

Rural Water Access and Management Approaches in Southern Africa: Lessons from Namibia and South Africa

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Abstract: Water scarcity is a major problem for Namibia and South Africa as both countries are classified as “water stressed”, based on their per capita water availability which is below the threshold of 1,000-1,666 m³·person⁻¹·year⁻¹. Water provision in both countries has traditionally relied on supply-side sources, and the potential for expansion is becoming dim, making efforts towards demand management approaches more feasible. Findings show that CBM (community based management) systems of water points offer an alternative in terms of ownership and self-reliance based on institutional arrangements at community level. However, the CBM system involves some forms of payment for water access, and affordability has become a main challenge, to the extent that some governments are considering the reintroduction of water subsidies for poor rural communities in the near future.

Key words: Water, water scarcity, rural, management, access.

1. Introduction

1.1 Background

The paper reviews water access and management in Namibia and South Africa. The two countries have a lot in common—stemming from their historical/political context, climatic conditions, and geographical location¹ etc.. It is imperative that from the outset, one looks at Namibia and South Africa as water scarce countries, based on their respective water availability. Water resources in Namibia are directly dependent on rainfall, which is highly variable, accompanied by constant threats of drought and high rates of evaporation [1]. Both Namibia and South Africa are classified as “water stressed”, based on their per capita water availability, which is below the threshold of

1000-1666 m³·person⁻¹·year⁻¹ [2]. In addition to water scarcity, affordability of basic services like water becomes another constrained, particularly for rural households who have to access water through various methods of payment, either in terms of distance or in monetary terms.

It has been noted that the southern African climate varies from tropical rain forests in the north of the region, to desert conditions in the south-west, making rainfall one of the most important climatological elements in this region. With very low rainfall and high evaporation rates in the south-western part of Africa, potential for ground water recharge is low and, therefore, water access plays an important role in the socio-economic development of the populations [2, 3].

In terms of water resources, water scarcity in Namibia has been cited as the biggest challenge to economic development, with the supply-side approach to water management becoming limited [4]. Similarly, although South Africa is performing relatively better

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¹Both countries are located in the south western part of Africa.

than Namibia in terms of water availability, recording 52 km³ in 2000 compared to 2.7 km³ for Namibia, scarcity remains a challenge in both countries. In terms of per capita water consumption in 2000, South Africa recorded 1,220 m³·person⁻¹·year⁻¹, while Namibia had 1,553 m³·person⁻¹·year⁻¹, with projections showing 1,077 m³·person⁻¹·year⁻¹ and 1,052 m³·person⁻¹·year⁻¹ for the two countries, respectively by 2025 [2]. According to calculations based upon the available data for Namibia, the country is in a state of absolute water scarcity as far as the adequacy of the resources to meet the demand is concerned [3]. In Namibia, 62% of the population resides in rural areas [4], and depends on livestock farming and crop production for their livelihoods. In addition, approximately 50% of the population resides near northern perennial and seasonal rivers, and utilizes surface water. The rest of the population resides inland and depends on groundwater reserves, since all perennial rivers form part of international boundaries [5]. Water management becomes crucial in an environment where the expansion of supply side sources is constrained. While water scarcity is a developmental challenge for both countries, affordability of water becomes a main challenge, particularly for rural households who have to access water through payment either in terms of distance or in monetary terms [6].

Historically, Namibia and South Africa have a lot in common, stemming from their political relationship—where South Africa was the colonial master of Namibia for many years until in 1990, when Namibia gained her political independence. This meant that the two countries shared legislation and policies governing the water sector, and all other related approaches. Under the colonial regime, both governments utilised water policies and legislations that supported a heterogeneous, segmented water market, divided by geographical location, ethnicity and the level of income. This fragmented market was created mainly to serve the white elite. The South African regime, hence, Namibian, relied on an

outdated water act of 1956 that provided for water subsidisation and created the impression of cheap and abundant water resources. During the apartheid era, the black population in both countries was confined to black settlements formerly known as “homelands” in South Africa and “reservations” in Namibia, when they were forcefully removed from the fertile land designated for the white commercial farmers. When the colonial rulers moved the marginalised communities to homelands and reservations respectively, they needed to put water points for people to access water through boreholes or piped water schemes connected to a system of bulk water supply. These kinds of water systems still prevail in the rural areas of both countries, in addition to other natural water sources [4].

