

# Institutions and the Sustainability of Community Borehole Water Supplies in Chiredzi Rural District, Zimbabwe

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## Abstract

This paper looks at institutions and sustainability of community-owned borehole water suppliers in Chiredzi Rural District of Zimbabwe. It examines the findings in Wards 13, 14 and 15 of Sengwe Communal Lands. The total number of boreholes in the mentioned wards amounts to 58. The paper also investigates the involvement of local institutions in the management of community boreholes, the socio-economic characteristics of the users of the boreholes, the number of boreholes and their functionality, and suggests a measurement of sustenance of the boreholes in the study area. The study uses both quantitative and qualitative methodology. Data were collected from both primary and secondary sources. Data gathering methods included questionnaires, interviews, focus group discussions and observations. The study reveals that in some villages of Sengwe Communal Lands, the majority of local institutions were not effectively involved in management of their boreholes and only a minority were effectively involved. In villages where there was less institutional involvement in the management of boreholes, most of the water points were in poor condition and needed repairs to function properly. The study concludes that there is need for policy-makers, planners, water agencies and water users to work collectively in the management and maintenance of the water points. The study therefore recommends a command approach in addition to the existing practice for sustainable water supply in the study area.

**Key words:** institutions, boreholes, management, collective action, community ownership

in Zimbabwe shape collective action in the management of boreholes. We argue that the local drivers promulgate the success in the management of resources at the local level in the South East Lowveld of Zimbabwe collectively. However, when the local drivers intersect with global drivers of change, they introduce new challenges that require innovative local responses that will be different for each locality.

## PURPOSE OF THE STUDY

Studying the contributions of community collective action efforts in management of community-owned boreholes in contextually different settings where users have diverging forms of capital (physical, human, social) which variably influence sustainability of infrastructure, provides alternative knowledge on the management of community boreholes and also gives suggestions on possible ways of overcoming collective action problems. Hence this paper informs planners, policy makers and water agencies towards more effective ways to enhance sustainability of borehole water schemes through community participation. The study also assists in the establishment and improvement of strong institutions that unite and encourage all community borehole-users to work together for the continued functionality of community boreholes, as step towards increasing access to safe water and livelihoods enhancement for rural men and women. The paper provides an understanding of the effectiveness of the local drivers, policies and indigenous strategies put in place to respond to climate change, socio-political and economic challenges. It also provides recommendation for improving performance for collective action in management and maintenance of water resources in Southern Africa. The study mainly used qualitative and quantitative research approaches.

## INTRODUCTION AND BACKGROUND

Community-owned boreholes<sup>1</sup> are particularly vulnerable to deterioration and over exploitation by users because they are difficult to exclude other people from using them hence need institutions. Institutions are defined as sets of agreed-upon rules and structures that are followed by most community members and which control access to and regulate competition over natural resources (Hyden, 1992). This study looks at community-owned boreholes as Non-excludable thereby making them unique Common-Pool Resources (CPRs) since they are neither public nor private goods. The study also examines and discusses how the dynamics of multi-scaled politics and power in the structuring of the management strategies by local institutions and borehole-user groups contribute towards the development and sustainability of borehole resources.

From a critical institutionalism approach the paper focuses on how local economic, political and social parameters of water resources management of Sengwe Communal Lands in Chiredzi Rural District of Masvingo Region

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<sup>1</sup> These are holes that are drilled vertically into the soil and have narrow shafts that are lined with metal casing and usually they are not lined with concrete.

# LITERATURE REVIEW

## Borehole Resource-User Attributes

Boreholes are vertical or horizontal shafts used to collect underground water, developed centuries ago by Chinese Egyptians and later westerners (Adesiyun et al., 1999). In Zimbabwe, most of community-owned boreholes are hand-operated. They are mostly vertical and have narrow shafts that are drilled and fitted with a metal casing to avoid soil falling back into the hole (Cleaver, 1990). A pump is often placed at the top of the shaft and is used to draw water out of the shaft using a long metal rod. While the borehole system is robust and durable, overuse can result in early breakages that are both complicated and expensive to repair (Cleaver, 1990). Therefore, a robust and effective borehole management system is needed at the community level to ensure the continuous functioning of the technology.

