External Evaluation of the NCA WASH Programme in Darfur

With Special Focus on IDP Camps in Zalingei

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1. Introduction

This report describes the evaluation of the NCA Water, Sanitation and Hygiene (WASH) Programme in Darfur from 2008 until mid 2010.

This evaluation was conducted in May-June 2010 by an external WASH consultant. Key persons involved in the design and organisation of the evaluation from NCA were Christopher Nyamandi, (Head of Programs in Darfur), John Borton (NCA Learning Support Adviser) and Ahmed Mohammed Ali, (WASH Sector Manager in Darfur).

The report starts by providing a background and explaining the objectives, scope and methodology. The findings and recommendations are presented in chapter 4 and 5.

2. Background

2.1 The WASH Programme

NCA has been implementing a comprehensive WASH programme in Darfur since 2004 in response to the humanitarian needs caused by widespread displacement. In 2008, this Programme reached at least 250,000 beneficiaries and in 2009 it reached around 300,000 beneficiaries in Nyala (South Darfur), Zalingei and Wadi Saleh (West Darfur). The programme targets mainly internally displaced persons living in populated camps as well as host communities near them. The purpose of this programme is to improve water and environmental sanitation conditions in Darfur to lead to a reduced incidence of water-borne or water-related diseases amongst the IDP population and host communities. The programme supplies water through motorized systems, open hand dug wells and hand pumps to targeted beneficiaries. It aims to improve sanitation through construction of new latrines and rehabilitation of old facilities and promoting safe personal hygiene practices.

The programme is funded by a number of donors including the ACT and Caritas networks of churches, the UN Common Humanitarian Fund (CHF), Diakonie and ECHO. NCA works with and through local partners.

In the aftermath of the March 2009 indictment of the President of Sudan, NCA took over WASH activities from organizations that were expelled. This was done under challenging conditions with no proper handover

2.2 The Evaluation

The initial requirements of the evaluation were laid down in Terms of References. A teleconference was held with members of the reference team (Christopher Nyamandi, Ahmed Mohammed Ali and John Borton) and the consultant on the 3rd of May, 2010. Numerous documents were shared and discussions were held by email with Mr. Nyamandi and Mr. Ali. The discussions and analysis resulted in a narrowed down scope that was defined in an evaluation plan dated the 17th of May, 2010. The aim was to provide a realistic plan for which the fieldwork could be completed within the available 18 days in Sudan and that maximized the usefulness for the WASH programme of NCA.

However, due to unfortunate issues the amount of effective working days in the field in Darfur was significantly reduced. The consultant arrived in Nyala according to the schedule but was unfortunately sent back to Khartoum by the Humanitarian Aid Commission (HAC). The reason provided was an issue with the photo permit that had to be resolved with HAC in Khartoum. This resulted in a long delay (and the absence of

photographic support). In the mean time the security situation around Nyala deteriorated due to a kidnapping.

Because of these issues the consultant could only visit 3 camps in Zalingei (West-Darfur), and had to cancel visits to Kubum, Bilel and Garsilla. Host communities could not be visited in any of the locations. As a result the final scope of this evaluation became narrower than intended.

3. Objectives and Scope

The evaluation had two main purposes.

Firstly, it aimed to evaluate the quality of the WASH programme of NCA in Darfur from 2008 until mid 2010. Specifically, it aimed to evaluate the impact and the appropriateness of the programme in the IDP camps.

Secondly, it aimed to provide recommendations for operating an IDP WASH programme in Darfur with a reduced budget in the future, assuming the beneficiary caseload remains fairly stable for the next few years.

The evaluation attempted to answer the key questions described below. Most of these questions were answered during the evaluation mission by the consultant assisted by NCA Staff using the methods described in the next chapter. Questions marked with * were meant to be answered in the 2010 KAP survey report to be implemented by NCA.

A. Did the programme have a positive impact on the diarrhoeal diseases morbidity in the target population? (Which health providers serve the population? What were the morbidity rates for reported diarrhoeal diseases in the target areas in the last 5 years? Is there any indication that people's reporting behaviour changed in this period (error)?)

B. Do people use a sufficient quantity of safe water? (How much safe water is distributed per person? *How much is collected per person (KAP)? What is the spillage estimate? What is the livestock use estimate? Is the water chlorinated? Is any household treatment taking place?)

C. Do the current defecation practices present a significant risk for faecal-oral disease transmission? (Is open defecation still taking place on a significant scale? Are latrines available to all? Are the latrines hygienic? *Are people washing their hands afterwards? What are the latrine maintenance and cleaning arrangements? Is the latrine technology appropriate?)

D. Are the hygiene promotion activities appropriate and efficient? (What methods are used? What are the different target groups? How frequently do activities take place for each target group? What kind of coverage is achieved? What are the messages? Are the messages relevant? *How have water supply, excreta disposal, solid waste disposal and hygiene knowledge, attitudes and behaviour changed in the period since the last baseline KAP)

E. How can the level of NCA involvement and budget be reduced whilst ensuring key WASH services continue? (What key activities can be taken over by the communities? What key activities need ongoing NCA support (directly or indirectly)?)

F. What is the likelihood for sustainability of the water supplies that were meant to be fully managed by the community/authorities/private sector? (When did a water point last break down and how was this resolved? Or: what exactly will happen when it breaks down in the future? Are technicians available to conduct repairs? What is the

next scheduled maintenance action? What was the last scheduled maintenance action)

4. Methodology

This section describes the methods used to obtain information and where they were used. The goal was to use all methods for all locations. However, due to the constraints mentioned in Section 2.2 this was not possible.

4.1 Review of Documents

The following documents were used to gain an understanding of the type of WASH programme that NCA has been implementing.

- Project Document by NCA for "Humanitarian Water, Sanitation and Hygiene Response for Darfur [2009]", dated 5th of April, 2009.
- Final Report by NCA for "Humanitarian Water, Sanitation and Hygiene Response for Darfur [2009]", dated 8th of February, 2010 (donor: CHF)
- Project Document by NCA for "Emergency WASH Project in South Darfur Region", dated 26th of April, 2010. (donor: CHF)
- Project Document by NCA for "Emergency WASH Project in West Darfur Region, dated 26th of April, 2010 (donor: CHF).
- Concept Paper by NCA for "Bilel Camp & Nyala Rural WatSan Intervention, January-March 2010", dated 21st of December 2009 (donor: Diakonie)
- Final Project Report by NCA for "Bilel Camp & Nyala Rural WatSan Intervention", dated 22nd of February 2010 (donor: Diakonie).
- NCA Pre-implementation Baseline Survey on WASH practices in Hassahissa, Hamediya, Khamsadagaig and Taiba, dated February 2007 (donor: ECHO).
- KAP survey report for Zalingei IDP Camps and Surrounding Villages, dated April 2009.
- Internal Evaluation Report by NCA/DCA "Participation, Security and Soap", dated 20th of November 2009.
- Single Form (revised proposal and intermediate report) for "Emergency Water, Sanitation and Hygiene Promotion Crisis Response in Darfur, dated the 2nd of February 2010 (revised proposal) and the 12th of December 2009 (intermediate report) (Donor: ECHO).

4.2 Observation of Interventions

Observation of the WASH interventions is particularly valuable, as this method introduces relatively little bias. The consultant visited a representative portion of the water supplies and latrines, camp surroundings, and attended a hygiene promotion group session. The observations aimed at identifying the appropriateness of the interventions (water protection, queues at distribution points, spillage observed, latrine state, presence of faeces in the surroundings, hygiene promotion techniques, visual aids, HP targeting). Due to the issues described in section 2.2 only the 3 IDP camps in Zalingei could be visited.

4.3 Meetings with community representatives

Partially structured meetings were held with community leaders at all visited camps to provide some information and to introduce the evaluation team, explain the purpose and agree on the evaluation activities that would take place. The key information to be obtained was related to the current 'sustainability' of the services (where relevant) and the responsibility the community could take on in the future (see points E and F of Chapter 3). Due to the issues described in section 2.2 only the 3 IDP camps in Zalingei could be visited.

4.4 Focus Group Discussions

Focus group discussion were held in 6 IDP camps: Deleigh, Jableen, Khamsa Dagaig, Hamedia, Hassa Hissa and Bilel. In most camps separate discussions were held with groups of adult men, adult women, boys between 8-15 years of age and girls between 8-15 years of age. The exceptions were Hassa Hissa where discussions with girls and with adult men were both cancelled due to a security issue and Bilel where discussions with girls and women were both cancelled due to unavailability of the facilitator. The groups had approximately 10 participants and were facilitated by Halema Ibrahim, an NCA staff member in the Organisational Development and Capacity Building Department, (women and girls) and Sulieman Ibrahim, an independent research assistant hired for this evaluation, (men and boys). An attempt was made to have a representative group with individuals of different backgrounds and different ages. The facilitators used a list of pre-defined questions to guide the discussion without providing any technical input themselves and tried to ensure that all participants shared their views and nobody dominated the discussion. The purpose of the Focus Group Discussion was to use the findings for triangulation of the KAP survey Results that would be provided by NCA.