Access to rural water is critical for the health and livelihoods of rural communities in both Namibia and South Africa, as is the case in other parts of the world. An estimated 39% of the population in sub-Saharan Africa did not have access to improved water by 2010, despite the fact that the MDGs (Millennium Development Goals) target of halving the proportion of the population without access to improved water had been achieved by 2010 [7, 8]. Sustaining rural water supply remains a challenge for most parts of the developing world. Past findings show that an estimated two out of three WPs (water points) in sub-Saharan Africa’s rural areas are functional at any given time [9, 10]. Rural areas in both Namibia and South Africa also face the challenge of functionality of water infrastructure.

1.2 Objectives

The main objective of the paper is to review the various approaches, methods and techniques of rural water access and management in Namibia and South Africa. The aim is to understand the constraints of implementing community based water management as a model of water access, utilisation and availability, as well as implications for rural communities’ livelihoods;

and water management and governance. Specific objectives are to: (1) assess the contribution of CBM (community based management) programmes to improved access to water; and (2) identify challenges that reduce rural communities' access to water.

1.3 Water Provision and Policy Perspective

Historically, water provision has been a function of the state in many parts of the world. According to the World Bank, both quantity and quality of water resources in sub-Saharan Africa are limited in the face of increasing demand, rising costs of delivery and social change as economic growth advances [11]. The historic approach to water management in Namibia and South Africa has focused on building and expanding water sources to meet the needs of various users, thus taking a supply-side approach to water provision. In the early 1990s, the democratic regimes in both countries needed to provide for the majority of the rural poor by improving access to basic services like water and sanitation, while addressing the challenge of poverty and inequality. Therefore, water provision became a priority to the new democratic governments that had to serve huge water backlogs for their people. The two governments then introduced policies, programmes and institutions to integrate the fragmented water markets into markets where the different income and ethnic groups of water users would access water at acceptable and equitable rates for all.

Water provision has been the responsibility of the DWA (Department of Water Affairs) in both countries. While the DWA continues to operate in South Africa, its function has been taken over by the MAWF (Ministry of Agriculture, Water and Forestry) in Namibia, under the DRWS (Directorate of Rural Water Supply). The DRWS provides water to communities through CBM programmes, where communities take responsibility of managing the water points on a daily basis, while government is responsible for major repairs. In the case of South Africa, the Strategic Framework for Water Services

consolidated previous legislation governing water services, and set out a framework for regulation and monitoring of water services. The framework makes local authorities responsible for all water services, assuming the role of WSA (Water Services Authorities) to individual consumers [12]. In addition, the "Strategic Framework" provides the norms and standards with regards to continuity of water supplies and water quality. Further, the Strategic Framework provides various institutional models for water service provision, which include: full municipal provision; community based provision; local municipal-owned utilities; water boards; integrated regional water utilities; and private sector involvement [12]. In terms of policy and legislation, both governments have taken an integrated approach in addressing the issue of water provision by ensuring improved water access to their populations. Both countries prioritised water services provision by enshrining it in their respective constitutions, with access to water classified as a basic human right [13, 14].

While water demand management in the urban areas can be enforced through tariffs and other conservation tools, water management in the rural areas relies heavily on institutional arrangements and the willingness and ability of rural people to pay for water and to honour those arrangements. Rural water is used mainly for human and livestock consumption as well as crop production, in areas where there is potential. However, the climatic conditions of Namibia and South Africa do not allow significant use of water for crop production, such that most rural people have to maintain small gardens for subsistence and rely mainly on the rain for water provision. Although water resources need to be conserved through environmental impact considerations, rural water extraction in most cases is based on demand, with little consideration for the environmental impacts.

