fish. The water is unclean and proposes health risks. There are areas in the canal that the team visited that was littered with trash.

Figure 15: Canal in Olushandja

X2.7.1. Dirty Canal Water

The team visited the Olushandja Dam which was used to control the level of the canal. More water was pumped into the dam if the canal water level was too high. Also, the dam was used to provide water if there was not enough water coming in from Angola. The dam water could be sustainable for approximately five months. NamWater had difficulty preventing locals from using the water in the dam for their farms. This created a problem with other commercial farmers that have to pay for water.

Figure 16: Olushandja dam

The purification plant process included all basic water treatment processes which are:

1. Screen
2. Rapid Mix: Chemical addition
3. Slow Mix
4. Settling Tank
5. Sand Filtration
6. Chlorination
7. Distribution

The purification process began with the reservoir which held water brought by the canal. Large particles were removed in the reservoir before water is collected to go through the purification plant. The chemicals such as alum and lime were mixed in the rapid mix process to equally distribute the chemicals in the dirty water. Then, the water was pumped up slowly to the slow mix tanks where coagulants started forming. The chemicals bonded with dirt and other particles forming the coagulants. The water filled with coagulants was sent to the settling tanks where the coagulants sank to the bottom due to gravity while clean water was collected on the surface catchments.

Figure 17: Sand Filters

Figure 18: Slow mix and Settling Tanks

After collecting the water in the settling tanks, the water went through the sand filters to remove any remaining particles that did not sink. Before pumping the water to the distribution system, the water was disinfected using chlorine to kill any microorganisms. The purification facilities were enormous in size which was very important to explain in the model. After being processed to the purification plants, the water was delivered to various water points all over the Cuvelai-Etosha to reach the users through a distribution system of pumps and pipelines.

Figure 19: Water Point

Figure 20: Distribution System – (Meters)

X2.8. OVERVIEW

The data collected reinforced the importance of water payment for the service of potable water. The data showed that NamWater must build large and very expensive infrastructure to handle the water need for the Cuvelai-Etosha region. The canals span for many kilometers and the purification process use many resources like chemicals and electricity. The development of the educational tool was very important so that it could be utilized to increase awareness in the rural communities.

X2.9. ANALYSIS

From the field-methodology, the team was able to assess what was the critical information that could further peoples understanding about the water supply process. The main ideas were:

1. "Do's with a pipeline" which explains good/correct practices at water points.
2. The health risks associated with drinking unpurified water.
3. Payment water supply which outlines major costs for providing water, and establishing a water point
4. The water purification and supply process. This includes:
   a. The canal from Angola to Oshakati that provides water to the purification plants
   b. The dams used to control the water level of the canal
   c. The purification plant, and the process of cleaning the water

These points were used to design an informational pamphlet, which is included in this auxiliary report. The team also created a three dimensional model that shows the water supply process. The main purpose of the model is as an education tool, that organizations such as the DRFN can use in an effort to explain the process of water supply and foster community-based water management. The model is designed to convey the large scale of infrastructure needed to provide potable water to communities.

The major issues address both the scale and complexity of the supply process, the extensive costs of the purification process, as well as the general health risks that are associated with drinking un-purified water. In this way this project aims to enhance water user understanding of why it is necessary to pay for water.

8 APPENDICES

A1. INTERVIEW KEY POINTS

STRATEGY

DRFN & BMA

Aune Amwaama-DRFN BMA & DRWS
1. Awareness training is key in the implementation of BMCs
2. Regional councilors are usually selected for training in BM techniques. There has yet to be a training program specific to basin management
3. Involvement with water management committees is entirely voluntary (no incentives, other than the likelihood of the water supply disappearing (NamWater shuts it off) without adequate management).
4. Cuvelai vs. Kuiseb: Cuvelai has different WPC strategies depending on whether the WP is pipeline or borehole
5. Training of the monitoring system may be able to be integrated into RWS committee training

