Water Supply System.

Onen David.

Africa Institute for Project Management Studies.

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Abstract

Community-based management (CBM) has proven to be an enduring strategy for operationalizing mainstream participatory development in rural water supply projects and programmes in sub-Saharan Africa. This participatory agenda took hold in the 1980s, the first UN “water decade” in the face of general disillusionment with top-down and supply driven approaches. The drive towards public participation and decision making ta local levels was echoed more broadly in agenda 21, a core output of the 1992 “Earth Summit” in Rio de Janeiro. As a result of these development, the CBM model became a central a tenet of major policy and practitioner discourses on rural water supply especially given the potential of this approach for improving participation and water governance in rural vulnerable communities in Africa.

Keywords: community management, community participation, water technologies and cost effectiveness.

# Why is community based managed essential in management of water resource?

A community is a group of people living within the same geographical area sharing common resources and comprising of different categories of people with common but also different needs and interests.

A community based management system is a system whereby the community takes overall responsibility for the management of the installed water facility and the district and sub-county levels are responsible for providing backup support to the communities. Community based management is essential because of the reasons highlighted below.

Ownership. Community based management promotes the sense of ownership among the community members since most of the interventions and the major decisions are made by them.

Sustainability. Community based management promotes sustainability of projects since the users are the ones managing the projects and are always compelled to work hard towards the maintenance of the projects because in case of failure of the project they will be the ones suffering.

Appropriateness and effectiveness of interventions. . Community based management ensures that interventions are made according to the community wants and this enable easy implementation of interventions since the interventions were made by them.

Control of their own lives. Community based management decreases dependency and increases self-reliance among the community members since they are the ones in control of their affairs.

Skills. Community based management enables community members to develop skills like leadership skill, technical skill and evaluation skill which further promotes self-reliance hence promoting sustainability even with minimum support from outside.

Platform for airing out their concerns. Community based management provides the community with the opportunity to air out their concerns and generate solutions.

Dignity and self-esteem. Community based management creates opportunities for people to solve their own problems and can lead to the growing of self-esteem.

Cost effectiveness. Community based management is cost effective since it mainly uses the local resources and the supporting agencies does not need very workers since the community can volunteer or provide low-cost labor.

## With examples, discuss the difference between community management and community participation.

Community management means the community exercise full responsibility for decision making and control over the development of its own resources to ensure sustainability.

Community participation means the involvement of the community members in projects to solve their own problems. The members are involved but they do not have full control over the management of the projects.

In community management, the community has legitimate authority and effective control over management of the water supply system and over the use of water while in community participation the community members are involved at various stages like planning, implementation and evaluation but the final decision and effective control is done by the agencies running the projects.

In community management, the community commits people and raises money towards the implementation and upkeep of the water system while in community participation the most of the money for implementation and maintenance is provided by the agencies.

In community management, supporting agencies provide advice and technical support but all key decisions are made by the community while in community participation supporting agencies provide advice and technical support and make all the decisions.

Community management is people centered and its success depends on the user community but community participation is not user centered and its success depends on the agencies.

In community management, the community is responsible for resource allocation, planning, implementation and evaluation while in community participation the allocation of resources, planning, implementation and evaluation is done by the supporting agencies.

In community management, the leadership of the water supply system is selected by the community members while in community participation the leadership is selected by the agencies with or without consulting the community members.

### Give five maintenance problems and difficulties. How can you overcome maintenance difficulties in water supply system management?

Inadequate skilled workforce. The number of skilled workforce to run the projects are few making the project overwhelming to the few available.

Leakage and wastage of water from reservoirs, transmission main, distribution system. This makes the intended users not to get the expected amount of water.

Limitation on funds available to run the project. This makes the project to be inefficient and the resources available will not be adequate.

Contamination from latrines, garbage collection points, industries, animal remains and domestic wastes.

Gender inequality in water point committees with the involvement of men mainly for financial gain.

Illegal connections, meter tampering and meter bypasses. This affect the money collection which is meant for the maintenance of the system.

Lack of spare parts for the repair of the broken down system parts. This makes some systems to be abandoned.

The ad hoc nature of each household’s contributions. This affects the running of the system.

The maintenance difficulties in water supply system can be overcome through the following ways.

Carrying out training and capacity building activities to improve on the number of the skilled workforce for the effective running of the system.

Forming leak detection specialist group who checks pipes on regular basis to avoid wastage as a result of leakages in the system.

Advocating for increased funding of water agencies by the financial institutions and governments.

Encouraging women to get involved in water management committees and take up financial role. Women are known to be trusted with money and since they are the primary users of water they will manage the system very well.