Community-owned boreholes or water points represent one of the most critical Common Pool/Property Resources (CPR) in Sengwe Communal Area (Chikozho, 2001). Hence, reviewing literature on CPRs is appropriate for this paper also shed light on the documented dynamics associated with common property resources. The governance of community-owned boreholes as common property may have many advantages over treating them as individual private property, but that is not to say that it is free from its own problems. Borehole-users may have conflicting interests and goals with regards to their borehole location, site and uses (Adekile & Olabode 2009). Individuals within the same village user-group may have different levels of knowledge about the resource and different access to information, economic resources and political power. These asymmetries complicate the individuals' efforts to achieve successful joint outcomes, and complicate the

way in which they should manage collectively their resource (Ostrom, 2009). Given the challenges in governing community-owned boreholes as a CPR, this study is premised on the assumption that socio-economic and physical contexts facilitate the emergence of effective and legitimate institutions that can properly manage the CPR. This is therefore used as a theoretical lens through which to investigate how villagers in Chiredzi Rural District collectively manage their community-owned boreholes.

## Borehole Management: A Review

National governments and donors in developing countries have made huge investments in the field of rural water supplies but infrastructural dilapidation is still observed at large (Cleaver, 1990). Many of the constructed systems are not maintained and have been abandoned. In some cases the few working boreholes are not fully utilized, hence water access remains a challenge. Manifestation of poor maintenance and management of the existing boreholes is reflected in the increasing down-time<sup>2</sup> period in most boreholes. Scholars such as Cleaver (1990), Taylor and Mudenge (1996) and Narayan, (1994), have written on issues for sustainable operations and maintenance on rural water supplies in developing countries, all pointing to poor understanding of community involvement and compromised management.

The rate at which water supply facilities such as community-owned boreholes are falling into disuse is alarming (Taylor & Mudenge, 1996; Glennie, 1983; Narayan 1994). Almost half of all water facilities constructed in developing countries are not operational (Kimena, 1998). In addition, most of these water facilities break down in the first three years of construction (Taylor & Madenge, 1996 & Glennie, 1983).

<sup>2</sup> This is the period between borehole breakdown and repair



*Women and children at a borehole. Photo taken by P. Feiereisen on 19 October 2011 in Norton, Zimbabwe. Flickr*

In trying to provide access to safe water for all rural people, the Zimbabwean government is faced with the problems of constructing new water facilities and maintaining existing ones. Wijk- sijbesma (1985) indicates that inaccessibility of boreholes due to dilapidation and a prohibitive management system poses huge challenges particularly to women water users (majority water users and managers) who inevitably have to walk longer distances to alternative sources of water. This was also observed by Narayan (1994) who contends that the consequences endured by women include physical strain through heavy loads and rough terrains which becomes detrimental, compromising their productive and reproductive roles at the household and community levels.

Therefore, maintaining the existing water schemes is very important in increasing access to safe water, without which sustainable community water supply will not be achieved. Resultantly, not having access to a safe water supply exposes water related disease, consequently increasing the vulnerability level for rural water users, especially women and children who frequently use borehole

water (Harvey & Skinner, 2000). Improving the sustainability of community water supplies ensures that the on-going provision of a water supply service would be fundamental in alleviating poverty as livelihoods are enhanced. Sustainability also depends upon user communities taking financial responsibility for their community boreholes. This facilitates government-community joint ownership that lift the financial load off the state (Uphoff, 1980), and consequently, enables the channeling of scarce resources from government and donor agencies towards specifically targeted impoverished populations where water supply is scarce. Given the intertwined factors that govern water accessibility and borehole management such as the political environment, external influence, community self-organization and related environments, water governance becomes very challenging as elaborated in the work by Chikozho (2001).

Challenges of collective action in governing resources such as community-owned boreholes occur when individuals, as part of a group, select strategies generating outcomes that are suboptimal from the perspective of the group. Accordingly, Tagutanazvo et al., (2015)

provide that power struggles among water users particularly between men and women, is a challenge towards the formulation and application of water governance mechanisms. According to Poteete and Ostrom (2004) these challenges are caused by a lack of information, difficulties in coordination, the existence of obstacles to exclusion and rivalry of extraction. This leads to information asymmetries, and motivational problems then arise which can then lead to dysfunctional operation of the community's borehole(s). Using a range of field observation, Ostrom (1990) showed that it is possible for local communities to self-organize in ways that resolve complex collective-action problems related to natural resources governance. In fact, local communities have often demonstrated that their self-organized efforts in natural resources management can outperform government programs (Ostrom 1990; Feeny et al. 1998).