Cathline Neels-DRFN
1. Communities are not as homogenous as is thought – for which the law was designed
2. Sustainability is a problem because people are not aware of the issues that surround water management
3. Policies are community-based but is implemented from the town because communities are not taking ownership
4. Lack of awareness about the intent and design of the law

a. People are still waiting for the government to tell them what to do

Wolfgang Werner-DRFN
1. There is a difference between the needs and understanding of the stakeholders on basin level for the Cuvelai and the Kuiseb basins.
2. The Cuvelai- Etosha basin is a much larger area and faces many challenges because of its scale and complexity. Also, stakeholders (made up of mostly farmers and livestock) may not have the understanding needed for basin level management.
3. There are discrepancies and conflicting issues in the policies for Water and Land management. Harmonizing is needed to prevent problems and complications.
4. Look into a wide range of communities in the Cuvelai; those who have benefited from NGO and Government programs and those who have not benefited from programs.
5. Raising awareness is the necessary to transfer ownership to the people and training for basic skills in management and finances is needed for implementation.

Viviane Kinyaga
1. A top-down approach (as in the Cuvelai) may not work because the policies are written such that the empowerment must be with the people.
2. Awareness of the act and of the concept of the basin as an entire entity is crucial for people's willingness to participate and become involved with the BMA.
3. Communication flow is a general problem in the BMA because the level of understanding is not where it needs to be.
4. A hastened approach to the BMA may not work because ample time is needed raise awareness and encourage those resistant to shared water management.
5. Best practices in Kuiseb may not be applicable in Cuvelai.

DRWS, MINISTRY LEVEL

Tjijenda Kaukirue
1. RWS personnel are government side, and are in a different chain of command from all the community committees
2. DRWS pays for water when communities are unable to.
a. Working at 100% self-sustainability within communities b. Working on establishing policy/criteria on who receives subsidized water
3. Distinction between borehole WPCs and pipeline based WPCs.
4. RWS-EO responsibilities include preparing communities for training (by paid consultants), monitoring the status of management structures in the area, and helping WPCs and LWCs with problems unsolvable on their own

John Nendongo-RWS-RH & IBMC Chairperson
1. Maintenance
a. A big area of focus for the DRWS is fixing broken equipment b. Some of the issues take weeks to fix i. Understaffed ii. Problems are too far spread across the Cuvelai
2. Responsibilities and Procedure
c. According to the RH all implementation is going as the process is defined d. They needed extensions because the Ministry wanted implementation too fast e. Carrying money from place to place seems to be the biggest issue in this area
3. Training
f. Extension officers train committees, caretakers and associations one time g. People are trained on how to fix issues so that the DRWS does not have to constantly maintain the water points h. Seems like there is no follow up to the training i. Responsibility of transferring knowledge when someone leaves
4. Payment
j. RH sees that all problems with BMA, is the payment side k. The focus was shifted greatly onto this aspect, overshadowed the BMA and the intricacies of whether it is working or not

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MAWF

Maria Amkali
1. Differences between Kuiseb Basin and Cuvelai Basin:
a. Stakeholder originated vs. not
b. Quicker establishment of IBMC than KBMC
2. Awareness programs
c. Cuvelai stakeholders more interested in CBM-less ind. agenda, saw no threat
d. Difficulty in breaking tradition
e. Awareness training is done to *address issues*
3. Lowest appropriate level of water management is basin or sub-basin level. In the long run, BMC should sever ties and support from MAWF

NAMWATER

Employee- General Manager
1. WPCs are now starting to pay directly to NamWater. System works fairly well, although some WP's have high debt. Governement (RWS) is spending money to

train users.
2. NamWater is taking control of some rural lines, including private offtakes. RWS and/or the communities control most rural, communal WPs.
3. NamWater used to do awareness programs on the radio about water, emphasizing the importance of paying for water.
4. BMA is not entirely correct according to this interviewee. Debt in small sections of a region cause the entire branch line to be in debt. NamWater cannot disconnect the line, because too many people aren't in debt. There are too many logistical problems in disconnecting and connecting single connections.

