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1. **Why is community based managed essential in management of water resource?**

The community based managed essential in management of water supply resource because integrated water management can only be possible if the community is empowered through decentralization and is free to make decisions on their natural resource management.

**The following are the four main important resources on the community management of water supply:**

1. land,

2. water,

3. livestock

4. And forest which form the village ecosystem. Without a balanced

Management of all of these four basic resources, the development process

Cannot be sustainable. The development programmers must be built

around a sound land-water-forest-livestock oriented model with decision

making at the micro level.

Rural water supply should not be treated as a mere service delivery process but as a step towards household water security. Water security requires household, community and national actions to protect and preserve water sources, to use water as a scarce resource and to ensure its equitable supply. Investment in the capacity building of the community in planning, development, implementation and maintenance of the water supply project is one of the first steps toward sustainable development. To analyze the complete socioeconomic impact of a water supply, sanitation and hygiene project, the full impact should be taken into consideration. They include less disease, better education for children (particularly girls), better nutrition for mothers and children, time energy saving for women and secure livelihoods. To achieve maximum impact through water and sanitation interventions in rural communities there is a need for multilevel and intersectional actions.

The UNICEF conceptual model for water and environmental sanitation identifies the conditions that have a bearing on achieving the desired outcome at three levels---structural, underlying and immediate. The structural conditions relate to natural, human and economic resources. In order to influence underlying conditions, it is necessary to have social and gender equity in the availability, access and control of these potential resources. The resources need to be organized to cultivate an empowering environment by promoting and supporting self-motivation, building skills, communicating knowledge and aligning social service systems.

The only way the goal of sustainable development can be achieved especially in fragile

Eco regions is through deepening democratic values and participation at the grassroots level.

Institutional decentralization along with empowerment will ensure the

survival base of the rural economy and will promote growth.

1. **With examples, discuss the difference between Community management and Community Participation**

1- **Community management**:

In our own context as South Sudanese, Community management or common-pool resource management is the management of a common resource or issue by a community through the collective action of volunteers and stakeholders. The resource managed can be either material or informational. **Examples include the management of common grazing and water rights; fisheries and open-**source software. In the case of physical resources, community management strategies are frequently employed to avoid the tragedy of the commons and to encourage sustainability.

Whereas,

**2-Community participation** is a process by which a community mobilizes its resources, initiates and takes responsibility for its own development activities and share in decision making for and implementation of all other development programmes for the overall improvement of theirs health status.

Therefore community participation arose as a concept in the mid-1960s and it was not adopted by the **International Drinking Water Supply and Sanitation Decade** **(**IDWSSD) until the mid-eighties after it became apparent that governments and donors could no longer afford totally to centralized operation and maintenance systems for water and sanitation.

Planners began to realize that in order to share the responsibilities for maintenance, beneficiaries or users would have to be involved in some way in the on-going maintenance of their own community systems.

It is now realized that if communities are expected to take responsibility for maintenance, they must also be involved in planning and implementation of projects from the initial stages. They must develop a sense of "ownership" and understand that maintenance is essential, and is a community responsibility.

Communities should be perceived as informed consumers, clients and managers, capable of making choices as to the type of services they have the capacity to provide rather than passive receivers. Communities must also acquire management and organization skills with leadership capable of defining tasks and managing facilities. It should be recognized that many communities may already have considerable management and organizational skills.

Central agencies responsible for water and sanitation must change from "benefactors" who make all the decisions to "facilitators" who enable communities to make their own decisions. Agencies must learn to be responsive to consumer-client demands.

Self-help activities in the construction phase are often ambiguous, calling for analysis on a case by-case basis. Some projects mention voluntary labor and contributions in cash or kind as a cost saving element. This approach can increase local pride and commitment, offer training possibilities and stimulate proper use and maintenance. However some managers maintain that private contractors are more efficient as they avoid delay, increased costs, over-burdening the community and poor construction leading to frequent breakdowns. There is also a temptation for governments to expect too much from poor communities. Self-help should not be used as an excuse to avoid giving poor communities a fairer share of tax revenues.

**A discussion follows describing issues associated with each classification is on.**

**Consultation**

Consultation is a basic means of giving communities some voice, of involving them in decision-making. Its main rationale is to ensure that projects or programmed introduced by outside agencies are adapted to meet community needs as well as to avoid difficulties in implementation.

Consultation may involve: Consultation with community representatives or leaders only. Such consultation does not amount to real community participation unless the decisions formally made by representatives or leaders are the result of wide consultation and consensus within the community, and unless the community is involved in decision-making on significant aspects of the project and Consultation with all sections of the community. This involves ascertaining the view of those sections of the community which may normally be excluded from decision-making (women, certain ethnic minorities or low caste groups, the poorer sections), whose interest may not be genuinely represented in the existing Processes of decision-making in the community. The rationale is to ensure that projects meet their needs also. This is not always easy, and there are differing views on how important broad involvement is.