2. Methods and Data

The study relies on secondary data for analysis of

existing systems of water access and management in South Africa and Namibia. Review of both grey literature (government reports and policy documents) and academic literature is utilised. For Namibia, the paper uses secondary data collected in Namibia since the inception of the CBM programme in the late 1990s. In the case of South Africa, the paper uses secondary data and reports from CSOs (civil society organisations) that document community based water management and institutional arrangements prior to their abolishment in 2002, as well as current work by NGOs (non-governmental organisations) that continue to spearhead CBM systems through cooperation with the local authorities and other water services providers.

In addition to the secondary data, the paper uses primary data, collected through interviews² with officials in the MAWRF (water ministry in Namibia), the DRWS in the respective regions, NWRMR (Namibia Water Resources Management Review) and some members of the WPAs (Water Point Associations) in the respective communities. The interviews [15, 16] were mainly to complement and verify data collected from the secondary sources as well as to elicit new information. The information collected with these tools was coded and entered using Excel and SPSS database to enable statistical analysis. The paper used descriptive statistics for quantitative data and qualitative techniques were used to analyse interviews and other filed observations.

3. Results and Discussions: Lessons from Namibia

3.1 Background on CBM Programme in Namibian

With the increasing demand for water surpassing supply, the Namibian government recognized that

²The primary data consist of primary data collected in 2002 and data collected through interviews with the officials from the DRWS at the head office in the capital Windhoek in 2002 and 2006 [15-16]. The 2002 survey data cover Omaheke, Otjozondjupa, Omusati and Oshana regions, while the 2009 primary data cover the Caprivi region, now called the Zambezi region [23].

water is a finite resource and should be managed and conserved accordingly. This is echoed in its National Water Policy White Paper, which states that: “The danger of the former “supply side” approach was that it did not adequately recognize water as a finite resource that needs to be conserved. Today, there is a growing recognition that in environments where water is scarce, every effort should be made to control utilization.” [17, 18].

In 1997, the government introduced institutional reforms aimed at sustainable water resource use to ensure sustainable socio-economic development. This was primarily for the water sector in rural communal areas where communities were not involved in the management of their natural resources before independence [18]. Water was centrally managed, depriving communities who are directly involved in the use of resources from managing natural resources including water. In water scarce countries like Namibia, it is of immense importance that water is managed by those who use it and understand its use. Hence, legal developments in Namibia after independence focused on promoting CBM of water resources, dealing with the development of institutional arrangements for water access and management. The Water Resources Management Act [1] provided the legal framework for the implementation of the water reform. The reformed legislation emphasised community involvement and participation, thus establishing community based organisations to assume responsibility for the management of water resources. However, the reform approach was polycentric because some control remained with the government [19].

The WPC (Water Point Committees) and WPAs were established to manage water resources in rural areas [20, 21]. There are mainly two sources of water supply in rural Namibia, namely: (1) borehole, under the DRWs, in the Ministry of Agriculture, Water and Forestry (but managed by WPCs); and (2) the water pipeline scheme, provided by the Namibia Water Corporation, known as Namwater and also managed

by WPCs. The pipeline scheme allows individuals to apply for water connections and pay user cost fees to Namwater directly. Communities living along a pipeline form WPAs and apply for water connections, then collect fees from the members to pay to Namwater. The successful implementation of the CBM programme is dependent on the empowerment of communities, and in particular, WPCs and WPAs through capacity building to operate and maintain infrastructure and conserve water. It is almost 15 years since the MAWF started implementing the CBM approach for water management, and empowering communities through capacity building to improve access to water [22].

