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WATER RESEARCH COMMISSION

GUIDELINE FOR RURAL WATER SUPPLY SYSTEMS

SUPPORTED SELF-SUPPLY & COMMUNITY MANAGED WATER SYSTEMS

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The Giyani Local Scale Climate Resilience Programme (GLSCRP) aims to develop and implement activities that will research, develop and demonstrate climate adaptive responses and solutions for optimising water utilisation in drought-stricken areas.

The programme will focus on the Greater Giyani Municipal area within the Mopani district and aims to impact an estimated 5000 beneficiaries over a three-year period in terms of water utilisation, improved water mix, and socio-economic opportunities as responses to climate adaptation.

A 2019 WRC study on droughts and adaptation strategies has highlighted risks to reduced productivity, livelihoods and food security, and an increase in vector and water-borne diseases in communities such as Giyani. Ultimately, climate change impacts on water resources in the Giyani area cannot be underestimated.

The programme has three key areas that will support for improving local scale adaptation and resilience in Giyani.

They are:

1) a strengthened enabling environment whereby local authorities, institutions, communities, traditional authorities and market players are mobilised to improve climate resilience and water utilisation;

2) improved energy, ground and surface water solutions developed with communities to optimise and diversify water sources;

3) activities that support livelihoods and local economic development opportunities.

The programme will cover a spectrum of rural and rural residential areas in Giyani, working closely with the Mopani District Municipality and the Greater Giyani Local Municipality. Implementation partners include Tsogang Water and Sanitation as the lead on water projects and infrastructure; Association for Water and Rural Development (AWARD) in support of capacity development and stakeholder engagement, University of the Western Cape (UWC) as the water and energy technical partner and the WRC's TTO Enterprise Development arm on social enterprise development supporting local economic development projects.

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SUPPORTED SELF-SUPPLY & COMMUNITY MANAGED WATER SYSTEMS

A guideline for community managed water systems in the rural villages of Greater Giyani Local Municipality

ABOUT THIS GUIDELINE

The Supported Self-Supply & Community Managed Water Systems guidelines outline various management options for rural water supply systems, with the primary aim of delivering adequate, safe, reliable, and sustainable water to communities in compliance with national legislation.

The guideline seeks to foster collaboration between communities, local governments, and development agencies, promoting joint actions and social accountability as essential strategies for improving rural water services.

Who is the guideline for?

The Supported Self-Supply & Community Managed Water Systems guideline is designed for rural communities, municipalities, local governments, and development agencies involved in water service delivery. It provides management options for rural water supply systems and aims to facilitate collaboration between these stakeholders to ensure safe, reliable, and sustainable water access. The guideline is particularly relevant for communities that rely on multiple water sources, such as springs, rivers, and boreholes, for various uses including domestic activities, agriculture, and small businesses. By promoting decentralised and community-based management, the guideline seeks to enhance joint actions and social accountability in the provision of rural water services.

What does the guideline contain?

The guideline covers community-based management models for rural water systems and outlines South Africa's key water policies, including the Water Services Act, National Water Act, and National Environmental Management Act. It also provides a historical overview of supported self-supply, co-management options, and the role of cost recovery in sustainable water management.

How to use the guideline?

To use the supported self-supply guideline effectively, communities, local governments, and development agencies should follow a collaborative approach to rural water management. First, assess the community's water needs and identify available water sources, such as springs, rivers, or boreholes, that can serve multiple uses like drinking, agriculture, and small businesses. Next, explore the different management options outlined in the guideline, which include decentralised and community-based approaches, to determine the most suitable method for sustainable water provision.

The guideline encourages building partnerships among stakeholders, ensuring that social accountability and joint actions are prioritized. By doing so, users can develop a tailored water supply system that is safe, reliable, and in line with national water policies.