4.5 Discussions with community individuals during house visits

During the walk through the camps and host communities the consultant and his assistants visited beneficiary households. The assistants each visited 5 households in all of the 6 visited camps and interviewed a household member with a structured questionnaire. The consultant conducted unstructured interviews during separate house visits (at all 3 visited camps in Zalingei). Questions covered were in particular those mentioned under points B, C and D in Chapter 3. The purpose of the Focus Group Discussion was to use the findings for triangulation of the KAP Survey Results that would be provided by NCA.

4.6 Discussions with water point caretakers

The goal was to assess the ownership arrangement and the responsibilities for operation, maintenance and repair and to assess whether this arrangement works.

4.7 Discussions with UNICEF

Semi-structured meetings with UNICEF in their roles of WASH coordinators were held in Zalingei and Khartoum (visits in Nyala were cancelled due to lack of time on return from Zalingei). These meetings covered the views of UNICEF as well as WES, on the services provided by NCA in the target camps and host communities during the evaluation period from 2008 until mid 2010. These discussions also served to gain an understanding of the WASH sector strategy for the future and in particular the role of the community in the management of WASH services.

4.8 Discussions with NCA staff and community volunteers

Briefings were held by NCA in Khartoum, Nyala and Zalingei to provide the background on the WASH programme. In addition continuous ad-hoc discussions were held with NCA staff and community volunteers to provide details on the programme activities, constraints and developments. Key NCA staff involved were Christopher Nyamandi, John Birchenough, George Wambugu, Mukhtar Idris, Ibrahim Mohammed, Halema Ibrahim and Ahmed Mohammed Ali as well as Sulieman Ibrahim, an independent research assistant hired for this evaluation.

4.9 Analyzing Health Statistics

Analysing disease incidence is the only real direct impact assessment of a water and sanitation programme. However, there are usually severe limitations in analysing this, in particular due to variations over time in population sizes, in healthcare providers and in clinic catchment populations. Dr. Raymond Mutisya (NCA Health Manager) provided data related to diarrhoea incidence in several camps where NCA provides health services.

4.10 KAP Survey Design and Studying of Results

The consultant provided advice on the design of a KAP survey. NCA had the responsibility for carrying out and analyzing it. The final results of the survey were not available at the time this report was written. However, rough collated data was available and key parameters were analyzed by the Consultant and used in this evaluation. A separate 2010 KAP survey report that is being prepared by NCA will have additional findings and conclusions.

NCA has conducted some KAP surveys in the past. Unfortunately, the methodology and survey quality was not consistent. To enable the evaluation of beneficiaries' change in behaviour, knowledge and attitudes related to WASH, at least one baseline survey had to be compared with an evaluation survey with a replicated methodology. Considering the inconsistency of past KAP surveys it would have been difficult and undesirable to replicate earlier surveys. Moreover, the Darfur WASH sector, headed by UNICEF, has developed a standard KAP survey form. Using the standardized form has advantages in

the ability to collate and compare data from different WASH implementing agencies. In discussions between the consultant and the NCA WASH Manager for Darfur it was concluded that it would be preferred to use the standard form.

However, using this form unchanged would have virtually eliminated the potential to reliably evaluate the behaviour change with the forthcoming survey as most questions would have been asked in a slightly different way than done in earlier NCA surveys. NCA was committed to providing an evaluation of current behaviour change status and ECHO expected this for their project. Therefore, the consultant looked into the possibility to amend some questions in the standard form to allow the evaluation of the change in at least some key knowledge, attitudes and practices in the ECHO target areas compared to either a 2007 or 2009 baseline KAP survey.

The consultants' advice regarding the design of the KAP survey is included in annex B.

5. Findings

This Chapter discusses the findings under both evaluation objectives.

5.1 Impact of the WASH Program

The real impact of a WASH program can be demonstrated by showing a significant reduction in morbidity incidence of WASH related diseases and the absence of outbreaks. The NCA Health department in Darfur provided data on the amount of cases of diarrhoea reported to the health clinics operated in some of the camps where NCA has implemented WASH projects, i.e. Khamsa Dagaig, Hassa Hissa, Hamedia and Deba (included as annex D).

The available data has the following limitations:

- NCA considers data before 2008 unreliable and therefore the period to be reviewed is limited. Yearly fluctuations (e.g. due to weather) cannot be filtered out in such a brief review period.
- The clinics' catchment populations have changed due to new births, deaths, population movement and possibly the closing of clinics. Unfortunately, population figures are not reliable and cannot be verified. Therefore, the variation in clinic catchment population size is not known and the incidence rate in number of reported cases per 10,000 people per month cannot be determined reliably. Only the total number of cases in each camp is known.
- Some of the figures after 2008 are questionable according to the NCA Health Manager. Those concern months in which no cases or a very low amount of cases were reported.

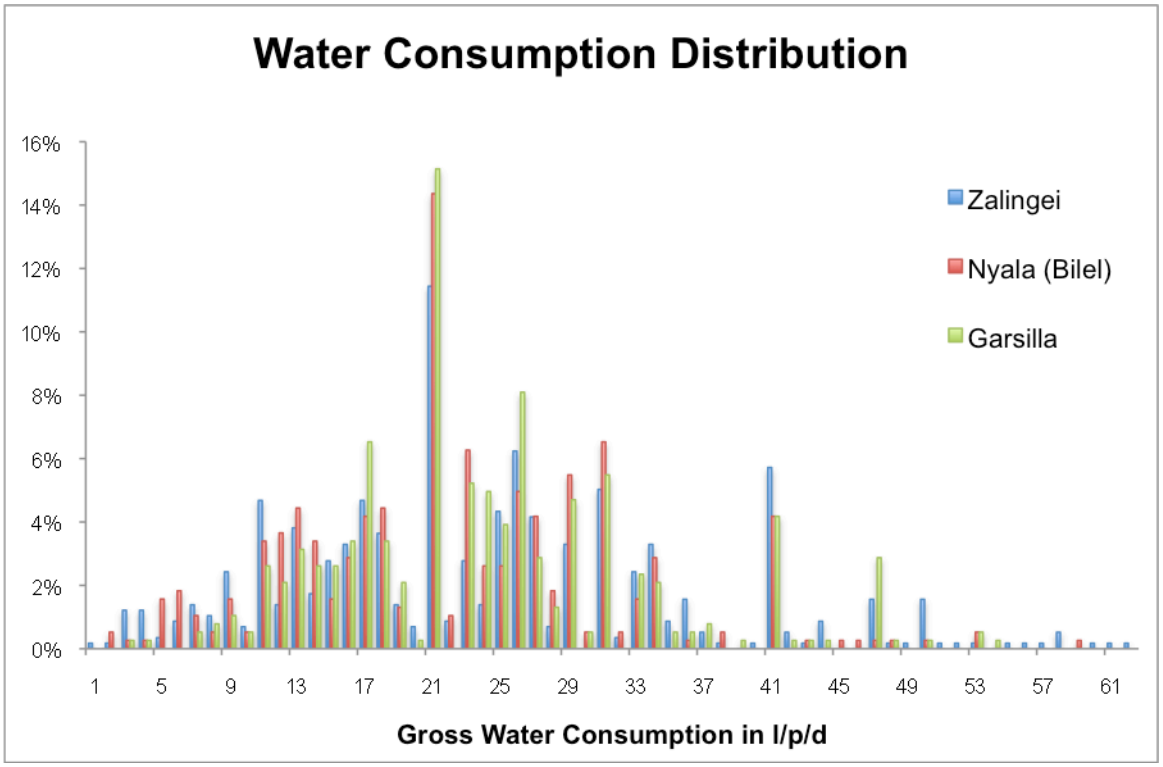
Diarrhoea accounts for between 5 to 22% of the medical conditions diagnosed in the clinics. The data shows that no major outbreak of diarrhoea has occurred in the review period. The impact of the WASH Programme was probably a significant factor in the avoidance of major diarrhoea outbreaks during the review period. The limitations of the morbidity data and the resulting inability to draw a harder conclusion on the impact of the WASH programme is unfortunately a common characteristic of most humanitarian WASH programs worldwide.

5.2 Water Supply

5.2.1 Water Quantity and Access

The 2010 KAP survey shows an average consumption of 19.6 to 22.2 litres per person per day in the three geographical areas Zalingei, Nyala and Garsilla. (A quantity for livestock and construction use of 6% was deducted based on earlier surveys as well as an estimate of 3% for spillage). Although these average consumption figures are

satisfactory as they are significantly above the minimum of 15 litres per person per day, there is a concern about the low consumption of a segment of the population. The distribution graph below demonstrates that a large percentage of the population consumes less than 15 l/p/d in all 3 geographical areas (exact figures: Zalingei: 32% (± 4%), Nyala: 32% (± 5%) and Garsilla: 26% (± 5%).