IMPLEMENTATION

WATER USERS

Komeine's Mother
1. WPC effectively managed the day to day details of the water point
2. Main issues with this water point is the unequal distribution of water with respect to payment
3. Water Point is only used during the dry season when the Oshana's are gone

March 31, 2007- 19 users
1. Livestock primarily use oshana's for water consumption during the rainy season
2. Community-based management is necessary for the non-wasting of the natural resource.
3. Forum meetings with the WPCs happen about two times a year, discussing: distances that must be traveled to the water point (ensuring it is within the 2.5 km range), and payment of water for livestock.
4. Often times the households do not have enough money to pay for livestock to use the Water Point when the oshana's go dry.
5. The WPC has put a maximum of 100litres/day which often times is not enough.
6. Only monitoring system is the caretaker making sure that each household does not exceed the 100 L/D limit. Many supported a pay as you use rather than the flat rate of N$15 per month. (*N$15/month is a deal- 3,000L/mon = 3 m^3/mon, N$15 < 3*N$6.79)*
7. The WPA reports problems and issues to the nearest committee member, but often times the committee members spot the problem first

March 31, 2007- 26 users
1. Livestock primarily use oshana's for water consumption during the rainy season
2. Now that Community-Based Management is in place, they are quite happy that

they can manage their own water point and be directly involved with the process
3. There is a concern among the water users that the "money might not reach the appropriate places." Some users think that some committee members might be taking money for themselves and not for the payment of water.
4. Some of the other major issues about the water point are the locations of the water meters and the distance needed to travel, a growing concern about the amount of volunteer work, and finally the payment of livestock for using the water point.
5. The payment method for this water point is a flat rate system paid each month.

Olukonda WP-April 2, 2007- 6 users
1. These water users primarily use the water points for drinking, cleaning, and cooking. If there is no water available in the oshana's then the livestock will use the Water Point.
2. Often difficult to work with the committee because they are not always readily available. Most concerns are about the payment for water. Overall unaware of what the WPC's specific duties are. All they know is that they open the water point.
3. Users don't go to the meetings because they feel that the committee does not understand water management. The biggest issue outside of payment that they feel is that there are disconnects between the committee and the community with both understanding and cooperation.
4. The users do not like to pay for water, some don't understand why they are paying for water and some do but refuse to pay for water. There is a flat rate of N$20 per month, but if livestock are to use the Water Point, they must pay extra before they are allowed to use it.
5. These users are not aware of Community-based management and the details of it. However, they are always being encouraged to participate in CBM.
6. These users last elected committee members in the 1999 time frame, but are unsure about the actual date. The committee was selected based off the proximity to the water point.

April 2, 2007- 3 users
1. These water users are happy with what the government thus far in getting water management into the hands of the communities
2. These users are aware of the Water Point Committee but are not sure how they are elected and they do not know any of the members. They do not use the water point very often because they use the Oshana's in the area to sustain their needs. There are meetings that are announced over the radio about two times in a year. The male of the household can not attend (medical conditions) the meetings so no one goes to them. There are a lot of questions that they have, but can not get them answered because they do not go to the meetings.
3. The payment for this water point is N$10 flat rate per month no matter how much or little they use. There is also a N$30 membership fee that must be paid once a year. This particular household just received a letter from the treasure telling them

that they owe N$150.
4. The knowledge of CBM is very limited all they know is that the community is in control which they like. They do not understand how the process is defined. They believe that the headman (traditional authority) is in charge but they are not sure. They do understand the process of reporting issues to the committee members, but they do not know any of them.

Amnume WP- April 2, 2007- 4 users
1. The main uses of this water point are for drinking, cooking, and livestock.
2. There is a flat rate of N$15 per month and a N$20 membership fee that they pay once a year. Typically people do not want to pay because they can not afford to pay and they do not understand why they are paying. They feel that there isn't enough knowledge of why people should pay for water.
3. In the response to their impressions on CBM these users believe that the overall idea is good, but are unaware of the specifics of what CBM entails.
4. They understand that if there is a problem they need to report it to the nearest committee member. However, they are not sure what the process is after that, it usually gets taken care of and that's all that matters to them.

Amnume WP- April 2, 2007- 2 users
1. These users only know who the members of the WPC are; they are unaware of their responsibilities. The water point is left open for several hours during the day; people can get water almost whenever they want.
2. The payment works to N$15 per month and a N$20 membership fee that is paid once a year
3. The WPC has just been put into place so they are unaware of the effectiveness of the community-based approach. So far there haven't been any issues so the users can not evaluate how effective the WPC.