WATER FOR ALL

Municipalities are obligated by the Water Services Act number 108 of 1997 to provide communities with reliable water services. The right to safe, reliable, affordable and sustainable access is also enshrined in the Constitution of South Africa. However, municipalities are yet to integrate decentralised and community-based management as one of the strategies for delivering water services to rural communities.

These are guidelines for different management options available for rural water supply systems. The main goal of a community-managed rural water supply system is to provide a community with adequate, safe, reliable, consistent, equitable and sustainable water in accordance to prevailing national legislation that addresses multiple sources of water for multiple uses. A water source may include protected springs and wetlands, streams and rivers, borehole hand-pumps or fully-mechanised piped water systems. Mulitple uses include water for domestic use, washing, drinking cooking, crop production, livestock raising and even small income generating activities such as backing, hair salons and so on.

The purpose of these guidelines is to present options for rural water supply systems which builds alliances between communities, local government and development agencies and promotes joint actions and social accountability as a key strategy for providing water services to rural communities. In developing these guidelines we draw on a case study developed with the community of Mayephu in Greater Giyani Local Municipality

Water is a basic human right and a vital resource for health, livelihoods and development. However, millions of people in South Africa still lack access to safe and reliable water sources, especially in rural and peri-urban areas. According to the World Health Organization, only 56% of the rural population and 79% of the urban population had access to at least basic water services in 2017 (WHO, 2017).

According to the United Nations "The water supply and sanitation facility for each person must be continuous and sufficient for personal and domestic uses. These uses ordinarily include drinking, personal sanitation, washing of clothes, food preparation and personal and household hygiene. According to the World Health Organization (WHO), between 50 and 100 litres of water per person per day are needed to ensure that most basic needs are met, and few health concerns arise." (United Nations, 2010)

SUSTAINABLE FUTURES

South Africa is also a signatory to the UN-Sustainable development goals. Sustainable Development Goal number 6 states:

Clean water and sanitation: Ensure availability and sustainable management of water and sanitation for all.

This goal is likely to be reached if we:

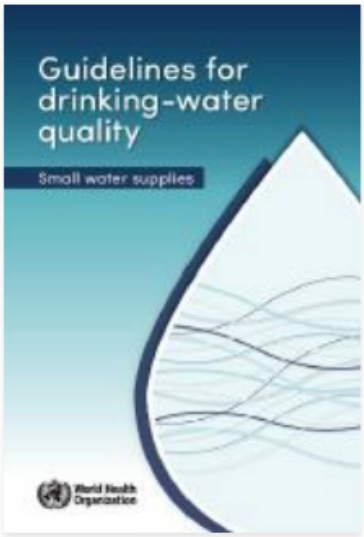
Expand international cooperation and capacity-building support to developing countries in water- and sanitation related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies and

Support and strengthen the participation of local communities in improving water and sanitation management.

WHAT ARE COMMUNITY WATER SUPPLY SYSTEMS?

Generally, these are "small" or contained systems. Globally, there is a diverse range of water supply systems classified as "small." These systems can serve a single household or multiple premises such as households, businesses, schools, and healthcare facilities in various settings including rural, small town, peri-urban, or urban areas.

They can be non-piped sources like boreholes, springs, rainwater collection systems, or other point sources, as well as piped supplies that deliver water to communal access points or private household connections. These supplies may or may not include water treatment and may be used year-round or seasonally. They can be managed by individual households, groups of households, community-based organizations, private operators, local governments, public or private utilities, or a mix of these. In this guideline we will look at community managed systems, their benefits, challenges and recommendations for a way forward.



In February 2024 the WHO with the Rural Water Supply Network (RWSN) updated their 1997 Guidelines on community water supplies. They provide specific guidance for managing small water supplies and integrate water safety planning, which helps suppliers proactively manage risks.