In Namibia, rural water management is handed over to the communities as part of the government's CBM programme, based on a demand management approach. Even though this programme has empowered some communities to manage their own water points, it came with challenges as the communities are now expected to contribute financially towards the daily operations and maintenance of their water points. After many years (during the colonial era until 1997) of relying on government for the provision of rural water, the new CBM programme was received with mixed feelings by the communities. While some communities successfully took over the responsibilities of managing their own water points, other communities are still struggling to get their water points running smoothly. The initial goal of the Namibian government was to introduce the CBM programme in three phases, as follows [22]:

- The first phase between 1997 and 1998 dealt with capacity building, which involved in-house preparation by training the officials in the DRWS and members of the communities;
- The second phase from 1998 to 2003 involved the handover for operations and maintenance of the water points to the communities. During the second phase, the communities were expected to be independent and rely on the government only for

major repair works, while government was expected to monitor the rehabilitated water points to ensure the complete handover of the water points in the third phase;

- The third and final phase was planned from 2003 to 2007, where government was expected to hand over the water points completely to the communities for full ownership, management and repair.

However, the proposed schedule was not feasible and could not be honoured due to financial and other resource constraints. MAWF then approached cabinet for an extension of the implementation date of phase two to July 2007, while phase three was extended to July 2010.

Unfortunately, this system has become a challenge in terms of affordability to some communities, to the extent that government is considering the reintroduction of water subsidies for poor rural communities by 2016 [6]. This implies that while communities are still in charge of managing the water points, to date, major repairs still rely on government for financial support.

3.2 Water Management in Namibia: Institutional Arrangements

The role of the Namibian government through the DRWS is to help communities manage their own water points. The role of the DRWS is to repair, rehabilitate the water point and hand it over to the rural communities for full control and ownership of their water points. Before a water point is handed over to the community, government has to ensure that the local people are well trained and have acquired the necessary skills to operate and maintain the water points, as well as manage the finances of the water points. The first step is for communities to establish a local WPA to which all the villagers who access the water point have membership. Once a WPA has been established, a village is expected to elect a few members to hold key positions such as chairperson, secretary, treasurer, a water point caretaker and two

additional members [15]. In general, women participation in the WPC has been increasing, which is an indication of women empowered even at the village level [16]. These elected members form part of the WPC, which is the executive body of the WPA. Once members of each WPC have received the necessary training, the committee is expected to prepare “a water constitution” and a business plan, in consultation with the DRWS in each district [15, 16].

Once the constitution has been accepted by the DRWS, the government conducts the final repairs of the water points and ensures that all the necessary facilities are in place before handing over the water point. After handover of water points for operations and maintenance, the community WPC qualifies to attend meetings of the LWC (Local Water Committee), which operates at a district level, consisting of all chairpersons and treasurers representing a WPC for each village in a particular district. The LWC falls under the Regional Water Committee, which reports to the Regional Council as part of the decentralization policy of the Namibian government. Therefore, the chairpersons and secretaries of all the LWCs for all the districts in each region constitute the Regional Water Committee [15, 16].

The main goal of the LWC is to prioritize all the needs arising from water provision for the different villages and forward them to the regional office of the DRWS. In cases where there are manageable water problems, the committee could look for help before calling on the regional office. The committee also resolves or gives advice on water conflicts which cannot be resolved at the village level. The LWC acts as a liaison officer between the regional offices and the communities in a specific region. The committee in each region sends two representatives to the regional office and information is supposed to flow from the Regional Water Committee to the LWC, then to the WPC and finally to the WPA [15, 16].

3.3 Results: Functioning of Water Points

With the introduction of the CBM programmes, the

DRWS in all the regions were given the mandate to ensure the transfer of the water points to the communities once those water points had been repaired, upgraded and rehabilitated to meet some basic requirements. When the DRWS introduced the CBM programme, the arrangement was for the government to start transferring 20% of the water bills to the communities on a monthly basis, with the aim of phasing out the scaled subsidy by August 2002 [15]. According to the DRWS [22], this goal had been achieved in full by July 2003. In terms of the CBM approach, the communal farmers own and operate the water installations. They use the funds generated through fees payment to cover operations and maintenance costs. In many communities, institutional arrangements encourage water users to participate in the maintenance of infrastructure and to reduce wastage and pollution [20, 21].