This could have a variety of reasons including hygiene awareness, distance to water collection points, availability of household collection and storage containers and queuing time or flow rate at the distribution points. NCA is planning to conduct a survey to measure queuing times and distance. This survey as well as the 2010 KAP survey report should shed some light on this.

Maps would be a useful tool in determining the maximum walking distance to a water point and in planning future construction or optimization. No maps of the Zalingei camps showing the different water distribution points were available in the office at the time of the visit (apart from design schemas of the distribution systems). However, OCHA has basic maps to scale that could be used if they are sufficiently up-to-date.

In general, IDPs certainly have much better access to water in the camps than they had at their pre-displacement homes. The key humanitarian justification for this is the higher risk for outbreaks of diseases in fairly crowded conditions. However, better water supply in camps may very well be a significant factor that would reduce the incentive to return. Therefore, should the security situation improve in the future, a successful return programme would have to be linked with the rehabilitation of previous water supplies as well as the development of new ones.

5.2.2 Water Quality

Water supplied from shallow wells through pipe networks is chlorinated. This is appropriate as this water is unlikely to be safe. Even if the sources are safe, contamination will enter through unavoidable pipe leaks because the pipes are not continuously under pressure (no 24 hour supply). The presence of residual chlorine for post-distribution protection is an added advantage. There is a widespread acceptance and preference for chlorinated water in the visited IDP camps in Zalingei.

Hand pumps are much deeper than the hand dug wells and presumably tap into a different aquifer. Hand pump water from boreholes cannot easily be chlorinated on a continuous basis. However, NCA implements chlorination campaigns for one month during the rainy season, when the risk of diarrhoeal disease outbreaks is the highest. During these campaigns chlorine solution is added to filled water containers at the hand pumps. This is an appropriate activity.

NCA tests the hand pump water regularly and rarely finds unacceptable levels of faecal coliforms. The maximum threshold of 10 faecal coliforms per 100 ml is appropriate (note that Sphere considers 0 faecal coliforms the required level). If unacceptable levels of faecal coliforms are found in the camps in Zalingei, the response is to conduct a sanitary survey to find the cause, to try to resolve the cause, to shock chlorinate, and to test again later when the chlorine has disappeared. This is an appropriate approach.

A surprisingly large 40% (± 3%) of the population reported using some form of household water treatment. A combination of the following methods was reported: boiling by 13%, chlorinating by 17%, using some kind of filter or cloth by 20%, using solar disinfection by 6%, and improving water through storage (time) by 31%. Further analysis on the KAP Survey data could be done with advanced queries to identify whether household treatment practices vary depending on the type of water source that is used. The purpose would be to better understand the awareness of water quality and behaviour with respect to filtration. For example, treating chlorinated piped water in the household has a very limited use and may be a waste of resources that could be addressed in hygiene promotion. On the other hand, treating water from the wadi is a very good practice that should be encouraged if necessary.

The KAP survey found that there is room for improvement in water storage and handling. The interviewers observed that 16% (± 3%) did not keep the place where water is stored neat and clean, 15% (± 3%) did not keep their water storage containers covered and 37% (± 3%) did not handle water hygienically when offering a glass to the interviewers.

5.2.3 Water Supply Solutions in Zalingei

The quantity of water in the 3 visited camps in Zalingei is generally[1] sufficient as indicated in section 5.2.1. Safe water is available from hand pumps and piped networks.

[1] *However, further analysis of individual camps is required and will be reported on in the 2010 KAP survey report.*

The networks supply chlorinated water with centrifugal pumps from hand-dug wells. In addition, especially in Hassa Hissa, people buy water from donkey carts. This water is pumped from a shallow aquifer in the 'dry' wadi by private vendors (bought for 1 SDG and sold for 5 SDG)[2]. The KAP survey results show that virtually no people report using this water for drinking and an in all camps combined 1% (± 3%) report using water from donkey carts for other purposes.

The water supply solutions in the Zalingei camps are largely appropriate, but efficiency can be increased as well as the preparedness for unforeseen events. The water committees are aware of their responsibilities, and the water is likely to be safe. The main issues with the current pipe networks in the visited camps in Zalingei are the difficulty in maintaining the variety of differently branded centrifugal pumps that are used and the high fuel demand to run them. There is a concern about the continuity of these systems should the available budget reduce or NCA no longer have access (see section 5.2.5)

Some PVC pipes at the water tanks are exposed to UV light and will deteriorate if not covered or replaced with non-UV sensitive pipes. Some sections of underground pipeline appear particularly vulnerable to damage and are frequently repaired. Several connections at the hand dug wells and reservoir were found leaking during the visit. Some wells were not covered.

The sources of the different networks are located close to each other, because different systems used to be operated by different NGOs. No pumping tests were conducted on these hand-dug wells so it is not known if they have significant spare capacity. Some of the wells have a low water table and the centrifugal pumps are operating close to the theoretical maximum suction head (of any centrifugal pump). This raises a concern about the fuel-efficiency of these pumps compared to an alternative solution with submersible electric pumps.

5.2.4 Solar-Powered Pumps

NCA has installed solar-powered systems camps in Kubum and Garsilla to replace fuel-powered systems. These systems could not be assessed in this evaluation due to the issues mentioned in section 2.2. NCA is planning to install additional systems in the Zalingei camps. Solar-powered systems that can be purchased, installed and repaired by Sudanese companies are an attractive option in Darfur because of the abundant year-round sunlight.

From a purely economical point-of-view the choice of a solar-powered pumping system versus an electrical submersible pump with generator may or may not make sense. For

[2] *Flexible pipes are covered with a cloth filter and buried about 1 meter deep in the wadi where water is present. The backfilled hoses are connected to a small centrifugal pump at the surface. The water is pumped straight into donkey carts. The aquifer is unconfined and shallow and should therefore be considered unsafe. The filling hose lies on the ground in between uses and introduces pollution from the surroundings to the donkey cart.*

an accurate analysis the missing information is the unknown required life of the system and the unknown long-term cost of repairing and maintaining it. However, the short-term advantages of a solar-powered system in the next few years in reducing monthly operating costs and increasing chances of continuity of water supply in a new emergency or possible drying up of funding, are significant. It is expected that these benefits would outweigh the much higher capital costs if the systems are reliable in the short-term (5 years) regardless of the unknown life and long-term maintenance and repair costs. Naturally, this is only an option if funding for the significant capital investment is currently available.

5.2.5 Continuity and Responsibility

NCA is responsible for operation and maintenance of the water supply infrastructure. Some labour for the pipe networks is provided for free by the IDP community. The water committee technicians conduct simple repairs for free. NCA would like to hand over systems to the water committees. Considering the length of time the camps have been in existence without an end in sight, this would be ideal. Moreover, if water supply is fully managed by the community it will offer the best possible chance of some continuity[3] in case funding dries up or NCA can no longer work in Darfur. Because of the unexpected expulsion of several NGOs in March 2009, it is prudent to consider a scenario where NCA suddenly has to leave too.

In a scenario where the systems are handed over, the committees would employ the water attendants and technicians, purchase spare parts and, through additional training, have the full capacity to operate and maintain the systems and hand pumps. Funds would be provided through NCA or the government and in the future possibly through charging usage fees. However, there are several issues that may make such a handover impossible, or very difficult, in the current context.

Firstly, Sudanese law is very employee-employer focused. Water attendants for the pipe networks used to be paid through the water committees, which was desirable because it gave the water committee more responsibility and feeling of ownership. However, NCA realized that legally this is a problem in Sudan and NCA now formally employs water attendants that work on the water supply systems on a daily basis. For legal reasons, the water attendants need to have employee status as the possibility of working on incentives is not present under Sudanese Labour Law[4]. In order for the water committee to take over operation and maintenance they will have to become legal bodies and register with the government. This may very well be a step the water committees are not willing to take. For the hand pumps this issue is less relevant as hand pumps do not require full-time attendants.

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[3] Continuity concerns the ongoing service provision for as long as the camps are in existence. Since the IDP camps should still be considered temporary it would not be realistic to aim at sustainable service provision, in the Consultant's opinion.

[4] From a discussion with the NCA Auditor, Mr. I. Dent.

Secondly, very few spare parts are available locally. Most parts for the water supply networks and hand pumps are procured in Khartoum. It would not be feasible for IDP water committees to purchase parts in Khartoum. It may be possible to get local vendors interested in stocking spare parts for hand pumps because only one type of hand pump (India MK II) is used and these pumps are also used in rural communities. However, for the variety of different motorized pumps and pipes, and possibly HTH (chlorine) this may not be feasible.