WPC & LWC

March 31, 2007- 3 members
1. The responsibilities of this committee are to manage the overall operations of the water point, which include broken equipment and payment.
2. Payment is an issue with this WPC. People do not want to pay and they take offense when asked to pay for water. Some do not understand why they are must pay for water, but others just simply refuse to pay.
3. The members have been on the committee since 2001 and they feel that they have been on the committee for too long. However, no one is stepping up for the volunteer work and they just get reelected. They often feel unappreciated for the work that they are doing

Olukonda WPC- Caretaker
1. The responsibility of the committee is to manage and look over the water point to make sure that no water is wasted. This member is the caretaker of the WPC and his specific responsibility is to open the water point every morning and in the afternoon. On the LWC he reads the NamWater meters.
2. The committee meets as needed when there are problems or issues that must be resolved immediately. After discussing the problem the WPC will relay the message to the water users. There are forum meetings with the water users two times in a year.
3. The typical issues discussed at meetings are that people can not afford to pay. Payment awareness has not "touched" everyone. A common perception is that the government should be paying for the water as they did in the past. Because of this people often refuse to pay.
4. The committee members were trained initially by a contractor. However, there has been no follow up training. This committee member has been on the committee for 9 years.
5. When there are problems the caretaker is usually the first person to see if there is something wrong. Typically he is responsible for getting funds from the treasurer and taking care of the problem. If he fixes the problem quickly, he might get some payment for it. When there is a big problem the care taker talk to the regional councilor to get a hold of Rural Water Supply.
6. The caretaker feels that it is very difficult to manage the water point and to get people to fully understand community-based management. He initially felt that it was put onto the communities too fast without proper explanation. For volunteers there is no reward for those who work very hard.
7. At this water point there is a flat rate of N$10 per household. He is aware of the proposed monitoring system about to be put into place but sees that there might be issues with the payment of livestock. He feels that people will probably not be able to afford to pay for both their domestic needs and the livestock in a pay as you use system.
8. This member has no knowledge of the Iishana Sub-Basin Management Committee.

Ontananga WPC- Chairperson
1. Her responsibilities used to be the solely be the treasurer, but now she is acting chairperson. As chairperson she organizes meetings with the community members which usually occur two times in a year. She could not imagine life without a water point committee; it's much more organized than it was previously.
2. Often times she feels that the other committee members are not doing the respective jobs because of the volunteer nature. Volunteer work makes people not want to be active because no one is getting paid
3. Currently there is no one recording how much water is being taken by each person. There is a flat rate of N$15 per month for water us and addition N$3 per

month per household for transportation fees. As treasurer she pays the regional councilor and he takes care of the processing thereafter.
4. When responding to Community-Based Management, she feels that overall managing your own resources might not work entirely because of the volunteer nature and how she witnesses it fail around her. She feels that people some people that are elected sometimes do not have the necessary skill to do the job correctly. There needs to be more training for members in order for CBM to work.
5. There are currently no specific long term goals for the Water Point Committee but she would like to have each household understand why they are paying for water, as well as a better payment system.
6. The Chairperson does not know about the Iishana Sub-Basin Management Committee.

Nakatopi WPC- March 29, 2007 2:20 pm
1. This water point Committee is following the policy and the BMA exactly how it is written – perhaps a model WPC
2. Training only occurred one time and it is difficult to retrain members as the elections come around
3. Payment is not flat rate, and extra money is provided for the care taker and for maintenance

Onguma WPC- March 31, 2007 1:30 PM
1. The length of time that the committee members have been in office is much longer than is required of them. Currently the committee members feel like their overdue for change but only the elders of the community want to step up for the committee positions. Currently there are two vacant positions because the members passed away as of late
2. The payment system in place is a flat rate which has resulted in times of surplus as well as months of being short money. There isn't a system to pay for cattle, so the flat rate "covers" the cattle when they have to use the water point.
3. There hasn't been a formal training since the first one in 2001 and there is a need for new training on how to manage the water point, maintain the equipment, and to better understand the principles of CBM. Positions such as treasurer and care taker are not being filled because there is absolutely no incentive besides the volunteer work.
4. There is mistrust of where the money is going with the committee members as well as the association.