In areas of water scarcity like in Chiredzi Rural District, where water is essential for local livelihoods or where water resources are isolated, state-controlled agents are commonly unable to secure, manage or protect the water infrastructure. Such a top down strategy can also generate undesirable side-effects, for example, policies may not be flexible enough to cope with local ecological variation or local people's needs, knowledge and preferences (Clever, 1990).

One of the major changes in Chiredzi Rural District has been to confer property rights over boreholes to local communities. Based on the idea that local communities in proximity to boreholes are primary users of borehole water, they often create de facto rules that significantly affect the functionality of boreholes. Besides the primary use rights already in place for the community water users, scholars and policy-makers such as Murphree (1991) argue that more equitable and effective outcomes can frequently (though not always) be reached by transferring ownership rights and tenure rights, over boreholes to

local communities.

The conditions that call for effective borehole management can be grouped into the following sets of variables as described by Ostrom (1999): attributes of the users, distribution of interests, and attributes of the resources (improvement potential, indicators, predictability and spatial extent). Nyumba (1990) postulates that a positive trade-off between costs and benefits must exist in order to achieve effective communal borehole water governance, provided there is sufficient information available, boreholes in good condition with enough water supply will give individuals more choice according to Ostrom (1999). Under these conditions, individuals are more likely to develop practices that can produce and sustain a self-organized system of borehole management.

## CONCEPTUAL FRAMEWORK

The research study is grounded in a conceptual framework of the key elements of Community Based Management (CBM) of water services in Zimbabwe. An extension of the CBM framework was developed for the purpose of this paper. Some factors were added as key pillars of analysis. These include: spatial variation, attribute of the resource (mechanical condition of infrastructure, functionality), attributes of the users, socio-economic environment and institutional organization. These key issues are utilized in this paper as a lens through which an understanding of the link between resource availability, access to the resources and the related benefits by the users can be attained. The framework provides a critical and analytical approach that views institutional and organizational issues linked to benefits and ability of the users to articulate agendas that meet both individual and communal interests (Murphree, 1991; Murombedzi, 1991). Furthermore, an initiative that seeks to undertake socio-economic change (water infrastructure) of such a huge

