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KATIVANI DAM AND EIGHT OFF-TAKE WELLS

1. INTRODUCTION

The site was visited on 16th aug.2008. The visiting SASOL party consisted of a Water Engineer, a Well Specialist and the SASOL Chairman. The purpose of the visit was to develop a site strategy in terms of dam and well sites addressing depth to firm rock, length of dam, location of dam to recharge the widest area, well sites, logistics and management issues. It was also to get a flavor of the possibility of community [participation.

The site is in Ngetha Sub-location, Mulala location in Makueni District. The average annual rainfall for the area is 350 mm in two rain seasons. The stream emanates from scattered hills and flows through undulating land to plain out on a large area where the stream slope is almost 0.1 at the point of interest for locating the dam. Below this point the river has migrated many times and there are wells, which almost bridge the dry seasons annually.

The soils in the area are mainly clay with kunkar rock outcrops. The area suffers dry winds as it's on the leeward side of the mountain.

The people in the sub location mainly rely on the scoop holes from the stream both for their domestic and livestock use. They also go to the neighbouring sublocation, which has a river, which runs longer than those found in their area. However these scoop holes are very deep during the dry spell providing inadequate water supplies and also posing a major safety threat due to the loose sandy formation along the channel.

The water in the river course is saline, however this will change after construction of the proposed dam, as it will dilute the water in the storage reservoir. Further, as more water is held in the catchment, dissolved salts are ultimately diluted.

2. THE DAM

The dam site lies on an altitude of 773.0m above sea level. The site pegged was chosen to capture water from two streams with the major one emanating from the hill heel and the tributary mainly collecting the market runoff. It is downstream of the market and the four sites, which were picked by the APA party. Those sites were rejected by SASOL for a variety of reasons.

First, the four sites would not yield as much water as the pegged site. Second, the dam is designed to contribute to stabilizing the erosion driven mainly by the market runoff. Third, a dam at this site would recharge vast areas downstream. This makes it possible to build seven wells downstream to increase the off take points so as to minimize ecological damage which would definitely result if all the people came to one well. All the other sites would have minimal recharge capacity downstream. Fourth, a well fed by the dam would be right next to the market center. Fifth and perhaps most important, a dam should enable many people in the community to get into new production e.g. micro-irrigation over and above providing drinking water and water for livestock.

The banks of the channel are of clay formation. There also is some clay and weathered rock under the sand as shown by the site pit, which was at one and a half meters. That is why the SASOL party insisted on deepening the site hole to get to hard rock.

The design envisaged will take care of the issues enumerated above by having a deep dam resting on hard rock, and extensive wing walls excavated to the same level hard rock together with bank protection. It is designed to systematically recharge the downstream flatlands to enable people to utilize wells for their water needs, the water needs of their livestock and new production.

3. WELLS

SASOL proposes construction of eight wells. Seven will be located downstream of the dam and one located 350m upstream. The location of the upstream well factors in reservoir contamination. The upstream well is proximate to the market, and its major road.

To achieve a safe yield from the wells, all year round, a well depth of 40feet is recommended. It should be noted that the strategy of locating the dam and wells downstream is not only driven by SASOL's experience in Kitui and elsewhere, but also by the number of existing short term wells in the downstream areas. Wells deepened to the recommended level would bridge any droughts.

4. LONG TERM WATER DEVELOPMENT FOR THE SUBLOCATION

It is SASOL's opinion that the sublocation should build about 10 dams, including the one under design. The nine should have allied wells. The reason for this argument is that construction of one dam and its allied wells will draw the sub location's population towards the envisaged water, especially during droughts, with extensive environmental degradation. The implication of this point needs to be taken into account by APA and its partners for building one dam will definitely lead to conflict not only over the water but also the use of other resources.

5. SITE ACCESSIBILITY

Two alternative routes:
1. Nairobi Mombasa Road via Emali Wote Road 13km to the project site
2. Machakos Wote Road via Kilala Emali Road 37 km from the turn off to site.

6. TIME FRAME FOR IMPLEMENTATION

All parties involved should be aware that when community labour is utilized for extensive earthworks and rains destroy these, it is almost impossible to re-mobilize them.

Given the pace and conflict about digging the site pit, necessary for establishing the depth the dam, for it is on clay, it is SASOL's judgment that they will not be able to excavate the whole dam trench, and take part as building labour before the ONSET OF THE RAINS IN OCTOBER. Note that to build this dam one would need two months of intensive construction work, with a minimum of 40 participants daily, after excavation and crushing and collection of construction stones, which the community made clear they would not do.

Note that the wells will need excavation and labour to make the special blocs for wells.

7. UTILISATION OF UTOONI/ECELLENT

After the function SASOL had with APA in Nairobi, a member of Kativani community called SASOL. SASOL then made a recommendation that since it was not working in Makueni district, it would be prudent, from a cost point of view, to link with Utooni and Excellent to build sand dams in the area. It is important to recognize that SASOL sand dam technology is a derivative of the Utooni sand dam experience. Between Utooni and Excellent they now have constructed over three hundred sand dams. They are experienced. There is a dam a dam built by Excellent on the way to the project site before Nziu Market. GPS no.117.

APA and their associates should consider approaching Utooni/Excellent for work in Makueni for they have the logistical and management systems in place. SASOL will have to set up in the region and travel from either Kitui or Nairobi to supervise work. This will no doubt impact on dam costs.