WPC – Olukonda Region Caretaker 8:00 AM April 3, 2007
1. The interviewee is the Caretaker of the water point. The Water Point was cut off due to non-payment in 2005. Basket weaving development project is the only use of the water point (grow palm trees).
2. Many households are unemployed. The Caretaker has been unemployed for more

than 10 years. It is very difficult for the community to come up with money. Community established maximum water debt of N$500.
3. Voluntarism is not a major issue and the committee keeps the Water point clean, prevents vandalism and check if there is a pipe burst.
4. The WPC with the help of the Regional Councilor holds meetings for awareness and information about new development. Also, if there is any problem, the RC is informed.
5. Perception of RWS: No follow-up training since 2003. RWS support can be quick or slow.
6. WPC Perception: problems with payment, but WPC is needed to manage water and WP. People are not aware of why they have to pay for water.

WPC Tresurer, LWC member- April 2, 2007
1. WPC is still only somewhat effective. They are collecting money, but not paying yet.
2. HH would rather use standing water (oshanas, pans) than pay for water
3. A consumption-based payment system would be preferred, but RWS has yet to provide it
4. LWC is defunct. It is not responsible for the money passing from users to NamWater
5. RWS maintenance is good, but more training for the WPC members would be useful. Only the initial training session has occurred, with little apparent follow-up guidance and no follow-up training.
6. Interviewee (WPC treasurer) demonstrated some of the entitlement attitude

Onakandi WPC- April 5, 2007
1. Problems with maintenance and monitoring the water point. Caretaker is not able to handle by himself fixing the point when it breaks or watching the point all the time it is open.
2. Flat rate system is working right now. The water point is not yet paying for the water, so the money they collect is precautionary billing for when they become self-sustaining.
3. The water point is only used when there is no ambient (surface) water from rain etc.. Consumption-based payment system will be introduced when the WP starts to be used again, in a few months.
4. RWS training did not supply all of them with the training they needed; instead the committee passed information to the new members from the old.
5. The WPC is indeed a useful organization, which fills a need in the community. They don't think the water point would survive without a WPC. Also, one member (treasurer) campaigned for the installation of the pipeline supplying the water.
6. The WPC is working towards raising awareness about the need to pay for water. They meet with the users (WPA) about 3 times a year to provide information to them. They also call emergency meetings of the WPA when needed.

WPC – Olukonda April 3, 2007 2:30 PM
1. RWS lacks support in maintenance and there is a need for follow up training.
2. People do not want to pay for water because they do not have the money or they lack understanding of why they should pay for water.
3. Regional Councilor is very active in creating awareness in the community.

WPC – Ishishete WPC April 3, 2007 3:30 PM
1. There is difficulty in payment collection which is very discouraging to the WPC members.
2. Community-based management is perceived as a good idea but users lack understanding on why they should pay for water.

Okaloko A – WPC (Deputy Headman) March 29, 2007 2:20 pm
1. There is a strong involvement between the WPC and traditional authorities in trying to manage the water point.
2. WPC creates a better control in the water point.
3. Traditional authorities play a vital role in mobilizing the community.

LWC- member interview 3- April 2007
1. LWCs he is a part of seem to be somewhat disorganized. There should be regular meeting times, for example.
2. The RWS monitoring cards are not yet being introduced to WPCs or LWCs that he interacts with. RWS support is alright, although it could certainly be much better.
3. NamWater's role is not completely understood. They are semi-private company that is responsible for making a profit. Users would prefer a government system (i.e., they wouldn't have to pay).
4. There are still many problems with maintenance and vandalism, and collecting money from users. However, the LWC and WPC system is necessary and working; otherwise, there wouldn't even be a way to report problems.
5. Awareness of IBMC is limited, although he has attended an IBMC meeting. An understanding of the IBMC's role is missing.

