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SUSTAINABLE ENVIRONMENTAL SANITATION AND WATER SERVICES

## Community management of deep boreholes

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AMONG THE 4.6 millions people living in Khartoum and its periphery, an estimated 1.5 millions are Internally Displaced People (IDPs) who came to the area since 1983, due to the severe droughts and the resumption of the civil war. In order to control their settlement, the Sudanese government created IDPs camps and resettlement areas in Khartoum State. While the camps are temporary, the resettlement areas constitute new suburbs fully administered by the authorities in which, the access to the land, health services or water are not free: the prices are fixed by the corresponding public institutions. However, their inability and the lack of means to provide basic needs to their inhabitants led to major and repeated cholera epidemics (1996,1998,1999).

In the resettlement areas, two main public institutions are in charge of water production and sale: the localities and the Khartoum State Water Corporation (KSWC). Their water yards face a lot of breakdowns. None of them have drainage to evacuate the wasted water, thus inducing stagnant water ponds (see Picture 1). In addition, it is often that their water stations are stopped for months. Indeed, their incomes are not dedicated to maintenance or running expenses and not even clearly traced. They are neither used for community projects nor saved for sustainability purpose but rather for paying the salaries of the officers. The communities are thus suffering from a lack of water availability and from the poor water quality and hygiene conditions induced by the stations surroundings.

In this context, the public authorities do not fulfil their responsibilities. In order to answer to the emergency in terms of water supply in a sustainable manner, new alternative ways of station management have to be found.

Moreover, even if the Nubian sandstone has huge quantities of water bearing layers, the static water level is around 70 meters. Complex pumping stations (in terms of management and maintenance) are thus necessary.

To ACF knowledge, no example of a borehole handed over to a structure independent from the above-mentioned authorities was found. Usually, the water stations were handed over to KSWC and were not working satisfactorily after one or two years.

### Program strategy

According to this context analysis, Action Contre la Faim designed its programmes in order to

- Increase the access to water for the IDPs (which was around 11 litres/head/day in the area)



Figure 1. Surroundings of KSWC water station

- Design the water stations in order to improve the hygiene conditions at their surroundings
- Reach the long-term sustainability through the involvement of the community in the water station management
- Set up a legal community-based structure that would invest the benefits for small-scale community projects

To this aim, several steps have been followed. The drillings of four water stations was sub-granted to local contractors and at the beginning of the drilling, water committees were created for each station. Then, ACF trained, supervised and monitored closely the water committee members and the staff of the station. The handover process was implemented as soon as each water committee fulfilled a set of criteria indicating its aptitude to manage properly and autonomously its station. In the following, these different steps are detailed.

### Design of the water stations

For the drilling and the building of the stations, ACF sub-granted local private companies in Khartoum. However, before the intervention, the main characteristics of most of the surrounding stations had been assessed. ACF improved the design of KSWC/locality water stations in order to reduce the stagnant water induced by the waste water, to minimize the queuing time at the water station for the donkey carts and to improve the hygiene of the donkey cart owners. Therefore, the following measures have been undertaken (see Picture 2):

- An inclined platform has been designed in order to avoid the presence of stagnant water ponds and to make the waste water collection easier
- The waste water has been directed to a garden area
- Three distribution pipes have been set instead of one in the other stations. That was done in order to improve the water availability in the area
- Fountains have been designed in order to make the distribution of water to neighboring people filling their jerrycan easier and safer
- Washing spots have been designed in which the donkey carts barrels are washed regularly

### Creation of the water committees

ACF faced difficulties to convince the authorities of the relevance of this approach. However, as no funds were engaged for the drillings until obtaining these authorisations, negotiations were made easier. ACF commitment was to make all the technical work (drilling, equipment ...) in exchange of:

- The procurement of the land for free from the locality
- The management of the station by the community of the block
- The written agreement that the incomes generated are under the responsibility of the water committee and used for the maintenance and small-scale community projects

However, it had to be accepted that the authorities nominate the water committee members with some restrictions imposed by ACF: the number of members having association or governmental responsibilities was limited to less than 50% of the 12 water committee members, the remaining being chosen among the teachers, tribal leaders and educated people of the area. As a result, the water committees members represented a wide spectrum of the community. However, due to the Sudanese society structure, women very rarely belong to one of these categories: therefore, they were not well represented in the water committees (table 1). Since the water committee members were nominated by the local authorities, they were considered by all the community members as legitimate and as people working together with ACF for the water supply improvement in the area.

