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Ogaden emergency water supply project

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I INTRODUCTION

In June and July of 1988 an estimated 250,000 Somali refugees arrived at Hartisheik A,B and Harshin camps in East Hararghe Region of Ethiopia, after fleeing the civil war in Northern Somalia. Most of the refugees were civilians from the town Hargeisa and the nomadic population of the surrounding area.

UNHCR being the responsible agency for the affairs of the refugees along with the host country Ethiopia, approached OXFAM to get involved in the supply of drinking water to the refugees in the camps.

In response to UNHCR's request OXFAM offered to intervene in the renovation of the existing water sources at the town of Jijiga,and the installation of storage and distribution facilities at the refugee camps.

Because the area settled by the refugees is a semi desert with no possibility of getting ground water upto the depth of 300 to 400 metres,it was decided to transport water from Jijiga, 77 kms away from the camps. The water is transported by water tankers every day, and this has been going on for the last three years.

II WATER SOURCE AND GANTRY LOADING FACILITY

The only possible water source to the camps in the vicinity of the area being the Jijiga town boreholes, OXFAM rehabilitated four of the wells with the installation of new submersible pumps. Three stand by generators were also supplied to be used when main line electric power fails, which is a common problem.

Specific to the refugee water supply, storage tanks and tanker loading gantries were installed at Jijiga,near the borehole sites. The gantry facility was arranged in such a way that water tankers can be loaded directly from the gantry as well as from the OXFAM storage tanks by means of TS2 Lister engined Atlanta pumps. (see fig.1)

This arrangement enabled us to load water onto the water tankers as much as 1.2 million litres per day. The average amount of water transported per day being 900,000 litres. This amount of water is 3 to 5 litres per person per day, which is far below the amount recommended by UNHCR. In such an emergency situation,and in an area where there is no drop of water, this was just like a blessing to the refugees. The supply was augmented by the water from Birkas for washing clothes and some other purpose,other than drinking. Birkas are water collecting earth ponds locally dug by the nomads of the surounding area. The soil of the area is very impermeable, thus the Birkas retain water for upto 3 months after rain,most of the water loss being by evaporation.

As the boreholes in Jijiga are meant for the use of the town water supply, UNHCR were requested to look for another source of water at Jerrer valley about 45 kms away from the camps. These wells will therefore be used up to the time when the alternative source at Jerrer currently being drilled by Ethiopian Water Works Construction Authority (EWWCA) is ready for use.

III WATER STORAGE TANKS AT THE CAMPS (BLADDERS, ALIBERTS AND OXFAM TANK KITS)

During the beginning of the programme, the influx to the camps was about 10,000 refugees each day. Inorder to prevent occurrence of any epidemic such as cholera or other water borne diseases, an immediate provision of drinking water to the camps was a priority. For this OXFAM's fast tanks and Bladder storages were used from which tapstands with six taps were connected for distribution of water. As far as possible the bladders were evenly distributed throughout the camp. (see fig.2)

Later these bladders were replaced by OXFAM standard steel storage tanks, in order to facilitate water distribution and to make chlorination possible at the storage tanks. When the bladders were in use, chlorination was done at the storage tanks in the gantry site at Jijiga.In this case the amount of residual chlorine after the tankers travel 77 kms was very small and chlorination at camp level was preferred.

OXFAM steel tanks of various capacities 95, 70, 45 and 10.5 m3 were installed on top of

a mound of selected material. The mounds were 1.5 m and the tapstands 0.6m high above the ground giving 90cm minimum height difference for gravity water flow.

Alibert plastic storages of 1000 litres and 800 litres were used in clincs and supplementary feeding centres, before the installation of the OXFAM 10.5 m3 steel tanks at those places.