Table 1 presents the number of water points by type of technology used for operation, using national data and data from a primary survey of the Zambezi region [22, 23]. According to the DRWS, the majority of water points are on pipeline schemes, which cover 40% of the total, followed by diesel engine, and the least is solar power operated water points [22]. From the regions covered in this paper, the majority of water point technologies are diesel operated boreholes, compared to pipelines and solar power.

Table 2 presents the level of achievement of the CBM programme by 2003, which was the initial targeted year for phasing out the handover of WPs to communities, even though it was not achieved. Table 2 shows that about 72% of the WPCs have been established countrywide and 50% of the committees received the necessary training to take over their water points by 2003. The low rate of 16% of the water points rehabilitated confirm the government’s constraints in repairing and rehabilitating the water points, which is mainly due to lack of funds [15, 22]. By the end of 2003, which was the initial target for phase two of the CBM programme, only 21% of the

Table 1 Total number of water points by technology: Zambezi region and national level.

Activity	Zambezi region	National	Percentage of total WPs (national) (%)
Water point driven by diesel engine only	31	1,842	26.8
Water point driven by windmill engine only	1	1,122	16
Water point driven by diesel engine and windmill	0	169	2.4
Water point driven by hand pump	524	931	13.6
Water point driven by solar power	14	94	1.4
Water point supplied by pipeline	224	2,709	39.5
Total number of water points	794	6,867	
Access to safe water (% of rural population)	86.3	87.2	

Source: constructed from Ref. [22] for the national data; and Ref. [23] for the Zambezi region data.

Table 2 CBM programme achievements by the end of 2003.

All regions	Totals required by 2003	Totals achieved by 2003	Percentage achieved by 2003 (%)
Water point committees established	4,892	3,535	72
Water point committees trained	4,814	2,399	50
Water point caretakers trained	5,560	2,339	42
Water point associations established	4,814	2,217	46
Water point associations registered	4,814	1,675	35
Water points rehabilitated	6,867	1,098	16
Water points handover for operation and maintenance	6,867	1,462	21

Source: Ref. [22].

water points had been handed over for operations and maintenance. The problem is more pronounced, since up to this year, 2014, no water point has been handed over for full ownership, while the initial deadline for phase three of the CBM programme was July 2007 [22].

The introduction of the CBM programme in Namibia has improved access to safe drinking water for the rural population from 43% in 1991 to 80% in 2001 [22], which was in line with the DRWS' target of 80% access for all by the year 2007. In 2003, the DRWS was planning to improve access to water for the three regions that fell below the target of 80%, which included Kavango region with 53.5%, Kunene region with 61.8% access, and Ohangwena region with 77.2% access [22]. In terms of payment, the different modes of payment range from fees, amounts of diesel per head of livestock, labour in kind for those who cannot afford to contribute, etc. [15]. For some communities, the proceeds are put in savings accounts

or advance payments for diesel with providers. Water conservation techniques include rationing, rotation of water channels to individual households, etc.. The WTP (willingness to pay) for water services shows that those communities are not only taking the CBM as a government initiative, but they fully participate by enforcing payment techniques and other methods of water point management. Data show that the implementation of the CBM programme has empowered women as active participants in their associations, and it also creates job opportunities for the care takers [16].

Other water conservation tools include rules of allowing water to each household once a week, and for the caretaker to refuse water to a household, which has a leakage in its pipe [15, 16]. Others try to discourage water pipes to go up to each household and only allow it for old people and those who cannot manage to walk the 100 m to 500 m to water livestock and fetch water for household consumption. In some

cases, villages facing water shortages can approach the next village for water and pay cash or diesel per head of livestock, depending on that village's institutional arrangement. Most villages agree to share water, but not grazing, with their neighbours who are in need. Regions like Omaheke and Otjozondjupa where villages are in close proximity to main centres for the purchase of diesel or for saving schemes, like the post office, seem to have been operating more efficiently compared to those regions like Omusati and Oshana where the long distance to main centres added to the operating costs [15, 16].

