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**QUESTION ONE**

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

Community-based management of water resources is a bottom up approach where communities become responsible in operation and maintenance of water resources. That is to say, they get involved in the initial stage of planning, budgeting and implementation of water resource projects which are supported by national government or donor agencies to achieved sustainable access to safe water and sanitation.

The importance of community based management of water resources include the following

1. As communities manage local water resources, they will increasingly have a stronger voice in influencing factors which affects the community's water balance.
2. Community based managed water resources are protected and conserved to ensure equitable access to safe water supply to all the beneficiary population.
3. The decentralization of the management of water resource to the community along capacity empowerment will ensure the survival base of the rural economy and will promote growth and economic development.
4. It also ensures that water resource projects introduced by external agencies are adapted to meet community needs as well as to avoid difficulties in implementation.
5. As communities manage their water resources, they become better able to manage their own affairs and hence contribute to positive change of mindset and attitude with regards to operation and maintenance of water systems and livelihood projects.
6. It improved access to clean drinking water and water for farming and livestock because access to clean water and sanitation is a fundamental need and human right which plays a vital role in improving health conditions and encouraging social and economic development of the society.
7. It also enables control over and the best use of water resources available within the community this is because water resources are scares due to the increase market and industrial demand for water to run manufacturing industries.
8. In the context of water resource management, community based managed projects enhance resilience and mitigate the impact of water resource related disasters in the population.
9. Moreover, community based managed water resources enable people in the community to become less vulnerable to emergencies and disasters.
10. Project that is managed by the community itself is much more cost effective in the long run than a "top down" project. When the community is involved at every stage from planning to operation and maintenance, it enhance a real sense of ownership of the system from the outset many costs are minimized.
11. The community may also provide the local knowledge necessary to avoid using water source that would be inappropriate for cultural reasons or identifying a water source such as a spring which may have been overlooked by outsiders.

**QUESTION TWO**

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

1. Community management is an approach seeking to make the best use of resources available within the community with support from government agencies, NGOs, the private sector, and other communities. The communities have the capability to control and influence the development of its development projects such as water resources whereas, Community participation is the active involvement of people from communities preparing for or reacting to the operation and maintenance of resources such as water and sanitation system.
2. In the context of water resource, community management takes into account the ownership of the water systems and the attendant obligations to the system on behalf of the users while community participation takes into account the direct involvement of the people in analysis, decision-making, planning and program implementation in all the activities.
3. Moreover, in case of disaster strike, community management has the legitimate right to make decisions regarding the disaster on behalf of the affected population whereas, participatory approach to disaster-related activities would involve the local people to make plans, avail resources and participate in reducing the risk of the disaster within the affected population.
4. In community management, consultation for new projects introduce by external agencies is done with a certain section of the community members which may be normally excluded from decision –making like women, certain ethnic minorities or the poor sections whose interest may not be genuinely represented in the process of decision –making in the community whereas, in community participation, consultation involves individuals in planning, decision-making process so as to ensure that the projects introduce by external agencies are adapted to meet community needs as well as to easy implementation process.
5. Community management has legitimate authority and effective control over management of the water supply systems and use of the water for example, community with funds raised internally pays for hiring of external expertise or professional staff on the other hand, where there is pressure for services to be provided to the community such as water facility, community would take the responsibility to provide local resources in order to ease the implementation.
6. In community management, the community commits people and raises money toward the implementation and maintenance of the water system. Whereas, in community participation, for operation and maintenance of water systems, people directly provide local materials not by buying goods and services from the external sources.
7. In community management, supporting agencies such as the National/ local government, NGOs and the private sector give advice, funds and technical support but all the key decisions are taken up with the community while through the element of community participation if there is an input from an external agency for example like Food-for-work projects, people may take part directly in implementation of the project which is paid in cash or kind
8. Community management is "people-centered" and its success depends on the user community and support agency that provide capacity-building to staff through training in order to acquire new skills to enhance their performance while on the other hand, community participatory approach enhance community active involvement in all aspects of programme development including situation analysis, development of strategies, monitoring, evaluation and being able to expect timely responses.
9. Also, during mass action for example draining of waste water, community participation is directly involve to improve environmental health condition of the area whereas, community management take into account authority to supervised mass actions activities on behalf of the community.
10. Besides, for cases where a community makes a collective decision to change customs or personal habits for example like hand washing with soap and water after visiting latrines; consumption of alcohol, community participation is involve through social pressure when an explicit decision is collectively taken unlike community management which enforce the actions as they have authority on behalf of the community.
11. A routine maintenance programme designed and implemented by the community itself will function much better than a system imposed from outside and will result in reduction in repair and replacement cost.