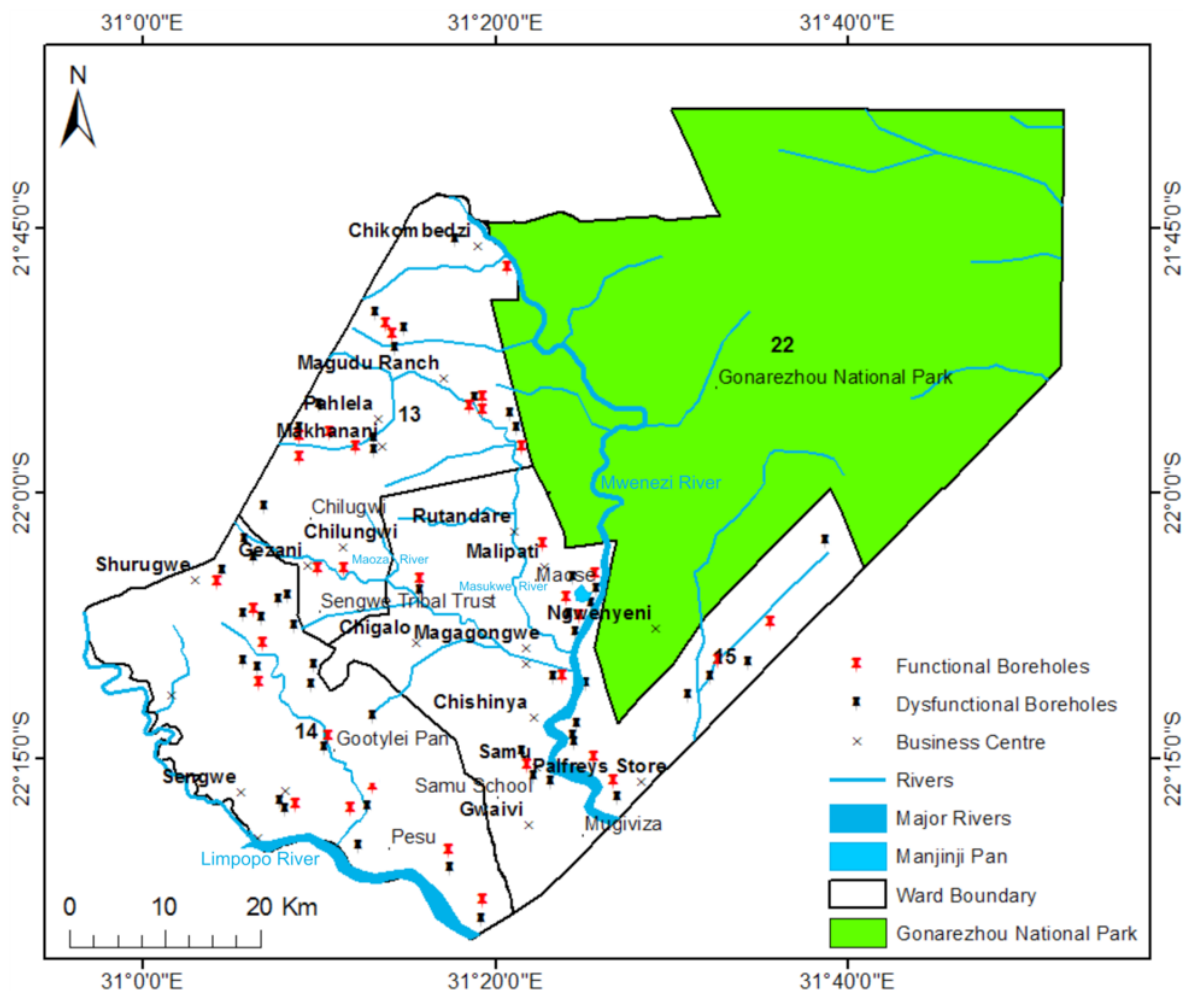


Plate 1: A map of Ward 13, 14 and 15 of Sengwe Communal Lands showing functional and dysfunctional boreholes, Source: ZINWA Map Office 2003

magnitude requires serious grounding and recognition of the importance of involving user communities of water infrastructure to have the control and responsibility for managing their water service. The framework also recognises that the setting up of powerful and effective institutions is only possible through well constituted organisational structures.

## STUDY SITE

Sengwe Communal Area is located in Chiredzi Rural District in Zimbabwe's South-East Lowveld (Chaumba, 2003a). It is about 120 km South-East of Chiredzi Town, on the east bank of the River Bubi. The Sengwe Communal Lands are inhabited by people of different ethnic origins (Scoones & Wolmer, 2003). The Shangaan and the Ndebele are the dominant ethnic groups in the study area who mostly

depend on borehole water supply for domestic uses, irrigation and livestock watering at the peak of dry season. Some of the ethnic groups found in the area include Venda, Karanga and Pfumbi.

The study area is located in agro-ecological Natural Region 5, characterised by low rainfall of about 500mm/yr and very high diurnal temperatures of 32 degrees centigrade (Scoones & Wolmer 2003). The major water resource types include rivers, dams, streams, pans and pools. Most of the water sources are ephemeral, containing water only for a few months or even less during the rainy season. This severely limits the importance of rivers and streams as sources of water for both domestic and production uses.

Climate change in the region is already threatening the ecosystem, and the livelihoods that

depend on them, at the regional, national and local levels. The main impacts of climate change are envisaged to affect food security through increasing occurrence of droughts and floods, scarcity of water resources; increasing conflicts; and raising unemployment. Dry-land farming and irrigation-based crop production and livestock rearing (mostly goats and cattle) are the major agricultural activities and potential sources of income that can be used to maintain the water infrastructure (Mavedzenge et al., 2006).

Labor migration is also a common feature in the area (Wolmer & Scoones, 2003). Most of the migrants go to neighbouring countries such as South Africa and Mozambique. The receipt of remittances from the migrant workers has also helped to establish and maintain water points such as wells and private-owned boreholes in the study area.