On the OXFAM steel tanks a problem of buckling of top wall sheet was encountered, as a result of rain water ponding on top of the fabric roofs causing lateral loads on the adjacent walls. Initially this problem was solved by drilling holes in the roof, allowing the water to get into the tanks instead of ponding on top. This of course had some side effects in particular the ingress of dust particles into the tank affecting the quality of the water. Reinforcing the top sheet with half sheet was also tried and found to be effective. Later on this problem was addressed to the tank manufacturers in England and they have come up with a modified roof design, in which case no rain water is retained on top, thus avoiding drilling of holes in the roof.

IV WATER QUALITY CONTOL

The water from the Jijiga boreholes has slightly high dissolved salt content and has conductivity of 234μs/cm average. The water before it is distributed to the refugees is chlorinated at the storage tanks, initially done at the tanks in Jijiga, and later at the tanks in the camps. This is done by putting chlorine tablets in a basket suspended inside the water in the tanks. The amount of chlorine tablets added to the tanks was determined by trial, in such a way that the residual chlorine at the taps was between 0.2 to 0.3 mg/l. The residual chlorine test is done using the comparator which is part of the OXFAM DelAgua water testing kit.

Bacteriological quality of the water is also closely monitored for the water from all the tanks in the camps at intervals of maximum of four weeks. This test is done using the same DelAgua water test kit.

V WATER TANKERING AND CONVERSION OF FLAT BED TRUCKS INTO WATER TANKERS

The water tankering operation initially was handled by UNHCR, by hiring tankers from local organizations. Later this operation was taken over by CARE.

The water transporting part of the programme had more problems in the begining, because of lack of enough water tankers and the poor road condition between Jijiga and Hartisheik camps. Many of the available trucks were getting broken frequently, aggravating the tanker shortage.

Inorder to solve this tanker shortage problem, Oxfam proposed and designed the conversion of flat bed trucks into tankers by loading 10 Aliberts on a truck and interconnecting the Aliberts by pipe fittings. Enough Alibert tanks were imported, and ten flat bed trucks were converted to water tankers, and this helped a lot in the transportation of ample water for the refugees in the camps.

VI DISTRIBUTION PIPELINE, RING MAIN AND SPUR SYSTEM

Hartisheik A - In this camp, when refugees first arrived they settled randomly where ever they liked, and likewise the storage tanks were placed in areas where there was high refugee concentration. From each storage tank two to three pipe line spurs were laied, and each spur fed water to two tapstands with six taps each. The spurs were of 3" PVC pipes reduced to 32mm polyethlene pipes by means of ferrule strap (saddle strap) fittings and connected to the tapstands.

Hartisheik B - Transportation of food and water to Harshin refugee camp was very difficult, because of the long distance, 50 kms from Hartisheik, without proper road link. UNHCR thus decided to move the refugees to Hartisheik B.

Hartisheik B unlike Hartisheik A camp was properly planned before the refugees were properly planned before the refugees were brought from Harshin and therefore storage tank location, tapstand distribution and refugee settlement areas were designed beforehand. Four 45 m3 tanks at each module were erected, interconnected to each other. These tanks fed water to ring mains, and the ring mains were further extended by two spurs of 250m length at right angles to each other. Each spur was provided by two tapstands. Besides these, additional tapstands, 20 in module A and 8 in module B were also provided in the ring mains.

Pipes used in the distribution net work were 3" PVC and 2" and 1" Polyethlene pipes. Plastic fittings such as compression unions, tees, elbows and saddle straps were also used.

In this camp the installation of 45 m3 tanks, which is only two sheets above the ground, has helped unload water by gravity. The distribution of water to the tapstands was partly by gravity, to those areas on the

lower side of the tanks and partly by pumping with the TS2 Lister pumps to those tapstands which were above the tanks.

VII SOAKAWAY PITS

At each tapstand site spillage of water created a muddy environment, which is not good for health aspects. To avoid this, soakawy pits were dug and filled with stone boulders and the waste water was allowed to flow into them so that the water could percolate into the soil. But unfortunately, because of the impermeable nature of the black clay soil this did not work very well. It is therefore planned to use the water for irrigating vegetable gardens in the future.