Thirdly, handing over ownership of the networks to a community that is 'temporary' may cause problems in the future. This may not be an issue if the settlement becomes permanent, but could very well become a source of conflict if the IDPs are leaving.

Because of these issues, it would probably be better to keep ownership of the systems with NCA and maintenance responsibility largely as it is while increasing the limited contribution of the community as much as is legally and realistically possible.

5.2.6 Preparing for Return

There is no realistic expectation for the return of significant numbers of IDPs to their homes of origin in the near future. It may therefore seem too early to plan a support programme. However, there are WASH-specific considerations in the current programme that are worthwhile to take into account.

As mentioned in Section 5.2.5, a return programme would have to be supported with the rehabilitation and new construction of water supplies. This increases the already considerable value of NCA's drilling rig and drilling team and is a strong additional argument to maintain the drilling capacity by continuing to make use of it in the current programme. A donor such as ECHO will likely be responsive to this argument. The same additional argument could be made for maintaining a reasonable level of other NCA WASH staff in Darfur. Considering the points made in section 5.2.5, this will probably already happen for staff involved in water supply.

If the data is available, or can be obtained, on the areas of origin of the IDPs in the camps in which NCA currently works, these should be collected. The data could be analyzed to identify key geographical areas of future support. If the security situation allows this, quick assessments of the water supplies could be conducted. The findings including estimates of the human and material resources required for rehabilitation and construction would allow NCA to mobilize quickly

5.3 Excreta Disposal

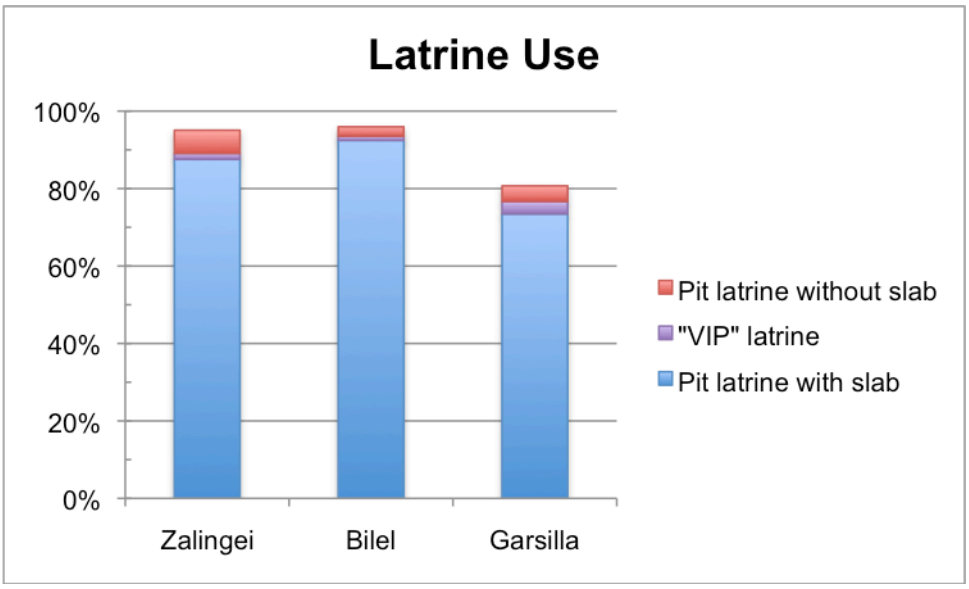
5.3.1 Latrine Availability and Usage

The 2010 KAP survey showed that 86% of the households use a latrine in the camps where NCA is currently responsible for sanitation programmes. In addition, 4% use pits

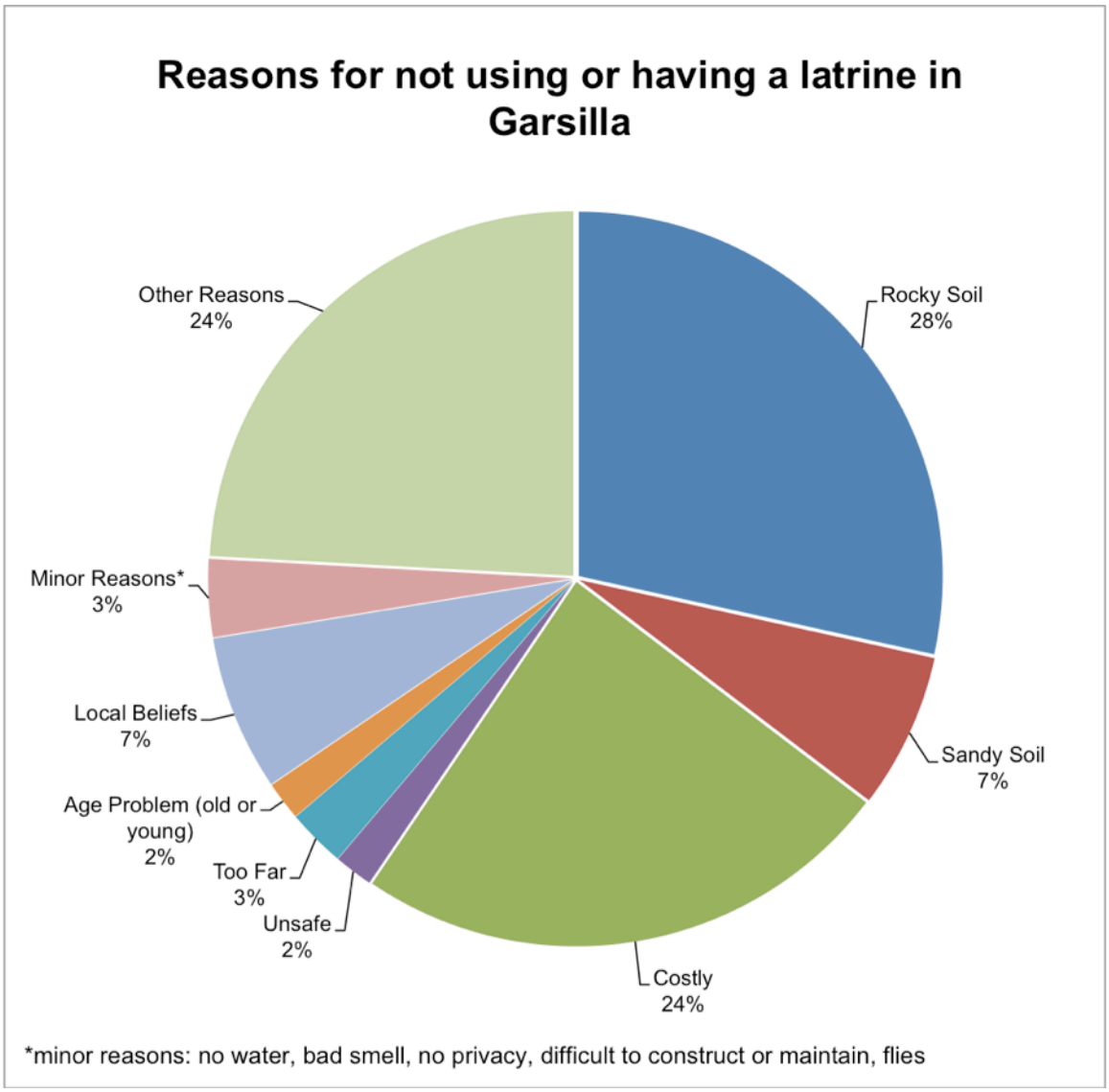
without a slab, some of which may also be safe from an environmental health perspective. Some households share a latrine with other households.

Considering the fact that most IDPs were likely not using latrines in their areas of origin the usage data presents an impressive overall result. Nevertheless, the Focus Group Discussions indicated that some open defecation generally takes place in all camps in sections where new arrivals are located that have not yet constructed a latrine.

When analyzing latrine use in the 3 geographical areas separately using the graph below, the picture changes somewhat. Bilel and Zalingei appear particularly well covered. Once all new arrivals and newly formed families receive a latrine, these camps will become very close to achieving the realistic maximum coverage. Unfortunately, the latrine use in Garsilla is insufficient with 19% of the population reportedly practicing open defecation.



The following graph illustrates the reasons cited in the KAP survey for not having or using a latrine in Garsilla. The reasons indicate that more latrine promotion is required to address a significant portion of the problems with open defecation. The cited costliness of a latrine should be addressed by NCA's ongoing programme to provide new latrine kits to new arrivals and to newly formed families in the camps. The 'Other' reasons will require further analysis of the KAP survey data in order to find possible significant common reasons. It may be difficult to address geological reasons that make it impossible to dig a latrine, other than locating latrines further away from the household and promotion.