These Guidelines aim to help governments and practitioners improve the safety of drinking-water delivered through small supplies.

https://www.who.int/publications

THE CHALLENGES FOR SMALL-SCALE WATER SSUPPLY SYSTEMS

Historical spatial planning in South Africa has left many rural areas without basic services, and current responses like voluntary migration impact water service planning, financing, and maintenance. Some schemes may be under-designed for rural densification or overly designed for communities facing migration. Geospatial disparities in water infrastructure run counter to pro-poor and broad-based economic goals, exposing rural communities to health risks and loss of productive time.

"Wherever practical, water services and infrastructure must provide water for multiple use and accommodate mixed levels of service within communities, allowing consumers to elect a level of service which suits their needs, is affordable to them (within the prevailing subsidy framework), addresses inequalities, utilises appropriate and upgradable technologies, and is governed effectively and responsibly to ensure sustainability."

Despite this statement in the latest DWS review of water service provision, the legal and regulatory framework for such implementation has yet to be developed. District and Local Municipalities are the mandated water service authorities (WSAs) and Water Service providers (WSPs), with Water Services Committees only possible if the Minister reinstates this mechanism fully.

POOR COLLABORATION & CO-OPERATION

Municipalities do not have policies that support community based management, hindering decentralized water systems (Buthelezi, 2006).This contributes to poor quality, inadequate, unaffordable, and inequitable water access in rural areas. A major problem is the reluctance to view community organizations as partners in delivering water services, leading to a reproduction of poverty penalties, particularly affecting young girls and women who spend excessive time fetching water (Geere & Cortobius, 2017).

The second issue arises when small-scale, stand-alone rural water schemes break down for extended periods, denying communities access to safe and reliable water. In breakdown situations, communities resort to alternative sources like springs and rivers, which may lack safety and affordability.

However, small water supply systems face unique challenges, such as breakdowns and contamination, due to insufficient training, support, resources, and oversight. This results in a smaller proportion of the population having access to safely managed drinking water compared to larger supplies. Those served by small supplies are at higher risk of waterborne illnesses.

MANAGEMENT MODELS

Because the diversity of small water supply systems encompasses a wide range of sizes, technologies, skills, resources, and support needs, these guidelines have established categories based on management models. The management model refers to the arrangements for the operation, maintenance, and administration of a water supply, indicating the number of consumers served, the level of water supplier expertise, available resources, and external support needs. The guidelines define three points on this spectrum of management models:

- Household-managed supplies
- Community-managed supplies, varying from limited to more advanced management and,
- Professionally managed supplies, including private management operators, public utilities, local government and other formalized entities responsible for supplying water

There are many positives to communities getting involved in water management, but this 'involvement' brings with it a number of challenges. These challenges are not only of the community's making but are often entrenched in socio-political and governance systems (Nortje, Mbhele, Polasi, & Zulu, 2022). Presently Municipal water services authorities (WSAs) are primarily concerned with communities taking more responsibility for operation, maintenance and efficient use of infrastructure provided, with a secondary concern of cost recovery mechanisms for longer term sustainability. Communities presently have a greater concern in having access to sufficient water for domestic and productive use and as such have shown a greater and remarkable willingness to be more involved in co-management of water supply options. Self-supply options, both on an individual and group level are already very common in many underserviced rural communities, South Africa and Limpopo (Hofstetter, van Koppen, & Bolding, 2021), including Giyani.

WHAT THE LAW SAYS

The policy framework for water service provision in South Africa consists broadly of the Water Services Act 108 of 1997 (WSA), the National Water Act 36 of 1998 (NWA) and the National Environmental Management Act 107 of 1998 (NEMA) which make provision for the regulation and provision of water services by different state institutions in South Africa. The relevant pieces of legislation are summarised briefly below:

The Constitution of the Republic of South Africa (1996), which recognizes the right to sufficient water and the duty of the state to ensure that everyone has access to water services.

The National Water Act (1998), which establishes the principles of integrated water resource management, participatory governance, equity and sustainability, and provides for the establishment of catchment management agencies, water user associations and other institutions to facilitate COWA.