From 1998 up to 2000, four water committees were created in the western periphery of Khartoum (table 1).

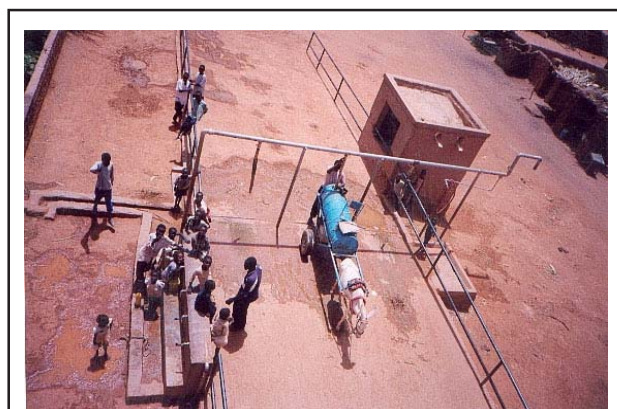


Figure 2. ACF water station (Es Salaam locality)

### Organisation and management of the water committees

Each water committee included

- A president (chairing the meetings) and a vice-president
- A secretary (taking the minutes of the meetings and filing and keeping all the documents)
- An accountant
- A mechanic (in charge of the running and the purchases for the station operation (fuel, oil, filters ...))

Despite their low representation, at least one woman occupied one of these key-positions in each water committee (two accountants and two secretaries). The water committee members were considered as volunteers working for the benefit of their own community even if for obvious reasons, meeting presence incentives were given to them (6 US\$ per meeting). The water committees employed salaried staff for the operation of the station: a mechanic and his assistant, two watchmen and two cash collectors.

The role of ACF was to train and advise the staff of the station and the water committee members for running / supervising the station operation and using the benefits in small-scale community projects. ACF also kept one of the two bank signatures (usually shared either with the accountant or the president).

Water committee meetings were held at least twice a month. During these meetings, a summary of the technical and financial data for the last period was given by both accountant and mechanic. The invoices of the reported expenditures were presented to the members and decisions regarding the use of the benefits were also taken.

Table 1. Creation date, number or beneficiaries and women representation for each water station drilled by ACF

Water Committee	Block 42	Block 43	Block 27	Block 23
Date of creation	Sept. 99	March 98	Nov. 99	Nov. 2000
Number of beneficiaries	11,000	23,000	15,000	11,000
Women representation in the water committee	3 / 12	3 / 12	3 / 12	1 / 12

In order to follow the operation of each water yard, the staff had to prepare daily reports including

- Technical data (pumping hours, volumes of water pumped and sold, percentage of water lost, number of donkey carts and jerrycans sold, fuel consumption and fuel consumption rate). This data is useful to monitor the incomes of the station and the good operation of the hardware and were prepared by the mechanic.
- Financial data: running and community project expenses, amount of money saved to bank, bank statement. These reports were prepared by the accountant of the water committee.

### Capacity building of the water committees

The capacity building of the water committees determined their aptitude to run the station properly and autonomously. The trainings provided by ACF mainly focused on the operation and the management of the station without longer term approach such as trainings on income generating projects or community development.

Concerning the technical aspect, ACF benefited from the involvement of local private companies for the drilling and equipment of the stations. Training periods were included in the contracts between ACF and the suppliers. The mechanics were thus able to operate properly the equipment, to do any minor maintenance and to follow-up some key-indicators in order to prevent any breakdown.

On a financial point of view, the accountants were trained to check rigorously the expenditures and to report properly to water committee members. Progressively, they implemented financial management through budget lines and were able to forecast the expenses and incomes for any forthcoming period, and thus to determine accurately the money potentially saved or available for community projects. They were also given the responsibilities of the staff management and trainings on the Sudanese Labour Law and staff contracts implementation were provided to them.

The water committees members were trained to design community projects with feasibility and cost studies. Among others, they implemented projects such as school building and/or rehabilitation, seedlings nursery, loans to starting activities (bakery), funding of health education programme during the rainy season.