In Otjozondjupa region, the Waterberg pipeline water scheme delayed the process of handover (except for a few villages who cooperated) because the communities did not support the government programme of CBM and that hindered the establishment of a LWC [15]. After several attempts to cut water were not effective, communities of the Waterberg scheme opted for an arrangement with Nam Water, where each household was billed on an individual basis. This means that an individual household can be responsible for a water point connected to its house directly [15, 22]. This arrangement is assisting the ministry to prepare for repair and complete handover of the tertiary lines to Nam Water, allowing the water corporation to deal directly with the communities. Findings from the traditional authorities in the Kavango and the Zambezi regions show that they still have a strong influence in decision making about the management of water resources. This diminished the role of the WPAs, which is a new governance structure established under the CBM approach, with little capacity to compete with the traditional authority [23].

4. Results and Discussions: Lessons from South Africa

4.1 Analysis of Water Access in South Africa

Access to safe potable water remains a critical challenge for most rural communities in South Africa.

Despite recent data from Census 2011 showing that 90.8% of the country's population is using an improved drinking water source, rural communities remain characterised by huge disparities in access to water. Some of the factors affecting access to safe potable water in rural areas include operation and maintenance challenges—with many rural areas considered to have been provided with infrastructure no longer having functional supply, in addition to those who already lack access. Despite the South African government targeting to achieve 100% access to safe potable water by 2014, existing rural infrastructure for water supply is failing and requiring intervention, especially with regard to operations and maintenance of infrastructure. Therefore, although the Census 2011 data show only about 9.2% backlog in access to safe potable water, the proportion in rural areas is significantly high due to both functional challenges of the water infrastructure that has been provided and the remaining backlogs still to be addressed [24-27].

Previous studies [25] found that in South Africa, only 8% of the land area produces 50% of surface run-off. In terms of access, about 60% of South Africa's 51 million population lives in the urban areas, while 40% live in rural settlements. South Africa has access to surface water (77% of total use), groundwater (9% of total use), and recycled water (14% of total use). However, the population's dependence on water is not evenly distributed, since the majority (74%) of the rural population are entirely dependent on groundwater sources, such as local wells and pumps, due to lack of water infrastructure in rural settlements [26]. On the other hand, rural communities get most of their water from surface sources like the Limpopo and Komati rivers in the north. Due to immigration and population growth, increase in rural settlements is putting stress on the country's water supply. Currently, 19% of the rural population lacks access to a reliable water supply and 33% do not have basic sanitation services, compared to cities with

universal water distribution systems and better infrastructure [26]. Another study [27] has shown that an estimated 16 million people do not have access to adequate sanitation, while 3.5 million do not have access to safe drinking water. In addition to the problem of water scarcity, it is the issue of inefficiency and water loss, where South Africa loses over 1.5 billion m³ of water a year due to faulty piping infrastructure that has outlived its lifespan.

Before South Africa instituted local authorities as providers and managers of water provision across the country in 2002, CBM models had been operating in various parts of the country, especially rural areas. For example, several CSOs and NGOs have piloted and tested community management approaches to rural water access. They argue that CBOs (Community Based Organisations) would be an appropriate mechanism for providing water services in South Africa's rural areas, based on empirical evidence of the operation and maintenance costs of rural water supply schemes—for example in the Eastern Cape Province [27-29].

Despite national policy and programmatic efforts to provide basic water services, many villages in South Africa's rural areas remain characterized by a disjuncture between water for livelihood needs and their actual access to the available water supply [30]. Effective and efficient management of rural water supply systems remains a challenge to South African municipalities. This is due to the long distances between consumers and municipal centres, the low income of most residents and the government's policy of FBW (free basic water) [31]. Many rural municipalities face additional challenges of limited revenue and limited managerial and technical capacity. Community management provides a sense of "ownership" to local communities. Despite an initial orientation towards community management in the early 1990s, most municipalities, which are legally responsible for all water services to individual consumers, have chosen not to involve communities

formally in the operation and maintenance of rural water schemes [32].