RWS-EO/CHIEF EO

Onakandi Water Point RWS – Four EOs April 5, 2007
1. The main responsibilities of the extension officers are to set up a Water Point Committee and a Water Point Association, to help construct a constitution for the water point, to help committees solve financial problems, and to help with the applications forms for private off-takes.
2. In order to establish a water point, they must make an activity plan for the five day program to train the members. Usually contractors come in and actually train

the members not extension officers themselves.
3. Members will understand what they have to do within hours, but it takes much longer for committee members to understand the grandeur scope of why they are doing the management techniques.
4. In order to determine how well a committee is performing at community-based management, extension officers will look at payment and debts of the WP. One of the biggest issues that come in is that people are sometimes unwilling to jump into CBM because of its unfamiliarity.
5. People do not understand the processing of water. Because of this lack of knowledge, people don't pay and the water point gets shut down. People would probably pay more often if they understood the process behind how water gets to the WP.
6. Each EO is responsible for maintaining anywhere up to 100 water points that are divided into schemes. The biggest inhibitor for support is the fixed amount of kilometers that each government vehicle is allowed to have. The EO can not exceed the mileage by the 15th of every month. This means that problems can go weeks without being attended to because of the vast distances needed to be traveled
7. Training people varies greatly, the older people are the more they don't understand CBM and the principles. If difficulties occur in the WPC it is common for people to quit rather than to stick with it and work out the problem. There are many problems with volunteerism.
8. Older people are more involved because communities fear young people will take the money and go to Windhoek and never return. Also, younger generations don not live on the farms, they work there and go back to their village when the work is done.
9. The EOs provide books on how to take care of water after the training is complete. There is some awareness programming in the training at the beginning but that is really the extent of it. People are encouraged to give peer to peer training.
10. The EOs see that there could be difficulties implementing the monitoring system. If the implementation is done in steps then it might be possible. Some see this as being a little ambitious for volunteers because people still want to make money.

March 26, 2007- Acting Chief EO
1. According to him, WPCs pay to LWCs who deal with money
2. Creation of WPC takes 5 days, and is done now by contractors with EO supervision. Awareness training is done about how to set up the WPC, not about water management.
3. NO control officer and only one (out of two) Chief EOs at RWS office.
4. Cards are being implemented (throughout, starting in June). This is an improvement over flat rate systems.
5. There are problems with misappropriation of funds within the WPCs, and problems with young caretaker/officers in WPCs leaving the area (for work or for

dying) and creating a vacuum in leadership.

March 26, 2007- EO
1. CBM is not self sustaining in Iishana at present. There is still a lot of need for government support.
2. Subscribers to CBM often do not know enough about the systems (BMA or WRMA part IV and V). The 5 day training course is not enough.
3. Women are somewhat underrepresented in v. poor areas, although overall there isn't (according to her) a big problem with gender issues.
4. Problems also with money: where does the money go, why do the constituents have to pay.
5. Voluntary nature of WPCs is crippling. It would be beneficial to provide for some reward for the officers in the WPC.
6. IBMC is new, and has had only a few (one) meetings.
7. Check up on committees as much as possible, not necessarily monthly. EOs go as often as transportation allows, and if a problem is reported, that is the priority.

BMC & RWS-CONTROL EO

Control Extension Officer March 29, 2007 1:00 PM
1. RWS seeks to provide clean potable water to everyone.
2. Control EO was formerly in the IBMC, and feels that the committee is working "fine"
3. The relationship with the regional councilors is perfect. The RWS shares ideas to the RC and they work together to communicate the information to the community. Communities are not willing to participate without the consultation of the RC.
4. Difficulties abound with payment for water. Although RWS is attempting to hand over control of WP's to communities, many are not ready to be self-sustaining. Either the community is unable to pay or is not taking ownership yet. A lot of debt with NamWater from the communities.
5. Communities understand they have to manage their own water, but the success still depends on how well they are being motivated and encouraged.

IBMC Secretariat Leonard Ronny March 29, 2007 DRWS 10:00 AM
1. The Cuvelai Basin is divided into four sub-basins due to its size and high population density. Only the Iishana is currently in the process of implementation.
2. Due to lack of funding and lack of enforcement because the WRMA of 2004 is not yet implemented, the IBMC is only in the planning stage and mostly focusing on awareness to the communities.
3. Water payment is an issue because people lack the knowledge and understanding why they should pay. Also, there is a lack of awareness of the institutions available to support the community such as the IBMC.
4. Regional Councilors and traditional authorities play a key role in any decision

	making because information must flow through them to be able to work with the communities.
5.	The IBMC cannot provide resources for people. The IBMC is formed to provide a platform for communication to address different issues besides water.