5.3.2 Latrine Construction Quality

The type of construction materials and slab sizes in the visited camps in Zalingei are appropriate. There appears to be enough demand for latrines for beneficiaries to participate significantly in the construction. NCA uses the correct approach to only provide the slab and superstructure materials after the beneficiaries have dug their pit.

The house visits in 6 camps indicate that there may have been a significant amount of latrine collapses especially in Khamsa Dagaig and Bilel. The sample size was too small to provide reliable estimates of the scale of this problem. Latrine collapses are obviously dangerous and it is therefore worthwhile to investigate further. It would be useful to know if the collapses are related to a particular way of constructing the latrines. Several actors have been involved in latrine construction in the past using different slabs and supports. In both Bilel and Garsilla problems exist with unstable soil. An effective partial or full lining solution should be found to enable the safe construction of latrines in these conditions.

5.3.3 Latrine Maintenance and Cleaning

Beneficiaries are maintaining the superstructure with a variety of materials. Some have upgraded the latrine walls with mud bricks similar to their (much larger) compound walls. NCA has been providing latrine wall 'rehabilitation materials' (in Zalingei: jute/burlap and rope) to beneficiaries. Since households already maintain large compound walls and latrines seem to be considered important, it no longer seems necessary to provide latrine maintenance materials. Instead, beneficiaries can use whatever they can obtain that provides sufficient privacy. Most visited beneficiaries and the Sheikhs in Zalingei mentioned that they could maintain the latrines without support.

The evaluation house visits raised a concern about the lack of latrine 'keyhole' covering. Therefore, an observation question was added to the KAP survey form and this revealed that 71% (± 3%) of the latrine keyholes were uncovered. The problem is greatest in Zalingei (74% ± 5%) and Nyala (76% ± 5%) but also present in Garsilla (60% ± 5%). The extent of the problem in the different geographical areas was largely supported by the findings of the house visits during the evaluation fieldwork. Although, at the time of the visit in May not many flies were present in Zalingei, uncovered latrine slab holes present a significant health hazard.

According to assessment by the KAP interviewers 27% (± 3%) of the latrines were not clean. Depending on other key behavioural hazards that will be identified in the KAP Survey report, it may be appropriate to add latrine cleaning as a key hygiene message in a subsequent hygiene promotion programme.

5.3.4 Excreta Disposal Continuity

It is likely that the excreta disposal practices will deteriorate if NCA can no longer work in Darfur[Error! Bookmark not defined.] or if the funding dries up. However, by achieving a high latrine usage ratio before this happens and by clearly giving beneficiaries the responsibility for maintenance and replacement of latrines, the impact would be limited as much as possible. This would seem the only realistic approach to ensuring a continuation of safe excreta disposal practices in such a changed scenario.

5.4 Hygiene Promotion

A comprehensive evaluation of the effectiveness of the hygiene promotion component requires the comparison of the 2009 KAP survey data, serving as a baseline, with the 2010 KAP survey data. The results of this analysis were not available by the time of writing this report. It is recommended to study the 2010 KAP survey report as it will provide an overview of the improvements in knowledge, attitude and behaviour that can be attributed to the NCA WASH programme.

5.4.1 Monitoring and Evaluation

As mentioned in section 4.10, a need was identified for a consistent KAP survey system. The survey designed under this evaluation is outlined in Annex B and C. It is recommended to repeat this survey in all locations once a year, and ideally in the same month to avoid errors due to seasonal variations.

Each year the hygiene promotion messages will be determined by the outcome of the latest KAP survey and address the key health hazards that are identified. The key messages should also be used as project indicators. Not all of the current hygiene indicators used by NCA are useful. Poor examples include:

> CHF 2010: "*80% of sampled beneficiaries ... report a greater awareness and practice of low risk hygiene and environmental sanitation*".
>
> ECHO 2009: "*70% … continue the proper hygiene and environmental sanitation practices on their own 1 month after project completion*".

These indicators are not specific, as they do not define what is "greater awareness and practice" and what are "proper hygiene and sanitation practices". Instead a specific indicator based on a key hygiene message identified in the previous KAP survey should be used such as:

> *"In Zalingei the amount of latrine keyholes covered will increase from 26% to 60% within the project period"*

5.4.2 Implementation of Hygiene Promotion

The variety of different hygiene promotion methods used in Zalingei is adequate but the programme may benefit from using more physical demonstration methods. For example, glitters could be used to powerfully demonstrate the transmission of pathogens via hand shaking.[5]

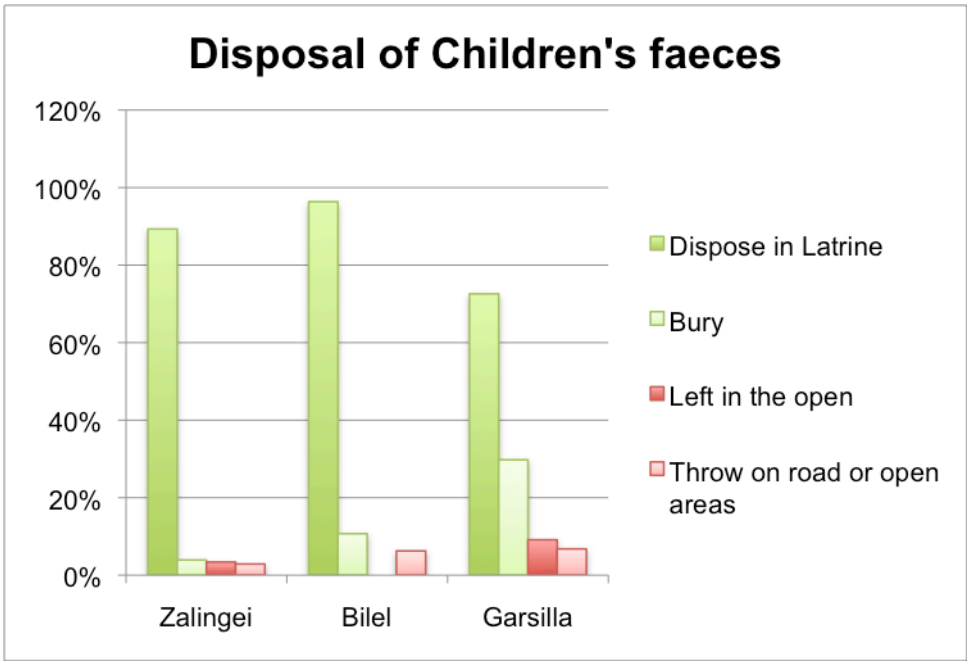
The amount of hygiene promoters in each camp should normally be proportional to the size of the target population. This is currently not the case as Khamsa Dagaig has 7 promoters covering an estimated population of 19,050 and Hamedia has 11 promoters covering an estimated population of 60,222. A guideline of 1 promoter for every 2,000 people would seem sensible. However, this may be adjusted based on the outcome of the KAP survey, which will demonstrate the amount of work that needs to be done in each site.

[5] *The facilitator secretly applies some glitters to his/her right hand and shakes the hands of the participants when they arrive. During the session, he/she asks the participants to look at their hands and see that the glitters (pathogens) have transferred. Many other demonstration methods can be designed that address specific behavioral concerns.*

5.4.3 Current Status of Hygiene Practices

In addition to the already mentioned behaviour with regards to household water treatment, water storage and handling, and the covering of latrine keyholes in sections 5.2 and 5.3, this evaluation looked at the handling of children's faeces and hand washing practices.

Young children's faeces are the most hazardous because generally they contain a higher concentration of pathogens than adult's faeces. Data from 2010 KAP Survey shows the reported disposal practices are safe in all locations (green is safe, red is unsafe and participants were allowed to have multiple answers).



This finding was supported by the findings of the house visits in these camps

The single most important factor that prevents the transmission of faecal-oral diseases is hand washing. The following table shows when the beneficiaries wash their hands according to their response when asked this question.

Hand Washing as Reported by Beneficiaries

confidence interval:	Zalingei ±5%	Belil ±5%	Garsilla ±5%	All ±3%
when hands are dirty	45%	50%	35%	43%
before prayers	18%	75%	37%	43%
before food preparation	45%	47%	48%	47%
before child weaning*	11%	80%	22%	38%
before eating	66%	47%	72%	62%
after urination	17%	68%	33%	39%
after defecation	51%	33%	52%	45%
after cleaning child after defecation/urination*	12%	56%	12%	27%
after eating	50%	88%	55%	64%

* The respondent may not have been responsible for weaning and cleaning a child

Although this question has limitations, the presented behaviour is worrying and needs to be addressed in future hygiene promotion campaigns. It should be noted that the instructions to the KAP survey interviewers were to probe for more answers and the extent to which this was done is critical for reliability. Because of this, the real confidence interval may be higher than the one indicated in the table based on sample size. It is nevertheless safe to conclude that the population in Belil shows particularly poor hand washing practices at critical times before eating and after defecation. It will be interesting to compare the recent findings with the 2009 baseline KAP survey. Particular attention should be given to hand washing after defecation and before eating as these would be expected to be mentioned when respondents are probed.

