

## **Introduction**

When a community has shown motivation to want to pay a 10% contribution towards a new water supply, it is appropriate to present options, so that individuals can choose a water supply that is among other things, appropriate in terms of cost, access, privacy, use, personal circumstances, operation and maintenance.

## **Water Use**

Choosing a water supply depends critically upon what the water is used for. There are four types of water use that the EU-RWSSP will support in a project; 1<sup>st</sup> is for water, 2<sup>nd</sup>, 3<sup>rd</sup>, & 4<sup>th</sup> for sanitation;

1. Drinking and cooking
2. Washing utensils and pots
3. Bathing
4. Laundry

Although water is used for livestock and gardening, this is not subsidised.

## **Water Sources**

The water can come from three sources; groundwater, surface water and/or rain. It is up to the community to decide how best to utilise these resources and apply an appropriate technical solution to supply the water to the community for different uses (mentioned above).

## **Water Supply**

Exploiting the water source can be done in three or four ways with several different combinations of appropriate technical solution.

Groundwater can be exploited by drilling or digging a borehole or shallow well, combined with either a hand pump or bucket and rope. Using a hand pump will possibly produce the best quality drinking water, and usually has sufficient quantity to provide for all water uses. A bucket and rope however, will cause contamination, compromising the quality, but is still very effective for sanitation.

Depending on specific conditions, surface water can be exploited as if it were groundwater, by locating an infiltration gallery and well, close to the source. An open source can also be developed into a gravity fed system, possibly combining a

hydraulic ram pump. Gravity fed systems will produce good quality drinking water only if a spring catchment has been properly constructed. The water points from a GFS can be sited at household clusters and can be later developed into individual household supplies.

Rain can be collected from roofs and channelled into reservoirs. If a down-pipe is used as a first flush, the quality of the water is less compromised. There is very little chance of supplying the water needs for all uses with rain catchment, and other water supply options need to be presented to communities for washing, bathing and laundry.

## **Guidelines**

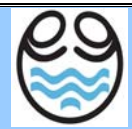
Proposed water supplies are public water points initially, for possible development later on to household level. There are general guidelines which can be adhered to for design and specification. Standards are indicative:

- 50 users / GFS or RC tank water point for drinking and cooking
- 200 users / Hand pump or rope and bucket
- 250 users / laundry facility
- 250 users / bathing facility
- 3 – 5 litres drinking & cooking water / person / day
- 25 - 30 litres sanitation use / person / day
- Maximum 100 - 200m distance of user from water point
- 0 coliforms and traces of e-coli, and <1 NTU / water sample

## **Presenting Water Supply Options**

Field workers, including engineers, should not make decisions on behalf of the community for the choice of water supply. Even limited options are presented. The field worker, presents options so that an informed end-user can decide on the preferred water supply. The standards and guidelines (above), may dictate to the field worker the amount of materials to be subsidised, but key decisions relating to access, privacy, maintenance, etc must come from community consensus.

Example; a community with an expected 1000 population has no open sources of water for 20km. It is a coastal area and a gravity fed system is not an option. Therefore, the only available options to be presented are 20 rain catchment tanks of 1000g each including 637m<sup>2</sup> corrugated sheeting



and structural materials for drinking and cooking and 10 shallow wells with hand pump for other water uses. At four of the wells, laundry facilities can be constructed, and at four of the wells, bathing facilities can be constructed. The costs of all of these will have been built into the original cost estimate presented as a budget with the proposal. The community is presented with the quotation and specification of the materials.

After some discussion the community decides that due to local needs and traditions, the corrugated sheeting materials can be reduced from the specifications by as much as half, because an existing community primary school roof will be used for rain catchment with four 2000g, each with two taps, and six other 2000g tanks will be located throughout the village, each with two taps, adjacent to the new rain catchment structures and these will become new clan meeting areas. The community decides that the savings made from reductions in the original specification will be spent on extra bathing and laundry facilities at the agreed ten wells. It is further agreed that only five hand pumps will be installed in the deepest wells to use as back up drinking water in the event of drought, and the remaining will be with rope and bucket. The further reductions made from the reduced expenditure on hand pumps will be spent on one additional tank and tap-stand with bathing and laundry facilities for the aid post. The community decision falls slightly outside of the guidelines, and adds K1,500 to the quotation. They agree to pay the extra money themselves.

### **Materials**

It is possible to construct new water supplies from a mixture of bush materials and fabricated materials from the local hardware supplier. The decision should be based on quality versus recurring maintenance. Keeping the costs down will allow a larger quantity of materials to be included in the design, but will mean more frequent maintenance activities. However, it is critical that some materials are the best materials available. for example, in gravity fed systems poly-pipes class 12, poly pipe connectors class 16, and generally all fittings should be of the highest quality standard. Reservoir tanks can be the monier or the tuffa upto 4000g, and under strict supervision tanks can be made of ferro-cement. The southern cross is usually the only available supplier above 4000g, however, under more strict supervision,

larger ferro-cement tanks can be constructed. PVC pipes can be used for guttering, but can be bought as pipe lengths and split through the length into two pieces. These types of savings can be used towards more specific water supply needs identified by the community.

Example 2; a community is informed and understands that the water supply consisting of 20 water points is a maximum that the donor will subsidise. The community contributes 10%, then contributes an extra K10,000 to buy and construct a further three or four water points.

### **Operation & Maintenance**

Presented options, must include the expected monthly or seasonal maintenance costs, and give an approximate schedule of activities. The community must understand that choosing specific option, incorporates deciding who is available to commit regularly to maintenance. It must be stipulated as part of the information that the NSA and the EU will not be responsible for future maintenance.

### **Concluding Comments**

Community development officers, health workers and engineers need to re-assess their role in their respective profession or sectors before embarking upon water and sanitation projects. Engineers are not employed to design and build. This is the job of the community. Engineers are facilitators of the design, and supervisors of the construction. The engineer's must facilitate discussion around options, feasibility and cost implications. Technical skills and knowledge will allow the engineer to consider if and how the ideas of the community can be incorporated as much as possible into the design, specifically location of water points, types of water use facilities, specific gender inclusion into decision-making, specific facilities for the vulnerable, etc

A thousand inputs from the community will produce a more appropriate design, than one single design by an 'outsider' engineer.



This programme is funded by the European Union