



Earth dam wells in Southern Sudan

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THE USE OF high imported technology for water supply and sanitation has proved unsustainable. Especially in poorer communities like South - Sudan where per capita income is US \$150 per year compared to US \$320 for the entire country in 1976 measurements. In big towns like Juba and Yei, the few available water taps are always dry. Besides, not enough funds are available for drilling more boreholes as an alternative for the scattered southern population of 6 million on 650,000 km² area. Leave alone lack of hard currency required for spare parts and setting up maintenance workshops. In areas with low water tables, the efficiency of such water pumps is greatly reduced, due to poor recharge especially in dry months of January-March. While in water table areas, there is also risk of surface water contamination. Earth dam wells could be an alternative to these constraints. As the name suggests, it consists of earth dam built across a valley to retain water during the rainy season. Adjacent to it is constructed a shallow well equipped with a built-in slow sand water filter, drawing water directly from the dam reservoir through a pipe.

Construction

Earth dam wells can provide sustainable water supply due to their huge storage ability. While the filter system ensures safe drinking water. The design can be altered to suit a particular size of community and local site. Slow sand filtration has been clearly demonstrated capable of complete removal of Giardia Cyst (the most resistant) after schmutzdecke ripening in 6 hours to about 30 days with suitable filtration rate (William et-al. 1985).

In addition it has the advantages of requiring little labour, little skill in operation, no chemical addition and relatively low capital outlay. The minimum effective layer of sand required is 0.5m. However, its control system needs further investigation. One simple technique is to provide hose pipe near the reservoir.

When no filtration is required as in the case of maintenance, the hose pipe is pulled up right with a rope thus stopping water flow into the filter box.

Although these combination of techniques are still more theoretical, experience gained in the field of each component by the author and many others strongly suggest that earth dam wells can be a sustainable water supply alternative. Its success depends mainly on availability of labour and suitable site. However, its technology used and materials are usually cheap and local e.g. clay, sand bricks, stones, wood etc. The communities

participating right from the beginning in the planning and construction of the project learn many things about improving their lives including knowledge of how to maintain and repair their water source as trained by the water technicians on site during the construction period. For instance in Dimo Area in Yei district where the author worked, it took about three months to convince and organize them to construct a well on self-help basis. But when the spirit was ripen, it took only one month for seventeen families to finish the work. They handed it over to the victorious community in a big meeting and feasting celebrating their own achievements. "The pride we have nobody can give nor take it away from us", they said, referring to the local politicians who have been promising them bore-holes during elections but disappeared only to return seeking another term of office. The elements of sound planning at the site is the sole responsibility of the technicians for success of this kind to occur.

Side benefits

Another important lesson learnt was that of a nearby community which managed to drain a swampy area separating their area from the main administrative and trading centre at Dimo.

They put logs of trees as bridge for cars to pass through. Another community at Kotetnamanyang also succeeded to construct 10km feeder road which involved laborious cutting of trees and removal of stones.

One major break through was that of a 25km road linking the whole of Dimo area directly with the main district headquarters Yei. All these were done on self-help basis after attaining special backing from the local chiefs, churches, schools, local traders and other influencing people of the area. The technical assistance and imported materials was provided by ACROSS; a UNHCR Ugandan refugees implementing agency in Sudan 1983/88. By the time I left, a total of eight wells had been constructed in the area in a relatively shorter time than in other places.

The cheerful communities were planing to build more wells, roads, schools, churches and health centres including markets, after they have been organized into the respective committees including women.

In 1986, the ACROSS water engineer started an earth dam well project in a Ugandan refugees camp at Adio in Yei. Unfortunately work could not continue because the refugees were planning to return home and there wasn't enough Sudanese labour.

However several earth dam ponds have successfully been constructed jointly by the refugees and local people in Tore and Rubeke camps.

These were mainly meant for fish production. The war has frustrated these primary initiatives. The technical assistance for these projects were provided by other implementing agencies. From these experiences, it can be argued that the construction of earth dam wells, and their subsequent maintenance and sustainability is feasible in South Sudan. Experience also shows that one way donors can evaluate the effectiveness of their aid dollar to poorer communities is by measuring the number of side projects initiated and achieved voluntarily by the near by communities as attributed to the impact of the main project supported in the area. Besides improvement of life and services.

Fishing in Southern Sudan

South Sudan is economically viable with potential agricultural development opportunities including fishing. Shifting agriculture is widely practised. Hunting and fishing are two other main activities (Wai D. 1973).

The present fishing practice in Sudan is a primitive one with annual fish production of 106,470 tons of fish under the fresh water. This reflects the low annual per capita fish consumption of 1.5kg compared to the standard figure of 15kg. [Fisheries studies University of Juba]. Fishing in

South Sudan is carried out mainly by women including fish processing and marketing.

This is especially true in areas far away from the Nile. Big towns like Torit, Yei, Maridi and Kajo - keji for instance depend on small rivers and seasonal streams for these. They use nets, wound gears and stupefying with herbs, for fresh fish supply. But due to high demand of fresh fish, one could hardly find in the market. Juba the southern capital is in shortage too. Its fishing ground on the Nile is poor. Therefore it has to rely mainly on Upper Nile Malakal and Mallgalla. Poor processing of fish, lack of refrigerators and transport facilities are the main limiting factors among many. Looking beyond the current war in South Sudan, these constraints will seem to continue to prevail. Encouragement of small scale fish farming to meet local demand is therefore a necessity. A number of reasons justify its sustainability. For instance lack of food especially vegetables during dry seasons is a familiar problem facing women; therefore any project addressing women's problems is likely to succeed. Also the regional government has plans to develop the national parks and the game reserves.

Conclusion

Hence prohibiting hunting of wild animals for food without offering an alternative. These measures have already been felt in Yei and Maridi district interfering with the



Figure 1. Cross section of an earthdam well equipped with slow sand filter system

protein requirements of the local people. Yet keeping of live stock has great limitation in many parts especially western Euatoria due to trypanosomiasis disease spread by tsetse fly. Therefore fish farming now and in the future is the alternative. In addition, earth dams provides water for watering animals in semi dry areas like Kapoeta and upper Nile Region where cattle keepers frequently clash over limited water resource causing lost of lives and instability in the region. Therefore earth dam wells have

universal and multi applications in other similar places like South Sudan.

References

- 1 Wai D. M 1973 “ The Southern Sudan: The problem of National Integrations Frank Cass 1973.
- 2 William et-al1985 : “Slowsand filtration and removing of Giardia cysts” Journal of American water works association 1985.