A Financial Contribution by the Community

Cash collection made by and within the community, generally prior to or at the time of implementation of a project, usually as a contribution to capital construction.

Excluded, as not really constituting community participation, are cases which amount to a payment by individual families for service, even when it is an advance payment.

**And community management consists of three basic components**:

o Responsibility: the community takes on the ownership of and attendant obligations to the system.

o Authority: the community has the legitimate right to make decisions regarding the system on behalf of the users.

o Control: the community is able to carry out and determine the outcome of its decisions." An emphasis should be placed upon establishing good communications

between professionals and communities facilitating closer dialogue and partnership, helping governments to move from being providers to becoming promoters and facilitators.

 According to Mc Common et al., important preconditions for community management are likely to include the following:

o "there must be community demand for an improved system;

o the information required to make informed decisions must be available to the community;

o Technologies and levels of service must be commensurate with the community's needs and capacity to finance, manage, and maintain them;

o the community must understand its options and be willing to take responsibility for the system;

o the community must be willing to invest in capital and recurrent costs;

o the community must be empowered to make decisions to control the system;

o they should have the institutional capacity to manage the development and operation of the system;

o the community should have the human resources to run these institutions;

o there should be a policy framework to permit and support community management;

o Effective external support services must be available from governments, donors, and the private sector (training, technical advice, credit, construction, contractors, etc.)." The benefits of community management should include the following (Mc Common et al., 1990):

Short term improvements in system performance such as greater use of water and sanitation facilities, adoption of improved hygiene practices, and greater community support for system maintenance;

Changes in support conditions: long term improvements in available resources and complementary investments;

Long term impacts: anticipated health, social well-being, economic and environmental quality changes.

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

The five maintenance problems and its difficulties in the water supply system management are as follows:

 Lack of entrepreneurs to bring spare parts and tools in order for the community to buy them for their maintenance and sustenance of the facility to run for a long term period.

 Some of the communities are far away from town; therefore they are not able to contribute money but make collection in form of in-kind and transport them to main or small town near them for sell in order to get money to buy spare parts to their water facility.

 Lack of unspecialized hand pump mechanic to fixed borehole that are broken down

 In-active contribution of water user groups led to poor maintenance or management of the facility.

 Poor infrastructure: Some of the roads are in accessible especially during rainy season.

The problem or difficulties mentioned above should be address or overcome in the following ways:

 Assistant water commissioners in the county has to engage directorate of water, hygiene and sanitation in the department of water hygiene and sanitation in the State to look for partners and private companies to buy spare parts and tools and bring them to the respective communities that are in needs so that they can buy for their facilities for long term management and sustainability.

 Directorate of water, hygiene and sanitation has to engage technical expert engineer to train UN specialized hand pump mechanic so that they become expert when fixing borehole.

 Government and the community has to cooperate in to construct road: community will contribute in human labor and government to help in bring expert and payment in order to build local roads for easy transportation though during rainy season

 Communities that are not able to get money at their villages has to be engage by community support organization (CSOs) existing in their area so that they form their local groups and run small business, they can go and buy goods in main town and bring them at their sites for sell.

 Community that are not active in contribution of user fees to running water facilities has to be encourage by chiefs, Assistant water commissioners and CSOs existing in that area to pay monthly or quarterly contribution in order to run their borehole for long term services within their village and also encourage sense of ownership, that borehole or facility is belong to the community nor government or company which installed it

1. **What are Water technologies available in your area? Explain five.**

Water technologies available in our area are:

**Design Options**,

Water can be "produced" from different sources by various technical means.

The supplies can then be "delivered" to consumers in different ways. Whatever the technical solution adopted, the aim is to make adequate quantities of water, which safe for human consumption, reasonably accessible to all, is including especially, the underprivileged groups of society.

Decisions on the level of service to be provided - how, where and in what quantities water

Will be delivered to users - are crucial in the planning of any water supply project. System

***Design options are*:**

 Single Point systems, which usually consist of dug wells or small-diameter drilled wells from which water is drawn using a hand pump.

 Standpipes: piped distribution systems which feed a limited number of public taps, each of which serves all households - and other users - in the vicinity.

 Household Connections: piped systems which deliver water to taps in individual household compounds or homes.

 Sources of water

There are basically three categories of naturally occurring water resources: groundwater, Rainwater and surface water.

Groundwater occurs under most of the world's land surface, but there are great variations in the depths at which it is found, its mineral quality, the quantities present and the rates of infiltration (thus yield potential) and the nature of the ground above it (thus accessibility). In hilly areas it emerges from the ground in places as natural springs, otherwise wells have to be constructed and pumps or other lft mechanisms installed.

Rainwater collection, from roofs or larger catchment areas, can be utilized as a source of drinking water, particularly where there are no other safe water sources available (for example in areas where groundwater is polluted or too deep to economically tap).