**QUESTION THREE**

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

Maintenance is the collection of activities required to keep the water system in proper conditions and to ensure continuous sustenance of water to the community or population.

a). Frequently encountered problems and difficulties with regards to operation and maintenance of the water supply system management include the following;

1. Lack of hand pump spare parts and tools in the local markets
2. Over pumping due to increased demand leading to breakage.
3. Pump failure due to power fluctuation
4. Poor water inflow due to poor installation of the water system.
5. Contamination due to a poor apron and slab designed by the contractors.

b) All water supply systems require some maintenance and repairs, that means, it need regular checking even when there are no problems of misuse. Thus, the above cited maintenance problems can be overcome as follows;

1. Lack of hand pump spare parts and tools in the local markets

This can be overcome through creating awareness to the local markets for the demand of water facilities spare part and tools to motivate private sector to supply water facilities spare parts. On the other hand, communities can be organized to form water user committees to mobilize resources from within the community for operation and maintenance of the facilities. This contribution can be cash or in-kind especially for the vulnerable groups.

1. Over pumping due to increased demand leading to frequent breakage of the hand pump

This problem is overcome through setting up of water system By-laws, for the use of water. Through the water user management committee, water user groups are sensitized on the proper usage of the hand pump and the underline penalty if one breaks the by-laws. The by-laws are enforced by stakeholders such as payam/village administrators, chiefs and the water management committees.

The water users are asked to queue up their water containers, serve by the principle of “first come, first to be served.”

1. Pump failure due to power fluctuation

The alternative solution is to adopt the use of solar powered pumps as for the case of South Sudan where sun shine is almost throughout the year to run the water system like water yard. Solar electricity is efficient and cost effective because it does not need fuel to run it but instead get energy from the sunlight.

1. Poor water inflow due to poor installation of the water system.

Issues of leakage caused by wrong installation of cylinder, couplings, worn out pipes or pipes not fix properly are repaired through engaging local hand pump mechanics. The local hand pump mechanics are trained and experience persons living in the community and are always available for hire in case there is a problem with the water system.

Through the water user committee- a body in charge of operation and maintenance of the water systems mobilizes resources from each household to pay for repair of the hand pump mechanics on behalf of the community. Also 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.

1. Contamination due to a poor apron designed by the contractors

This can be overcome through community sensitization on water source protection so that the community build a fence around the water source to keep it clean, and ensure that children do not play, people wash clothes or animals not watered on the hand pump.

Also the community can protect the apron by stones and soil embankment, regular cleaning, repair of cracked and broken concrete to avoid water contamination.

**QUESTION FOUR**

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

The technology used to produce water in our area or community depends on the occurrence of the water source (Ground, Rain or surface water), and they includes;

1. Single point systems, which usually consist of hand-, dug wells or small-diameter hand drilled wells from which water is drawn using a hand pump. This water system is efficient and cost effective since it does not require a highly skilled person to install the facility. unlike most bore wells, water can continue to be drawn from a hand-dug well even if the pump is broken or where a pump has never been installed
2. Machine drilled-hand pumps which draw ground water and consist of aprons from which waste water is drained away supplemented with cattle troughs for watering animals and small vegetable gardens in order to enhance their diet and boost household incomes.

The operation is done through hand pumping by the water users to cause outflow of the water for consumption. However, water yield depends on the depth and design, normally in the range of 600 to 1,500 liters per hour during constant us.