6. Conclusions and Recommendations

The situation with regards to water, sanitation and hygiene in the NCA-supported camps in Zalingei is reasonable as key transmission routes of faecal-oral diseases are blocked. The Consultant could unfortunately not personally visit the camps in Garsilla and Nyala. However, from the information that could be obtained, the camps in these regions are also enjoying a reasonable WASH service. From an environmental health perspective the key concerns are the low usage of latrines in Garsilla and the lack of some key safe hygiene practices in all camps.

There is scope to improve the WASH programme by reducing the operating costs and management requirements. This will serve to prepare for a situation where NCA can no longer provide support or the available donor funds reduce.

The evaluation provides the following recommendations for improvement:

I. **To improve impact measurement, diarrhoea morbidity data should continue to be collected (by NCA Health) and with an improved reliability.** The NCA WASH department should request the data on a regular basis and use it to track their progress, justify interventions and become able to reliably measure impact of their programme. However, in order to do this, accurate population (clinic catchment) figures and their fluctuations over time will be required, which may be the key challenge.

II. **Focus the water supply component on reducing the monthly costs of water supply by making smart capital investments.** The following recommendations for the next few years could help to achieve this.

III. **Increase the amount of hand pumps, where water taste and quality is acceptable.** This will reduce dependency on pipe systems and increase the coping capacity of the IDP population if the situation changes and they no longer have the same level of support that NCA has been providing. Because NCA has its own drilling rig and experienced crew it is in an excellent position to increase the amount of hand pumps provided the drilling rig does not reach the end of its life as an earlier rig did. It is recommended to continue efforts to make community committees responsible for maintenance and repair, including more difficult repairs. As long as the economic means of the IDPs remain limited, NCA should continue to provide spare parts to the committees. To improve chances of future sustainability it is worthwhile to try to get the private sector interested in stocking hand pump spare parts in areas where WES does not have this capacity (e.g. in Zalingei). NCA could provide a stimulus to local businesses by trying to procure hand pump spare parts locally.

IV. **In the future, reduce the amount of piped water pumped each day based on future water consumption surveys (which are part of the new KAP survey) results and the previously recommended new construction of boreholes with**

hand pumps. Eventually, pumps may be shared by two independent systems that are filled consecutively. This would simplify the maintenance requirements.

V. **Standardize motorized pumps in each of 3 geographic areas.** Purchase the highest quality pump available locally and maintain a spare capacity for when a pump is being repaired or maintained. This may mean the replacement of many existing pumps. Replacing centrifugal pumps would be a relatively small investment with considerable maintenance advantages and better potential for continuity during unforeseen events. In Zalingei both IDPs and NCA staff preferred to use Andoria[6] pumps due to their low maintenance requirements and local availability. Further investigation is required to select the best locally available type in all 3 locations and include the availability of spare parts and fuel efficiency, if possible. Submersible pumps with generators should also be considered at sources where the drawdown and water table depth require centrifugal pumps to operate at less than 80% of their Best Efficiency Point (BEP). This would reduce the fuel consumption. If this appears to be the case with most of the hand dug wells, NCA should consider replacing all centrifugal pumps with submersible ones with locally available generators[7].

VI. At the end of the dry season, conduct pumping tests of the wells that are used as sources for the pipe networks. If the tests show that the capacity is high enough to supply more networks with the same source, the number of sources can be reduced. This would reduce maintenance costs as fewer attendants will be required to manage the systems. It is worthwhile to consider increasing the yield of a hand dug well by deepening it or jetting borehole screens in the bottom as done in a recently constructed well in Hamedia.

VII. **Consider supporting alternative commercial water supplies with a one-time investment**. This would be particularly attractive for supplies that are already used by the target population. The goal would be to make this water safer for consumption e.g. by improving the source protection and facilitate the hygienic filling of donkey carts in a filling station. Although this water is not provided for free, the commercial supplies are the most likely to continue in a new emergency scenario.

VIII. **Evaluate solar-powered systems already constructed or planned by NCA**. If no problems arise with breakdowns or theft, consider scaling up by replacing more carbon fuel-powered systems. A detailed cost-benefit analysis may not be possible due to too many unknowns. However, if the systems are considered reliable for the first 5 years, it is expected that the benefits in continuity during reduced funding or NCA expulsion, would outweigh the much higher capital costs regardless of the unknown life and long-term maintenance and repair costs.

IX. Durably replace or protect vulnerable parts of the above ground and underground pipelines to reduce the amount of future leaks.

---

[6] Andoria pumps are made in Poland. NCA inherited and is operating two of these pumps in Hamedia camp.

[7] An exception would be the situation seen in Hamedia where small reservoirs are placed next to the source for chlorination. In this situation centrifugal pumps are required to pump from the lower reservoir to the elevated reservoir.

X. **Investigate the reasons for low water consumption amongst a third of the IDP population.** A good start would be to analyze the already planned water point queuing-time-and-distance survey. If significant issues are uncovered in this survey, they should be addressed and the subsequent KAP survey could identify whether fewer people consume less than 15 l/p/d. If the queuing-time-and-distance survey does not identify significant issues, further analysis is required.

XI. **Use basic though accurate maps of the camps to assess walking distance to water distribution points and to plan the locatio of new boreholes.** If not available or reliable from third sources such as OCHA, the maps could be created by a GPS trace of the contours and main roads of the camp and the GPS locations of all the water points. Google Earth or other mapping software and a GPS with drivers and cables to export data from the device to the computer will be required. Note that the maps do not need to be detailed, as long as they are to scale.

XII. **Prepare the essential WASH support a future return of IDPs by maintaining at least a basic level of WASH staff.** Return of IDPs will have to be supported with at least the rehabilitation and new construction of water sources. This provides an additional argument for maintaining NCA's drilling capacity and reasonable level of staffing. Although, this additional argument is probably not required since there are reasons based on the needs of NCA's current beneficiary population in IDP camps to do this, it is nevertheless useful to keep in mind and important to describe in project proposals to donors. If possible, data on IDP origins should be analysed to identify key areas of return and assess the water supply situation in those areas.

XIII. **Set up a reporting mechanism and investigate all future latrine collapses.** The purpose is to find out if there are common reasons for collapse and if the current construction techniques need to be revised.

XIV. **Provide a latrine solution with partial or full lining in areas where the soil is unstable.** This recommendation is related to the previous recommendation and also to the reported issue in Bilel where latrines could not be constructed. Since Bilel, could not be visited by the consultant, a more detailed recommendation on the lining cannot be provided.

XV. **Stop providing latrine rehabilitation materials.** This is not only appropriate to increase the beneficiaries' responsibilities; it will also reduce the maintenance budget of NCA. The latrine strategy should be to only provide new latrine kits to new arrivals and newly formed families and if necessary a new slab when full or collapsed latrines have to be replaced.

XVI. **The new KAP survey Methodology outlined in Annex B should be used to conduct identical surveys on a yearly basis.** To avoid seasonal bias, the surveys should ideally be conducted in the same month every year at the end of a funding cycle. The surveys will not only serve to monitor progress and report to the donor, but also to assist in programme development. A new project would use the previous survey as a baseline to determine key hygiene messages.

XVII. **Use specific and measurable indicators for hygiene improvement.** The indicators should cover the key hygiene messages for the project and will normally be different in subsequent projects (see previous indicator). *E.g.: The % of people*

that report washing their hands after defecation increases from 35% (+/- 5%) to 55% (+/-5%).

XVIII. **Analyze household treatment practices for the different water sources.** This can be done by conducting advanced queries on the data collected in the 2010 KAP survey to determine the relation between the two relevant questions. The purpose is to better understand the awareness of water quality amongst the IDP population and their treatment practices.

XIX. Determine the appropriate ratio of the number hygiene promoters versus the population size in all camps. A ratio of one promoter for every 2,000 persons may be sensible in the long-term IDP camps. However, based on the issues identified in the KAP survey the ratio of promoters and population can be lowered or increased on a camp-by-camp basis.

XX. New arrivals should be targeted more intensely for hygiene promotion than long-term residents.

XXI. Adopt 'hand washing' as they key hygiene promotion message in all camps in subsequent projects. This message lends itself particularly well to using a powerful promotion method using demonstration of disease transmission via unwashed hands.

XXII. Improve the latrine usage in Garsilla. This will include a more intensive promotion and probably a larger latrine kit distribution campaign. The 2010 KAP survey data of the response 'Other Reasons for not using a latrine' amongst respondents in Garsilla should be analysed to find common reasons that could be specifically addressed in subsequent projects.