## RESEARCH METHODOLOGY AND METHODS USED

A qualitative paradigm was utilized with limited descriptive measures. A qualitative approach was used since communities are social organisations that exist within particular socio-cultural contexts. It was used to study phenomena in their natural contexts and from the perspective of the participants. It allowed the researcher to get right to the root of the problem through investigating the behavior and attitudes of villagers when managing their community boreholes. In addition, this helped to identify and examine the challenges and opportunities faced by user communities in operation and maintenance of the water infrastructure. Survey gathered descriptive data at a particular point in time with the intention of describing the nature of existing conditions (Cohen & Manion, 1994). On this basis, a descriptive approach was relevant to this study as it intended to gather data explaining the extent to which local institutions and borehole users in each village differed in

collective management of their water points.

Data gathering instruments used in this research were questionnaires, interviews and focus group discussions. 58 boreholes were randomly selected from 3 wards in Sengwe Communal Lands and their management by and usefulness to the community the community were analyzed in this study. The questionnaires provided the baseline data for the study. A self-administered, semi structured questionnaire was completed by 180 households in the study area. Closed questions were used because they provided answers that were standard and hence could be compared from person to person. Open ended questions were used to allow for respondents to express their personal views. The questionnaire was used to gather data from local institutions and users of community boreholes at the site of the boreholes to delineate problems faced when collecting water and the rules applied to operating the borehole, whether the users have been trained or not on borehole use, and contributions on the maintenance of the borehole. Interviews were conducted with the two officials from Chiredzi Rural District, three Councillors from Wards 13, 14 and 15, five Village Heads, ten Borehole Water Management Committee Members and five Point Caretakers. To complement and validate the data obtained from questionnaires, the data was coded and categorized into themes that reflected the purpose of the research. From the themes and codes came narrative descriptions constructed by identifying dialogue that provided support of the themes. Quotes were collected from interviews data as well as responses to open-ended questions. This was done to allow the data to speak for itself, improving the validity of the findings.

The interviews solicited the respondents' views with regards to training users, selecting of member of the water committees, availability of maintenance tools, and problems faced when using the boreholes. Focus group dis-

cussions were held with the community borehole users at the borehole sites. Observations were done on borehole sites to capture the user's behavior and attitudes when collecting water, to see whether rules were followed, and to ascertain the cleanliness of the site and the borehole, allowing the researcher to collect data on both expected and unexpected dimensions on the use of community boreholes and providing opportunity to assess the reality of what takes place at the borehole sites with regards to peoples' behaviour and attitude. All the data collection instruments required respondents to give reasons for their responses, thus emphasizing the essence of the qualitative research paradigm.

Some of the secondary data was explored by reading through all Rural District Council's records, reports from water user meetings and workshops conducted by institutions such as Borehole Water Committee, Village Head Council and Ward Councillors.

The study investigated the socio-economic characteristics of the respondents as well as an analysis of the participation gradient that exists between men and women water users to give an insight of the potential inherent in the water-users management of the boreholes. The level of sustainability of the infrastructure was drawn from information gathered from the functionality of the boreholes.<sup>3</sup>

## POPULATION AND SAMPLE

Leedy (1995) describes a population as a large group which consists of all the defined members to be studied. The population of this study was made up of households in Wards 13, 14 and 15, officials from Chiredzi Rural District Council, Ward Councillors, Village Heads, Borehole Water Management Committee members and Water Point Caretakers. These included 180 households in

3 
$$\text{Functionality} = \frac{\text{Number of boreholes functioning in a given area}}{\text{Total number of boreholes in a given area}}$$

three Wards, two officials from Chiredzi Rural District, three Ward Councillors, five Village Heads, ten members of the Borehole Water Management Committee and three Water Point Caretakers. The total respondents were 203. Targeted sampling was used to select the wards to be included in the study because it allows the researcher to include only those wards believed to be critical to the research.

## FINDINGS OF THE STUDY

The study revealed that in some villages of Sengwe Communal Lands, the majority (56%) of the local institutions were not effectively involved in the management of their boreholes while 44% were effectively involved. In villages where there was less institutional involvement in borehole management, 80% of the water points were in poor condition and needed repairs to function properly.

Some of the institutions that showed ineffectiveness were inclusive of the Rural District Council (RDC), the District Water Supply and Sanitation Sub-Committee (DWSSC), Water Development Agencies (WDA) and Local Institutions in Water Resources Management (LI-WRM). These institutions still face the dilemma of balancing operation and maintenance of water infrastructure due limited financial and human resources capacity. At present, operations and abstraction levels far exceed maintenance efforts which have led to drastically dysfunctional community boreholes in the district.