The Water Services Act (1997), which defines the roles and responsibilities of water services authorities, water services providers, water services intermediaries and consumers, and sets the standards and norms for water services delivery.

The Strategic Framework for Water Services (2003), which outlines the vision, goals, objectives and strategies for improving water services in South Africa, and promotes community management as a viable option for rural and peri-urban areas.

The National Development Plan (2012), which identifies community owned systems as a key intervention to achieve universal access to water and sanitation by 2030, and calls for strengthening the capacity and accountability of community management institutions.

The National Water Resource Strategy (2013), which provides the strategic direction for the management of water resources in South Africa, and supports community owned water access as a means to enhance water security and resilience and The National Environmental Management Act which provides principles intended to inform the management of natural resources including principles of environmental justice, equitable access and sustainable development. The key feature of the National Environmental Management Act is the obligation to obtain an environmental authorisation before proceeding with development which has a potential impact on the environment.

> **"The Water Services Act (No. 108 of 1997) provides a number of opportunities for communities towards self-supply. However, in this case we find that bureaucratic processes are particularly hindering and c umbersome, especially for communities if they seek to operate within the bounds of the law. Under this Act, communities in terms of self-supply, can become a Water Services Provider (WSP). If a community wants to operate as a WSP they have to register as a Community-Based Organisation (CBO)."**

BEST PRACTICE

COMMUNITY BASED MANAGEMENT MODELS & APPROACHES

There are several community-based management models that can be considered for stand-alone rural water supply schemes. This section considers two options for rural water supply systems.

The first option involves a community operating a small water supply system (self-supply) without the involvement and support of a water services authority, that is, a municipality. The second option involves a municipality taking the role of construction, operation and maintenance of a water scheme in collaboration with a community-based institution. However, both schemes and services need to be piloted and tested in different contexts to provide a realistic framework and process, (prototypes), for institutionalization and formal recognition of these models.

SELF -SUPPLY OR COMMUNITY OWNED WATER ACCESS (COWA)

This is a form of decentralized water management that involves the participation and empowerment of local communities in the planning, implementation, operation, and maintenance of their own water systems, which can offer several benefits, such as:

- Enhancing the sustainability and resilience of water systems by reducing dependency on external actors and resources.
- Improving the affordability and accessibility of water services by tailoring them to the specific needs and preferences of the communities.
- Promoting the social and environmental justice of water allocation by ensuring that the rights and interests of marginalized groups are respected and protected and;
- Fostering the social cohesion and empowerment of communities by strengthening their collective identity, agency, and ownership of their water resources.

However, COWA also faces several challenges, such as:
- Lack of adequate technical, financial, institutional, and human capacity to design, construct, operate, and maintain water systems.
- Lack of clear legal and regulatory frameworks to support and protect the rights and responsibilities of COWA actors.
- Lack of effective coordination and collaboration among different stakeholders, such as government agencies, NGOs, private sector, and other communities and;
- Lack of sufficient monitoring and evaluation mechanisms to ensure the quality, efficiency, and accountability of water services.

Self-supply is 100% user-funded, governed and operated. A community-based and informal organisation is usually established to deal with governance and operational matters. Water infrastructure is provided on incremental basis. Users decide on the most appropriate technology, financing arrangements, cost-recovery strategy and type of services they want. Spring water protection and small piped water schemes that use gravity to feed small reservoirs are preferred options.

Despite the rapid extension of public service delivery into rural areas since the end of 1994, many rural citizens in South Africa still rely on their own initiatives and infrastructure to access water. They construct, improve, operate and maintain infrastructure of different complexities, from individual wells to complex collectively owned water schemes. While most of these schemes operate without legal recognition, they provide essential services to many households (Hofstetter, van Koppen, & Bolding, 2021). Lessons learned from studying such schemes as locally adapted prototypes have the potential to improve public approaches to service delivery.