XXIII. When available, study the 2010 KAP Survey report by NCA in particular to improve hygiene promotion. Additional key hygiene messages may be identified. Hygiene Promotion methods may have to be revised if the improvements in behaviour, knowledge and attitude compared tot eh 2009 baseline are found to be insufficient.

XXIV. Adopt 'covering latrine holes' as a key hygiene promotion message in subsequent projects.

XXV. Adopt 'safe household water handling and storage' as a key hygiene promotion practice in subsequent projects.

XXVI. **When available, use the 2010 KAP survey report by NCA for additional findings and recommendations,** especially with regards to hygiene promotion.

Annex A: Schedule

date(s)	work days	activities
1-11 May	2	reading, preparation of evaluation plan, travel preparations
10-11 May	2	travelling to Nairobi
12-14 May	3	obtained visa, reading, preparation of evaluation plan
15 May	1	travelled to Khartoum, briefing, reading, preparation of evaluation plan
16 May	1	obtained travel permit, administrative matters
17 May	1	travelled to Nyala briefed by NCA staff finalized evaluation plan
18 May	1	visited HAC to be sent back to Khartoum briefed assistants (Sulieman & Halema)
19 May	3	travelling to Khartoum assistants (Suleiman & Halema) travelling to Garsilla assistants conducted Focus Group Discussions and House Visits in a camp in Deleigh and a camp in town.
22 May	1	assistants returning to Nyala
23 May	1	waiting for HAC
24 May	1	assistants travelling to Zalengei HAC issue resolved
25 May	1	returning to Nyala
26 May	1	travelling to Zalingei visiting HAC meeting community leaders in Hamedia reviewing FGDs and discussion with assistants
27 May	1	meeting with community leaders in Hassa Hissa assistants conducting FGD and house visits in Hamedia visiting Hamedia camp
28 May	1	KAP survey design & discussion
29 May	1	visiting Khamsa Dagaig camp final KAP survey discussion discussion with George Wambugu discussion with Mukhtar and Ibrahim
30 May	1	visiting Hassa Hissa camp assistants conducting FGDs and house visits in Hassa Hissa meeting community leaders Khamsa Dagaig meeting with ACTED meeting with UNICEF (HoO Mohammed Osman & WASH Officer

30 May	1	visiting Hassa Hissa camp assistants conducting FGDs and house visits in Hassa Hissa meeting community leaders Khamsa Dagaig meeting with ACTED meeting with UNICEF (HoO Mohammed Osman & WASH Officer Rashid Mudall)
31 May	1	attempting return to Nyala, flight cancelled writing
1 June	1	return to Nyala debriefing with Ahmed and Chris return to Khartoum
2 June	1	writing
3 June	1	phone conversation with NCA Auditor meeting with UNICEF WASH Khartoum (Chief WASH Haraprasad Vaddiparthi & Head of WES) return flight to Denver at 7pm
4 June	1	arrival in Denver at 6pm
7-16 June	3	preparing incomplete pre-final report (without KAP Data) and submitting to NCA
14 June	-	Sulieman does FGD and house visits in Bilel
17 July	-	receive compiled rough KAP Data from NCA
19-22 July	3	analyzing KAP data, requesting and receiving clarification from NCA, finalizing a full draft of the report.

Annex B: KAP Survey Design Advice

Sample size

Choosing the right sample size requires using a formula with variables for the confidence level confidence interval (aka precision), and population. Contrary to popular belief the sample size does not need to be increased significantly for a larger population, i.e. for a population of 10,000 you need approximately the same sample size as for a population of 100,000. For practical purposes a web-based tool such as http://www.surveysystem.com/sscalc.htm could be used to easily calculate your sample size or to calculate the confidence interval for a particular sample size (The formula used by this application can be found at: http://www.surveysystem.com/sample-size-formula.htm). Since most KAP questions will relate to the household of the interviewer, the 'Population' should be taken as the number of households.

A confidence level of 95% could be used and a confidence interval of 5% would give a good precision. This means that it is 95% sure that a particular result is correct with a plus or minus 5% precision. The confidence interval (or precision) could be increased to 6% or 7% to reduce the amount of resources required.

It is recommended to use this precision for all IDP camps combined in a particular project, and not per camp, to reduce the amount of resources required. This will provide a lower precision per camp but an adequate precision for monitoring purposes and donor reporting. This means that for all 3 ECHO-funded camps combined in Zalingei, the combined sample size is approximately 383 households (and not 3 times 383).

NCA has 3 groups of camps (ECHO, CHF, DIAKONIE) that would each require a sample of approximately 383 households per group. Per group, this would require about 38 effective hours (7 days) for a team of 10 interviewers. It is therefore a large undertaking. To reduce the resources and time required, NCA could decide to use a confidence interval of 6% per donor cluster of camps, which would reduce the amount of interviewees per donor cluster significantly to about 266.

In order to make camp-to-camp comparisons, the sample size per camp should be calculated to achieve a similar confidence interval in each camp. E.g. for Zalingei, using the web applications mentioned before, the total sample size could be divided amongst the 3 camps as shown in the table below.

Camp	pop.	# hh	sample size	confidence interval		
Khamsa Dagaig	19,050	3,810	**188**	7.0% (KAP incl water	**4.0% (water only)**	**5.0% (KAP incl water)**
Hamedia	60,222	12,045	**195**	7.0% (KAP incl water)		
Hassa Hissa (only water consumption part of KAP survey)	62,000	12,400	**195**	7.0% (water only)		
Total	141,272	28,254	578			

The KAP survey also includes a water consumption survey. In Hassa Hissa only the water consumption part of the KAP survey will be implemented as NCA is not responsible for sanitation and hygiene promotion in this camp. To still maintain a confidence interval of at least 5% for all sanitation and hygiene questions combined, this means that Hamedia and Khamsa Dagaig, a combined sample size of 383 has to be used.

Ensuring a random sample

To reduce bias as much as possible, the interviewees would have to be selected randomly. If some kind of household numbering system is used in a site, Excel could be used (RANDBETWEEN formula) to create a randomly selected list of interviewee households or a web-based tool such as http://www.random.org/sequences/. In the consultant's opinion these are the preferred was of randomizing a sample. However, this does not appear to be possible in the camps visited in Zalingei and likely also not in the other camps.

Another method is for interviewers to start at central locations in a camp sector, and toss a pen up in the air. The tip of the pen will indicate the direction they have to walk. They could then pick a random number x from a pre-prepared sheet of paper to pick the x^{th} household to conduct the survey. They could repeat the same method to select the next household. This method should be carefully planned because somehow each area in the camp/sector will have to have an equal chance of being selected for an interview. Rules should be established on what to do when the interviewer reaches the border of a sector or a household that was already interviewed. In the former case, the interviewer could stand at the border and toss the pen again until it points into the sector to continue. In the latter case, the interviewer could toss the pen again.

Ideally, only one person in a household is interviewed and there will be representative distribution of male and female respondents. However, it is far more likely that women are available as interviewees as men are absent. This could be accepted. However, to increase the reliability of the answers it is recommended to

have a higher percentage of female interviewers. If it is difficult to find suitable female interviewers, one option is to extend the duration of the survey and use fewer interviewers.

Recommendations for additions and changes in the survey form

It was agreed to try to use the WASH sector KAP survey form but amend it in such a way that the 2009 KAP survey could be used as a baseline for some key questions. The key recommended amendments are listed below. In addition, after extensive discussion with Ibrahim in Zalingei, several suggestions for improvements to the (UNICEF) WASH Sector form were made for questions that were not appropriate to the context of the IDP camps. Finally, some questions were removed to cater to concerns expressed by HAC. The recommended changes have been kept to a minimum to stay as close as possible to the agreed WASH Sector form and corresponding questions have kept the original number. This will have advantages in case the Sector will start to collate and analyze data from different Sector members. Nevertheless, the changes with the Sector form are quite significant.

The key recommended changes are:

- In questions 9 and 10: Changing water supply answer options to include the real available options and exclude ones that are not applicable in any of the camps.
- Adding additional questions to question #15: “What is the approximate volume of each container used (interviewer may estimate him/herself)? How many times is each used container filled per day (if a container lasts 2 days fill in: ½, if a container lasts 3 days fill in: 1/3 etcetera)?”
- Add additional answer to question 18: “some closed, some open”
- Add new question to 18: “(If you have not yet been offered and accepted a glass of water, please request one.) Was the water provided hygienically without hands or dirty parts of a cup touching the water in the container? [OBSERVE YOURSELF] .. hygienic, .. not hygienic
- Change answer “Neat” to question 24 to “Neat/Clean”
- Add additional answer to question 27: “Lots of flies” and “Difficult to construct”
- Change question 28 to “What are the reasons for latrine use?”
- Change the answers to question 28 as follows: remove “for defecation”, add “social status” and add “provided/persuaded by NGOs” and add “for safety”
- Add answers to Q30: “to kill germs” and “to be free from bad smell”
- Add answer to Q31: with ash
- Remove questions 36, 37 and 39
- Change question 38 to “Have you attended a hygiene promotion group session or drama in the last 12 months?”
- Add new question 43b: “Is there a presence of excreta in the compound? (interviewer observes him/herself)”
- Change disease prevention questions focusing on diarrhoea (Q47) and malaria (Q48).