A2. WATER RESOURCES MANAGEMENT ACT NO. 24 OF 2004: SECTION IV

PART IV

BASIN MANAGEMENT COMMITTEES

Establishment of basin management committee

12. (1) For the purpose of proper management of the water resources of the basins in Namibia, the Minister, by notice in the *Gazette*, upon his or her own initiative or upon application by interested persons within a basin, may establish a basin management committee and give it a name.

(2) Subject to subsections (3) and (4), the members of a basin management committee must be appointed in the prescribed manner, and the constitution of the committee and other matters necessary for the proper functioning of the committee must be as prescribed.

(3) A regional council must nominate a person for each basin management committee in its region to be appointed as member of such committee.

(4) The Minister must ensure that every basin management committee is broadly representative of all interested persons.

(5) After having established a basin management committee, the Minister must declare a water management area for the committee in accordance with section 72 within which the committee will conduct the protection, use, development, conservation, management and control of water resources.

Functions of basin management committee

13. The functions of a basin management committee are -

(a) to protect, develop, conserve, manage and control water resources within its water management area;

(b) to promote community participation in the protection, use, development, conservation, management and control of water resources in its water management area through education and other appropriate activities;

(c) to prepare a water resources plan for the basin which plan must be submitted to the Minister for consideration when developing the Master Plan in terms of section 23;

(d) to make recommendations regarding the issuance or cancellation of licences and permits under this Act;

(e) to promote community self-reliance, including the recovery of costs for the operation and maintenance of waterworks;

(f) to facilitate the establishment of an operational system and maintenance system of waterworks and the accessing of technical support for water management institutions within its water management area;

(g) to monitor and report on the effectiveness of policies and action in achieving sustainable management of water resources in its water management area;

(h) to collect, manage and share such data as are necessary to properly manage the basin in coordination with the Water Resources Management Agency;

(i) to develop a water research agenda, together with the Water Resources Management Agency, appropriate to the needs of water management institutions and water users within its water management area;

(j) to help resolve conflicts relating to water resources in its water management area; and

(k) to perform any such additional functions as the Minister may direct under section 9 or assign under section 10.

Basin management committee to coordinate with regional planning component in region

14. A basin management committee must co-ordinate with the regional planning component in the regional council concerned to ensure that water resources within the basin and the region are effectively managed in accordance with this Act.

Dissolution of basin management committee

15. The Minister, by notice in the *Gazette,* may dissolve a basin management committee if, in the Minister's opinion, it is necessary to do so -

(a) for purposes of re-organising water management institutions in its area of jurisdiction in the interests of effective water resources management; or

(b) because the circumstances which supported the establishment of the basin management committee no longer exist.

A3. WATER RESOURCES MANAGEMENT ACT NO. 24 OF 2004: SECTION V

PART V

MANAGEMENT OF RURAL WATER SUPPLY

Formation of water point user associations and local water user associations and election of committees

16. (1) Any group of rural households using a particular water point for their water supply needs may form a water point user association to maintain the water point and to manage water supply services at the water point.

(2) The members of a water point user association must elect a water point committee to manage the affairs and the day to day activities of the water point user association, including financial matters.

(3) A water point committee must consist of not less than five and not more than seven members elected in accordance with its constitution and rules.

(4) A group of water point user associations and other persons using a particular rural water supply scheme for their water supply needs must form a local water user association to coordinate the activities and management of their water points and to protect the rural water supply scheme against vandalism and other damages.

(5) The members of the local water user association must elect a local water committee to manage the day to day activities of the local water user association, including financial matters.

(6) A local water committee must consist of not less than five and not more than seven members elected in accordance with its constitution and rules.

(7) A water point user association or local water user association is a non-profit making entity.

(8) Despite the provisions of any other law to the contrary, a water point user association or local water user association is not liable to pay any tax or charge on its income, or any transfer duty.

(9) Upon registration in terms of section 21, a water point user association or local water user association becomes a body corporate, a legal person with full capacity to sue and be sued in court, to contract and acquire rights and duties, and to own and dispose properties.

(10) If rural households or water point user associations fail to form in terms of this section a water point user association or local water user association, as the case may be, the Minister may close the water point or the rural water supply scheme concerned.