VIII PUMPING SYSTEM

In this programme for various reasons pumping could not be avoided. One of the main reasons was that, ramp construction to avoid pumping happened to be time consuming and difficult to obtain the necessary selected material beside its enormous cost. Due to this fact there was no other option but to introduce a pumping component to the system.

Pumping is carried out by two pumps, TS2 and TS1 Lister engines coupled with Atlanta pumps.The bigger TS2 pumps are used for loading tankers at the gantry in Jijiga and to pump water from the storage tanks to the tapstands at Hartisheik B. The smaller TS1 pumps are used to unload water from the water tankers into the storage tanks in Hartisheik A camp.

Standardization of pump for the project meant a great deal both in terms of training technicians and the spare parts required for the engines

OXFAM in its programme has a workshop for the pumps. All repair and over-hauling is done in this workshop including modification of fuel tanks. Some problems were experienced on the coupling of the engine with the pumps and this was tackled by working out frequent alignment checkups.

IX CENTRALIZED WATER UNLOADING AND PUMPING SYSTEM FOR HARTISHEIK A CAMP

In Hartisheik A camp, CARE tankers have to drive for at least half an hour after arriving at the camp and reaching the unloading point, and have to be unloaded by the TS1 Lister engined pumps which takes minimum 20 minutes. This we found to be more expensive in terms of time and the fuel consumed both by CARE trucks and the OXFAM pumps doing the unloading task.

To minimize this cost and to do more efficient work, OXFAM decided to centralize the unloading and pumping system.

The central unloading facility was decided to be placed in the higher area at the outskirt of the camp. This central unloading point consisted of four 70 m3 storage tanks, all interconnected to each other. Four TS2 lister engined Atlanta swift pumps were also installed here. Two of the pumps will be working at the same time while the other two are meant to be standby. Water is pumped through two 6" pipeline mains, each of which inturn supply water into different sized pipelines feeding all the existing tanks in the camp.

All the necessary design including the hydraulic calculations required for the system was done. Construction of the system has already been finalized and test pumping successfully carried out. At the moment full operation of the system is awaiting the construction of the road to the unloading point, which is going to be done by UNHCR .

X INTERAGENCY RELATIONSHIP IN THE EMERGENCY PROGRAMME

The emergency programme being a life saving activity encompasses other aspects like health, food distribution, nutrition and security programmes dealt by various NGOs and governmental organizations. The agencies directly involved in the programme are, OXFAM (UK), SCF (UK),Committee for American Relief Everywhere (CARE), Ministry of Health (MOH), Ministry of Internal Affairs (MOIA), Administration for refugee affairs (ARA), World Food Programme (WFP),World Transport Operation Ethiopia (WTOE), Transport Operation for Refugees (GTZ) and UNHCR.

Weekly coordination meetings are held among these concerned agencies under the chairmanship of UNHCR, to discuss and come up with solutions for every problem that arises in the programme. This part of the activity was an important aspect of the work and the coordination meeting was more or less acting as a steering committee for the programme.

Other than the coordination between the above agencies, for OXFAM working closely with the Water Supply and Sewerage Authority (WSSA) office at Jijiga was also a neccessity and has been successful.

XI) STAFFING

The programme is and has been run by Ethiopian national staff both technical and administrative with an imput from

expatriates working on short assignments, as team leaders and technical engineers. Technical support from the Oxfam Technical Unit at Oxford was also an important part of the programme.

Other than the local and expatriate staff the programme has also refugee staff working in different parts of the work. In fact most of the field work in the camp such as tank erection, pipe laying and the mechanical workshop for the pumps is handled by the refugees under the guidance of the engineers. Having refugees as working staff has helped them get some sort of employment and the programme has benefitted from their involvement in smoothening the relationship with the refugee community in all aspects of the work.