Plate 1 shows the distribution of functional and dysfunctional boreholes in Sengwe Communal Lands. Most of the boreholes are found near Gonarezhou National Park. Some are scattered along the banks of rivers; Mwenezi, Masukwe, Maose and Limpopo. Other boreholes are found along the main roads rather than in the large interior areas of Chilugwi, Chigalo and Chishinya villages which



are characterized by “drought and lack of water all-year around”. Surprisingly, the number of boreholes is decreasing in areas away from the National Park where the majority of the people live.

ing well, 2 were partially functioning and 4 were not functioning. For example, the breakdown of community boreholes in Sengwe Communal Lands between 1990 and 2005 was estimated at 5%, 15% and 20% in Wards 13, 14 and 15, respectively and the prevalence

Table 1: Functionality of Boreholes in Sengwe Communal Lands

Administrative Wards	Number of Boreholes	Functioning	Partial Functioning	Not Functioning at all
13	27	11	2	4
14	31	8	1	8
15	43	15	0	9
<b>Total</b>	101	34	3	21

The map also shows that 70% of the functional boreholes are located at the edges or boundaries of Gonarezhou National Park in order to provide water for animals in the park. Since the boreholes are closer to the park, Game Park management in institutions in charge of the park make sure that they are always well maintained so that animals get water for drinking.

## Functionality of Boreholes in Sengwe Communal Lands

A point worth noting is that some heavily populated villages have fewer boreholes which are mostly scattered closer to the banks of Mwenezi, Limpopo, Maose and Masukwe Rivers far away from the national park. In this study, 80% of the few boreholes in the densely populated zones were dysfunctional. They were meant to provide water for the villagers in Wards 13, 14 and 15. Poor maintenance by the user communities have resulted in their dysfunctionality.

In Ward 13, out of total number of 17 randomly selected boreholes, 11 were function-

ing well at the time of data collection. However, a significant number of boreholes were not in a functional condition thereby affecting community water supply in Sengwe Communal Lands. Ward 15, which had the highest number of randomly-selected boreholes, fell along the Trans frontier. The second highest number of boreholes that were not functioning well was recorded in Ward 14. Interestingly to note, was that Ward 14 had more boreholes than Ward 13.

rate of dysfunctional community-owned boreholes in the study area has continued at an estimated rate of 2.2% (ZIMSTAT, 2012). Table 1 below shows the functionality of community boreholes in Wards 13, 14 and 15. Across the three Wards studied, out of a total of 58 randomly-selected boreholes, more than half of the boreholes were functioning well at the time of data collection. However, a significant number of boreholes were not in a functional condition thereby affecting community water supply in Sengwe Communal Lands. Ward 15, which had the highest number of randomly-selected boreholes, fell along the Trans frontier. The second highest number of boreholes that were not functioning well was recorded in Ward 14. Interestingly to note, was that Ward 14 had more boreholes than Ward 13.

## Spatial and Temporal Variations in the Attributes of the Borehole and Related Resources

The current number of community-owned boreholes for the supply of water in the study area is not adequate because almost 80%

of them are dysfunctional. During the time of installation in the 1980s, these boreholes were underutilized due to locational differences---with reference to wards in which they were located. Attempts by local institutions such as Ward Councillors, Village Heads, schools, churches and villagers to collectively organize themselves and the failure to detach from colonial water management mechanisms by post-colonial local institutions led to mismanagement of the boreholes. Moreover significant variations in distance among user households relative to the location of the boreholes have undermined their sustainability. A distance of 3 km and further from residential areas has made it difficult for user communities to effectively manage their water facilities. Thus communities that were closer to the borehole had more power over the management of these boreholes. This

challenge was largely shouldered by women who are the primary water users at the household level hence the stakeholder with the greatest interest. The wide dispersment of boreholes created difficulties in monitoring the use of boreholes, as well as the provision of labor and repairs which are more costly. Moreover, abrupt changes to post-colonial administrative of the systems left management of the systems at best fragmented.