These self-supply options show the willingness of community members to engage with service delivery and their ability to provide services in cases where the state has failed and where bulk supply options for water provision are constrained. They also provide pointers and learning for collaborate and community co-management of state supplied infrastructure, something that is crucial for efficiency, equity and long-term sustainability.

SUPPORTED SELF-SUPPLY & CO-MANAGED OPTION

Historically, a supported self-supply approach was mainly promoted by non-governmental organisations and international donors in the community water space which allowed for funding support for rural water schemes. For instance, a rural community would seek support from an outside development agency, and usually a non-governmental organisation. A non-governmental organisation would engage community stakeholders, conduct an assessment, confirm water as a priority need, and prepare a funding application for submission to national and/or international donors. A community-based water institution would be established when funds have been secured in preparation for implementation. A community-based water institution would be trained and capacitated to take some project management roles as well as operations and maintenance roles post project completion. The water infrastructure would be managed by a community-based water institution. However, this approach was more appropriate for small rural communities. This approach is yet to be tried by municipalities.

Collaborative/co-management water management between communities and mandated Government stakeholders presently has no legal, structural or process underpinning, but does happen on an ad hoc basis depending on personal interest, involvement and commitment of both government officials and community members and their institutions. There is a growing movement towards developing guidelines, procedures and case examples toward institutionalising these approaches.

The co-management process may be phased in with a co-management agreement being introduced until complete community ownership is achieved after, say, a five year period. The "Build, Operate, Train and Transfer" (BOTT) approach, introduced in South Africa in 1997, aimed to fast-track water and sanitation projects, particularly in former homeland areas, through public-private partnerships.

While it sought to improve efficiency and empower personnel, BOTT faced criticism for being expensive and overly centralized, weakening local government and non-profit organizations along the way. Despite criticisms, BOTT emphasized community participation, skills development, and job creation, aiming to establish community-based water institutions. However, the implementation of the Water Service Act of 1997 shifted ownership to municipalities, marginalizing community-based water institutions. Challenges included over-centralization and a private sector-driven nature, with civil society organizations and research institutions criticizing the approach.

Supported self-supply models are currently being seriously considered as a way of seeking co-management arrangements in rural areas. One of the biggest issues in supported self-supply schemes is the need for communities to collect money for maintaining and operating their schemes.

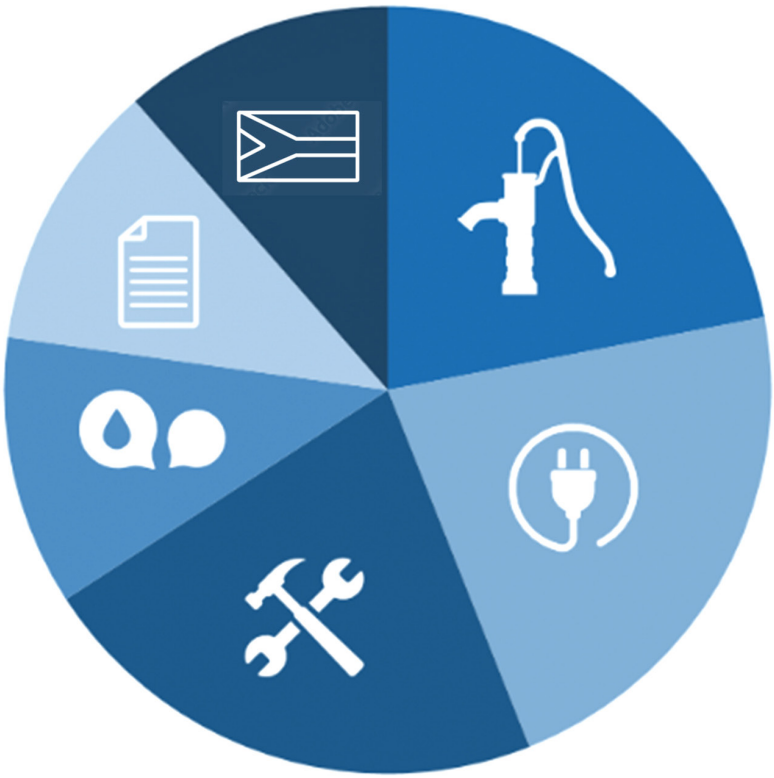
It is important to look at where the money comes from in these systems and how it is distributed as expenditure. This can help communities find ways to use money more effectively where it is needed most. When we talk about funds for small water supply systems, we should consider three main things:

- How much money comes from the fees people pay for water.

- How much money the government provides for building and running water systems.

- How much money comes from outside sources like aid or loans. We also need to think about whether small water systems make enough money to cover their costs or if they need help to keep running. We should also see if there are ways to get loans or other financial support for these systems.

LIFE-CYCLE COST OF DRINKING-WATER SERVICE DELIVERY



An illustration from the WHO Guidelines show what costs should be factored into a small supply system (WHO, 2024)

Life cycle costs are shown in the figure below and include the folloing.

Capital Expenditure:
Construction and Installation of infrastructure.

Operating and minor maintenance expenditure: Recurrent expenditure on staff, energy and materials needed for routine operations and maintenance.

Capital Maintenance Expenditure:
Renewal and rehabilitation costs.

Expenditure on direct support:
Ongoing support to water suppliers, e.g. the costs of surveillance, technical advice and training.

Expenditure on indirect support:
Costs of Government planning, policy-making and regulation.

Cost of Capital:
Cost of servicing capital, e.g. loan repayments.

THE ROLE OF COST RECOVERY IN SUSTAINABLE COMMUNITY WATER MANAGEMENT

Operation and Maintenance (O&M) of water supply systems is often perceived as a straightforward technical issue, but the reality in many villages reveals that it involves a complex interplay of organizational functions and competencies. Adequate O&M is not just about having the right technical skills or tools on hand; it is equally about securing the financial resources necessary to maintain these systems over time. Central to this challenge is the theme of cost recovery, which underpins the sustainability of water services in any community.

Persistent breakdowns in water supply systems highlight the critical need for a comprehensive approach to O&M, one that includes suitable human resources, access to necessary tools and spare parts, reliable transportation, effective reporting mechanisms, and robust accountability frameworks. However, all these elements are dependent on one crucial factor: regular and assured funding. Without a steady stream of financial resources, even the most well-designed technical and operational procedures will falter.

O&M involves regular tasks such as replacing worn parts, refueling, servicing, cleaning, and monitoring, as well as addressing irregular issues like breakages, outages, and malfunctions. The long-term success of these activities hinges on having skilled and motivated personnel, but also on the financial and political viability of the institutional and organizational systems that support them. In this context, cost recovery is not just a financial mechanism; it is the foundation upon which the entire O&M process rests.

The quality of O&M is determined by several factors, including the expertise of staff, the availability of dedicated O&M funds, and the accuracy of records and data analysis. However, without effective cost recovery strategies, the availability of these funds is not guaranteed. This raises important questions about how communities can engage in the financial aspects of O&M, ensuring that they have the resources needed to sustain their water systems.

In many communities, there is an assumption—by both local beneficiaries and water service providers—that communities can handle day-to-day O&M tasks.

Indeed, community members often demonstrate their ability to carry out simple, low-cost maintenance activities, such as replacing leaking taps, fixing pipe leaks, and managing water distribution by operating pumps and valves. These activities, though essential, are often funded informally, with little consideration for the long-term financial sustainability of the systems they support.

The challenge becomes more pronounced when technical faults occur, such as pump malfunctions or issues with electrical or fuel supply systems. In these cases, communities often struggle due to a lack of technical expertise and, more critically, insufficient financial resources to procure the necessary parts or services. Building strong relationships with technical and institutional partners is important, but these relationships must be underpinned by a clear and sustainable financial plan that includes cost recovery mechanisms.