- Many small changes to reduce risk for misunderstanding by interviewers
- Changes made by Ibrahim based on his experience with earlier KAP surveys and to cater to concerns expressed by HAC, include:
  - Removal of Q 6,7,8
  - Removal of Q11 to replace with separate observation method.
  - Removal of Q19
  - Reduce latrine/toilet options
  - Removal of Q25
  - Removal of anal cleansing questions Q32 and Q34

The proposed revised KAP survey form is included in Annex C. All changes are marked in green.

In subsequent years the form has to be kept the same to allow for easy and more detailed analysis of progress.

Training & Implementation

It is critical to train the KAP survey interviewers thoroughly and go through each question with them. If different interviewers have to be used in different camps it would be preferable to train them by the same person in the same manner. The quality of the survey depends entirely on whether the questions are asked (and translated) correctly and in the same way every year the KAP survey is conducted. For example question 18f (hygienic handling of water) might require significant explanation.

The survey form specifies for which question the interviewer should read the answer options out loud and for which they should not. It also specifies when multiple answers are possible and when only one answer is allowed. This guidance is very important and should remain written in the form. This will avoid changes in the future due to staff turnover or not exactly remembering how it was asked in the previous year.

Interviewers should be told that it is acceptable to make a mistake but they have to make sure that the biased data is clearly marked. For example if an interviewer accidentally reads the answer options but realizes that this was not allowed, he/she should clearly strikethrough this question and the answer on the form to make sure the data entry person will skip this question. It would be useful to check the forms of each interviewer after the first day of the KAP survey to check if there may be misunderstandings or problems with reporting.

In 2010, before the KAP survey is started (and every time it is changed in the future) the form should be tested to remove ambiguities.

Data Cleaning

The data entry person will have to perform certain checks on all forms to discard invalid ones before the data is entered into the system. A suggested check to be performed is: *If the answer to question 20 was 'no facilities' but question 21 or 22 or 23 or 24 or 25 or 26 is still answered, the complete interview should be considered unreliable and discarded.*

Data Entry

Data entry should be done with software that can automatically tabulate results. If NCA already has a trained data entry person and software such as EPInfo or SPSS, it would be best to make use of this. It is highly preferably to keep using the same software year after year to allow for easier analysis of the datasets (baseline and evaluation datasets).

Before data entry, it is recommended to manually number all the paper forms with a unique number and to add this number as a field in the system. This will enable the supervisor to easily perform a random check of a small percentage of forms that were entered in the system. The check would focus on identifying data entry and data cleaning errors. If errors are found, additional reviews by the data entry person and additional checks by the supervisor will have to be performed.

Data Analysis

With the form changes suggested before, the following comparisons with the 2009 baseline in the camps in Zalingei can be made to evaluate progress.

2009 KAP survey Question #	2010 KAP survey Question #	Comments
3	9	the only comparison that can be made is % taking drinking water from safe sources and % from unsafe sources (adding up)
4	15	No need to compare with baseline unless something interesting is observed.
5	18	No need to compare with baseline unless something interesting is observed.
6	16	
14	12	Can probably be compared unless 'by all' was mentioned a lot in 2009
18	18	"5 cover water container" can be compared with "18 …. closed or open"
19	20	combine all latrine types in 2010
20	26	combine girls and boys in 2010
21	23	
22	24	only cleanliness can be compared if "moderate" and "good" from the 2009 survey are combined. Make note of this in the

		report (not so reliable)
24	28	"prevent diseases" and "avoid disease" can be compared. Also "privacy" can be compared"
27	27	"Expensive" and "costly" can be compared (very limited analysis)
29	29	only similar answers can be compared
30	31	only similar answers can be compared
31	30	only similar answers can be compared
32	35	only similar answers can be compared
37	47	only similar answers can be compared

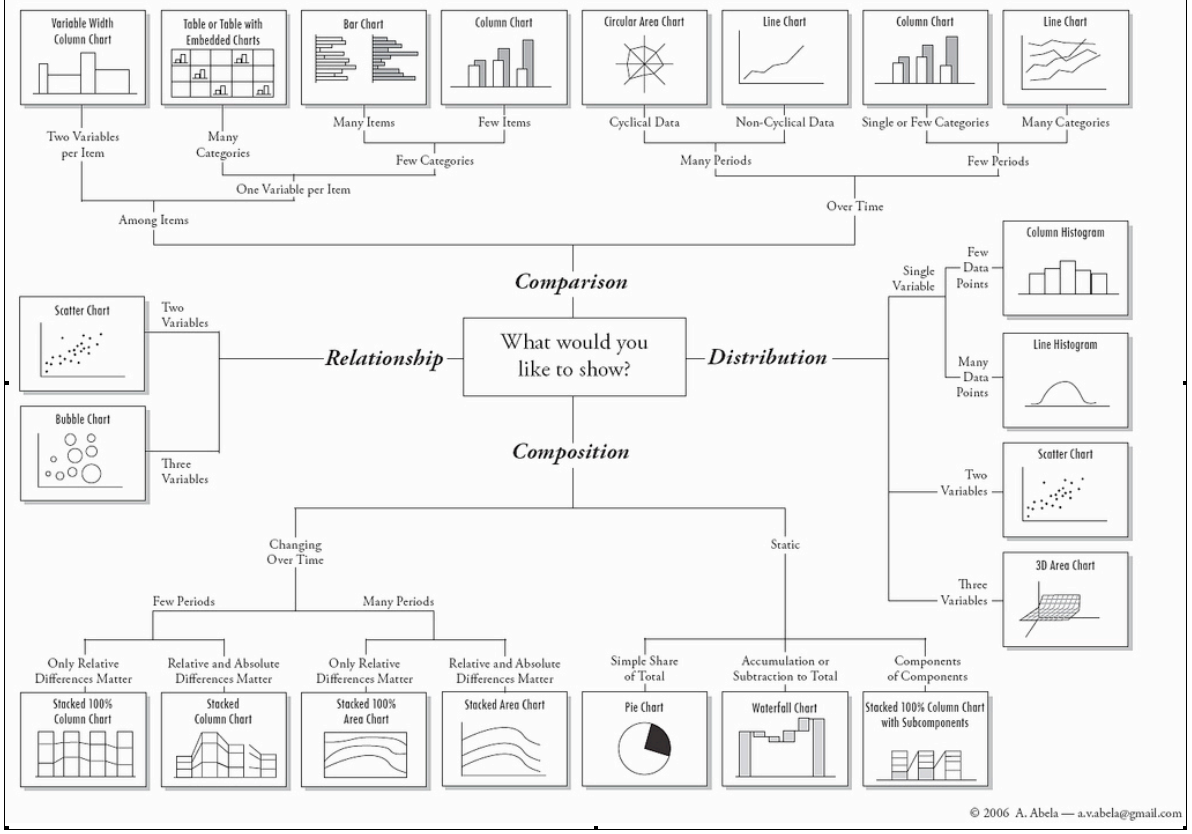
From 2011 onwards the analyses will be much easier and more detailed.

It is important to consider the confidence interval of both the baseline survey and evaluation survey when analyzing results. E.g. if the baseline survey found that 40% **(+/- 15%)** of the respondents washed their hands after defecation and the evaluation survey found that 50% **(+/- 5%)** did this, no reliable conclusion can be drawn.

In addition to evaluating progress, the 2010 KAP survey report should also present an overview of the current knowledge, attitudes and practices. The objective is to identify key Hygiene Promotion messages (and possibly hardware support) for the subsequent year's programme. Each year, the KAP survey would serve as the main tool in designing the future Hygiene Promotion strategy.

An unlimited number of analyses can be performed (e.g. aggregating results by gender, age, education, responses to other questions) so it is important to limit the analysis to what you're trying to achieve, i.e. evaluate improvements and areas of concern. Graphs are important tools for analysis and for creating a readable report and the type of graph should be selected with care. The image on the following page is an excellent tool assist with selecting.

Chart Suggestions—A Thought-Starter



Annex C: KAP Survey Form

(See separate file.)

Annex D: Diarrhoea incidence data

The attached Excel file provides diarrhoea incidence data from Khamsa Dagaig, Hassa Hissa, Hamedia and Deba. The file was prepared by the NCA Health Department.

Notes:

- 2007 data is not considered reliable by the NCA Health Manager
- data marked in yellow is not considered reliable by the NCA Health Manager