In extreme situations, small quantities of water can be condensed from the atmosphere (as dew) on screens or similar devices.

Surface Water, in streams, lakes and ponds is readily available in many populated areas, but it is almost always polluted, often grossly so. It should only be used if there are no other safe sources of water available.

The amount and reliability of background data on water resources varies between countries. In many, a certain amount of additional surveying and exploration is necessary before projects can be planned in detail, especially where groundwater is concerned.

** Digging of well**.

In our area community are able to dig a well into 8 -10 meters in order to get water for drinking.

After well is dug, water flow and doll is use with long rope for pulling water for drinking, well last for long time but water remain un safe because the well is the open source, and when this water use without filtration or boiling it causes diarrhea and body itching.

 **Drilling of borehole**

Government should engages private company to drill hand pump so that people in the village can use it and it is safe when drinks, and the hand pump is management and protected by the community.

 Pulling water from well using doll.

A doll is the small drum which is open and put small piece of stick and tide with rope for pulling water underground and people use it for drinking,

 Boiling of water

 Digging hole in swampy area in dry season to get water from well and use it for domestic consumption.

 Use of sedimentary/filtration from unprotected source.

All projects start with a decision on the level of service to be provided: single point

Systems, standpipes or household connections

 In many situations there are three principal constraints affecting the implementation of a water system: water resource availability and quality, financial resources and technical and managerial skills of the community and the service providers.

* there are three basic categories of water sources: **groundwater, rainwater and surface water**
* Groundwater is the most commonly used source for water supply projects due to its general good quality and wide availability

**There are some principal methods for extracting groundwater:**

Sub-surface dams

Spring protection

hand-dug wells

hand-drilled bore wells

machine drilled bore wells

and Hand pumps are the most common and, in most cases, the only economically feasible water lifting device for community needs are:

the UNICEF guidelines for hand pump selection and standardization should be used by all country programmes involved in hand pump policy and technology

while other pumping systems such as diesel, petrol, electric, wind and solar powered pumps are available and appropriate in specific situations, hand pumps are generally an order of magnitude cheaper

water storage systems are required for most piped systems, all rainwater collection systems and on some single point systems

bacteria from human faeces are the most serious threat to water quality and are best eliminated by breaking the faecal-oral cycle through source protection, periodic disinfection, removal of contamination sources and, most importantly, through community education and mobilization

chemical contaminants such as iron, fluoride and dissolved salts are more widely affecting community water systems and must be minimized or eliminated through appropriate technologies and methodologies

Water quality monitoring should become a more important part of UNICEF water programmes, in the light of increasing pollution and contamination.

Community-based quality surveillance systems can help to empower communities with knowledge about the quality of their own systems.

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

**Effective cost of water supply can be ensuring:**

 By use of effective fence around water point for protection of the facility.

 Clean environment

 Hygiene education

 Social marketing of good hygiene practices

 Regulation of drinking safe water

 Monitoring of water quality

 Set of hardware and software of the facility.

Nevertheless One of the most common institutional arrangements is the three-tier system, originating in our area and used there and elsewhere, where:

o Hand pump caretakers, selected from among the villagers, are responsible for the general care and routine maintenance of the hand pumps in their own villages which is one of the practices we do in our area;

o Pump mechanics and mechanical engineer at the sub-district level regularly inspect all installations and make

 **Minor repairs as and when necessary;**

o Teams of more highly trained mechanics based at state/provincial level are called in for Major repair and replacement work; they are equipped with all the necessary tools and Machinery.

In some villages or area, it has been found that even a fairly general institutional

Framework like that of three-tier maintenance cannot be applied everywhere. The institutional

Arrangements should be made (or modified) on a case-by-case basis, as far as possible. The

Ultimate decision of the form of the maintenance system should be made by the community Itself. For example, even though the three-tier system is long established and widely

Implemented throughout the country, in some areas communities or districts are using different Systems those are more locally appropriate, such as combining the first two tiers and training

"Caretaker cum mechanics" instead of separate groups of caretakers and mechanics, or

Eliminating caretakers’ altogether and expanding the duties of the mechanic.

Training of personnel at all levels should include operation and maintenance. Technicians should be specifically trained in these techniques and selected community members trained to undertake specific tasks within their capabilities.

In some cases the government pays local-level pump mechanics and repair teams and subsidizes

Prices of spare parts which are made available at different levels; in other cases, communities have to pay.

Caretakers are remunerated by their communities which also pay for spare parts, Either out of communal funds (from regular payments by households) or by collecting money when necessary for repairs.

While project planners and government staff can provide training

And suggestions to the community in the area of managing the financial arrangements for maintenance, the final decision on the structure and details of the financial system used is best Left to the community itself.

Over-reliance on central government bodies should be avoided for managing individual on-site Projects and ongoing operation and maintenance of systems. The development of local Government and community capacity to operate and maintain the system and design the Institutional arrangements will help to ensure long system lifetimes.

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