Pit latrines and soakways are at least 30 meters away from the groundwater sources and the bottom of any latrine is at least 1.5 meters above water table and drainage must not run towards any surfacewater source or shallow groundwater source to avoid contamination.

Sensitization of the users about the importance of contributions towards the maintenance of the supply system.

#### What are water technologies available in your area? Explain five.

**Rainwater harvesting**. Rainwater harvesting refers to the collection and storage of rainwater for future use. A rainwater harvesting system consists of three main components;

* The catchment surface where rainwater is collected. It should be firm, clean and free from potentially harmful bacteria. The surface mainly used is roofs (corrugated sheets or tiles).
* The collection/delivery system for transporting the water from the catchment to the storage reservoir.
* The storage facility where the water is stored for future use especially during dry seasons. The common storage is tanks which are of different types.

**Spring protection**. A spring occurs naturally where the groundwater table intersects the ground surface and they are mainly occur in steep valleys where the groundwater table is near the surface. Unprotected springs are usually exposed to contamination from runoff and human activities. Spring protection is one of the cheapest technologies of water supplies and it involves four critical components;

* Spring development carrying out to clear out the sediments accumulated around the spring ‘eyes’. This normally improves the spring flow and remove the unstable soil around the spring ‘eyes’.
* Capping the spring involves constructing a water tight enclose with an outlet around the spring eye to prevent contaminated surfacewater from mixing with the spring water.
* Constructing a retaining wall to hold back the soil and backflow around the spring eye to prevent soil collapse and erosion that would encourage flooding around the spring eye.
* Constructing drainage channels to divert runoff away from the immediate area upstream of the spring and carry away wastewater into the natural drainage channels.

**Shallow wells**. In Uganda, shallow wells refers to water wells constructed to a depth of up to 30 meters to abstract shallow groundwater. Shallow wells are usually located in valleys where groundwater table is near the surface. There are two broad types of shallow wells, hand-dug wells and tube wells. Hand-dug wells are drilled manually using hands usually wider and can be enclosed with a pump of left open and water is pulled by a pulley system using a bucket. Tube wells are drilled using light machines and the hole is line with a plastic pipe.

**Deep borehole construction**. Deep boreholes are similar to the tube wells but are usually to depths ranging from 30 to 120 meters and 20 centimeters diameter thereby tapping into deep and more reliable groundwater body. Boreholes are drilled using heavy duty rigs that can easily drill through consolidated rock formation. The wells are lined with plastic castings backfilled with gravel pack and cement grout and are usually installed with hand pumps.

**Piped water supply**. Piped water supply basically refers to the piping of water from the source to large number of consumers settled in wide areas often far away from the source. There are two main types of piped water supply, gravity flow scheme (GFC) and pumped scheme (PS). For GFC, the water source is uphill from the target population and water flows by gravity through the pipe networks to the various distribution points near the consumers. PS normally draw water from any source using solar power, wind power or mechanical power but the water is pumped up into a reservoir tank located above the target population then flow by gravity to the distribution points near the consumers. The key components of piped water supply are;

* The intake works at the source which can be protected spring, deep borehole.
* Water treatment plant to improve water quality.
* Pumping main (for the pumped supply) or supply main (for the gravity flow system).
* Storage or service reservoir supplying the distribution networks.
* Distribution pipe networks.
* Break pressure tanks (BPTs) especially in hilly areas where the water pressure is higher than the pressure rating of the piped used.
* Tap stands.

##### **How do you ensure cost effectiveness in supply of water?**

Through community management. Ensuring that community members are managers of their own water systems. When the community is involved at every stage from planning to operation and maintenance and thus has a real sense of ownership of the system from the onset, many costs are minimized or eliminated. Cost saving can be direct such as when the community provides volunteers of low-cost labor during construction or contributes locally available resources.

Through capacity building. Long-term cost reduction and sustainability can only be achieved if capacity for delivery of these services is enhanced through training, planning and organization. Capacity building should ideally be carried out at the community, technical and managerial levels.

Through encouraging participation of women. Women are the primary stakeholders in the area of domestic water supply. If women are fully involved at all stages of project implementation, the risk of cost errors in system design will be minimized. In addition, the active participation of women in community management bodies will ensure that these bodies are effective and therefore cost efficient.

Correct choice of drilling equipment, drilling areas and drilling rigs can reduce the overall cost. Selection of the right equipment depends on the geological conditions and anticipated drilling depths. Proper surveys prior to drilling can contribute significantly to cost reduction since there will minimum cases of the source drying up or breakages.

Through using the locally available materials. Use of the locally produced materials including spare parts promotes cost effectiveness since the materials are available within the country and import cost eliminated.

Through convergence of resources. Consolidation of several small drilling projects into one larger project leading to reduction of overheads and the cost of logistical support.

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