### Reaching the sustainability

The sustainability encompasses several aspects of the management and operation of the station. This is why a criteria

set has been developed as an indicator for water committee aptitude in regards to future planned hand-over. Criteria is based on the following main points:

- Satisfactory technical management and autonomy to run the station
  - Clear and sound technical reporting
  - Sound analysis of data concerning the running of the station
  - Good present state of the station equipment
  - Understanding of committee rights and obligations in relation to the hardware contractors
  - Knowledge of the different contractors and autonomy in case of major breakdowns
- Satisfactory financial and organisational management
  - Clear and sound financial reporting
  - Clear understanding of duties, responsibilities and rights of the water committee and staff members
  - Enough amount of money saved in bank to prevent any technical problem
- Commitment to use savings for community development projects
  - Experience in projects conception and implementation
  - Aptitude to analyse the impact of these projects

It has to be mentioned that reaching sustainability has been made easier by the fact that in resettlement areas, the water is not free (500 Sudanese Pound (500 SDP~0.2 US\$) for one drum (around 400 litres)). Moreover, due to their proper operation and to the needs of water within the area the stations were attracting a high number of donkey carts and were making considerable profits (see table 2).

Two of them (blocks 43 and 27) replaced their former diesel engine and turbine pump into diesel generator and submersible pump (cost: 16,000 US\$ for each station). This change was necessary since a verticality default of the drilling induced repeated breakdowns. The water committees afforded the totality of the replacement costs. For block 23 (the most recent), the equipment was originally a submersible pump and a diesel generator. For block 42, repeated mismanagements led to a failure of the project and, consequently, to hand over the station to the locality.

### The handover process

In March and April 2002, the water stations of blocks 23, 27 and 43 were handed over to the community through the creation of a cooperative association for each water point.

**Table 2. Main characteristics of the stations from July 1st, 2001 to March 31st, 2002 (after hardware replacement)**

Water station	Average monthly breakdown days	Average monthly water volume sold (m <sup>3</sup> )	Average monthly income (US\$)	Average monthly difference (income-running expenses) (US\$)	Bank statement on 31 <sup>st</sup> of March 2002 (US\$)
Block 23	0.7	4,160	2,080	1,220	7,312
Block 27	1.2	5,054	2,527	1,662	10,408
Block 43	0.6	7,795	3,897	2,555	16,320

They are supervised by the Department of Ministry of Finance for the Cooperative Associations. Their objectives are to improve the water supply and to contribute to the health and the education in the area, through building and/or rehabilitating schools, giving scholarships, building consultation rooms in order to attract doctors ... Income generating activities can also be implemented in order to provide services (soap, chickens, seedlings) at a cheaper price than the market price.

The associations have members and an executive body. According to their regulations, membership is open for all the residents of the area and the executive committee is elected by the members. Representatives of ACF, of the locality and of the Ministry of Finance are also present in the executive committee. Community meetings were organised to explain the association creation process and then, the members elected the executive committee. On the one hand, these elections endangered the sustainability of the stations since the former water committee members had no guarantee to be elected in the association executive committee, but on the other hand, it was the only way to legitimate the association (most of the water committee members have been elected). All the assets are now the property of the association and the bank signatures are held by three association executive committee members.

### **Project constraints**

The main difficulty that yielded the project to last longer than expected is purely technical. Since two of the drillings were not vertical, it took two to three years to the water committees to replace the turbine pumps by submersible pumps and thus to reduce significantly both breakdown days and maintenance expenses and achieve the 'technical sustainability'.

On the other hand, the other constraints were obviously related to the context (unstructured, IDPs). Due to the origin of its members and to its financial success, the water committees were understood as being able to handle most of the problems of the communities. Difficulties were encountered to convince them that the money generated should be used for the benefit of the majority rather than for individual cases.

At last, the ethnic origin of the populations as well as their adaptation ability and motivation to a context differing

strongly from their original habits and coping mechanisms had a great influence on the project and explains the failure for the block 42, that was handed over to the locality.

### **Conclusions**

Obviously, it is still too early to assume that the associations will be sustainable. However, some conclusions can be drawn from this experience.

This program clearly showed that, in such a context, the involvement of the community is well suited in order to have a chance to reach long-term sustainability, even in such a complex situation with heavy equipment to maintain and difficulties with the authorities. However, this community involvement must respect the social and political structures of the intervention area and try at any time to rely on the legitimacy of the community members involved in the project and on the local capacities (such as the private contractors for the maintenance).

Special care should be dedicated to the technical choices that can endanger the sustainability of the stations or increase the time needed to reach it. A better preliminary assessment of the local capacities as well as a longer experience in dealing with private companies, would have saved time, money and also allowed the community capacities building on longer term activities such as the implementation of income generating activities and community development.

At last, since this kind of structure represents the only source of revenue of the community, the motivation of each community member involved in the project should be investigated in order to rely on it properly and efficiently. This individual approach combined with a very close monitoring of the activities require time but yield to give an efficient and mastered tool to the community for further development.

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