1. Solar powered water yards with elevated tanks which draw its water from the ground and the distribution system is through public taps intended to serve densely populated community especially in urban areas or municipal towns.
2. Rain water collection system, with this water system, individual or communities collect water through gutters to cisterns. These cisterns are large enough to serve a family or an institution like school as they are mad of different water storage capacities range of 100-5000litres.
3. Public piped systems fed by gravity flow draw water directly from surface water like river or lakes and undergo water chlorination before it is supplied to the communities for consumption through the use of taps. The water system however, is being used in poor urban areas because it involves some cost where people pay for the use of water.

**QUESTION FIVE**

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

1. Through effective Community Management of water supply systems

Engagement of the Community itself is much more cost effective in the long run than a "top down" project management. That is to say, when the community is involved at every stage from planning to operation and maintenance there is a real sense of ownership of the system from the outset because many costs are minimized or eliminated.

For example, when the community is involved in the planning stage of the project, it may provide the local knowledge necessary to avoid using a water source that would be inappropriate for cultural reasons or identifying a water source such as a spring which may have been overlooked by outsiders.

Cost savings through community management are often significant in the area of operation and maintenance for instance; a community can provides volunteer or low-cost labor during construction or contributes locally available materials for construction of the water system. Hence the community itself will function much better than a system imposed from outside and will result in a reduction in repair and replacement costs.

ii. Participation of women in water system.

In areas of domestic water supply systems, women are the primary stakeholders since there are responsible for all issues of water at household levels and could influence decisions regarding communal water supplies.

More so, if women are fully involved at all stages of project implementation in community management bodies, the risk of costly errors in system design will be minimized. This will ensure that these bodies are effective, and therefore cost efficient.

1. Systems Management control

In this context, if output is increase using the available manpower resources, it could contribute to both an increase in the number of water facilities and the unit cost of a water point is significantly reduce. Also the coordination between the donor agencies through their resources in the provision of rural water and the community management body can contribute to reduction of the cost for water hence ensure effectiveness of the system management cost

1. Strengthening and capacity building of communities.

To achieve a long-term cost reduction and sustainability in water system operation and maintenance, National government or agencies working in the water sector, should provide training, planning and organization capacity building of communities so that they are able to manage maintenance of their water systems. This will reduce the overhead cost of administration and hence better services provided at a lower cost to the communities.

1. Community Management and Participation in water projects.

Communities should be empowered by National governments to manage their own water supply systems as a means of reducing long-terms costs. During projects designs, community participation should be encourage from the initial need assessment process to the implementation to ensure sustainability and reduction of maintenance cost since there will no recruitment of external expatriates to manage the maintenance but the community.

1. Choosing correct and cost effective drilling equipment

Agencies working in water sector government of private should choose correct and cost effective drilling equipment, drilling area to minimize the overall cost of operation. Selection of the right equipment depends on the geological conditions and anticipated drilling depths including proper surveys prior to drilling can significantly reduce the cost of establishing the system.

Equipment selection should be based on the diameter of the wells to be drilled and the average depth to be drilled, the geological formation to be drilled and the accessibility of the drilling sites. For wider coverage smaller rigs should be used with larger rigs for drilling in certain areas only to make it cost effective.

1. Improvements in technical and engineering design.

To lower the cost of establishment and maintenance of a water facility, the target yield in the water facility design should be only that required by the hand pump to be installed, which is usually in the range 750 to 1,000 liters an hour. Increasing the yield more than the cited ranges say 3000 liters just in case could increase the cost and drain more resources especially for project drilling large number of hand pumps.

Doubling the diameter of a well, or increasing its depth will substantially increase the costs. In most situations, the diameter of the well is the sole function of the hand pump to be installed (100mm to 125mm diameter bore well is sufficient for most hand pumps). The depth range of the wells should be defined by scientific investigations and proper surveys in accordance with the design yield to ensure cost effectiveness.

1. Reduction of Tariff on imported water system equipment or spare parts

As for the case of south Sudan which does not produce water system equipment or spare parts, the government should substantially reduce or eliminates tariffs on imported water system spare tools. This will minimize the cost of operation and maintenance by the community or any agency working on water system development.

1. Local Production of Materials and Spare Parts

To ensure cost effectiveness of water system materials and spare parts, government should encourage the private sector to produce materials and spare parts locally so that, the cost of importation and transportation is reduce. If spare parts are available locally, communities can easily access them at a low cost and since there will be no cost incurred in importation.

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