4.2 Water Management in South Africa: Institutional Arrangements

The key role players in the provision of water resources are the national DWA and the local municipalities or the district municipalities. While the DWA is responsible for overseeing and managing the country's water resources by ensuring that all citizens have access to adequate water and sanitation services, the respective municipalities are responsible for facilitating the provision of water services to communities [33]. In terms of institutional arrangements, rural water supply lies with local municipalities, while the DWA is responsible for major repairs of infrastructure, in cooperation with the district municipalities. Review of Refs. [34, 35] shows that local municipalities are facing challenges to keep up with efficient provision of water services in rural communities, due to capacity and resource constraints. Before the responsibilities of rural water were given to local authorities, CBM approaches had been operating in various parts of South Africa. These common models included three types: (1) stand-alone schemes; (2) group schemes; and (3) sub-regional schemes. The stand-alone schemes are community owned sources (a spring protection or borehole) that serve one village of up to 1,000 people. A group scheme serves several villages (up to 5,000 people) within close proximity in a district or geographical area. Sub-regional schemes are community owned sources that serve many villages spread over large geographical areas based on gravity fed systems [34].

There are mixed experiences from community management of rural water schemes in South Africa. For example, previous studies [32] found negative experiences in four Kwa Zulu-Natal district municipalities, and in all instances the centralised systems were used. Others [35] acknowledge that despite the considerable efforts and infrastructural

development by the South African government since 1994, rural communities still face serious challenges to access potable clean water, such that women have to travel long distances to fetch water. Nevertheless, evidence from one of the district municipalities (Alfred Nzo District Municipality) showed that the community water management model was working sustainably and efficiently. This might be one example among many cases, but experiences with rural water services in the country require detailed research of how community water management models can be re-invigorated to complement efforts to provide efficient and sustainable water services in rural areas. The participation of local community organisations assisted in some of the common problems that beset rural water schemes, such as vandalism and water wastage. Clearly, there is great need for municipalities with remote rural water schemes to seriously consider community management as an effective and efficient delivery mechanism [32].

Further, lessons from other case studies [34] of water management by rural communities show some positive results and provide opportunities for rolling out similar programmes across the country. A review of a research project for completed water schemes to develop guidelines for institutional arrangements by the WRC (Water Research Council) found some degree of existing institutional arrangements among the communities, irrespective of size or type of scheme. Communities had elected representatives as water committees, who act as the water service provider; some communities had made financial contributions to pay local operators and bookkeepers; some communities were paying flat rates on a regular basis to cover operation costs. Based on findings supported by existing financial, management and technical arrangements, the WRC developed a generic water scheme model as provided for by the Water Services Act. The model suggests that community based water service providers are generally the most suitable for rural water supply at a community level,

whereas a village-based water provider would be ideal to serve a sub-regional scheme on a contractual basis with a bulk water provider [34].

Another contractual community water service provider is presented by the Amanziwethu Services, a public-public partnership between Maluti a Phofung Council and Rand Water for service delivery in the Greater Harrismith Area. This unique contractual arrangement between a local authority and a bulk water provider (in this case, Rand Water) yielded some benefits for the rural communities. These benefits are in the form of improved efficiency and cost effective ways of rendering water services; improved access to technical resources of Rand Water; improved compliance with legislation and customer care services; training, skills development and transfer to local communities; and improved financial management systems [36].