The principle that underpins successful community water management is that all members must be engaged, not just in the technical aspects of O&M, but also in the financial planning and cost recovery processes. This includes understanding the costs associated with water service delivery, participating in the setting of tariffs or fees, and ensuring that funds are collected and allocated appropriately. These activities fall under the broader umbrella of corrective maintenance and are typically demand-driven, addressing issues as they arise. However, for truly sustainable water management, preventative maintenance - supported by proactive financial planning and collaboration among all stakeholders—is essential.

In conclusion, community water management is not just about technical solutions; it is fundamentally about financial sustainability. Cost recovery is the linchpin that ensures that water systems can be maintained over the long term. By integrating cost recovery strategies into the O&M framework, communities can better manage their water resources, ensuring reliable access to water services for all members

PAYMENT FOR SERVICES IN MAYEPHU VILLAGE

Discussions were held at Mayephu village with the intention of exploring options for payments by community members for operation and maintenance of their system.

The community is aware that in towns people pay for water access. They claimed that they will struggle to pay in these villages as people are unemployed and survive primarily off social grants, which is not enough for all their needs, as these grants also have to provide for their farming activities. Participants did mention that they could collect and contribute on an ad hoc basis for maintenance of the system, with items such as taps, pipes, valves and broken pumps.

In the past they paid R5/month/household to the 'municipality' for diesel for the borehole pumps. At that time, not all the households were paying, but those who did not were not allowed water allocations for funerals. Despite the financial contributions, maintenance of the system was not undertaken well by the Municipality as there were leaks and breakages that went unattended for long periods of time.

They were not open to discussing options of using stokvels and savings groups as vehicles for payment for water services and believe that the system set up through the water committee and traditional council should be adequate for payments.

The group felt that it is the community's responsibility to look after the infrastructure and do day-to-day management and maintenance. They admitted however that people in the community don't really take responsibility for this. They felt that those with 'illegal' yard connections should at the very least ensure that their pipes do not leak, as this wastes a lot of water.

GUIDING PRINCIPLES FOR COMMUNITY INVOLVEMENT IN WATER MANAGEMENT

Community involvement is pivotal for successful and sustainable water management. To ensure active engagement and empowerment of community members, consider these guiding principles:

Participation in All Phases
Engage community members not only in feasibility and assessment but also in the design and implementation stages of water projects. Their involvement should extend to operation and maintenance to foster a sense of ownership.

Negotiation and Responsibility
Communities should be able to negotiate all aspects of water schemes, taking responsibility for their operation and management. Empower them to make informed decisions.

Informed Decision-Making
Provide communities with the necessary information to make rational decisions about water use and management. Accessible information forms the foundation for responsible choices.

Broad Community Engagement
Involve a wide spectrum of community members beyond committees and operators throughout all project stages. Ensure representation from various groups, including traditional authorities, local government representatives, and vulnerable populations.

Respect and Interrogate Governance
Acknowledge and respect local governance systems, but also assess their equity in providing water access within the community. Address any disparities and work towards fairness.

Transparent Communication
Maintain transparent communication throughout the project lifecycle. Explain changes, challenges, and difficulties as they arise. Transparency builds trust, rapport, and accountability among stakeholders.

Monitoring and Reporting
Establish ongoing monitoring mechanisms, especially for borehole schemes. Provide scheme operators with dip meters and a reporting system. This ensures efficient decision-making regarding water use and remedial actions.

Catchment Management
Recognize the increasing demand for water alongside decreasing environmental water supply capacity. Prioritize catchment and recharge area management. Consider rangeland and livestock management as critical factors.

Effective community involvement in water management not only enhances the sustainability of water projects but also empowers communities to take charge of their water resources. These principles serve as a foundation for successful and equitable water management initiatives.

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