XII STOCK CONTROL

In this programme,despite the nature of the emergency situation which demanded heavy work in a short time, the staff has managed to establish a very good stock control system. Equipment procurred and arriving at the camp was immediately entered into the stock cards before it was issued out to the field to be used. Unlike other emergency works, accountability of every project equipment and material was handled properly. From this the project has learned that in future emergency work, stock control facilities such as cabinets and stock cards with the type of equipments already written should be part of an emergency stock.

XIII PROJECT COST

Over the last three years the total project cost for the emergency water supply project has been about £1,095,210. This covers the cost for water tank kits, water pumps, pipeline equipment and staff salaries both expatriate, local and refugee staff.

XIV CONCLUSION

This Ogaden emergency water supply programme implemented by OXFAM has and is being efficiently carried out. Numerous problems were encounterd and tackled properly and timely in terms of the following aspects.

1) Despite the lack of water in the vicinity of the camps every possible effort is being done to supply water to the refugee community who would have been badly exposed to epidemics with out clean drinking water.

2) OXFAM's preparedness for emergency water supply has been remarkable both in terms of the supply of water equipments and the assignment of experienced staff.

3) The system applied both in the construction of storage tanks and the installation of water distribution pipe lines has been efficient and very timely to the emergency situation.

4) In solving the shortage of water tankers, converting flat bed trucks in to water tankers by loading Alibert tanks has been helpfull and first of its kind.

Generally, in view of the present unstable situation in most parts of Africa and Asia, where great number of people are fleeing their home country and taking asylum in neighbouring countries. The experience gained in this project concerning emergency water supply is enormous and will be beneficial for us and for any organization who might be involved in this type of work in the future.

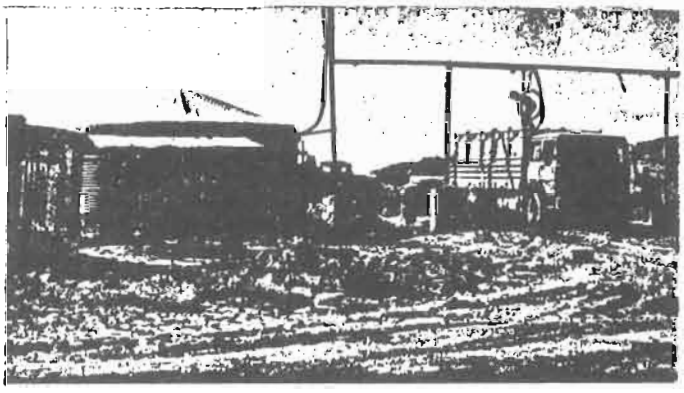

Fig.1 Flat bed truck converted into water tanker being loaded at Jijiga Gantry.

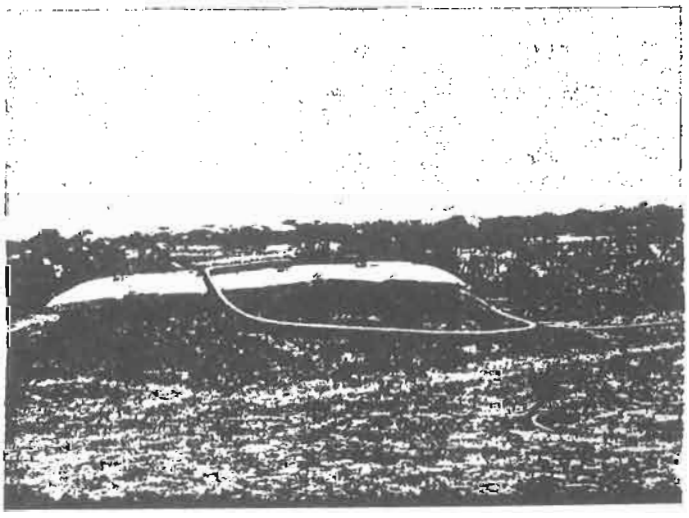

Fig. 2 Bladder storage tank at Hartisheik A.