## Attributes of the Borehole Water Users

### (a) Water user attributes and their knowledge systems

In very dry areas the psychological bond between the resource and the users is strong compared to villages with readily available alternative sources of water. In some villages of Sengwe Communal Lands such as Gezani and Chigalo which are very dry and hot, the villagers have attached an exceptionally high value of sustainability to their community boreholes. Households located in very dry areas valued cooperation at a higher level because of the absence of alternative water sources. In these very dry and hot areas, the cost of organizing and maintaining a self-governing system by local institutions and villagers is a worthy effort. Of the 44% of the institutions that were effective in borehole management, more than half of them were observed in Ward 14 which is much drier than the other two wards. Out of the total amount of water users who showed substantial knowledge of the significance of borehole maintenance, 54% of them were from the driest zone (Ward 14).

While users from the remaining Wards appreciated the importance of boreholes only 46% of them recognized the borehole as an important source of water. This value is lower than that of Ward 14. The villagers collective action in using alternative water sources lo-



Some residents and some vendors are fetching water. Photo taken by P. Feiereisen on 19 October 2011 in Norton, Zimbabwe. Flickr

cated in and around their areas was found to complicate and divide the water users attention. For households with alternative sources closer at hand, cooperation to protect and maintain the primary community borehole located farther away is seen as an unnecessary cost. Similarly, when the boreholes must serve competing or conflicting purposes, local institutions are less likely to be successful in sustaining the water points.

Homogeneity of resource users increases the chances of effective collective management of the resource. The tasks of local institutions in management of water points are greatly simplified when users are homogeneous since decisions can be uniform since their needs are basically the same. This leveraged the participation of women in the collective management of resources since they made up the majority of the users. The potential benefits of cooperation are perceived to be greater than the costs. A total of 68% of the local institutions and 70% of the villagers in the study area have a shared common knowledge of the importance of community boreholes in providing clean water for domestic purposes, gardening and watering livestock. They know which boreholes are functioning. They are aware of what causes borehole dysfunctionality because they have selected members of the village to be on the borehole water management committees which supervise the operation and maintenance of the water points.

In Sengwe communal area, these committees are comprised of the chairperson, secretary, treasurer and two committee members. Out of the 58 borehole committees 23 of them were chaired by women while 35 were chaired by men. The women enjoyed a success rate of 73% while the men's committees had a success rate of only 40%. Overall, women have proved to be more effective organizers of collective community water resources management likely due to their status as the water collectors for the household.

These committees have also developed rules to govern the use of the boreholes. The committees use a constitution for conflict management which sanctions of rule/norm breakers and as a guideline to common resource management. However, as has already mentioned, collective action in some areas has been undermined by lack of knowledge by some committee members and water users of the requirements of the constitution and other water access rules. The drawbacks were observed mostly from male-led committees who often indicated that water rules are women's territory.

***“Water is women's business, they formulate operational rules... men usually give the framework of operation and they install the boreholes for women to use”***

(Interview held with Mr Kasela on 20 September, 2015 Chiredzi)

(b) Inadequate knowledge of the users on operation and Maintenance of boreholes

There is an overall lack of detailed figures to determine how much it costs to undertake an adequate operation and maintenance program for various types of facilities in different Wards. Until this information is forthcoming it will be impossible to accurately assess the overall performance of the operation and maintenance. Exact financial data is urgently needed to demonstrate to decision-makers the advisability of implementing sound operation and maintenance program in order to reduce losses to national economies.

(c) Socio-economic attributes of water users

Insufficient funding has been identified as a major contributor to poor management and maintenance performance. This lack of funds undermines the managing and operation of water supply facilities, as money is not available to buy spare parts and properly train user communities to use water facilities well. External support agencies have traditionally been reluctant to finance the management and maintenance activities, while the national government has often given it a low priority. The national government is frequently stressed for cash, especially hard cash currency which is needed to pay for spare parts.

The users are a potential source of finance for water supply systems. They are often unable or unwilling to contribute for repairs and maintenance. The poor management within institutions such as water management committees result in the squandering of resources which then reduces the viability of the water supply system. The people responsible for operating water facilities need to look carefully at their management to ensure that they are operating efficiently. Common problems are often caused by a lack of information on how to manage water facilities, difficulty coordinating the people who are using the facilities and poor and inefficient organizational structures. The inefficient water management committee is a serious deficiency and will not promote and allow efficient management and maintenance of the water supply system.