(11) Before the Minister closes a water point or a rural water supply scheme under subsection (10), the Minister must give rural households or water point user associations an opportunity to make representations on the matter.

Qualification for membership of water point user association and local water user association and termination and suspension of membership

17. (1) Any rural household which regularly uses a particular water point for water supply needs qualifies for water point user association membership.

(2) A rural household may become a member of more than one water point user association if the household regularly uses more than one water point.

(3) A water point user association whose members, and other persons who, use a particular rural water supply scheme for their water supply needs qualifies for membership in the local water user association concerned.

(4) A water point user association or local water user association may terminate any member's membership or suspend its member by a majority vote of the entire membership of the water point user association or local water user association on the grounds and in the manner provided in its constitution or rules.

(5) A member of a water point user association may terminate his or her membership if such member ceases to receive water supply from the water point concerned.

Functions of water point user association and local water user association

18. (1) The functions of a water point user association are -

(a) to manage water supply at its water point; and

(b) to maintain its water point and protect it against vandalism and other damages.

(2) The functions of a local water user association are -

(a) to coordinate and oversee the activities and management of water supply service by its members so as -

(i) to foster a sense of ownership among the users;

(ii) to promote economic development; and

(iii) to ensure sustainability of such service; and

(b) to protect the rural water supply scheme concerned against vandalism and other damages.

Powers of water point user association and local water user association

19. (1) Subject to this Act, the powers of a water point user association or local water user association, include -

(a) the powers contained in its constitution;

(b) the power to make rules for the use of the rural water supply scheme or water point by members and non-members;

(c) the power to prevent any person who does not comply with the rules or the constitution of a water point user association or local water user association from using such water point;

(d) the power to adopt measures to prevent the wastage of water by any person; and

(e) the power to plan and control the use of communal land in the immediate vicinity of the water point in cooperation with the communal land board and the traditional authority concerned.

Constitution of water point user association or local water user association

20. (1) A constitution establishing a water point user association or local water user association which may not provide anything contrary to this Act must include, among others -

(a) qualification for membership of such association and provisions on termination or suspension of such membership;

(b) constitution of a management committee of such association;

(c) qualification for election as member of management committee of such association;

(d) term of office of member of management committee of such association;

(e) procedure and quorum at any meeting and elections;

(f) opening of banking account and keeping of books of accounts and the maintenance of financial discipline;

(g) provisions on the dissolution of such association and on what would happen with its assets after the dissolution;

(h) procedural requirements for appointment of persons as employees of such association, when the necessity to employ such persons arises;

(i) the financial obligation of members towards such association; and

(j) powers and functions of such association.

(2) The constitution of a water point user association or local water user association must first be adopted by the members and approved by the Minister before such association is registered under section 21.

(3) A constitution adopted by members of a water point user association or local water user association is binding on all its members.

Registration of water point user association or local water user association

21. (1) An application for registration as a water point user association or a local water user association must be made in the prescribed manner.

(2) A water point user association or local water user association may not deliver any service in terms of this Act without being registered with the Minister as such.

(3) Only one water point user association or local water user association may be registered for each water point or rural water supply scheme, respectively.

(4) Upon receipt of an application for registration as water point user association or local water user association, the Minister must -

(a) through the traditional authority concerned, invite interested persons to make written objections, if any, against the application;

(b) give the applicant an opportunity to make representations, if there is any objections made against the application; and

(c) register the applicant, if, after considering the application, the Minister is satisfied that the applicant meets the requirements, and publish the registration in the *Gazette*.

Deregistration of water point user association or local water user association

22. (1) The Minister, by notice in the *Gazette*, may deregister a water point user association or local water user association, if the association -

(a) refuses or fails to comply with this Act or its constitution or rules, and fails to remedy the situation;

(b) if the association is no longer active or effective; or

(c) if the association requests for its deregistration on any grounds in its best interest or the public interest.

(2) Before any deregistration of a water point user association or local water user association under subsection (1), the Minister, in writing, must -

(a) inform the association of his or her intention to deregister the association, and give reasons for the deregistration; and

(b) call upon the association to show cause within a specified period why the deregistration should not be effected.

A4. EDUCATIONAL PAMPHLET