One example of a water CBM programme is by the AWARD (Association for Water and Rural Development), known as SWELL (securing water to enhance local livelihoods). SWELL is a holistic and integrated approach to water planning, based on a participatory process that brings together community stakeholders, water service implementers, government departments, and other agencies [37]. SWELL was first piloted in one village in the Bushbuckridge Local Municipality. Findings show that while the SWELL community model seems to be broadly consultative with various stakeholders involved, access to clean and safe drinking water remains a challenge in the Mpumalanga Province [38]. The consultative approach by the SWELL model helped in creating a better understanding of the water situation in the area, as well as in identifying the limiting impacts it has on people's livelihood activities. Plans that were developed by the communities in partnership with the local authorities tried to address these through a combination of short-term measures with long-term strategies [37].

The DWAF, in conjunction with the NORAD

(Norwegian Agency for Development Corporation), developed a sustainability assessment tool looking at the functionality of water and sanitation schemes in the Eastern Cape, Kwa Zulu-Natal and the Limpopo Province. Analysis of the assessment tool found that there were no cost recovery mechanisms in the rural water and sanitation schemes assessed [39]. Evidence shows a lack of capacity at the rural community level, which needs to be enhanced through skills transfer and capacity building and partnership with those who have the skills. The DWAF/NORAD study suggested that attention should focus on local institutional and capacity building to provide the necessary expertise and skills for executing new functions and responsibilities at the community level. These include improving the management capacity and enhancing the efficiency relating to bookkeeping and related skills. This requires involvement of the local municipalities, where possible, to facilitate and enhance institutional and capacity building for rural community water schemes. Another study conducted in two local municipalities, Nkomazi in Mpumalanga Province and Makhado in the Limpopo Province to assess water access challenges in these municipalities, also found similar challenges at the community level. The two municipalities experienced common challenges such as: lack of regulation; lack of capacity and skills; insufficient funding; non-functional infrastructure (broken taps or standpipes); lack of clean water (due to pollution); use of unsafe water sources; poverty in communities; and lack of reliable water resources in general [40].

5. Conclusions and Policy Implications

Review of the existing models of community water provision and institutional arrangements shows that there are opportunities to improve water access to local communities in both countries. The challenge of infrastructure maintenance and lack of technical skills at the local authority level in South Africa calls for more participation of communities in the provision

and management of their water services. Benefits from past CBM programmes have shown the potential of such schemes, and the two countries' governments need to encourage it more at the local level. Since the water legislations allow for such arrangements, partnerships between communities and local authorities or bulk water providers can ease the burden on local authorities as the custodian water service providers.

In Namibia, the DRWS is responsible for ensuring effective operation of rural water points through communities' involvement, giving full management responsibilities and ownership to the communities. The challenge that threatens the effectiveness and efficiency of the CBM programme to take complete responsibility arises from socio-economic considerations of affordability by communities. Due to the high costs of repairs and long distances between villages and main centres, the Namibian government had to keep on hold the complete handover of water points to rural communities. It has gone further to reconsider the introduction of water subsidies for water operations in future.

Successful implementation of the community based water management is dependent on the empowerment of communities, and in particular, WPCs and WPAs through capacity building to operate and maintain infrastructure and conserve water. It is almost 15 years (since 1997) that the MAWF started implementing the CBM approach for water management in Namibia, and empowering communities through capacity building to improve access to water.

Despite the positive impacts of the reform on water management, the Namibian government is concerned that cost recovery of rural water supply puts too high a burden on rural water users. The micro impact of the Namibian rural water supply reform on rural livelihoods needs to be carefully assessed. Thus, a number of issues come to the fore. The cost recovery principle implies the ability to pay, which raises the question of affordability and, hence, access to this

vital resource, and how this affects rural livelihoods.

Nevertheless, experience from both countries shows that the benefits from CBM programmes outweigh the costs associated with it. The fact that the most communities who are currently operating their own water schemes are willing to contribute financially and otherwise towards the success of their water schemes amidst their prevailing challenges needs to be supported by both governments. Management of own water resources gives a sense of ownership to communities and supports women participation in water management. Partnerships between the respective stakeholders need to be encouraged, e.g., communities and private or public water providers; while governments continue to fulfil their constitutional mandates.

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