From the interview with the twelve Water Point Caretakers representing the villages in three Wards, it was established that only 5% of the caretakers were paid from the user contribution fees for the maintenance of boreholes across the study area. Lack of remuneration is therefore considered a serious threat to sustainability of community boreholes, as evidenced by the testimony below,

*“For us to have full commitment to our work, we need some remuneration. We have tried to raise this issue several times but our words are falling on deaf ears. The Borehole Management Water Committees have little commitment to the water points and .. misuse the funds”*

(Interview held on 13 October 2015, Chiredzi)

Apart from misusing the funds, the Water Point Caretakers believed that the level of motivation of the villagers was too low for them to fully appreciate their responsibilities. It also emerged from focus group discussions that some local institutions and user communities of boreholes were not trained in book keeping, technical maintenance, keeping the area surrounding the borehole clean and the importance of reporting breakdowns quickly. Lack of training, shortage of material and shortage of tools to manage water facilities were the most highlighted challenges by the user communities.

## Organization of the Water User

(a) Duties of the borehole management committee

Appropriate authority status over water resources management vary from place to place in Sengwe Communal Lands. In some areas such as Muhlakeni and Mugwayivhi, the users of community boreholes are not well-versed in the collective management of their water points. The users are still depending on

water agencies and local Non-Governmental Organizations for repairs and maintenance. Decentralization of authority to local user communities to allow for the “full autonomy” needed to be well explained since the Rural District Council is the first say in determining autonomous operation and maintenance of water points. Local people only have autonomy relating to the selection of water management committees. Local communities have little say in deciding the designing, planning, constructing and enforcement of rules regarding their water facilities. This is a major challenge to self-organization..

All Ward Councillors representing their respective Wards and Village Heads interviewed; agreed that the people who use community boreholes must have control and responsibility for managing their water points. The Ward Councillors and Village Heads noted,

***“Local institutions and borehole water users must be able to develop rules for management of their water points, engage in mutual monitoring and enforce their rules through social sanctions ... to defend their water points from encroachment by other communities”***

(Interview held on 30 September 2015, Chiredzi)

Local institutions and user communities protect their water points against rule-violations by both community members and outsiders by appointing Water Point Caretakers to guard the water points. From the survey,

98.5% of the respondents indicated that Water Point Caretakers reside closer to the boreholes and can easily monitor events taking place at borehole sites. The Water Point Caretakers are in charge of examining the pump regularly, applying grease, checking the tightness of the bolts and reporting problems to the Borehole Water Management Committee expeditiously. Some of them are highly motivated towards collective development activities since they are paid monthly for their work.

(b) Lack of Political Good Will and Commitment at Local and National Levels

It is the lack of political good will and commitment at the local and national levels that most undermines the institutional ability to monitor and enforce water resource management rules and regulations and this has led to poor water resources management practices. These have led to poor governance, weak water resources management, and low enforcement of borehole management rules, which have resulted in poor conditions and dysfunctionality of water infrastructure in the study area.

## CONCLUSIONS

The paper finds that effectiveness in collective borehole management was observed only in situations where the borehole water supply generated significant socio-monetary or subsistence benefits for the local populations. These were mostly from the dry areas where there was limited choice of other alternative sources of water. The observation made in the Sengwe communal area is that borehole management has created space for women to become actively engaged in water resources management and they have shown to be effective contributors towards collective community activities, a situation which reverses the patriarchal social order of resources management. Another important contextual factor is that the autonomous collective be-

haviour by water users has been compromised by poor planning and management systems. More so, inability to monitor and enforce the regulations by local institutions; lack of commitment by user communities and conflicting policies within the water resources management sector has compromised autonomy in the management of boreholes. This was further perpetuated by failure to implement policies and legislation governing the use of water resources by local institutions. Variation in the stakeholder interests has led to the skewed concentration of boreholes towards the national parks where community water users had limited access to the borehole benefits. Decentralization and delimitation of village boundaries has displaced the villagers and as a result this dissolved the collective glue between the water users. In some cases villages that were in proximity to the boreholes gained more power in the management of the resources, a factor which defeats one of the key pillars of collective action which emphasise the need for diffuse power and discursive management strategies.

## RECOMMENDATIONS

In Sengwe Communal Lands, participatory policies have been in place for over a decade and there are signs of positive outcomes in some areas such as increased borehole water being effectively managed by communities. Due to high involvement of women and high success rate of women-led institutions in collective and effective community management boreholes at local level, the paper suggests an increase in the involvement of women at the policy making, planning and decision making level to complement water user efforts at the grassroots level.

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